The Raven

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2. Other forays or field trips lasting a day or more and scheduled throughout the year so as to include all seasons and to cover the major physiographic regions of the state.
3. A journal, *The Raven*, published twice yearly, containing articles relevant to Virginia ornithology, as well as news of the activities of the Society and its chapters.
4. A newsletter, published quarterly, containing current news items of interest to members and information about upcoming events and pertinent conservation issues.
5. Study projects (nesting studies, winter bird population surveys, etc.) aimed at making genuine contributions to ornithological knowledge.

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Editorial queries and comments may be directed to Douglas H. Shedd, Department of Biology, Randolph-Macon Woman's College, Lynchburg, Virginia 24503.

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SEASONAL VARIATION OF HUMAN-CAUSED MORTALITY OF BIRDS IN THE RICHMOND AREA

CHARLES R. BLEM
BETH A. WILLIS
Virginia Commonwealth University
Department of Biology
Richmond, Virginia 23284-2012

INTRODUCTION

Birds frequently are killed by collisions with buildings, particularly windows, and with motor vehicles. In the present study we examine the relative frequency of such deaths in the greater metropolitan Richmond area over the past 28 years. For the data base we used records from the Virginia Commonwealth University Ornithological Collection. The VCUOC, founded in 1969, has grown to 2,200 catalogued items (1,601 skins; 599 skeletons). VCUOC specimens have been acquired opportunistically through salvage of window- and road-killed birds, hunter kills, mist-net mortalities, and donations. Location, date, and biological data (body mass, sex, molt, fat, and cause of death) consistently have been recorded for each specimen. It is our hypothesis that VCUOC data can provide insight into the species most commonly killed as well as the frequency of accidental deaths of birds over the annual cycle.

METHODS

In the present study we extracted all VCUOC records of species salvaged as window-kills or highway deaths in Richmond and the surrounding Chesterfield and Henrico Counties (N = 1024) since 1969. Since only specimens in good condition typically have been recovered for the VCUOC, date of salvage and date of death are assumed to be approximately the same. For purposes of the present analyses, we excluded birds for which date of collection was unknown, or those which were salvaged from sources other than window or vehicular mortality. The collection data previously were logged into a large computer file, allowing easy and rapid retrieval of individual records. Many of the birds in these analyses were found near large office buildings and at a few private residences. Based on Kain (1987), we categorized each specimen either as: (1) permanent resident, (2) summer resident, (3) winter resident/visitor, or (4) migrant. For example, Ruby-throated Hummingbirds (all scientific names are in Appendix I)

found in April or September-October were classified as migrants. Hummingbirds found in May-August were classified as summer residents. There obviously is potential for mis-classification at the interface of residency/migration times, but there were few such birds. Tests of observed counts vs. expected counts were performed by chi-square analysis (Zar 1984).

RESULTS AND DISCUSSION

A remarkable diversity of birds was salvaged (Appendix 1), considering the relatively restricted area of the study. A total of 111 species were recovered, of which the majority (81.8%) were passerine birds. Locally abundant species, e. g. House Sparrows, Dark-eyed Juncos, and Brown-headed Cowbirds, are most common in the data set. Permanent residents (576 birds, 56.3% of the total sample) were salvaged more frequently than winter residents (196, 19.1%), migrants (154, 15.0%), or summer residents (98, 9.6%; chi-square = 440.6, $P < 0.01$). Birds that occupy habitats near the ground also appeared more likely to strike cars and windows than those which frequent higher levels of the forest canopy. For example, among the warblers, Common Yellowthroats and Ovenbirds were salvaged frequently while warblers of the upper forest strata were recovered rarely, if at all (Appendix 1). Undoubtedly, ambient temperature and activity of humans introduces biases in the frequency of discovery of dead birds. Birds that die in the heat of the summer are not likely to remain intact for long and quickly become repulsive to salvagers. The number of birds recovered differed significantly among months (chi-square = 197.0; $P < 0.01$). Permanent residents represented the highest number of deaths in all but three months (Fig. 1). In September and October, mortality was highest among migrants and in November mortality was highest among winter residents. Abundant, widespread species comprised the greatest amount of mortality. House Sparrows were more frequently found dead than any other species, followed by Brown-headed Cowbirds and Cedar Waxwings. These three species comprised 17% of the total data set. House Sparrows, Song Sparrows, and Brown-headed Cowbirds were the most commonly killed permanent residents, and these three species accounted for 28% of that residency category. Ruby-throated Hummingbirds are the most numerous species among summer residents, followed by Wood Thrushes and Gray Catbirds. These three constituted 40% of summer residents, but these data could include birds killed during early or late migration. There were 31 Ruby-throated Hummingbirds in our study group. Sixteen of those were collected in the months of May through August and were therefore classified as summer residents. The remaining fifteen were collected in April, September and October and labeled as migrants (Fig. 2). Cedar Waxwings, White-throated Sparrows and Dark-eyed Juncos comprised the majority of the winter residents (65%). Common Yellowthroats, Ovenbirds and Ruby-throated Hummingbirds account for 47% of the migrants salvaged.

The timing of mortality of some species is noteworthy. Common Yellowthroats and Ovenbirds were subject more often to mortality during migration than as summer residents. There were distinct spring and autumn peaks of occurrence of these species (Fig. 2). Cedar Waxwings were at greatest risk in

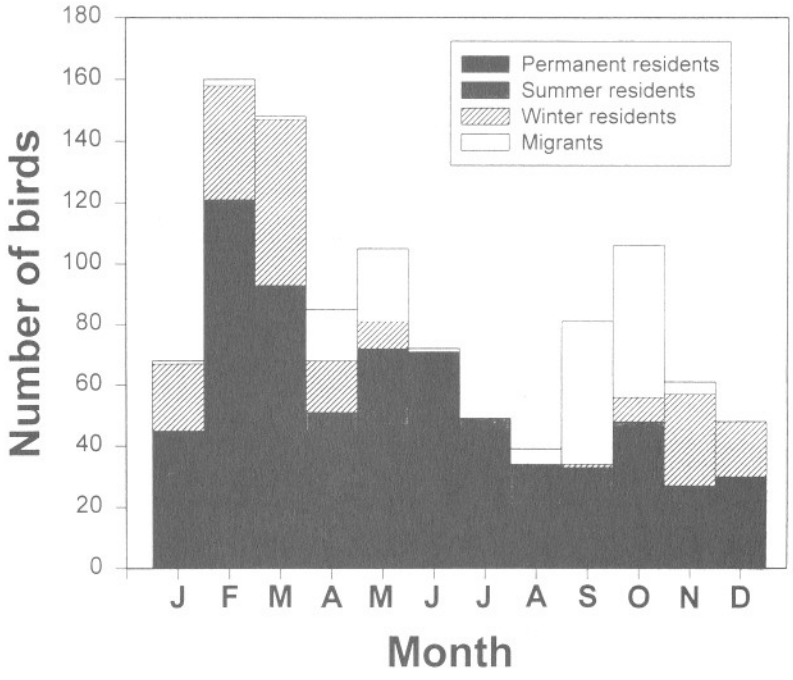

Figure 1. Seasonal distribution of avian mortality in the greater Richmond, Virginia, metropolitan area.

spring, hummingbirds throughout the spring and summer, and permanent resident species such as the House Sparrow were found throughout the year.

