

This summer's weather was generally cool early but warm later. There were no extended periods of really hot, dry weather. Precipitation was about average until late June and July, when above average rainfall occurred, especially inland. Most observers felt that nesting success was about normal, with no major problems or failures.

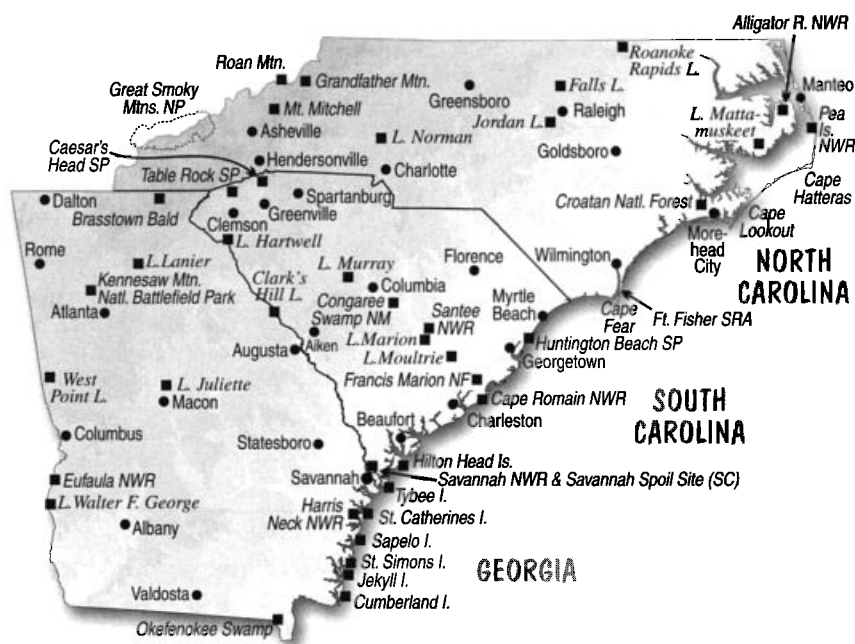
Abbreviations: C. Hatt. (Cape Hatteras, NC); E.L.H. (E.L. Huie Land Application Facility, Clayton, GA); H.B.S.P. (Huntington Beach S.P., SC); Hoop. (Hooper Lane, Henderson, NC); K. Mt. (Kennesaw Mt. National Battlefield Park, GA); L. Matt. (L. Mattamuskeet N.W.R., NC); P.I. (Pea I. N.W.R., NC); S.S.S. (Savannah Spoil Site, Jasper, SC).

LOONS THROUGH WOOD STORK

Lingering Common Loons were not as plentiful this year along the coast as last year, but there were more inland reports. There were several montane reports, with 3 at L. James, NC 8 Jul (*vide* TP), one in alternate plumage at Bass L., Blowing Rock, NC 5 Jun (A&CR), and one at L. Junaluska, NC 20 Jun (JM). Also of note were 2 at the Merry Ponds, Augusta, GA 4 & 12 Jun (AW et al.). Summer Pied-billed Grebes included a pair with young at the Goldsboro, NC W.T.P. 24 Jul (ED, GH), one in *Bartow*, GA 5 Jun (MD), and one at E.L.H. 17 Jul (JFI, EH). Another lingerer of note was the Horned Grebe in alternate plumage at Oregon Inlet, NC 6 Jun (R&PT). The last of the spring pelagic trips off North Carolina's Outer Banks were run in early Jun. Highlights included an impressive count of 3 Fea's Petrels off Oregon Inlet 4 Jun, single Manx Shearwaters off Hatteras 5 & 6 Jun, a subad. Red-billed Tropicbird off Oregon Inlet 1 Jun, an imm. Red-billed off Hatteras 5 Jun, and an imm. Masked Booby off Hatteras 6 Jun (BP). Other pelagics involved a White-faced Storm-Petrel off Oregon Inlet in late Jun (*vide* BP) and a subad. Masked Booby off C. Hatt. 2 Jul, observed from the *Queen Mary II* (MJ)! American White Pelicans continued to make news in the Region, with large numbers still being found in coastal s. South Carolina (e.g., 128 at Bear Island W.M.A. 2 Jul [LM]), and inland reports of up to 22 at L. Carroll, GA 8 Jun (BL, DMc) and 5 at Plant Hammond, Floyd, GA 7 Jun (*vide* MD). This season's Magnificent Frigatebirds included an imm. at Ft. Macon, NC 11 Jun (RN), an ad. male at Frisco, NC 14 Jun (MO), and a juv. inland at Falls L., NC 17-18 Jul (BBo, ph. R&PT et al.). The latter bird provided only about the 3rd inland report for the Carolinas and was quite a surprise, as there were no storms present to bring this bird inland.

