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PEREGRINE FALCON GROWTH AND BEHAVIOR FROM NESTING TO DISPERSAL STAGES AT A SMOKY MOUNTAIN EYRIE

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Editor's Note and Abstract. During the summer of 1997 a pair of adult Peregrine Falcons successfully reared three young in the Great Smoky Mountains National Park (GSMNP), as recorded in a previous issue of *The Migrant* (Knight and Hatcher 1997). The adult falcons were first observed in the area on 12 March 1997, and a female was seen entering a suitable nest site on 12 May. Later it was estimated that the chicks hatched on about 17 May. Between 9 June and 17 September, 1997, Dick Dickenson spent approximately 90 hours at Alum Cave Bluff in the GSMNP observing and photographing the rearing of these Peregrine Falcons by their parents. The following is a collection of edited excerpts from notes written by Dickenson, documenting in detail both parent and offspring behavior. The notes cover the period from early nesting (about three weeks old) to the dispersal of the immature falcons.

BACKGROUND

"When observations of three Peregrine Falcon (*Falco peregrinus*) chicks commenced in late spring of 1997, [I noted] with great interest that the nest was in the same spot that the last known... peregrines in the Great Smoky Mountains had nested in 1942 (Stupka, 1963). It was even more interesting when notes were found of observations [of peregrines] at the exact same location in 1931. After additional research, notes were found of a nest with three eggs at the same site in 1929. [My] interest level reached its peak... when [I discovered that] in 1848 a writer named Charles Lanman recorded, what [he] believed to have been, a peregrine nest at the same site. He went on, in his notes, to describe in detail the 'very narrow and ragged ridge, without a particle of vegetation, with holes leading like windows entirely through it' (Stupka, 1963). [Thus,] the history of what has been referred to as Duck Hawk Hollow, Peregrine [Ridge], Inspiration Point, the 'Eye of the Needle,' [or] the North Eye... goes back to at least the mid 1800s.

"The date that will live forever in my memory is 8 June 1997. It had been raining for the better part of three weeks. David Morris, a Park Service volunteer, and I hiked to Inspiration Point in the fog, wind and unusually cold weather. The fog was rolling through the hollow between our vantage point and what would prove

to be the nesting site. As we looked toward the rocky ridge, David noted that the direction we were looking was one of the possible locations of the nest. Before my pack could be removed, I saw two adult peregrines. One was perched atop the rocky ridge and the other was in flight just above the perched adult. After setting up his spotting scope, [David announced,] 'We have chicks in the nest.'

THE FEEDING OF YOUNG NESTLINGS

"The three chicks in the nest [judged to be three weeks old] reminded me of fuzzy white tennis balls. Most of the time the chicks did a lot of sleeping. The visibility on the initial visit was not as one would wish. As brief breaks would occur in the fog, very little movement was witnessed. Two of the chicks were visible most of the time, but the smaller, third one, was very difficult to witness. [I felt] an immediate concern... for its small size in comparison to its siblings, [as I knew] that a bird of prey in this critical growth stage of its life might be eaten by its larger siblings if the parents did not provide an adequate food supply.

"[While the chicks were in the nestling stage], only one parent did the hunting. [The other] adult was perched near the nest and kept an eye on the chicks. The hunting parent was on an almost exact schedule with the rations. Upon returning to the nest site, both adults would scream with a very high pitched cry. A great deal of excitement was shown by the chicks upon the adult arrival. The perched adult would meet the hunting adult in the air and a corkscrew spiral would occur. Due to the low ceiling, it could not be determined how high these two would climb. The adults would then land, apparently eat some of the food the hunting bird had captured, and then the chicks would be fed. The adult would pluck the prey, tear it into small bits, and feed the chicks. The chicks did not jockey for position, or have their mouths open like song birds do, but appeared to be standing at attention like little soldiers. The same pecking order was displayed at each feeding. The chicks always stood with the larger chick on the left, the middle chick in the middle, and the smaller chick on the right. The adult always fed the larger chick first, the middle chick next, and the smaller chick last. As soon as the smallest chick was fed, the adult would then start the entire sequence again. When the food supply was exhausted the adult would leave the nest, scream at the top of its lungs, and the perched adult would join it in flight, a corkscrew spiral would follow, and the entire hunting, perching sequence would start again.

"While the parents would, on occasion, swap the hunting/guarding sequence, the larger of the two adults [the female] did most of the hunting. The female seemed to dominate the smaller adult male. [He appeared] to have some slight streaking on its breast, leading the observer to conclude that he was a very young bird (Brown and Amaden, 1968). It is well known that the female [averages about] one-third larger than the male, but this male was more like one-half smaller than the female and, as noted above, was under total domination of the larger bird. At this stage of [nestling] development, the adults fed the chicks on almost exactly two hour intervals. Nothing much changed over the next couple of days. The female did most of the hunting, the male stood guard [and] did a lot of preening, and the chicks did a lot of sleeping.

LATER FEEDING BEHAVIOR AND DEVELOPMENT

"On 12 June [about 25 days old], the corkscrew spirals stopped, [and] time spent at the nest stopped. The adult would bring in food, drop it off, and exit the nest.

The feeding interval of two hours had not changed. No interaction was noted between the adults. [There was] no screaming, no acknowledgment of the other adult. The chicks were allowed to fight over the food and a lot of tug of war battles took place. At the 10:10 a.m. feeding, the larger adult delivered a small mammal to the nest. It is the opinion of the writer that it was a red squirrel that is referred to locally as a 'boomer'. The [author could find no] information in... previous writing [to] show... evidence of mammal feeding to chicks.

"[At 25 days old], the two larger chicks were beginning to show a faint black line on the side of their wings. It was apparent that some primary feathers were beginning to develop. No indication of tail feathers was evident at this time. The smallest chick was still in full down plumage with a slight tint of yellow coloration. [By] 20 June [at 33 days old], the two larger chicks had primary feathers; tail feathers were evident but not fully developed. The smaller chick still had some down showing but had the dark black wing line described above.

"Upon [our] arrival [on 20 June], there was no adult guard. For the first time the fog was gone, the sky was clear, and a lot of screaming could be heard, not from the adults, but from the chicks. It was apparent they were hungry. The adults were feeding [them] about every 15 minutes. At times the adult would enter the nest, drop the food, and go hunting again. At other times the adult did not even land. The nest site is merely a crevice in the rock with a natural rock roof. The [flight] angle of the approach by the adult [enabled him] to fly by, drop the food at the same angle, allow it to drop in the nest and never have to stop. The activity of the adults was fast and furious. The chicks were in the peak of their growth, needed food, and the food was provided. No additional notes were made concerning any feeding of mammals. The prey seemed to be dark gray songbirds. On one visit it was observed that the adults had captured a Blue Jay [*Cyanocitta cristata*].

FLEDGING

"A visit to the site on 30 June [43 days] revealed the two larger chicks climbing out of the crevice nest and climbing around on the rocks outside the nest. They wanted to fly badly. They were flapping their wings, screaming at the top of their lungs, and, to be honest, I felt they were in some danger that they would lose their balance. [This happened a few times and they] seemed uncertain about how to regain [their balance]. Feeding now was back to once an hour, and the non-hunting adult had moved in much closer to the nest. After watching the interaction between the adults and the chicks for many hours, it was my opinion that the adult was guarding the nest to make sure [no harm came to the] chicks. When the chicks would lose their balance, the adult would appear very edgy. [I believed] that if one of these chicks were to fall, the adult was prepared to catch it in flight to prevent it from being killed. Interaction between the two adults started again. Since, in my opinion, the adults knew that the chicks were almost large enough to fly, it was time to start paying attention to each other again. No spins, corkscrew spirals took place, but the larger [female] hunting adult would go out of its way to fly by and 'buzz' the guard adult on [her] entrance to and departure from the nest with food. The smallest chick had developed its primary, secondary, and tail feathers, but still was not nearly as adventurous as its two siblings.