The data gained from this study illustrates the huge carnage inflicted upon birds by man. Estimates of the number of bird deaths attributable solely to window strikes at both homes and businesses range from 1.25 million (Banks 1976) to 975.6 million birds per year (Klem 1989, Dunn 1993). Window-strikes particularly occur at large suburban office complexes and are especially troubling when we consider the present movement to create more suburban office parks. These complexes typically consist of many bird attractants surrounded by glass-plated buildings. Birds seem especially vulnerable to glass reflecting landscape images, as well as to clear glass producing the impression of a clear passageway (Klem 1989). It has been suggested that birds living in proximity to such structures may become habituated to their presence and learn to avoid them (Klem 1990), suggesting that migrants or winter visitors are at higher risk of injury. When one adds the mortality at buildings to the 57 million road kills per year (Gill 1995) and the billion birds estimated to be killed by domesticated cats in North America each year (Stallcup 1991), it is not surprising that some species are declining significantly.

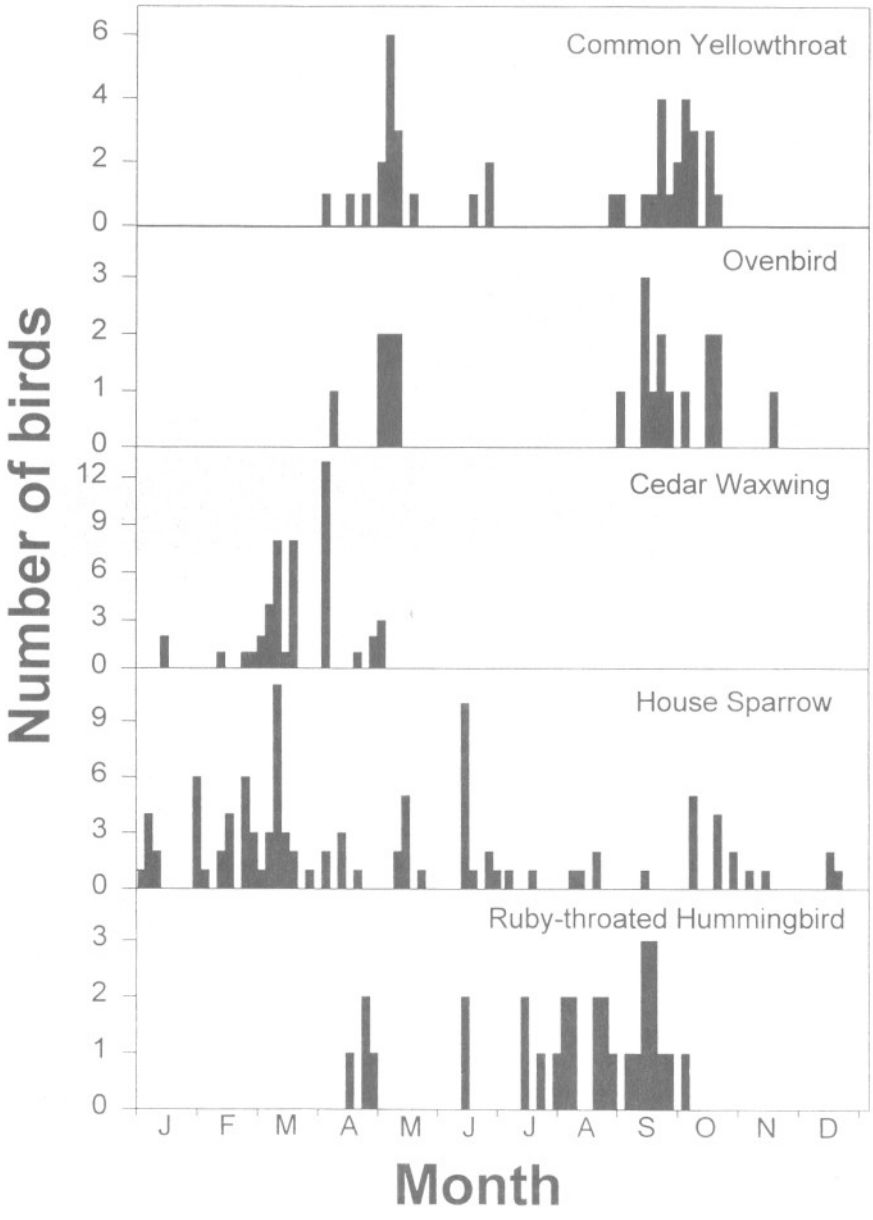

Figure 2. Seasonal distribution of mortality of Common Yellowthroats, Ovenbirds, Cedar Waxwings, House Sparrows, and Ruby-throated Hummingbirds.

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APPENDIX I.

Window- and road-killed birds in the Richmond area.