Rare for the Atlanta area was the Least Bittern found in *Bartow*, GA 5 Jun (MD). Not as rare and definitely increasing as a Piedmont breeder, Great Blue Heron had its best

Southern Atlantic



nesting report: 40 nests at the Ellerbe Creek, upper Falls L., NC heronry 10 Jun (JR). Unusual was the Snowy Egret offshore of Oregon Inlet, NC 1 Jun (BP). Reddish Egrets continue to increase. This season an impressive count of at least 15 (including 4 white morphs!) was present on Little St. Simons I., GA 18 Jul+ (BN). Other good counts included 6 on Cumberland I., GA 14-15 Jul (RW) and 2 at Portsmouth, NC 24 Jul (JF et al.). Rare mountain-area Black-crowned Night-Herons included one in *Henderson*, NC 10-27 Jul (MW, WF) and one at Blackrock L., *Rabun*, GA 25 Jul (G&BB). The best Roseate Spoonbill counts were an impressive 16 at Little St. Simons I., GA 18 Jul (BN), 5 at Bear Island W.M.A., SC 3 Jul (KO, AC), and 3 on Skidaway I., GA 26-27 Jul (RS, RW). Another good find was one at Sunset Beach, NC 22 Jul (*vide* TP). Inland Wood Storks of note involved 9 over n. *Greene*, GA 18 Jul (PS) and 3 along the Lumber R. near Long Branch, NC 21-28 Jul (CG et al.).

WHISTLING-DUCKS THROUGH CRANES

Black-bellied Whistling-Ducks continued their presence at Donnelley W.M.A., SC, with up to 22 there during the summer (*vide* RC), while up to 12 were present at Savannah N.W.R., SC in early Jun (*vide* PM). Elsewhere, a flock of 8 was at L. Medcalf, Sunset Beach, NC 14 Jun-9 Jul (MM), although at least one observer expressed some concern

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that these could have been escapees from a development in nearby Myrtle Beach, SC. As is typical, there were a few lingering waterfowl in the Region this summer: a Snow Goose at P.I. 6 Jun (R&PT), 2 Northern Pintails, 3 Ring-necked Ducks, a Lesser Scaup, and a Ruddy Duck at the E.L.H. throughout the period (CL, m.ob.), 2 Surf Scoters at the n. end of Wassaw I., GA 12 Jun (PS), 5 Red-breasted Mergansers at Oregon Inlet, NC 6 Jun (R&PT), and another Red-breasted, apparently injured, at Riverbend Park, *Catawba*, NC 3-31 Jul (DM et al.).

An Osprey was a surprise in the mountains over Hemphill Bald, *Haywood*, NC 20 Jul (JM); there are no known nesting sites anywhere near there. Also unusual was the Swallow-tailed Kite found sitting in an old Osprey nest at Orton Pond, *Brunswick*, NC 17 Jun (*vide* SC). This species has not been documented as nesting in that state; apparently the bird was using the nest as a roost site. Reports of Mississippi Kites from new areas continue to surface in the Region. This

summer, a family group of 5 (3 ads., 2 juvs.) was located in nw. Greensboro, NC 29 Jul+ (SD, HLi, ph. MWh). As the young were still being fed by the ads., breeding surely occurred not too far away. Unusual so far s. in summer, one kite at Little St. Simons I., GA 19 Jul (BN) was a complete surprise. The only breeding report of Sharp-shinned Hawk was of a nest with 3 fledglings at Miller Cr., Wilkes, NC in early Jul (*vide* RT). Cooper's Hawk reports continue to increase across the Region during the breeding season, with sightings from all three states. Always noteworthy, single Golden Eagles were at Bakers Mt. Park, Catawba, NC 4 Jul (JSu), at Mor-