"On 2 July Bob Hatcher of TWRA called... and reported that Rick Knight had seen the first chick [at about 45 days old] leave the nest earlier that day. How appropriate that the man who had spent three years guarding the released birds in

the 1980s was the person who saw the first successful wild fledging [in Tennessee] in 55 years! On 4 July, [I arrived] at daylight [to see that] the two larger chicks had fledged from the nest and were perched above and slightly to the left of the nest atop the top of rocky cliff. The 'baby runt' was still in the nest, and [it appeared that she] very much wanted to join her siblings atop the cliff. A 'pep rally' was going on. The two fledged birds [appeared to be] screaming for her to fly from the nest. She would look off the ledge, and scream back, as if to say, 'Do you know how far it is down the side of this cliff?' A remarkable change had occurred in 'the runt' since the week before. She was larger than the other two. The breast on the two [males] that had already fledged was a dingy white and the streaks were a faded light brown. The [former] 'runt,' which was now the largest, had a 'driven snow' white breast and the streaks on her breast were as bright as a new copper penny. This 'pep rally' went on from daylight until 8:28 a.m. At that time [the female nestling] dropped her load, bobbed her head, set her wings, made a perfect flight of about 500 yards and made a perfect landing on top of the 'eye of the needle.' The flight was to the left of the nest, down the hollow, across the top of her siblings, back parallel to and directly above the nest. The entire flight was accompanied by the [screaming of her] siblings.

"FLIGHT TRAINING" AND LEARNING TO HUNT

"On 8 July [51 days old]... the adults were teaching the fledglings the fine art of 'in flight' maneuvers. It appeared that the parents did not know what to expect form the fledglings. On one of the climbs, the lead parent made a turn to the left to see how her fledglings were doing, and the fledglings were apparently closer than the parent expected. The events that followed are beyond my ability to describe. One parent took two fledglings, and the other parent took one, and the 'workout' began. Spins, rolls, turns, spirals, dives, and every maneuver I have ever seen, and a lot I had never seen, began. The training would go on for 7-8 minutes, at which time a scream could be heard and the action would stop. A lot of preening, stretching and wing exercise would follow for about 15 minutes. At that time, the [sequence of] activity described above would start again.

"[Upon my arrival] on 16 July, the three fledglings were feeding, flying, and screaming. They perched atop the "eye of the needle," ate their morning meal, and on two occasions visited the nest. No adults were seen. The visits to the old nest lasted about 30 seconds. On 25 July, [I observed] three more 30-second visits to the old nest. A close examination of the nest with a 15 x 60 spotting scope showed nothing in the nest except several moths flying in and out. Apparently these young birds were eating the moths and butterflies that were attracted to the carcasses remaining in the nest. The primary prey being eaten [by the fledglings] on the cliffs appeared to be [gray birds]. No mammal prey had been seen at this point. No more Blue Jays had been seen. The most common songbirds around the observation point were [Dark-eyed] Juncos [*Junco hyemalis*].

"[By 25 July, the 68-day-old fledglings'] feet and cere were a brilliant yellow, and... the legs were feathered all the way to the feet. The feathers were very thick, like a pair of baggy trousers, and were especially heavily streaked on the larger [female] fledgling. The streaks were... the copper penny color described earlier on the breast. The smaller [male] fledglings were beginning to develop a stronger color contrast between the breast feathers and the streaks. It could not be determined if

the white was becoming whiter or the brown streaks were becoming more copper color. Also, the first two to fledge did not have the feathers coming down their legs as far as the more brightly colored last fledgling.

"The highlight of [30 July] was observing an adult crow disappear behind a ridge and fail to appear on the other side. The flight should have taken 5-7 seconds. About two-thirds of the way, a sound was heard that sounded like a bass hitting a popping bug. This happened at 8:05 a.m. No sound was made by the peregrine prior to or after the sound was heard. No peregrine was seen. At 8:30 a.m. the other two fledglings returned from hunting. At that time all three fledglings returned to the eyrie. One of the peregrines was carrying a crow as large as the fledgling itself. What had happened between 8:05 and 8:30? Why did the fledgling that captured the crow not fly into the eyrie and eat? Why did it wait for its siblings? I have no idea. As the fledgling picked its prey, the feathers descended the eyrie like the wind blowing against a dandelion seed pod. It is noted that each time the fledglings enter or depart the eyrie, a chorus of screams can be heard. Also noted was the fact that neither adult had been seen since 8 July.

"On 8 August [at about 9:15 a.m.], all three fledglings instantly took to the wing and flew directly south to join an adult peregrine in flight, and the high pitch screams began. After a couple of minutes of flight, all four birds came to the eyrie. The adult dropped its prey and began teaching 'in flight' maneuvers. The speed described before was slow compared to what was shown during these observations. It was impossible to keep up with all that was going on. They played a game that I call 'playing chicken.' They would fly directly at each other at a speed that I did not have the ability to estimate. The trick was to see how close they could get to each other before one of them 'chickened out.' As soon as one of them veered off, the entire process would start again. This game continued for about 30 minutes. The adult then returned to the prey it had brought in and began to feed. A vocal command was rendered by the adult, and, with the ever present vocal chorus, the fledglings flew away to hunt.

"On 14 August, the entire observation area — eyrie and everything in between — was covered with the thickest fog one could imagine. For an hour and a half, the peregrines were in flight between the observation area and the eyrie. The vocal chorus never stopped. They were in flight, communicating with each other in what I guess was an attempt to let each other know their location. By stepping off the distance, [I estimated] that visibility was down to 25-30 yards. The birds were very close but not visible, [and presumably] the birds were unable to see any better than the observer. Then, on occasion, a peregrine would appear for an instant, and, with amazing speed, vanish. At times, I would catch myself flinching because of the closeness and speed of the birds. They literally were like arrows in flight. The close proximity and the loud screams of the birds were incredible.

AN INTRUDER

"On 22 August at 8:30 a.m., I noticed what I thought to be a juvenile Bald Eagle [*Haliaeetus albicilla*] land and perch for about 15 seconds, slightly east of the 'north eye'. All communication between the peregrines stopped. Instead of the normal 'vocal chorus' and flying into the eyrie to eat, preen and exercise, they kept a very low profile. Flight was confined to very high altitudes, and no sounds were heard at all. The large predator had put a stop to routine daily activities. The large bird of

prey reappeared at 12:20 p.m. It flew from the previously described location, almost directly toward me and then turned due east. The large bird was easy to identify. It was an adult Golden Eagle [*Aquila chrysaetos*]. The lighter colored feathers were apparent on the back of the neck. Had the Golden been here all week and contributed to the fact that the peregrines were keeping the low profile? Was it only passing through and caused a lull in peregrine activity? Was the Golden Eagle the reason no one had seen the peregrines for a week? Did the Golden Eagle have anything to do with the fact that one of the adult peregrines has not been seen since 8 July?

CONCLUSION

"In conclusion, I spent 88 hours on Inspiration Point over a 13 week period. No words can express my feelings as I witnessed the rearing of three falcons in the wild. Sometime late next winter you can expect to find this writer hiding behind the rocks looking for these beloved birds."