Green Heron (*Butorides striatus*) 1
Turkey Vulture (*Cathartes aura*) 1
Sharp-shinned Hawk (*Accipiter striatus*) 4
Cooper's Hawk (*A. cooperii*) 1
Red-shouldered Hawk (*Buteo lineatus*) 3
Broad-winged Hawk (*B. platypterus*) 4
Red-tailed Hawk (*B. jamaicensis*) 6
American Kestrel (*Falco sparverius*) 4
Northern Bobwhite (*Colinus virginianus*) 6
Clapper Rail (*Rallus longirostris*) 3
Virginia Rail (*R. limicola*) 1
American Coot (*Fulica americana*) 2
Killdeer (*Charadrius vociferus*) 1
American Woodcock (*Scolopax minor*) 7
Rock Dove (*Columba livia*) 5
Mourning Dove (*Zenaida macroura*) 17
Black-billed Cuckoo (*Coccyzus erythropthalmus*) 1
Yellow-billed Cuckoo (*C. americanus*) 5
Eastern Screech-Owl (*Otus asio*) 15
Great Horned Owl (*Bubo virginianus*) 3
Barred Owl (*Strix varia*) 6
Common Nighthawk (*Chordeiles minor*) 2
Chuck-Will's-Widow (*Caprimulgus carolinensis*) 1
Whip-Poor-Will (*C. vociferus*) 1
Chimney Swift (*Chaetura pelagica*) 2
Ruby-throated Hummingbird (*Archilochus colubris*) 31
Belted Kingfisher (*Ceryle alcyon*) 2
Red-bellied Woodpecker (*Melanerpes carolinus*) 2
Red-headed Woodpecker (*M. erythrocephalus*) 6
Yellow-bellied Sapsucker (*Sphyrapicus varius*) 15
Downy Woodpecker (*Picoides pubescens*) 5
Northern Flicker (*Colaptes auratus*) 19
Pileated Woodpecker (*Dryocopus pileatus*) 4
Acadian Flycatcher (*Empidonax virescens*) 2
Eastern Phoebe (*Sayornis phoebe*) 1
Eastern Kingbird (*Tyrannus tyrannus*) 2
Purple Martin (*Progne subis*) 2
Barn Swallow (*Hirundo rustica*) 1
Blue Jay (*Cyanocitta cristata*) 14
American Crow (*Corvus brachyrhynchos*) 2
Fish Crow (*C. ossifragus*) 1
Carolina Chickadee (*Parus carolinensis*) 28
Tufted Titmouse (*P. bicolor*) 11
White-breasted Nuthatch (*Sitta carolinensis*) 4
Brown Creeper (*Certhia americana*) 7
Carolina Wren (*Thryothorus ludovicianus*) 30
House Wren (*Troglodytes aedon*) 6
Winter Wren (*T. troglodytes*) 4
Marsh Wren (*Cistothorus palustris*) 1
Golden-crowned Kinglet (*Regulus satrapa*) 3
Ruby-crowned Kinglet (*R. calendula*) 9
Blue-gray Gnatcatcher (*Polioptila caerulea*) 1
Eastern Bluebird (*Sialia sialis*) 6
Veery (*Catharus fuscescens*) 2
Swainson's Thrush (*C.ustulatus*) 5
Hermit Thrush (*C. guttatus*) 14
Wood Thrush (*Hylocichla mustelina*) 15
American Robin (*Turdus migratorius*) 30
Gray Catbird (*Dumetella carolinensis*) 9
Northern Mockingbird (*Mimus polyglottos*) 10
Brown Thrasher (*Toxostoma rufum*) 20
Cedar Waxwing (*Bombycilla cedrorum*) 49
Loggerhead Shrike (*Lanius ludovicianus*) 1
European Starling (*Sturnus vulgaris*) 22
Red-eyed Vireo (*Vireo olivaceus*) 3
Tennessee Warbler (*Vermivora peregrina*) 2
Orange-crowned Warbler (*V. celata*) 1
Northern Parula (*Parula americana*) 2
Yellow Warbler (*Dendroica petechia*) 1
Magnolia Warbler (*D. magnolia*) 3
Cape May Warbler (*D. tigrina*) 5
Black-throated Blue Warbler (*D. caerulescens*) 8
Yellow-rumped Warbler (*D. coronata*) 10
Pine Warbler (*D. pinus*) 2
Prairie Warbler (*D. discolor*) 3
Bay-breasted Warbler (*D. castanea*) 1
Blackpoll Warbler (*D. striata*) 1
Black-and-white Warbler (*Mniotilta varia*) 6
American Redstart (*Setophaga ruticilla*) 2
Ovenbird (*Seiurus aurocapillus*) 23
Northern Waterthrush (*S. noveboracensis*) 2
Kentucky Warbler (*Oporornis formosus*) 1
Connecticut Warbler (*O. agilis*) 1
Mourning Warbler (*O. philadelphia*) 1
Common Yellowthroat (*Geothlypis trichas*) 42
Wilson's Warbler (*Wilsonia pusilla*) 1
Yellow-breasted Chat (*Icteria virens*) 2
Summer Tanager (*Piranga rubra*) 2
Scarlet Tanager (*Piranga olivacea*) 1
Northern Cardinal (*Cardinalis cardinalis*) 38
Blue Grosbeak (*Guiraca caerulea*) 2
Indigo Bunting (*Passerina cyanea*) 7
Rufous-sided Towhee (*Pipilo erythrophthalmus*) 19
Chipping Sparrow (*Spizella passerina*) 4
Field Sparrow (*S. pusilla*) 11
Fox Sparrow (*Passerella iliaca*) 2
Song Sparrow (*Melospiza melodia*) 39
Swamp Sparrow (*M. georgiana*) 3
White-throated Sparrow (*Zonotrichia albicollis*) 38
Dark-eyed Junco (*Junco hyemalis*) 40
Red-winged Blackbird (*Agelaius phoeniceus*) 3
Common Grackle (*Quiscalus quiscula*) 9
Brown-headed Cowbird (*Molothrus ater*) 53
Orchard Oriole (*Icterus spurius*) 4
Baltimore Oriole (*I. galbula*) 1
Purple Finch (*Carpodacus purpureus*) 9
House Finch (*C. mexicanus*) 23
Pine Siskin (*Carduelis pinus*) 6
American Goldfinch (*C. tristis*) 4
Evening Grosbeak (*Coccothraustes vespertinus*) 13
House Sparrow (*Passer domesticus*) 71

A SURVEY OF THE BACHMAN'S SPARROW IN SOUTHEASTERN VIRGINIA

BRYAN D. WATTS
MICHAEL D. WILSON
DANA S. BRADSHAW
Center for Conservation Biology
College of William and Mary
Williamsburg, Virginia 23187-8795

AMANDA S. ALLEN
Department of Forestry and Natural Resources
Purdue University
West Lafayette, Indiana 47907

INTRODUCTION

The Bachman's Sparrow (*Aimophila aestivalis*) is endemic to the southeastern United States where, historically, it inhabited open pinelands and savannah-like habitats (Dunning 1993). At the beginning of the 20th century, this species underwent a large, northerly range expansion with first breeding records being reported from Illinois, Ohio, West Virginia, and Pennsylvania (Eifrig 1915, Brooks 1938). Since the 1930's, however, this trend has apparently been reversed throughout the northern fringe of the species' new range. This range contraction, coupled with declines within the species' original range (Dunning and Watts 1990), are leading to concerns about its future status.