The appearance of this juvenile Magnificent Frigatebird at Falls Lake, North Carolina 18 July 2004 was not related to the passage of a storm—unusual for an interior report away from Florida and the Southwest. It provided only the second inland report for the state. Photograph by Patricia Tyndall.

ganton, Burke, NC in Jun (*vide* DM), and at McDowell Prairie, Mecklenburg, NC 16 Jul (*vide* TP). Nesting American Kestrels were reported somewhat more than usual this summer, but the species continues to be a very localized breeder in the Region. Very rare in summer and unexpected was the Merlin seen at the Santee R. delta, SC 24 Jul (DF et al.). Another rare summer occurrence was the Peregrine Falcon seen chasing an Anhinga at Macon, GA 3 Jul (TI)!

A count of at least 6 Black Rails in n. Greene, GA (PWS, SH) was encouraging. Locally rare for the Atlanta area was a Common Moorhen at E.L.H. 2–24 Jun (CL). Noteworthy breeding-season American Coots involved a single at Woodlake, Moore, NC 25–27 Jun (R&PT) and a brood at the Goldsboro, NC W.T.P. (ED, GH). One of the rarest birds of the season was the Limpkin found at Blalock Res., Clayton, GA 6–8 Jun (PB, ph. DV, m.ob.). A Sandhill Crane flying over Hoop. 6 Jul was quite unusual in summer (DS).

PLOVERS THROUGH TERNS

Piping Plover counts at Little St. Simons I., GA rose during Jul, with an impressive peak of 90 on 31 Jul (BN). Black-necked Stilts were found in very unusual locations this summer. One was far offshore of Oregon In-

let, NC 4 Jun (BP), and one was inland in e. Franklin, NC 5 Jun (RD). These birds provided the first offshore report and about the 5th truly inland report for that state. Four American Avocets were unusual lingerers at Little St. Simons I., GA 13 Jun (BN). The first returning Upland Sandpipers included 4 at North R. farms, Carteret, NC 18 Jul (JF) and 3 at the Cherry Hospital, Wayne, NC grounds 24 Jul (ED, GH). Always noteworthy in our Region, Long-billed Curlews included up to 3 at Little St. Simons I., GA 18–31 Jul (BN) and one at Portsmouth, NC 24 Jul (JF et al.). Somewhat late spring sandpipers were 20 White-rumped and one Pec-

toral in Bartow, GA 1 Jun (PH). Three Short-billed Dowitchers at the Winston-Salem, NC W.T.P. 24–31 Jul (RS et al.) provided about the 3rd Forsyth report. Always a surprise in summer in the Region, an American Woodcock was a good find in sw. Croatan N.F., Carteret, NC 22 Jun (JF); no evidence of breeding was noted. A Wilson's Phalarope was quite late and unusual inland at a pond on Brandon Farm Rd., Bartow, GA 5 Jun (SB, JS). Inland gulls of note involved 2 Laughings and a Herring at L. Murray, SC 1 Jun (MT) and a Laughing at L. Hickory, NC 13 Jun (DM). Also very unusual was a second-winter Glaucous Gull on an island in the Cape Fear R. near Southport, NC 24–25 Jun (WG, CC); summering birds of this species are almost unknown in the Region. Tern highlights for the season included a Roseate at C. Hatt. 17 Jul (SBn, EE), a well-described ad. Arctic on the beach at Ft. Macon, NC 5 Jun (AG), and 2 Bridleds and a Sooty off Savannah, GA 25 Jun (RW). Inland tern reports of note were 2 Caspians at the Merry Ponds, Augusta, GA 30 Jul (LS), 2 Forster's at Santee N.W.R., SC 24 Jul (MT), a Forster's at L. Hickory, NC 29 Jul (DM), 5 Blacks on Brandon Farm Rd., Bartow, GA 31 Jul (SB), and 2 Blacks along the French Broad R., Henderson, NC 31 Jul (WF).

DOVES THROUGH THRUSHES

This summer's reports of White-winged Doves, now annual in the Region, totaled three singles: near Watkinsville, GA 7 Jun (PS), at Skidaway I., GA 24–27 Jul (AWd, RW), and at Beaufort, NC 2 Jun (R&SBo). Single Black-billed Cuckoos, annual at this season in e. North Carolina, were near Washington 4 Jun (MJ) and near Catfish L., Croatan N.F. 9 Jun (JF). No evidence of

breeding was noted, and these birds were most likely late migrants. Of interest was the female Ruby-throated Hummingbird found dead at New Bern, NC 12 Jun (*vide* SC). The bird had been banded in West Columbia, TX in Sep 2003, thus suggesting a circum-Gulf migration route for this individual.