ACNOWLEDGMENTS

I would like to thank the following people who have made major contributions to me and offered encouragement: Bob Hatcher, Pete Wyatt, Jim Campbell, and Teresa Collins.

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The Migrant, 68 (4): 123, 1997.

EVIDENCE OF PROBABLY BREEDING BY THE HERMIT THRUSH ON ROAN MOUNTAIN, TENNESSEE/NORTH CAROLINA

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A hatching-year (HY) Hermit Thrush (*Catharus guttatus*) was captured and banded on 12 September 1997 at Carver's Gap (1860 m elevation) on Roan Mountain, astride the Tennessee and North Carolina border. The bird was captured in a mist net set up on the Tennessee side, but within 10 m of the state line, while operating a bird banding station to monitor autumn passerine migration. The habitat was the fringe of the spruce-fir forest.

This individual was easily identified as a Hermit Thrush by the rufous tail contrasting with a brownish back. Its age was determined using criteria by Pyle et al. (1987). The most notable plumage characteristics as an HY bird were the bright buffy tips and terminal shaft streaks of the greater coverts; these features would likely be visible on an unrestrained bird under good viewing conditions.

The occurrence of the Hermit Thrush during the breeding season in the Southern Appalachians is a recent phenomenon — on Roan Mountain since 1979 — and the species is known from just a handful of sites (Knight 1997). The southernmost documented breeding in the Appalachians comes from Mount Rogers, Virginia (Scott 1982), which is about 80 km northeast of Roan Mountain. To my knowledge and that of H.E. LeGrand (pers. comm.) the only evidence of breeding in Tennessee or North Carolina has been the presence of males singing on territory from May through July.

The HY bird reported here was caught nearly a month before the expected arrival of autumn migrants from northerly breeding areas. Robinson (1990) states that the Hermit Thrush generally arrives in Tennessee by early October and cites record early arrivals on 20 September and 27 September (twice). Migrant Hermit Thrushes do not reach North Carolina until mid-October in the Piedmont, and perhaps by early October in the mountains (H.E. Legrand pers. comm.). The first capture of apparent migrants during the two years of this banding project at Roan Mountain were on 4 October 1996 and 8 October 1997. While the capture of an HY Hermit Thrush in early September is not conclusive evidence of local breeding, it is certainly suggestive of such.

My thanks to Harry E. LeGrand for comments on Hermit Thrush distribution in North Carolina.

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The Migrant, 68 (4): 124-126, 1997.

ROUND TABLE NOTES

YELLOW-BREASTED CHAT IN WINTER AT CHATTANOOGA, TENNESSEE

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On the 14 December 1991 Chattanooga Christmas Bird Count, Kenneth H. Dubke and David F. Vogt identified a Yellow-breasted Chat (*Icteria virens*). The bird was in typical brushy habitat at Amnicola Marsh, Chattanooga, Hamilton County, Tennessee. They observed all field marks at about 6 m in good light for about a minute in duration. Both observers are well acquainted with the species.

Upon learning about the sighting, I traveled to the location on 21 December and eventually found the bird and watched it for several minutes. While I watched, the chat ate 10-15 privet (*Ligustrum spp.*) berries. I returned again on 8 January 1992 and found the bird in the same location, this time eating Japanese honeysuckle (*Lonicera japonica*) berries. I did not find the bird during subsequent visits to the area. John C. Robinson (1990) states that there are about nine winter records in Tennessee for this species, which typically departs this region in late September. Searches of The Migrant found no additional winter reports from 1990 to 1997. To my knowledge, this is the first Hamilton county winter record.

ROBINSON, J.C. 1990. *An Annotated Checklist of the Birds of Tennessee*. University of Tennessee Press, Knoxville.

POSSIBLE WESTERN RACE OF DOUBLE-CRESTED CORMORANT AT KINGSTON STEAM PLANT

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In late April of 1995, Frank Bills and I were birding at Kingston Steam Plant near Harriman, Tennessee, when we spotted a raft of about 15 Double-crested Cormorants (*Phalacrocorax auritus*). We had set up a telescope (Swarovski AT-80, 20-60x eyepiece) to look at them, when we noticed that one of them had a fair-sized patch of white feathers coming out from above and behind the eye. None of the other cormorants had these feathers. We consulted the *National Geographic Field Guide to the Birds of North America* (1983) and saw that this was common for the western race

of the Double-crested Cormorant (*P. a. albociliatus*), also called Farallon Cormorant (Johnsgard, 1993). The Alaskan race (*P. a. cincinatus*) has fewer white feathers in this area and is thought to winter only as far south as Vancouver Island, British Columbia. Johnsgard (1993) stated that the western races are only slightly migratory and that the western mountain ranges (Sierra Nevada and Rocky Mountains) act as an effective barrier to the mixing of the eastern and western races of this species. Normally the western race is confined to the Pacific coastline of North America and certain inland portions of California and Oregon (The National Geographic Society, 1983).

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SANDHILL CRANE NUMBERS INCREASING IN WEST TENNESSEE

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Overwintering Sandhill Crane (*Grus canadensis*) numbers have steadily increased at Hop-In Refuge, Obion County, Tennessee, since 1994. Hop-In Refuge is a public wildlife refuge managed by the Tennessee Wildlife Resources Agency. In November 1994, Tennessee Wildlife Resources Agency personnel observed 4 individuals using the refuge; by 1998, this number had increased to 467 individuals (Table 1).

Table 1. Numbers of overwintering cranes at Hop-In Refuge, Obion County, TN, from 1994 through 1998.

Year	Number of Cranes
1994-95	4
1995-96	86
1996-97	267
1997-98	467

Cranes arrive in west Tennessee in November and leave in early March each year. Daily patterns seem fairly consistent. Each night, the cranes roost on the refuge and leave by about 0600 CST to forage in surrounding areas or return to the refuge to forage and rest. These cranes rarely travel more than about 4 km from the refuge. About one or two hours before sunset, all of the cranes return to the refuge.

Feeding behavior has been observed to include grains in nearby fields, and probing in wet open fields.

Previously, one or two individuals were observed at different times in west Tennessee throughout the 1980s (Ford, *Migrant* 56:45-46; Waldron, *Migrant* 52:72). Sandhill Cranes at Hop-In Refuge represent the largest known concentrations of cranes in west Tennessee since the 1800s (Devore, *Migrant* 51:43-53). The Tennessee Wildlife Resources Agency will continue to monitor the number of cranes overwintering at the refuge.

EASTERN BLUEBIRD ATTACK OF SPIDER WITH AVIAN EGG

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On 24 May 1997, while participating in the Fayette County Foray in west Tennessee, we were driving along a rural paved road, when we observed a male Eastern Bluebird (*Sialia sialis*) attacking an object in the road. When we approached the scene, the bluebird flew to a perch on a power line. When we stopped to observe more closely, we observed a Wolf spider, about 3.5 inches in diameter, with a small bird egg in its mouth. The intact egg was cream-colored with brown speckles, about three-quarters of an inch long and slightly less wide. We tentatively identified the egg as that of a cavity nester, such as a Carolina Chickadee (*Parus carolinensis*). This was the first time that either of us had observed a spider demonstrating such behavior.

The Migrant, 68 (4): 127-129, 1997.

BOOK REVIEWS

AUDREY R. HOFF

A FIELD GUIDE TO WARBLERS OF NORTH AMERICA. THE PETERSON FIELD GUIDE SERIES. Jon L.Dunn and Kimball L. Garrett. Illustrated by Thomas R. Schlitz and Cindy House. Maps by Sue A. Tackett and Larry O. Rosche. Houghton Mifflin Company, 1997. 656 pp., 32 color plates, 141 color photographs, 60 color maps, 13 drawings.