In Virginia, the Bachman's Sparrow was first documented as a breeding species in 1897 (Murray 1933). Throughout the early 1900's the species was observed during the summer months in 16 different Virginia counties, primarily west of the fall line (Dalmas pers. comm.). The number of sightings declined throughout the mid-1900's, ending abruptly in the late 1960's. Between 1968 and 1986, no observations of Bachman's Sparrows were reported in Virginia (Dalmas pers. comm.). In 1986, the species was rediscovered in Brunswick County (Dalmas pers. comm.). This finding was followed by reports from Sussex County (Hilton 1990) and Greensville County (Dalmas 1992). Breeding populations also recently have been located within the artillery firing ranges on Fort Pickett and Fort A. P. Hill (Fleming and Alstine 1994a, 1994b).

The purpose of this study was to investigate the current status and distribu-

tion of the Bachman's Sparrow within the region where it has been documented in recent years (excluding military lands).

METHODS

Surveys were conducted within a one degree block (between 36° 30" and 37° 00" North latitute and 77° 00" and 78° 00" West longitude) in southeastern Virginia. The study block included portions of Brunswick, Dinwiddie, Greensville, Sussex, and Southampton Counties. This block was chosen because it encompasses all of the areas where Bachman's Sparrows have been observed since 1986 (with the exception of the military impact areas).

Surveys were conducted by systematically driving all improved roadways on each of 32 topographic quadrangles and searching for habitat patches suitable for Bachman's Sparrows. Within this region, there are no known mature pine stands or abandoned farmlands that contain the vegetation profile needed to support Bachman's Sparrows (pers. obs.). All recent observations of this species in the region (with the exception of military impact areas) have been made in regenerating clearcuts. For this reason, only young clearcuts were included in the survey. Clearcuts were included in the study if they were estimated to be younger than 6 years old. All suitable clearcuts were mapped on 7.5 min topographic quadrangles. Based on estimated size, clearcuts were categorized as: $\leq$ 5 ha, 6-10 ha, 11-50 ha, or > 50 ha.

Appropriate clearcuts were surveyed for sparrows using a standardized point count methodology (Ralph et al. 1995). Territorial, male Bachman's Sparrows readily respond to broadcast songs by singing and approaching tape players (Dunning and Watts 1990). Point counts consisted of playbacks of the primary advertising song of Bachman's Sparrow interspersed with silent listening periods. A cassette tape was made that consisted of alternating one minute segments of the male advertising song (2 segments) and one minute silent periods (3 segments). Tapes were broadcast using portable tape players and hand-held, 9 volt amplifiers.

Upon encountering a suitable clearcut, point counts were conducted at 250 m intervals along the clearcut edge. Point counts were conducted from the roadside such that only males singing within hearing distance of the road could be detected. Singing males may generally be detected over a distance of approximately 200 m (pers. obs.). Placing point counts at 250 m intervals along the road ensured that all of the near-road areas were adequately covered. We acknowledge that different proportions of clearcuts were sampled using this approach according to patch size and shape. However, it was not possible to acquire landowner permission to access lands across the entire study block. All singing males were recorded. Bachman's Sparrows sing throughout the summer and at all times of the day (Stoddard 1978). Surveys were conducted throughout the daylight hours from 30 May to 21 June, 1996.

RESULTS

A total of 525 point counts were conducted within 280 different clearcuts. Clearcut size varied considerably across the one degree study area (Table 1). Bachman's Sparrows were detected within only 4 (1.4%) clearcuts. This included singing males in the three larger clearcut size categories (Table 1). Both of the occupied clearcuts > 50 ha in area contained 2 singing males. No Bachman's Sparrows were detected within clearcuts estimated to be ≤ 5 ha in area.

Table 1: Results of surveys for Bachman's Sparrows in southeastern Virginia.

Patch Size (ha)	Clearcuts	Occupied Patches	Singing Males
≤ 5	71	0	0
6-10	65	1	1
11-50	105	1	1
> 50	39	2	4
Total	280	4	6

The clearcuts containing singing males were widely distributed over the study area (Fig. 1). A single occupied clearcut was detected in both Brunswick and Greensville Counties and two occupied clearcuts were detected in Sussex County. Both occupied clearcuts in Sussex County were > 50 ha in area and both contained Henslow's Sparrows.

DISCUSSION

Within the study area, Bachman's Sparrows were detected in very low densities. Sparrow numbers observed here are apparently lower than those from only 10 years ago. For example, in June of 1989, Watts and Bradshaw found singing males in 7 different clearcuts in Sussex County. In 1991, Hilton reported 5 singing males within a clearcut in Brunswick County (Dalmas 1992).

The distribution of occupied clearcuts is consistent with sightings of Bachman's Sparrows over the past 10 years. All documented locations of Bachman's Sparrow in the recent past (excluding military sites) have been in Brunswick, Greensville, and Sussex Counties. However, as would be expected due to the succession of clearcut patches, none of the sites located in this study were previously known.

All of the occupied sites detected within this study were 2-3 year old clearcuts that are wet in winter through spring and contain dense stands of bunch grasses such as broomsedge (*Andropogon virginicus*) and a low density of young saplings.