Localized summer outposts of breeding Willow Flycatchers at Macon, GA and Coddle Creek Res., Cabarrus, NC hosted birds again this summer. Between four and six pairs were at Macon for the 3rd year in a row (TI, m.ob.), and one was singing along Shimcock Rd., Coddle Creek Res. 15–28 Jun (JB). Scissor-tailed Flycatchers were again found summering, an annual event for the past several years. The best report was of the 5 (family group) w. of Saluda, Edgefield, SC 24–30 Jul (JG, RC, CE, DSL, MS). One was near the Orangeburg, SC sod farm 23 Jul (BM, BF), and one was along Southpoint Rd., Ocracoke, NC 1 Jun (*vide* EHa). The previous nesting locations of McDonough, GA and Monroe, NC hosted only single birds this year, and those stayed only briefly.

Of interest was the young Blue-headed Vireo near the Taliaferro/Warren, GA county line 11 Jul (JFI, EH); this is a very localized and uncommon breeder near the Fall Line. An interesting breeding record was provided by the 2 ad. Tree Swallows with 2 young at Big Lazar W.M.A., Talbot, GA 17 Jul (JFI, EH). This extends the known nesting range in that state a little farther w. and s. of the previous Macon area nesting location. Up to 2 Brown Creepers were noted in Rabun, GA 19 Jun (JS, BL); there are still no confirmed breeding records for that state. Probably the most unusual report of the season was of the pair of Bewick's Wrens at Chickamauga Battlefield Park, Walker/Catoosa, GA (ph. SP). The birds were apparently present since late May until early Aug, and on 24 Jul Pangle observed 2 ads. feeding 2 juvs., representing the first breeding evidence in the Region since the early 1980s. Very early migrant Veeries included one observed singing in a yard at Beaufort, NC 22–23 Jul (R&SBo) and one heard over Rocky Mount, NC 28 Jul (RD). A Hermit Thrush singing on Grandfather Mt., NC 17 Jul (CW) added to the growing number of locations for this uncommon breeder in that state's mountains.

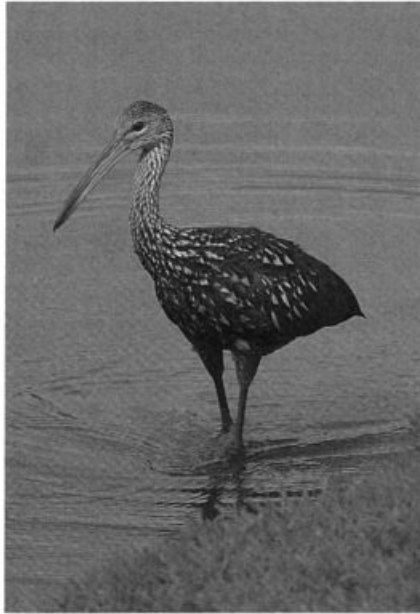
WARBLERS THROUGH FINCHES

There were several noteworthy lingering warblers found this summer. A singing male Cape May Warbler was found at Suwanee, Gwinnett, GA 14–16 Jun (ph. RTI), and single Blackpoll Warblers were at Augusta, GA 13 Jun (*vide* AW) and in downtown Atlanta, GA 17 Jun (DH). This summer produced a few more breeding-season reports of ad. male Yellow-rumped Warbler in North Carolina: at Mt. Mitchell 19–22 Jun (SC) and at

Clingman's Dome, Great Smoky Mts. N.P. 4 Jul (MTo). Cerulean Warbler is one of the first warblers to start the fall migration, but two reports this summer were noteworthy, as the species is not often reported on migration. An imm. male was at Banks L., Lanier, GA 25 Jul (JFI, EH), providing a new early fall date for the state's Coastal Plain, and a male was singing at Southern Shores, NC 19 Jul (JL)—either a very early migrant or a wandering bird. Worm-eating Warblers made news, with one at Carter Cr., Randolph, GA 19 Jun (JFI, EH) being very far s. in that state, and one at Congaree N.P., Richland, SC 12 Jun (RC) being unusual in summer in the cen. part of that state.