Dunn and Garrett attempt to be both a natural history and a field guide to the identification of warblers, and by their very ambition, leave the reader without a clear idea of where this book will fit on the shelf. However, it is a work that deserves to be on the shelf or in the daypack during the warbler season in Tennessee. There really are too many details for a good field guide, thereby making it too big to fit comfortably into a pocket, but it is an excellent reference written in readable form that many birders will find more interesting in the armchair than in the field. When in the field, it is also a reference one would want to have in the vehicle, for when something out of the ordinary appears. This could mean out-of-season birds, immatures, females, hybrids and races, where *A Field Guide to Warblers of North America* excels in providing excellent references and many interesting facts. For instance, the Yellow-breasted Chat (*Icteria virens*) "is one of the few warblers to scratch under the wing, and is the only warbler known to hold food in its feet" (p. 600).

One area that will often be referred to is the illustrations of undertail patterns, not fully covered in other field guides. A sticky area for many is comparisons with similar species, and this is where this guide excels, even to describing them on the wintering grounds. Strangely, this is lacking in Curson's *Warblers of the Americas*, which includes all the New World warblers, while Dunn and Garrett cover only North American warblers. Vocalizations include good description of song and call notes, and compares them with similar species, again an area lacking in Curson. Range maps and migration routes appear to be up to date, although the detail on spottily distributed warblers, such as Cerulean (*Dendroica cerulea*) is so thorough as to give the appearance of measles.

Plates have the useful Peterson arrows, and show plumages and races in well-rendered illustrations. For the general reader there is some overkill on the races, particularly Orange-crowned (*Vermivora celata*) and Yellow Warbler (*Dendroica petechia*). Species illustrations are labeled with the bird's name on the plate itself, instead of a number referencing the description page opposite. There is a good representation of hybrids, and the undertail pattern plates show what you see in the treetops. Species references are separated by subject, general, distribution, ecology, behavior, vocalizations and conservation, where applicable. This should narrow literature searches for researchers, however there unfortunately are references given which are not found in the reference list at the end of the book. The description sections offer little more than the average field guides, but if one perseveres, a thorough discussion of plumages and moults eventually appears, when it would have been more useful if all descriptive data were to be in one place.

If forced to choose one supplementary field guide for North American warblers, Dunn and Garrett is a better choice than Curson. It is much more complete in its

discussion and illustration of plumages and races, and has a good method of listing species' references. Hopefully in future editions the omission of references will be cleared up.

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ATLAS OF THE BREEDING BIRDS OF TENNESSEE. Charles P. Nicholson. 1997. The University of Tennessee Press, Knoxville. 426 pp. $45.

Tennessee Ornithological Society members and others have combined to amass the most comprehensive overview of breeding birds in the history of Tennessee ornithology. The results of this tremendous effort, which involved over 35,000 volunteer hours between 1986 and 1991, was published by the University of Tennessee Press in 1997 as the *Atlas of the Breeding Birds of Tennessee.* Charles P. Nicholson served as the project leader, and subsequently authored the book with contributions from others. The work clearly stands as a significant regional contribution to ornithology, and I have no doubt it will be used as a benchmark for decades to come.

The book begins with an introduction to the Atlas project methods, followed by several chapters regarding the birds and landscape of Tennessee. The first section following the introduction is a fascinating and personable account of the history of Tennessee ornithology. Prior to this book, those interested in Tennessee's ornithological history had to depend on scattered papers, anecdotes, and personal journals. Nicholson moves on to discuss the environment, landscape, and historic changes in Tennessee, and then concludes with an overview and analysis of Atlas results. The amount of scientific analysis and technical writing increases progressively through this section. As a result, some readers may find this section difficult to follow. However, the analysis is a critical component of the book, and I believe readers benefit from the broad patterns of bird distribution as presented here.

The bulk of the *Atlas* provides detailed accounts for 170 bird species found during the Atlas period. Species accounts include a brief speculation about prehistoric range and abundance in Tennessee, followed by historical and current information. Next, species accounts provide a review of breeding biology. The species accounts follow this review with an exhaustive list of Atlas results and citations specific to Tennessee in regard to incubation, nest placement, nest structure, average clutch size, cowbird parasitism, and many more aspects of nesting. The accounts are easy to read, and arranged so that each account follows the same outline. Readers, therefore, can find the information quickly in all the species accounts. Relative abundance, conservation status, maps and sketches are included with species accounts. Mini-routes (i.e. roadside counts of 15 stops per Atlas block) originated with the Maryland Breeding Bird Atlas fieldwork. The Tennessee Atlas fieldwork results provide breeding abundance for each species across Tennessee. Maps are

presented that quickly provide information about locations of common occurrence as well as areas where a species is absent or present in low numbers; however, it should be noted that similar atlases in other states have used different methods of mapping relative abundance. Another map is included with each species account that shows the location of each Atlas record in the state for that species. The book format often forces a map for one species onto the page where a different species account begins; therefore, readers should be careful to relate the map to the correct text.

Nicholson also provides notes on the conservation status of species, and, as a result, the *Atlas* has already been used to update the state lists of threatened and endangered birds. Original line drawings accompany each account, and often capture the habitat and behavior of the species. The last section is entitled "Miscellaneous Species" and includes possible/probable breeding species, former breeding species, unsuccessfully introduced species, and hybrids. This section furnishes provocative thought about different species to look for during nest season in Tennessee, as well as opinions about species that may or may not have occurred here, such as the Golden Eagle. Finally, this section provides insight into historic and prehistoric records for birds, such as Common Merganser. Nicholson wisely chose not to include species that nested in nearby states historically, but for which we have no definite Tennessee records, such as Ivory-billed Woodpecker and Bachman's Warbler.

The *Atlas of the Breeding Birds of Tennessee* is neither a coffee table book nor a bird identification book, as the author readily admits. It is, however, a working desktop and car trunk book, a book to be kept on hand wherever one studies and enjoys the breeding birds of Tennessee. As such, it will be extremely valuable for land managers in the state as well as all students of Tennessee birds. The "Literature Cited" alone is worth the price of the book; it is surely the most complete reference for Tennessee breeding birds ever assembled. For special breeding bird research or monitoring purposes, copies of the raw data (excluding GIS files) are available on computer disk or by email directly from Nicholson. In regard to maps, all are published at the same scale. Therefore, I recommend making clear mylar copies of the state, county or physiographic area maps (such as Map 3 on page 20). These maps can be used to overlap species distribution and abundance maps and provide a quick assessment of areas where birds are present or absent.

The Atlas results provide the Tennessee Ornithological Society not a closing point, but an unparalleled springboard for bird conservation in the state. Our exciting challenge from the Atlas results is to hasten site-specific bird conservation and management efforts, to monitor baseline data provided by the *Atlas*, and continue to fill the gaps of our knowledge of Tennessee ornithology.

The Migrant, 68 (4): 130-132, 1997.