Bachman's Sparrow Survey Sites

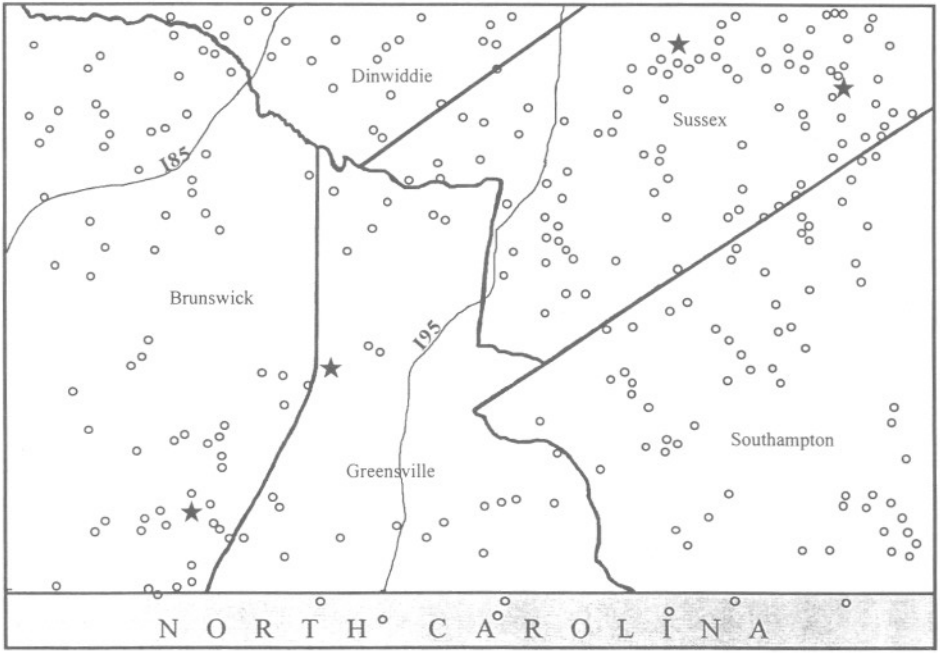

Figure 1. Map of 1 degree block surveyed for Bachman's Sparrows in 1996. Dark lines indicate county boundaries. Light lines indicate U.S. Interstate 85 (I-85) and U.S. Interstate 95 (I-95). Open circles give the locations of clearcut patches surveyed for Bachman's Sparrows. Stars indicate clearcut patches where singing males were detected.

This habitat profile is consistent with breeding sites in Virginia that have been described over the past few years (e.g., Hilton 1990, Dalmas pers. comm.) and with sites elsewhere within the species range (e.g., Hardin et al. 1982, Wan A. Kadir 1987, Haggerty 1988, Dunning and Watts 1990). Bachman's Sparrows require dense stands of grasses and forbs in the first meter layer above the ground and low densities of vegetation in the second to forth meter above the ground (Dunning and Watts 1990).

Without a regular disturbance regime, habitat patches, suitable for Bachman's Sparrows are ephemeral. Within mature pine forests, regeneration of understory vegetation leads to patch abandonment within 4-5 years after burning (Engstrom et al. 1984, Gobris 1992). Within clearcuts of the southeast, tree growth leads to abandonment within 5-7 years of planting (Dunning pers. comm.). Small populations of Bachman's Sparrows appear to have been supported for a substantial period of time on Fort Pickett and Fort A.P. Hill because frequent fires resulting from artillery impacts have maintained the sites in a savannah-like condition. In the absence of regular fires, these sites would become unusable within a short period of time as succession proceeds beyond where it is suitable for the species.

The Bachman's Sparrow utilizes a variety of early successional habitats (i.e., clearcuts, abandoned farmland, utility rights-of-way) and mature pine stands. Mature pine stands provide breeding habitat for an indefinite period of time as long as they are burned on a regular basis. Clearcuts that are managed for timber production do not offer this opportunity. Results of population simulations within forested landscapes suggest that without some stable patches of breeding habitat (i.e., mature pine stands burned on a regular basis or early successional patches maintained as savannahs), Bachman's Sparrow populations will go extinct within a relatively short period of time (Pulliam et al. 1992). It seems likely that without some concerted effort to produce and maintain a stable source of breeding habitat within southeastern Virginia, Bachman's Sparrows will continue to be only erratic summer residents.

ACKNOWLEDGMENTS

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THE 1997 COLONIAL AND BEACH-NESTING WATERBIRDS SURVEY OF THE VIRGINIA BARRIER ISLANDS

BILL WILLIAMS
154 Lakewood Drive
Williamsburg, Virginia 23185

BILL AKERS
3265 Laurel Drive
Blacksburg, Virginia 24060

MICHAEL BECK
3 Shiley Street
Annapolis, Maryland 21401

RUTH BECK
P.O. Box 2 70
Barhamsville, Virginia 23011

JERRY VIA
3265 Laurel Drive
Blacksburg, Virginia 24060

INTRODUCTION

The twenty-third consecutive annual survey of the colonial and beach-nesting birds of the Virginia barrier islands was conducted 15-18 June 1997. All of the barrier islands from Assawoman Island on the north through Fishermans Island on the south, except Parramore Island, were surveyed. Survey techniques were consistent with those described previously (Williams et al. 1990). Appendix I presents an island-by-island summary of the survey results, including a longitudinal survey mean calculated for data through 1994.

Weather through mid-June was unseasonably cool and unusually dry. Record low temperatures for 8 and 10 June were recorded at Norfolk. Birds seemed to be late arriving throughout the early nesting season (M. Erwin, B. Truitt, B. Wafts, pers. comm.). The period 2-6 June witnessed back-to-back low pressure disturbances off the mid-Atlantic coast. Persistent northeast winds from each created significant beach overwash and marsh flooding particularly on 3 June. Ephemeral

inlets breached Myrtle and Wreck islands. Significant beach overwash was noted on every island visited during the survey. Cedar, parts of Hog, Cobb, Wreck, Ship Shoal, Myrtle, Smith, and Fishermans Islands lost all beach up to their preexisting dune and/or shrub lines. All beach-nesting species encountered during the survey were renesting. Only the Royal Terns *(Stema maxima)*, Sandwich Terns *(S. sandvicensis)*, and Brown Pelicans *(Pelecanus occidentals)*, occupying the low beach dunes on Fishermans Island's northeast corner escaped the flooding. Dune-nesting gull species were disrupted on Metompkin, Cedar, Cobb and Wreck islands.

The most notable physiographic change among the islands was the reopening of the inlet between the north end of Cedar Island and its sandbar extension. This inlet was found closed during the 1996 survey (Williams et al. 1997).

In the decade since Brown Pelicans first bred in Virginia (Williams 1989; Williams et al. 1990), numbers of breeding pelicans have increased annually on the barrier islands. The initial nesting on Metompkin Island in 1987 seems small compared to the 1,646 nesting birds found this year at their only barrier island nesting site on the northeast corner of Fishermans Island. This year's total is a 20% increase over the 1996 count (1,370, Williams et al. 1997). In stark contrast to the abundance of this species on Fishermans Island on 15 June was the complete absence of pelicans on any of the other islands.

Great Blue Herons *(Ardea herodius)* declined significantly from their survey high of 38 in 1996 (Williams et al. 1997). Great Egret *(Ardea alba)* numbers were consistent with previous survey counts and 12% above the 20-yr. mean of 397. This species showed notable storm-related effects on Fishermans Island with numerous dead young seen hanging below tree-top nests.