Lark Sparrows are very localized in the sandhills region of North Carolina during the breeding season. Reports have been few of late, but this year, a pair was noted at Camp Mackall, Scotland 5 Jun (HL). Elsewhere, a Lark Sparrow in Turner, GA 31 Jul (JFI, EH) was most likely a very early migrant. Georgia had a few breeding-season range extensions for Song Sparrow this summer, in Columbus 12 Jun (WCh) and 3 (including 2 hatch-year birds) in n. Greene 18 Jul (PWS, SH). Very noteworthy lingering sparrows included a White-throated in Beaufort, NC all summer (!) (R&SBo); 2 White-throateds near Darien, GA 10 Jun, with one until 16 Jun (DCo); a White-crowned netted at Wassaw I., GA 11 Jun (PR, PWS), providing that state's first Jun record; a White-crowned at Emerald Isle, NC 29 Jun (SCr, JV); and a Dark-eyed Junco in ne. Atlanta, GA 15 Jun (fide TM). As usual, Dickcissel reports were spread around the Region. The best numbers were 4 at Brandon Farm Rd., Bartow, GA 5 Jun (SB), 4 at the usual Gaston, NC site 18 Jun–8 Jul (ST, JMr, JB), and two pairs in e. Franklin, NC 5 Jun (RD). Elsewhere, one near North R., Carteret, NC 11–25 Jul (JF, JFe) provided the only

breeding-season record for that county. Only one Yellow-headed Blackbird was found this season, an ad. male at a feeder near Back Cr., Carteret, NC 21 Jul (fide JF). This season's Shiny Cowbird sightings were of a male and a female on Wassaw I., GA 10–11 Jun (PWS, PR) and a male at PI. 23 Jul+ (JF et al., m.ob.). Summer reports of Baltimore Oriole



This Limpkin visited Lake Blalock in Clayton County, Georgia 6 (here) through 8 June 2004; the species is still very rare in the Southern Atlantic region but appears to be increasing as a visitor here. Photograph by D. Vickers.

outside the known nesting range included 3 singing males at Riverbend Park, Catawba, NC 5 Jun (DM) and a male near Coddle Creek Res., Cabarrus, NC 15 Jun (JB). Rare summer House Finch reports in Georgia included a pair on Wassaw I. 10 Jun (PS) and 3 in Lowndes 25 Jul (JFI, EH). The Lowndes birds were extremely far south; the Wassaw I.

birds were the observer's first for a barrier island in that state. Interesting Red Crossbill sightings included an impressive group of about 100 near Black Balsam along the Blue Ridge Parkway, Haywood, NC 5 Jun (fide WF) and 2 visiting a feeder in Suches, Union, GA 26 Jun (fide TM). Three Pine Siskins were unusual in Cherry Log, Gilmer, GA in Jun, with one remaining all summer (TS).

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State of the Region

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The biogeography of the Carolinas and Georgia is often described using the Region's three distinct physiographic provinces, the Coastal Plain (all areas east of the fall line), the Piedmont (from the fall line west to the foothills), and the Mountains. This old tripartite division is convenient for the study of birdlife in this Region (and in neighboring Virginia), and it is used by bird conservationists to describe regional priorities, for instance in the NABC Bird Conservation Regions, in which these provinces correspond to BCRs 27, 29, and 28, respectively. We will use those BCRs to consider the most pressing conservation concerns in the Southern Atlantic region—all of which are being addressed by federal and state wildlife and conservation agencies to some degree, but few of which appear to be well in hand.

Coastal Plain • Probably the biggest conservation concern for birds on the outer coasts is continued human population growth on barrier islands and adjacent mainland, which puts tremendous pressure on nesting colonial waterbirds, especially terns, skimmers, and shorebirds. More and more people, their SUVs, their boats, and their pets, are visiting the