ABSTRACTS OF PAPERS DELIVERED AT THE TOS STATE MEETING, AUTUMN 1997

NESTING ECOLOGY OF THE CERULEAN WARBLER IN THE CUMBERLAND MOUNTAINS OF TENNESSEE

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The Cerulean Warbler (*Dendroica cerulea*) has reached its greatest abundance in the Ohio Hills/Cumberland Plateau region, where some of the steepest population declines also occur. We studied nesting and habitat requirements of the Cerulean Warbler from 1995 to 1997 near the southern end of this region, in relatively unfragmented forests of the Cumberland Mountains of Tennessee. Densities on five census plots in hardwood forests ranged from 18 to 190 pairs/100 ha. Twenty-nine nests averaged 16.7 m above ground (range 8.4 to 27.5 m) and were most frequently in the lower half of the tree canopy. With an average diameter of 41 cm and height of 24.3 m, nest trees did not differ from those of the surrounding stand. Vegetation characteristics in the vicinity of nests, however, differed significantly from those of randomly selected points in the same stands. Compared to random points, nest sites tended to have greater tree basal area, larger diameter trees, taller saplings, less shrub cover, less canopy cover, and a more northeasterly aspect. A discriminant analysis using these variables correctly classified 60 of 68 points; the heaviest loading was on canopy cover.

HOW NEOTROPICAL MIGRANTS USE RADNOR LAKE: PRELIMINARY RESULTS OF A SPRING MIGRATION STUDY

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The decline in many species of neotropical migrants has led to increased attention on the habitat requirements of these species on the breeding grounds, wintering grounds and stopover habitats used during migration. This study looked at habitat use by neotropical migrants at Radnor Lake State Natural Area, Davidson County, TN. From 11 April through 16 May 1997, six transects, each covering 1 km, were simultaneously censused each week. Two of the transects were located on ridges, three surrounding the lake and one in a 25-year-old "old field." Teams of local birdwatchers with at least one member of each team experienced in identify-

ing birds by song, walked the transect three times in the first three hours after dawn at a rate of 1 km per hour. A summary count for each day was obtained by taking the highest count for each species seen during that morning. Preliminary results indicate that early migrants (omitting Yellow-rumped Warblers) preferred the ridges. On the 11 April and 18 April combined censuses, twice the number of species were found on the two ridge routes as on the other routes combined; 78% of the individuals counted on all routes on these dates were found on the two ridge routes. This tendency shifted to a preference for the lake side routes by 16 May, with 38% more birds using the lake area then would be expected if all habitats were used equally. Black-throated Green Warblers, Cerulean Warblers and Swainson's Thrush continued to show a preference for the ridges during the entire census period while Cape May, Bay-breasted and Blackpoll Warblers were primarily found around the lake. The implication from this study is that there appears to be stopover habitat selection by migrants based on the timing of migration in the spring and species specific habitat preferences throughout spring migration. Further research is needed, especially in habitat surrounding Radnor Lake to detect differential use between Radnor and the surrounding area.

EFFECTIVENESS OF SHOREBIRD MANAGEMENT ON THREE STATE WATERFOWL MANAGEMENT AREAS IN WESTERN TENNESSEE

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The loss of wetlands and shifting public interest towards the conservation of biological diversity and ecosystem management have encouraged wetland managers to consider management for more than just waterfowl. Tennessee Wildlife Resources Agency has embraced this challenge and included management plans for nongame birds, especially migrating shorebirds, as part of their management objectives for wetlands in western Tennessee. Because of the unique habitat requirements and the limited information available on migrant shorebirds in Tennessee, it has been challenging to formulate sound shorebird management plans. The goal of this research was to evaluate and suggest possible improvements for shorebird management in western Tennessee. We present and discuss results using data collected during peak spring and fall shorebird migrations from two related studies; a 1994 pre-management pilot study and a two year study conducted from fall 1995 through spring 1997, where shorebird management had been enacted. We monitored waterbird (especially shorebird) use of all study areas at least five times per week. This included recording habitat use, bird activity, and species for each bird on the wetland. Habitat conditions were also documented daily for each compartment on the study areas. Shorebirds responded positively to management. Natural variation in water availability had a large influence on shorebird use of managed and unmanaged wetlands.

PREDATION OF ARTIFICIAL NESTS IN GRASSLAND/SHRUBLAND FRAGMENTS IN WESTERN TENNESSEE

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We placed and monitored over 900 artificial nests throughout old-field and open-canopy woodland habitats on Ames Plantation in western Tennessee in 1996-1997 to evaluate vulnerability of breeding birds to predation in these grassland fragments. Predation differed by habitat type, predator type (rodents vs. non-rodents), and egg size (Northern Bobwhite [*Colinus virgianus*] vs. Society Finch). Nests in woodland habitats experienced greater predation rates than did nests in old fields. Rodents, especially white-footed mice (*Peromyscus leucopus*) and hispid cotton rats (*Sigmodon hispidus*), accounted for almost 70% of predations. Smaller finch eggs experienced greater predation rates than did the larger bobwhite eggs. Rodents appear to have a significant influence on small ground-nesting passerine reproduction and may also affect reproductive success of larger grassland-nesting birds like Northern Bobwhite.

GOLDEN-WINGED WARBLER HABITAT USE IN THE SOUTHERN APPALACHIANS

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The Golden-winged Warbler (*Vermivora chrysoptera*) has experienced significant population decline throughout much of its range during the last half of this century. As a result, this species is of management concern in Tennessee. Several factors have been proposed as causes of the decline including: competition with the closely related Blue-winged Warbler (*Vermivora pinus*) and loss of habitat. Golden-winged warblers have been found to specialize in a specific stage of early succession composed of limited trees, a widespread matrix of shrubs, especially blackberry and its relatives (*Rubus spp.*) and a significant amount of herbaceous materials. Changes in forest harvest methods and site preparation, as well as changes in the management of roadsides may represent the best form of management available in the Southeast for this species.

The Migrant, 68 (4): 133-138, 1997.

THE SEASON

RICHARD L. KNIGHT, Editor

SUMMER: 1 JUNE-31 JULY 1997

Several rare or localized breeding species were reported this summer. Most exciting were the first two nests of Peregrine Falcon in Tennessee in half a century, with one nest in the Great Smoky Mountains National Park and another in Chattanooga. Both fledged young. Also notable was breeding evidence for Double-crested Cormorant, Scissor-tailed Flycatcher, Bachman's Sparrow and King Rail. The Black-necked Stilt population along the Mississippi River continues to grow. Territorial Henslow's Sparrows in two Middle Tennessee counties represent a recent expansion into the state. Savannah Sparrows maintained their summer toehold in East Tennessee. After a cool beginning, particularly in the East, weather conditions seemed conducive for a productive season for most breeding species.

A few late spring migrants, residuals from that cooler than usual season, were noted in early June. The late summer migration and/or dispersal of a variety of waterbirds was detected widely. Some non-breeding ducks occurred also. Neotropic Cormorant and Western Kingbird highlighted the list of vagrants.

Using the recently published *Atlas of the Breeding Birds of Tennessee* (Nicholson 1997) as a basis, observers should grasp the opportunity to further our knowledge of the state's breeding avifauna. Gaps in distribution could be filled, especially for expanding species like Tree Swallow (many new county records are possible). Details of breeding biology could be expounded upon.

Standard Abbreviations

ad - adult	max - maximum one day count
Co. - County	NWR - National Wildlife Refuge
ers - earliest reported sighting	pr - pair
f - female	SP - State Park
im - immature	WMA - Wildlife Management Area
L. - Lake	yg - young
m - male	

WESTERN COASTAL PLAIN: Many of the reported sightings reflect a fairly typical summer seasonal period for West Tennessee. Bottomlands and wet areas hosted usual nesters. Field birds were in small numbers and few visitors were reported throughout the region. Black-necked Stilts continue to spread their nesting areas north along the Mississippi River. With the industrialization of the EARTH Complex in Memphis, some of the stilts' nesting habitat may disappear. Species of interest were Neotropic Cormorant, Common Moorhen, Western Kingbird, Brown-headed Nuthatch, Swainson's Thrush and House Wren.