Snowy Egrets *(Egretta thula)* numbers were only 15% of the 20-yr. survey mean of 628. Little Blue Herons *(Egretta caerulea)* tied their second all-time survey low of 45 recorded in 1996 (Williams et al. 1997). Their numbers were well below their 20-yr. mean of 144. Tricolored Herons *(Egretta tricolor)* also had a second lowest tally with 153 birds distributed among three colonies. Forty-eight percent of the total were found at the Wreck Island colony site. This year's total is significantly below their 20-yr. mean of 517. Cattle Egret *(Bubulcus ibis)* figures were up after two seasons of decline, yet were 39% below the 20-yr. mean of 200. Black-crowned Night Herons *(Nycticorax nycticorax)* were at their second lowest survey total after a highly successful 1996 (Williams et al. 1997). This species has a 20-yr. mean of 893, so this season's total may signal concern.

Green Herons *(Butorides striatus)* and Yellow-crowned Night Herons *(Nycticorax violaceus)* had numbers below their 20-yr. means of 32 and 57, respectively. However, their penchant to nest away from mixed heronry sites often results in their being undercounted via our survey strategies.

White Ibis *(Endocimus albus)* numbers increased dramatically over previous counts. In addition to the 31 adults noted at the Fishermans Island colony site, 18 second-year birds were seen feeding nearby. Glossy Ibis *(Plegadis falcinellus)* posted their second lowest count (188), far below their 20-yr. mean of 569.

Both Wilson's Plovers *(Charadrius wilsonia)* and Piping Plovers *(C. melodus)* continued a two-year decline. Wilson's Plover numbers (41) were 18% below the longitudinal survey mean of 50 and 42% below the all-time high count of 70 in 1995 (Williams et al. 1996a). The Piping Plover total of 117 was down 21 % from the 1996 total of 148 (Williams et al. 1997), yet 9% higher than the mean of 107.

Assawoman, Cedar and Metompkin islands continue to serve as the most significant breeding locations for the two species. They accounted for 98% of the Wilson's Plovers and 96% of the Piping Plovers. In that regard, it is worth noting that vegetational succession has claimed significant upperbeach nesting habitat on the north end of Cedar Island.

American Oystercatcher *(Haemaptopus palleatus)* numbers increased for the third consecutive year. The total of 695 this season represented a 15% gain over the 1996 total of 604 (Williams et al. 1997) and a 24% gain over the 561 in 1995 (Williams et al. 1996a). However, it was well below the survey mean of 911. Forty-seven percent (285) of the birds counted this year were on Metompkin and Cedar islands with 166 and 119 respectively.

Both Laughing Gull *(Larus atricilla)* and Herring Gull *(L. agentatus)* breeding populations posted gains over 1996 (Williams et al. 1997). For the former, the Fishermans Island colony held 5,582 birds, 57% above the all-time survey low of 3,566 noted the previous year. However, this figure is significantly (54%) below the 20-yr. mean of 12,260. The latter species increased 10% over 1996 to 3,139, approximately equal to the overall survey mean of 3,194. Great Black-backed Gulls *(L. marinus)* had their third highest total ever at 403.

Most severely affected by the pre-survey storms were the beach-nesting tern species and Black Skimmer *(Rhynchops niger)*. All-time low counts were recorded for Gull-billed Terns *(Stema nilotica)*; 102, Common Terns *(S. hirundo)*; 598, Least Terns *(S. antillarum)*; 115, and Black Skimmers (1,678); these species' totals were below their 20-yr. means by 86%, 84%, 86%, and 67%, respectively. This year's Gull-billed Tern figure marks a 95% decline for this species since the survey commenced in 1975 (Williams, 1976).

Subsequent to the season's field work, Barry Truitt (pers. comm.) reported that fox *(Vulpesl/Urocyon)* predation caused colony abandonment on Cedar Island. Raccoons *(Procyon lotor)* were the likely cause of colony abandonment on Ship Shoal Island.

Field experiences on the barrier islands are seldom without noteworthy sightings. This survey was no exception. A single American White Pelican *(Pelecanus erythrorhyncho)s* was seen at the Fishermans Island site on 15 June. A female Redbreasted Merganser *(Mergus serrator)* was seen on Wreck Island on 16 June. The same day, 94 Red Knots *(Calidris canutus)* were observed on Myrtle Island along with two White-rumped Sandpipers *(C. fuscicollis)*. Eight more of the latter were seen on 17 June on Cedar Island. Though not seen during the survey, Bob Cross (pers. comm.) reported a single male Snowy Plover *(Charadrius alexandrinus)* had been present prior to 3 June on the same portion of beach on Cedar Island where one had been found the previous two years (Williams et al. 1996a; 1996b). Michael Beck discovered a second year Iceland Gull *(Larus glaucoides)* on Hog Island 18 June. On 17 June, Barry Truitt saw a Cory's Shearwater *(Calonectris deomedea)* off Cedar Island and Bill Williams watched a Common Tern chase an adult Parasitic Jaeger *(Stercorarius parasiticus)* down the beach of Assawoman Island. A Willett *(Catoptrophorus semipalmatu)s* nest with four eggs was located on Ship Shoal Island 16 June. The next day, one Willet nest with two eggs was found on Metompkin Island and another nest with three eggs was located on Assawoman Island. Two Seaside Sparrow *(Ammordramus maritimus)* nests were discovered on Ship Shoal Island on 16 June, one with four eggs and one with two eggs.

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APPENDIX I

1997 Virginia Barrier Islands Colonial and Beach-nesting Waterbirds Survey - Total Number of Adults

June 15-18

	Assa	Metom	Cedar	Daw Sh	Parra	Chm Pl	Sandy	Hog	Rogue	Cobb	L. Cobb	Wreck	ShipShl	Gdwn	Mink	Myrtle	Smith	Fisher	Total	*Mean
Brn Pel																		1646	1646	415
GBl Her																		18	18	12
Grt Egt						54				22		72						297	445	397
Sny Egt						26				11		28						28	93	628
Lt Bl Her										9		15						21	45	144
Tri Her										52		74						27	153	517
Cat Egt												10						111	121	200
Grn Her						2						6							8	32
BCN Her										44		84						68	196	893
YCN Her										4									4	57
Wht Ibis																		31	31	3
Glsy Ibis						16				82		31						59	188	569
No Har								1	1	1		1							4	6
Wil Plvr	16	3	19									1	2						41	50
Pip Plvr	33	45	35							1		2					1		117	107
Am Oys	34	166	119	16		28	18	94		47	10	44	26			29	24	40	695	911
Lgh Gull																		5582	5582	12260
Her Gull		102	20			851	146			682	88	836						414	3139	3194
GBb Gull		4	2			124	12			69	12	114						66	403	173
Gb Tern			40								2	10	50						102	754
Cas Tern																			0	4
Ryl Tern											12		11					3670	3693	5284
Snd Tern																		3	3	35
Com Tern	2		133				46	36			56	68	250			7			598	3646
For Tern							27												27	122
Lst Tern			30					8				39	12			26			115	842
Blk Skm	16		627	6				238			156	145	490						1678	5087
Ngt Hwk																			0	
Hrn Lark	3	10	6										2				1		22	