barrier islands. More and more often, there are incidents involving people driving through nesting bird colonies, creating ruts in sand that impact movement of chicks (and hatching sea turtles), unleashing their dogs into colonies, and running over nesting birds, eggs, or chicks. Although areas of nesting plovers and terns are cordoned off and posted against disturbance, these efforts at protection are often sabotaged. Education of coastal communities about bird conservation is increasingly difficult, as the coasts come to be used by transients for holiday purposes during the warm months, the most crucial time for bird reproduction. Having more people along the coast also attracts more mammals such as raccoons and opossums that feed on garbage—and on eggs and chicks of terns and shorebirds. American Oystercatchers (a species of high concern in the *U. S. Shorebird Conservation Plan*), Willets, herons and egrets, and other island-, beach- and wrack-nesting bird species, while not of highest concern, are negatively affected by the increase in disturbance and predators. Finally, the clearing of "brush"—coastal shrub-scrub habitat, increasingly fragmented and hard to find—for homes on the coast has resulted in a tremendous reduction in bird species that nest chiefly in such habitat in the Carolinas, such as Painted Bunting and Common Ground-Dove.

Adding to the problem is the increasing difficulty for government agencies to have dredge material placed on beaches or islands to help species that require very early successional beach habitat—e.g., Gull-billed, Common, and Least Terns, Black Skimmers, and

(often) Wilson's Plovers. The U. S. Army Corps of Engineers has had severe budget constraints, and beach communities now must often pay to have dredge material pumped onto their beaches to provide extra sand buffer to protect beach homes. Formerly, during routine dredging operations, the Corps placed dredge material on new islands in channels, or added to existing islands. Now, sand that is not deposited on beachfronts is often placed offshore, or in diked impoundments, sites these birds cannot utilize. The result is that the Region is seeing drastic declines in these terns, plovers, and the skimmer, though there is a bright spot for some species, such as Least Terns, which have taken to nesting on the flat rooftops of strip-malls, now an abundant artificial habitat in many beach communities. In contrast to what seem intractable impossibilities for bird conservation elsewhere, the situation on the outer coasts could be improved immediately by a multi-agency effort to increase nesting habitats, to exclude predators, and to staff monitoring agencies with full-time wardens to minimize human disturbance during the nesting season. We hope to see such an effort materialize in the near future. Overshadowing our best efforts may be the no-longer-theoretical specter of global climate change, in which sea-level rise would erase most coastal habitats, more frequent and severe hurricanes would further damage what habitat remains, and warmer climate could alter plant and avifaunal communities radically.

Away from the immediate coastlines, both Swainson's Warbler and *waynei* Black-throated Green Warbler have been species of study and concern because of their limited ranges and deficiencies of data on their pocosin habitats in the outer Coastal Plain, and Wood Thrush has clearly declined in adjacent moist deciduous woodlands. However, the major concern over the past few decades in the inner Coastal Plain has been the loss of the Longleaf Pine ecosystem. Development, fire suppression, and conversion to Loblolly Pine or Slash Pine plantations have meant a loss of habitat for resident Red-cockaded Woodpecker and Bachman's Sparrows, wintering Henslow's Sparrows, and many other animals. The exotic Fire Ant, now abundant in Longleaf Pine systems, also seems to be impacting ground-nesting species such as Bachman's Sparrow, Common Nighthawk, Chuck-will's-widow, Whip-poor-will, and Northern Bobwhite.

Although there are positive signs in terms of protection of Longleaf Pine systems and increased fire management to promote the pre-settlement fire regime, Red-cockaded Woodpeckers and Bachman's Sparrows in all three states are increasingly limited to protected sites, such as military reservations, national forests, and various refuges and parks. It is costly for conservation agencies to acquire Loblolly or Slash Pine plantations, remove such trees, plant Longleaf seedlings, and start a burning program, but this is being done on a small scale, and in order to increase the acreage of the Longleaf Pine system, this is the best option. Conservation organizations are working with private landowners, through Safe Harbor or other types of easements and programs, to provide management guidance, personnel for prescribed burning, and other assistance to have private lands better managed for species of the Longleaf Pine system. Of course, these few bird species are just the tip of the iceberg of rare species present in this system, one that contains dozens of globally rare plants, invertebrates, reptiles, and amphibians.