Loon-Hawk: **Common Loon:** 3/12 Jun (1) Phillipy Pits (WGC). **Pied-billed Grebe:** 6 Jun (2) Fayette Co. (Robert P. Ford, SNM, MGW); 11 Jun (1 yg) Hwy 79W & Gr. River Rd., Dyer Co (WGC). **American White Pelican:** 8 Jun-1 Jul (50 max) Lake Co.; 25 Jun (4) Dyer Co. (WGC). **NEOTROPIC CORMORANT:** 6-7 Jul (1) Mud L., Lake Co. (JRW, MAG, Nancy Moore, Bettye Sumara, David Chaffin). **Anhinga:** 25 Jun (1 m) Heloise rookery, Dyer Co. (WGC); 6 Jul (1) Mud L., Lake Co. (MAG). **Least Bittern:** 22 Jul (5)/26 Jul (1) Reelfoot Lake, Lake & Obion Cos. (WGC/KAC, DFV). Great Blue Heron (400 max), Great Egret (650 max), Snowy Egret (110 max) at Phillipy Pits 19/29 Jul (WGC). **Snowy Egret:** 5 Jul (1) Big Hill Pond SP, McNairy Co. (Gaynell Perry, SRM, Karen Cook). **Tricolored Heron:** 29 Jul (1 im) Whites Lake WMA (WGC). **Black-crowned Night-Heron:** 7 Jun (2) Whites Lake WMA, 18 Jun (1) Humboldt (MAG); 25 Jun-9 Jul (1) Hwy 79W & Gr. River Rd., Dyer Co., 15 Jul (1) Whites Lake WMA (WGC). **Yellow-crowned Night-Heron:** 11 Jun (12) Wolf River WMA, Fayette Co. (SNM, MGW). **American Black Duck:** 2 Jun (pr) Island 21, Dyer Co. (WGC). **Northern Pintail:** 8 Jun (2 m) Mud L., Lake Co. (WGC). **Blue-winged Teal:** 7 Jun (1 m) Hwy 79W & Gr. River Rd., Dyer Co. (WGC, MAG); 22 Jun/30 Jul (1 m/pr) Mud L./Black Bayou WMA (WGC). **American Wigeon:** 19 Jul (1 m) Black Bayou WMA (WGC). **Osprey:** 1-10 Jul (on nest) Keystone & Samburg areas, Reelfoot Lake, Lake & Obion Cos. (WGC). **Mississippi Kite:** 5 Jun (16-20) north Memphis (James Ferguson); 1 Jun-Jul (prs) reported from all areas of Shelby Co. (LCC, MaH, OKM, MGW). **Bald Eagle:** 26 Jun (1 im) Fayette Co. (OKM), bird was presumed poisoned, treated, banded & released at Reelfoot Lake SP. **Cooper's Hawk:** 1 Jun-Jul (2 ad) Humboldt (MAG); 15 Jul (1) Whites Lake WMA (WGC). **Sharp-shinned Hawk:** 12 Jul (1) Pickwick SP, Hardin Co. (SRM, Bob Cox); 21 Jul (1) EARTH Complex (CHB, VBR, MGW). **Broad-winged Hawk:** 1 Jun (carrying nest material) Overton Park, Memphis (OKM).

Rail-Owl: **King Rail:** 9-15 Jul (2 ad) Black Bayou WMA & (2 ad, 1 yg) New Markham, Lake Co. (WGC); 19/26 Jul (2 ad) Black Bayou WMA (WGC, KAC, DFV, MAG, Beth Greene). **Common Moorhen:** 1-29 Jun (1) nw Shelby Co. (LCC, MaH). Shorebird observers at the EARTH Complex were CHB, VBR, MGW, Linda & John Zempel. **Black-necked Stilt:** 7 Jun-29 Jul (5 ad, 1 nest) Whites Lake WMA (WGC, JRW, MAG); 21 Jun (38 ad, 6 yg), 2-10 Aug (46 ad, 3 yg) nw Shelby Co. (LCC, MaH); 15 Jun-Jul (57 max, 5 nests) EARTH Complex; 6-27 Jul (18 max) Eagle Lake WMA, Shelby Co. (WRP); 30 Jun-1 Jul (1) Mud L., Lake Co., 19 Jul (3) Black Bayou WMA, 24 Jul (5) Phillipy Pits (WGC). **American Avocet:** 19/29 Jul (1) Black Bayou WMA/Whites Lake WMA (WGC). **Greater Yellowlegs:** 30 Jun (1) Whites Lake WMA (WGC). **Upland Sandpiper:** 5 Jul (1) Hwy 103 & Gr. River Rd., Dyer Co. (WGC, JRW). **Western Sandpiper:** 9 Jul (3) Mud L., Lake Co., 19 Jul (5) Phillipy Pits (WGC). **Least Sandpiper:** 17 Jun-Jul (451 max) EARTH Complex; 19 Jul (176) Black Bayou WMA (WGC). **White-rumped Sandpiper:** 7 Jun (20) Mud L., Lake Co. (WGC, MAG). **Common Snipe:** 9 Jul (1) Black Bayou WMA (WGC). **Bonaparte's Gull:** 7 Jun (37) Mud L., Lake Co. (WGC). **Common Nighthawk:** 4 Jun-Jul (1-2) various sites in Shelby Co. (LCC, MaH). **Chuck-wills-widow:** 16 Jun (1) Fayette Co. (SNM, MGW); 18-19 Jun (1) Humboldt (MAG). **Barn Owl:** 8 Jun (nest, 2 yg) Collierville, Shelby Co., fourth year at this site (OKM); 23 Jun (nest, 2 yg) Covington, Tipton Co. (OKM).

Kingbird-Sparrow: **WESTERN KINGBIRD:** 1-11 Jun (1) Fayette Co. (SNM, MGW). **Brown-headed Nuthatch:** 12 Jul (2) Pickwick SP, Hardin Co. (SRM, Bob Cox).

Swainson's Thrush: 1 Jun (3) nw Shelby Co. (LCC, MaH), late West Tenn. **Tree Swallow:** 1 Jun (1) sw Lake Co. (WRP); 9 Jul (3) Whites Lake WMA (WGC). **House Wren:** 1 Jun-Jul (2) Humboldt (MAG); 9 Jun (1) east Memphis (SNM), late Shelby Co. **Cedar Waxwing:** 1 Jun (15) Mud Island, nw Shelby Co. (LCC, MaH); 1 Jun (38 total) BBS, 4 stops, Obion & Lake Cos. (WRP); 5 Jun (20) Humboldt (MAG). **Blue-winged Warbler:** 3 Jun (2) BBS, sw of Silerton, Hardeman Co. (VBR). **Worm-eating Warbler:** 6 Jul (1) Shelby Forest SP, Shelby Co. (WRP). **Black-and-white Warbler:** 6 Jun (1) Fayette Co. (SNM, MGW). **Grasshopper Sparrow:** 1 Jun (2) BBS, Lake Co. (WRP). **Song Sparrow:** 7 Jun (1) Mud L., Lake Co. (MAG); 15 Jun-Jul (5) EARTH Complex (CHB, VBR, MGW, James Waldron).

Locations: Black Bayou WMA - in Lake Co.; EARTH Complex - in Shelby Co.; Humboldt - in Gibson Co.; Phillipy Pits - in Lake Co.; Whites Lake WMA - in Dyer Co.