*All data 1975-1994

STATUS AND DISTRIBUTION OF COLONIAL WATERBIRDS IN COASTAL VIRGINIA

BRYAN D. WATTS
MITCHELL A. BYRD
Center for Conservation Biology
College of William & Mary
Williamsburg, Virginia 23185

INTRODUCTION

For the years prior to the mid-1970's, systematic information on the abundance and distribution of colonial waterbirds in Virginia does not exist. Information during this period is available only from a smattering of nesting records (e.g., Murray 1952), accounts of individual colonies (e.g., Abbott 1955), and area bird lists (e.g., Grey 1950). During the 1975 and 1976 breeding seasons, the first systematic survey of wading bird colonies in coastal Virginia was completed in association with a broad-based survey covering the entire Atlantic Coast (Custer and Osborn 1977). During 1977, the first systematic survey of all colonial waterbird species was conducted in association with the "Maine to Virginia" project (Erwin and Korschgen 1979). Both of these studies focused primarily on the coastal fringe and did not attempt to cover the entire coastal plain. Since the mid-1970's, colonial waterbird work has either examined assemblages within specific locations (Williams et al. 1990) or targeted individual species over broad areas (e.g., Beck et al. 1990). No attempt has been made to coordinate a comprehensive survey of the entire colonial waterbird assemblage.

The purpose of this study was to generate population estimates for all colonial waterbird species currently breeding on the Coastal Plain of Virginia. Information presented is intended to: (1) be used in the formulation of management recommendations, (2) allow for the assessment of long-term population trends, and (3) provide a baseline for future comparisons.

METHODS

An extensive aerial survey was conducted using fixed-wing aircraft in 1993 during early stages of the breeding season. All mainland waterways, barrier islands, Bay islands, and marshlands were overflown and searched for wading bird colonies. Due to their wide distribution and large numbers, only the largest

inland reservoirs and farm ponds were surveyed. Because Great Blue Heron colonies often form near the headwaters of small streams, a special attempt was made to follow all tributaries to their origin. Aerial surveys were conducted by systematically flying over areas at an altitude of approximately 100 - 150 m and searching for evidence of breeding colonies. Once detected, a colony was circled long enough to allow observers to map the colony location and estimate its size. All colonies were given a unique numerical code and plotted on 7.5 min topographic quadrangles. Groups of breeding pairs were considered independent colonies if they were: (1) separated from other groups within a continuous habitat by at least 400 m, (2) separated from other groups by a distinctive barrier, or (3) separated from other groups by a significant habitat discontinuity (e.g., birds in dune grassland adjacent to birds in patch of deciduous saplings).

Follow-up ground counts were conducted for all locations except inland Great Blue Heron colonies. Great Blue Heron colonies were widespread and often situated in remote locations or over extensive swamps. Financial and logistical constraints did not allow for ground surveys of these sites.

Colony size estimates were based primarily on active nests, and occasionally on the number of adults present. The number of breeding adults was used when nest counts were impractical or when deemed inappropriate due to colony disturbance. Colony size was based on complete counts whenever possible. However, due to the large size of many colonies, estimates were derived for a large portion of the colonies. All estimates for aerial surveys were performed by the same observer. Many different observers were involved with ground surveys. To reduce observer bias across surveys, data resolution for estimates was reduced by rounding off reported numbers to the nearest value using the following graded scale: nearest 5 for < 50, nearest 10 for 50 - 200, nearest 25 for 200 - 400, nearest 50 for 400 - 1,000, nearest 100 for 1,000 - 2,000, nearest 200 for >2,000. Complete counts were used when reported.

Breeding chronology was taken into account when designing the survey. Mainland areas likely to support early nesting waders were flown from early April to mid-May. Coastal marshes and islands supporting gulls, terns, and allies were flown between mid-May and mid-June. Ground counts of urban areas were conducted during April, May, and June. Ground counts of barrier islands, Bay islands, and marshlands were conducted during June and July.

Due to the differences in breeding chronology and circumstances, different surveys were used to generate population estimates for different species. Numbers from aerial surveys were used for inland wader colonies. Ground surveys were used for all urban colonies and colonies on Barrier and Bay islands. Ground surveys were also used for colonies on marshlands with the exception of Laughing Gull colonies. Laughing Gull colonies often cover many hectares making estimation of nest numbers much easier from the air. Also, Laughing Gulls were very synchronous in mid to late May of 1993 when marsh colonies were flown. Afterward, they were disrupted by successive high tides, making ground counts less reliable for estimating total population size.

Population estimates are presented as breeding pairs. Breeding pairs were estimated on a colony by colony basis and compiled to generate an overall population estimate. For colonies surveyed using nest counts or estimates, a one-to-one relationship between nests and pairs was assumed. For colonies surveyed

using counts or estimates of adults, a one-to-one relationship between adults and pairs was assumed. The portion of population estimates that were based on nests is provided to allow the reader to recalculate population estimates based on number of adults.

Figure 1. Map of study area. Study covered the entire Coastal Plain of Virginia (inset map). For purposes of presentation, the Coastal Plain was subdivided into geographic regions (large map) including: (1) seaside, (2) Bay islands, (3) urban, (4) western shore, and (5) southside.

For presentation of gross distribution patterns, the Coastal Plain was broken down into five geographic regions (Fig. 1). Regions included were: (1) Eastern Shore seaside – barrier island/lagoon system along seaward margin of Delmarva Peninsula up to the Maryland/Virginia boundary line, (2) Bayside and Bay islands – western shoreline of the Delmarva Peninsula to the Maryland/Virginia border, and Chesapeake Bay islands of Virginia, (3) Urban – major urban areas of lower tidewater, including the cities of Virginia Beach, Norfolk, Portsmouth, Chesapeake, Newport News, and Hampton, (4) Western Shore – south shoreline

of the Potomac River to the south shoreline of the James River including all areas from the western shore of the Chesapeake Bay west to the fall line, and (5) Southside – lands south of the James River to the Virginia/North Carolina boarder including all lands between the Atlantic Ocean and the fall line (except areas designated as urban).