Piedmont • The bulk of the population in the Region lives in the Piedmont. Many millions live in the swath from Atlanta northeastward through Athens, Greenville, Spartanburg, Charlotte, Winston-Salem, Greensboro, Durham, and Raleigh. Needless to say, habitats for nesting birds are being lost at the rate of thousands of acres per day. Perhaps the biggest concern is loss of farmland and early successional habitats, especially for species requiring grassland. Of course, pastures and fields are not natural habitats in this region of 40–55 inches of yearly rainfall. But Grasshopper Sparrows, Eastern Meadowlarks, Loggerhead Shrikes, and a few other species spread eastward in centuries past, as forests were cleared for agriculture. Christmas Bird Count data clearly indicate that wintering species that utilize open-field habitats—such as American Kestrel, Northern Harrier, American Pipit, Savannah Sparrow (and other sparrows), and Eastern Meadowlark—are declining across the Piedmont as well, but no more formal study has been conducted on such declines. Most of the development today takes place in former farmland, and thus the Region is seeing steeper declines in these bird species than it is in forest-based species, though fragmentation of forests has surely also taken a toll on many passerines and near-passerines, reducing nesting success and making them more vulnerable to brood parasitism by Brown-headed Cowbird.

What can be done to slow the loss of fields and farmland to development? This is a dilemma: if human population must expand, is it better to

build homes in already cleared/disturbed land such as fields than it is in pristine forests? Certainly, homes should be built in a way that minimizes negative effects on wildlife. In most cases, conservation of farmland is most readily achievable through zoning or other governmental actions, and some conservation organizations have been acquiring easements on farmland in order to maintain landscapes in pastures and various fields. Some municipalities are creating "Piedmont Prairies," a somewhat artificial situation today but which may well have been a natural condition during drier times thousands of years ago. We all want to see Loggerhead Shrikes and other open-country birds thriving in our Region—but will this come at the expense of conservation efforts to protect forested lands and other natural habitats? This physiographic province also lacks a comprehensive plan to prioritize and set aside corridors of both field and forest for wildlife and for future generations.

Mountains • One can draw up a list of dozens of exotic plants and animals that have impacted the Carolinas and Georgia over the past 100 years—Asiatic Clam, European Starling, *Phragmites*, *Microstegium*, and Japanese Honeysuckle to name a few—but hardly any may have the impact that the Hemlock Woolly Adelgid will have over the next 10–20 years. This exotic pest has devastated Canada and Carolina Hemlocks from Virginia northward, and now hemlocks are dying in the North Carolina mountains. After having lost nearly all mature Fraser Firs on our mountaintops to the Balsam Woolly Adelgid in the late 1970s and 1980s, we now face the real possibility of losing many or most mature hemlocks in southern Appalachia. Will the White Pines, which also favor coves and cooler slopes, take the place of the hemlocks and provide enough cover, food, and cool microclimate to allow species such as Blackburnian and Black-throated Green Warblers, and more boreal species such as Red-breasted Nuthatch, Brown Creeper, and Golden-crowned Kinglet, to maintain current population levels? Will Red Spruce islands become the last refuges of these boreal species in southern Appalachia?

Biologists have detected tremendous declines in breeding birds that utilize conifers in the spruce–fir zone of North Carolina over the past 25 years. Most of the species mentioned above have either moved downslope into hemlock-shaded ravines or have disappeared locally altogether. The once thriving Appalachian mountain ecosystems have already been ravaged by air pollution and resulting acid rain, by the Balsam Woolly Adelgid, and probably by global warming, and the future of these ecosystems looks bleak at present. Fortunately, the high-elevation forests at greatest risk are mostly on public lands, where human activities are relatively controlled and modification of habitat is limited. Some would argue that concern is misplaced here, that we are in little danger of losing such spruce–fir–hemlock species on a global level, as most of them nest in the boreal zone across Canada. But that enormous ecosystem has similar problems with overharvesting of timber, climate change, insect infestations, and, increasingly, pollution. In the Carolina mountains, some agencies are releasing adelgid-eating beetles to combat the problem of the Hemlock Woolly Adelgid, but this is an expensive proposition that may save only a few acres of trees. For the sake of the marvelous biodiversity of North Carolina, South Carolina, and Georgia, we can only hope that such efforts meet with some success.



A song almost certainly never to be heard again: this male Bachman's Warbler on territory in Charleston, South Carolina 5 May 1958 was one of the last individuals to be documented anywhere. Though the causes of the species' demise are not known, the widespread alteration of lowland woodland habitats in the Southeast was almost certainly a contributing factor. Photograph by J. H. Dick/VIREO.