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HIGHLAND RIM AND BASIN REGION: The summer season produced typical and atypical weather. June was a clear aberration, being 4 degrees cooler and 3 inches wetter than normal in the Nashville area. On the other hand, July maintained near normal conditions. Highlights included the return of Henslow's Sparrows to a farm field in Stewart County; on one occasion at least 18 were tallied. A second small group of Henslow's was found at the AEDC airport. A few Bachman's Sparrows were also found in this latter area. Cormorant nests were observed on Old Hickory Lake.

Loon-Tern: **Common Loon:** 13 Jun (1 in alternate plumage) Old Hickory L. (CAS). **Double-crested Cormorant:** 13 Jun (6 on nests) Old Hickory L. (CAS); 2 Jul (7) Pennington Bend (MLM). **American White Pelican:** 1 Jun (2) Chandler's Lake, Hickman Co. (David Anderson). **Yellow-crowned Night-Heron:** 14 Jun (1) Pennington Bend (MLM). **Sharp-shinned Hawk:** 24 Jul (2 begging yg) Putnam Co. (SJS, Ginger Ensor), rare breeder. **American Coot:** 13 Jun (1) Old Hickory L. (CAS). **Spotted Sandpiper:** 16 Jul (1) Metro Center, Davidson Co. (HKC). **Ruddy Turnstone:** 1 Jun (1) Cross Creeks NWR (CAS). **Semipalmated Sandpiper:** 1 Jun (1) Cross Creeks NWR (CAS). **Ring-billed Gull:** 13 Jun (5) Old Hickory L. (CAS). **Caspian Tern:** 13 Jun (3) Old Hickory L. (CAS). **Common Tern:** 13 Jun (5) Old Hickory L. (CAS). **Black Tern:** 13 Jun (1) Old Hickory L. (CAS).

Woodpecker-Waxwing: **Red-headed Woodpecker:** 17 Jun (1) Radnor Lake, Davidson Co. (Wayne Palmer). **Willow Flycatcher:** 16 Jul (1) Metro Center, Davidson Co. (HKC, JKS). **Scissor-tailed Flycatcher:** 2 Jul (1) Peytonsville Rd., Williamson Co. (Paul Cambre). **Tree Swallow:** 2 Jun (1) Center Hill Dam, DeKalb Co. (SJS); 13 Jun (4) Old Hickory L. (CAS); probably nesting. **Bank Swallow:** 1 Jun (1) Cross Creeks NWR (CAS). **Cliff Swallow:** 16 Jun (several) n Maury Co., on Wrigley BBS (SJS). **Bewick's Wren:** 7 Jun (1 singing) e Williamson Co. (SJS), on Peytonsville BBS. **Cedar Waxwing:** 1 Jun (30) Stewart Co. (CAS).

Warbler-Oriole: **Magnolia Warbler:** 4 Jun (1) Radnor Lake, Davidson Co. (Francis Fekel), new Nashville area late spring date. **Prairie Warbler:** 16 Jun (3) Warren Co. (SNM). **Blackpoll Warbler:** 7 Jun (1) Pennington Bend (MLM), new Nashville area late spring date. **Worm-eating Warbler:** 6 Jun (1) Love Circle, Davidson Co. (Jan

Alexander); 19 Jul (1) Pennington Bend (MLM). **Rose-breasted Grosbeak:** 7 Jun (1) Green Hills, Davidson Co. (Michael Bierly); 20 Jul (1) Natchez Trace, Williamson Co. (MJW). **Dickcissel:** 13 Jun (1) Sumner Co. (Richard Connors, JKS); 3 Jun (several singing) Cannon & Bedford Cos., on Bradyville BBS (SJS). **Bachman's Sparrow:** 26/28 Jun (2 ad, 1 yg) AEDC (HKC, JKS, Phillip Casteel/CAS), very rare summer resident. **Grasshopper Sparrow:** 16 Jun (5) Warren Co (SNM). **HENSLOW'S SPARROW:** 1 Jun (6) Stewart Co. (CAS); 7/28 Jun (2/5) AEDC airport (Don Davidson, John Lamb, Polly Rooker et al.); 10 Jun (18) Stewart Co. (MJW), max; 21 Jun (5) Old Rt. 18, Stewart Co. (CAS). **White-throated Sparrow:** Jun & Jul (1) Crieve Hall, Davidson Co. (HKC). **Baltimore Oriole:** 7 Jun (1) e Williamson Co., on Peytonsville BBS (SJS).

Locations: AEDC - Arnold Engineering Development Center, Coffee Co.; Cross Creeks NWR - in Stewart Co.; Old Hickory L. - Sumner Co. portion; Pennington Bend - in Davidson Co.

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CUMBERLAND PLATEAU/RIDGE AND VALLEY REGION: After a cool late spring, early June continued abnormally cool. By mid month, however, temperatures were back to normal. Rainfall was near normal in the Northeast, but above average elsewhere in the region.

The season was highlighted by breeding Peregrine Falcons and Scissor-tailed Flycatchers. Several other scarce or local breeders were found also, including some from the northern Cumberlands.

Grebe-Woodpecker: **Pied-billed Grebe:** 17 Jun (1) Brainerd Levee, Hmlt. Co. (Carla Christensen). **Least Bittern:** 29 Jun (ad feeding 2 yg) near Hwy 58 bridge over Tenn. River, Meigs Co. (TLR). **Ring-necked Duck:** 7 Jul (1 m) Wash. Co. (RLK). **Lesser Scaup:** 29 Jul-21 Aug (1 m) Wash. Co. (RLK). **Bufflehead:** all summer (1 f) Kingston Steam Plant, Roane Co. (DJT). Osprey: 13 Jul (10 ad, 3 yg at 6 nests) Chickamauga Lake, Hmlt. Co. (Roi Shannon), only report on this population. **PEREGRINE FALCON:** pr present from last season thru Aug, 1 yg seen 23 Jun-3 Jul (Jonnie Sue Lyons et al.) & 22 Jul into Aug (Harold Sharp et al.) near Chickamauga Dam, Hmlt. Co. **King Rail:** 24 Jun-31 Jul (1) Sugar Creek, Meigs Co. (KAC, DFV). **Spotted Sandpiper:** 13 Jul (1) Greene Co. (ACL, DHM), ers. **Least Tern:** 1 Jun (1) Brainerd Levee, Hmlt. Co. (Jim & Cynthia Wilkerson), apparently first Co. record. **Barn Owl:** 1-3 all season at Tusculum College, Greene Co. (ACL, DHM). **Red-headed Woodpecker:** present at 5+ sites in Wash. Co. (RLK, RPL) & 1 Greene Co. site (ACL, DHM).

Flycatcher-Sparrow: **Willow Flycatcher:** 3 Jun (1) Hmlt. Co . (Ken Dubke). **SCISSOR-TAILED FLYCATCHER:** 15 Jul thru season (pr & 1 yg) I-75 at Charleston exit, Bradley Co. (Boyd Sharp, m.ob.). **Horned Lark:** 30 Jun (2) Lst. (RLK). **Tree Swallow:** 15 & 30 Jun (ad feeding 2 yg) separate Wash. Co. sites (RLK). **Veery:** 6 Jun (4) Frz. Hd. (SJS). **Loggerhead Shrike:** present at 2 Greene Co. sites, with 1 yg 23-28 Jul (ACL, DHM). **Warbling Vireo:** 1-2 Jun (1) Holly Creek & 9 Jun (2) Moon Creek, both sites near Tusculum, Greene Co. (ACL, DHM); 15 Jun (1) Knob Creek in Johnson City, (2) Boone's Creek, (2) Leesburg — all in Wash. Co. (RLK); a localized breeding species in northeast part of region. **Black-throated Blue Warbler:** 6 Jun (6) Frz. Hd. (SJS). **Cerulean Warbler:** 6 Jun (85) Frz. Hd. (SJS). **Swainson's Warbler:** 3 Jun (1) jct. Emory & Obed Rivers, Morgan Co. (SJS, BHS); 21 & 27 Jun (2)

Clear Creek, Morgan Co. (SJS, BHS). **Connecticut Warbler:** 1 Jun (1) Tenn. River gorge, Marion Co. (TLR), late migrant. **Canada Warbler:** 6 Jun (4) Frz. Hd. (SJS). **Rose-breasted Grosbeak:** 6 Jun (1) Frz. Hd. (SJS). **Dickcissel:** from May-20 Jul (8+ at 3 sites) Lst./Conklin area, Wash. Co. (RLK). **Savannah Sparrow:** 15 Jun (1) Gray, site occupied second consecutive year; 20 Jul (1) Lst. & (1) north of Jonesborough; all were singing males in Wash. Co. (RLK). **Grasshopper Sparrow:** 5 Jun (14) Wash. Co. (RLK), max.

Locations: Frz. Hd. - Frozen Head State Park, Morgan Co.; Hmlt. Co. - Hamilton Co.; Lst. - Limestone, Washington Co. Wash. Co. - Washington Co.

Corrigendum: In the Spring 1994 report (*Migrant* 65:54), the **Common Raven** nest was in a quarry at the town of Watauga in Carter Co. (not Watauga & Carter Cos.).

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EASTERN MOUNTAIN REGION: There was good news regarding raptor nesting. Nests were found for Sharp-shinned Hawk and Cooper's Hawk. Also, the first Peregrine Falcon nest in Tennessee in 50 years was found in the Smokies. Grebe, egret and shorebird activity was less this year at South Holston Lake than the same time last year.

Grebe-Tern: **Pied-billed Grebe:** 21 Jul (1) S. Hol. L. (LCM), ers. **Least Bittern:** 20 Jul (1) Shady Valley, Johnson County (JWC, LCM), first record there. **Great Egret:** 29 Jun (3) S. Hol. L. (JWC). **Yellow-crowned Night-Heron:** 1 Jul (2) Stoney Creek, Carter Co. (Tom McNeil). **Sharp-shinned Hawk:** 7-16 Jun (1 at nest) Roan Mtn. SP (RLK). **Cooper's Hawk:** 8 Jun (2 nestlings banded) S. Hol. L. (RPL et al.). **PEREGRINE FALCON:** 8 Jun (3 nestlings)/2-4 Jul (3 yg fledged) Great Smoky Mtns. N. P. (David Morris, Dick Dickenson/RLK et al.), first nest in Tenn. in 50 years. **Northern Bobwhite:** 13 Jul (1) Clingman's Dome, Great Smoky Mtns. N. P. (DJT), above 6000 ft. **Least Sandpiper:** 21 Jul (9) S. Hol. L. (JWC, LCM). **Semipalmated Sandpiper:** 21 Jul (1) S. Hol. L. (LCM). **Ring-billed Gull:** 3 at S. Hol. L. all summer (LCM, JWC). **Forster's Tern:** 30 Jul (3) S. Hol. L. (LCM).

Flycatcher-Siskin: **Acadian Flycatcher:** 16 Jun (14) Walnut Mtn., Carter Co. (RLK), max. **Alder Flycatcher:** 23 Jun (4) Roan Mtn. (RLK). **Willow Flycatcher:** 1-2 each at following sites during Jun: Hampton Cr. Cove & Walnut Mtn., Carter Co, Butler & Doe Valley, Johnson Co. (RLK). **Least Flycatcher:** 7 Jun (nest under construction) Roan Mtn. (RLK). **Tree Swallow:** 16 Jun (2) Roan Mtn. village; 21 Jun (5 fledged yg) Watauga L., Carter Co.; 28 Jun (2 pr at nest boxes) Mountain City, Johnson Co. (RLK). **Brown Creeper:** 16 Jun (pr feeding yg in nest) Walnut Mtn. ; 23 Jun (5 singing) Roan Mtn., max there; 24 Jun (1) Unaka Mtn. (RLK). Veery: 24 Jun (24) Unaka Mtn. (RLK), max. **Hermit Thrush:** up to 5 singing all season, Roan Mtn. (RLK). **Magnolia Warbler:** 24 Jun/19 Jul (2-4 m) Unaka Mtn. (RLK). **Yellow-rumped Warbler:** 4 Jul (1 singing m) Roan Mtn., N.C. side (RLK), not present later dates; near where a pair nested in 1993. **Blackburnian Warbler:** 13 Jul (many) near Clingman's Dome, Great Smoky Mtns. N. P. (DJT). **Yellow-throated Warbler:** 21 Jun (22) Watauga Lake, Carter & Johnson Cos. (RLK), max. **Canada Warbler:** 24 Jun (18) Unaka Mtn. (RLK), max. **Vesper Sparrow:** 28 Jun (2 singing, plus pr feeding yg) Mill Creek, Johnson Co. (RLK). **Savannah Sparrow:** 28 Jun (2 singing) Doe Valley & Mill Creek, Johnson Co. (RLK). **Grasshopper Sparrow:** 28 Jun (3) Mill Creek, Johnson Co. (RLK), max. **Dark-eyed Junco:** 21 Jul (nest with 2 eggs, f incubating), then 1 Aug (2 small

yg in same nest) Roan Mtn. (RLK), seems late. **Brown-headed Cowbird:** 16 Jun (1 m) Rich Gap at 3680 ft., Carter Co. (RLK). **Red Crossbill:** 24 Jun (10+) Unaka Mtn. (RLK, Rad Mayfield), max; 29 Jul (1 f) Stoney Creek, Carter Co. (Tom McNeil), low elevation. **Pine Siskin:** small numbers on Roan Mtn. & in Great Smoky Mtns. N. P. (RLK et al.).

Locations: Roan Mtn. - in Carter Co.; Roan Mtn. SP - in Carter Co.; S. Hol. L. - South Holston Lake, Sullivan Co.; Unaka Mtn. - in Unicoi Co.

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SPECIES INDEX TO VOLUME 68, 1997

INSTRUCTIONS TO AUTHORS

The Migrant records observations and studies of birds in Tennessee and adjacent areas. Most articles are written by members of the Tennessee Ornithological Society.

SUBMISSIONS: The original and, if feasible, two copies of the manuscript should be sent to the Editor: J.D. Joslin, 112 Newcrest Lane, Oak Ridge, TN 37830. Manuscripts that have been published in other journals should not be submitted. Electronic copies, on disk or sent by e-mail, are greatly appreciated.

MATERIAL: The subject matter should relate to some phase of Tennessee ornithology. It should be original, factual, concise, and scientifically accurate.

STYLE: Both articles and short notes are solicited; recent issues of *The Migrant* should be used as a guide in the preparation of manuscripts. Where more detail is needed, reference should be made to the *CBE Style Manual;* this book is available at many public libraries and from the Council of Biology Editors, Inc., 111 East Wacker Drive, Suite 3200, Chicago, IL 60601-4298.

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NOMENCLATURE: The scientific name of a species should be given after the first use of the full common name in the text. The scientific name should be underlined and in parentheses. Names should follow the *A.O.U. Check-list of North American Birds* (sixth edition, 1983, or supplements).

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NOTICE TO RESEARCHERS

Several references in this issue include dates later than the cover date of December 1997. The journal is behind schedule and it has been necessary to use material which, in some cases, was submitted and accepted later in the year.

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