RESULTS

Population Estimates

A total of 446 different colonies was mapped and surveyed during the breeding season. Colonies contained an estimated 94,947 breeding pairs of 24 species (Appendix 1). Colony size varied from 2 to 5,400 pairs with 63% <100 pairs. The majority (66.3 %) of colonies contained only one species and 93.3 % contained three species or less. Ten mixed-species rookeries contained seven species or more.

Abundance varied widely between species and species groups (Table 1). Gulls were the most abundant group with > 54,000 breeding pairs. Tems and waders accounted for > 20,000 and > 18,500 pairs respectively. Although waders accounted for < 20 % of all pairs detected, they accounted for > 50 % of all colonies. Laughing Gulls were several times more abundant than any other species and accounted for 47.9% of the total breeding pairs observed. Great Blue Herons and Herring Gulls numbered > 8,500 pairs, and Common and Royal Terns > 6,000 pairs. The remaining 19 species combined accounted for < 20 % of the total breeding pairs.

Geographic Distribution

The barrier island/lagoon system of the Eastern Shore was the most important region for the majority of colonial species encountered (Table 2). In 1993, this region supported 23 of the 24 colonial species found in coastal Virginia and accounted for > 70% and 50% of all breeding pairs and colonies, respectively. For 18 of the 24 species, the region supported > 50% of the known coastal population. Many of these species were found almost exclusively in this region. Only the Double-crested Cormorant, Great Blue Heron, Great Egret, Green-backed Heron, and Yellow-crowned Night Heron were more abundant in other regions. The number of species supported by the other four geographic regions varied widely. The Bay region supported 20 species whereas the urban, western shore, and southside regions supported only 9, 5, and 2, respectively. The Bay region also had 12 species in common with the seaside of the Eastern Shore that were not found elsewhere. The Bay region was the dominant region for the Green-backed Heron. The cities included in the urban region supported substantial populations of Common Terns, Least Terns, Double-crested Cormorants, Great Egrets, Green-backed Herons, and Yellow-crowned Night Herons. This was the dominant region for the Yellow-crowned Night Heron. The western shore was the dominant region for the Double-crested Cormorant and the Great Blue Heron. Greater than 70% of all Great Blue Heron colonies were located in this region. The

Species	Colonies	Mean±S.E.	Range	%Nests	Pop. Est.
Waders					
White Ibis	1	3.0	-----	0.0	3
Glossy Ibis	11	91.6±104.94	2-320	0.0	1,008
Great Blue Heron	156	58.7±134.70	1-1300	>99.9	9,112
Great Egret	45	56.0±78.67	1-350	64.9	2,520
Snowy Egret	15	155.3±183.86	3-650	7.5	2,329
Tricolored Heron	11	69.7±69.27	2-225	0.3	767
Little Blue Heron	10	37.4±34.63	1-130	0.0	374
Cattle Egret	9	162.1±185.19	5-550	15.8	1,459
Green-backed Heron	22	7.0±10.53	1-50	74.0	154
Black-crowned Night Heron	13	40.5±58.01	1-225	1.1	526
Yellow-crowned Night Heron	35	11.1±12.01	1-58	97.7	388
Gulls					
Great Black-backed Gull	26	19.8±23.69	1-90	19.5	514
Herring Gull	35	251.5±276.09	1-1056	27.3	8,801
Laughing Gull	110	412.6±645.46	5-5400	78.3	45,387
Terns					
Gull-billed Tern	30	20.2±39.43	1-200	14.0	606
Caspian Tern	5	1.6±0.49	1-2	0.0	8
Royal Tern	3	2083.3±1091.13	550-3000	48.0	6,250
Sandwich Tern	2	15.0±4.00	11-19	0.0	30
Forster's Tern	72	40.8±67.46	5-550	61.9	2,939
Common Tern	40	169.5±521.80	1-3134	55.1	6,781
Least Tern	26	45.0±56.41	4-271	36.2	1,171
Others					
Black Skimmer	25	123.9±200.15	2-750	22.6	3,098
Double-crested Cormorant	4	88.5±73.68	6-180	100.0	354
Brown Pelican	2	184.0±140.00	44-324	100.0	368
Total	446	212.9±153.6	2-6490	63.4	94,947

Table 1. Estimated number of breeding pairs for all geographic regions combined. The category "colonies" refers to the number of colonies that included each species. Mean and range indicates the number of individuals/colony calculated for each species separately. "%nests" is the portion of the population estimate that was based on observations of nests rather than adults (see methods).

Species	Seaside			Bay Islands			Urban			W. Shore			Southside		
	Col.	Prs	%	Col.	Prs	%	Col.	Prs	%	Col.	Prs	%	Col.	Prs	%
Waders															
White Ibis	1	3	100.0	---	---	---	---	---	---	---	---	---	---	---	---
Glossy Ibis	9	779	77.3	2	229	22.7	---	---	---	---	---	---	---	---	---
Great Blue Heron	1	8	>0.1	11	212	2.3	4	46	0.5	111	6683	73.3	29	2163	23.7
Great Egret	10	885	35.0	1	50	2.0	7	785	31.2	13	193	7.7	14	607	24.1
Snowy Egret	12	1862	79.9	3	467	20.1	---	---	---	---	---	---	---	---	---
Tricolored Heron	9	713	93.0	2	54	7.0	---	---	---	---	---	---	---	---	---
Little Blue Heron	8	330	88.2	2	44	11.8	---	---	---	---	---	---	---	---	---
Cattle Egret	6	854	58.5	1	375	25.7	---	---	---	1	230	15.8	---	---	---
Green-backed Heron	7	47	30.5	2	58	37.7	11	37	24.0	1	12	7.8	---	---	---
Black-crowned Night Heron	9	442	84.0	4	84	16.0	---	---	---	---	---	---	---	---	---
Yellow-crowned Night Heron	3	63	11.7	2	9	2.4	30	316	85.9	---	---	---	---	---	---
Gulls															
Great Black-backed Gull	20	362	70.4	6	152	29.6	---	---	---	---	---	---	---	---	---
Herring Gull	27	6106	69.4	8	2695	30.6	---	---	---	---	---	---	---	---	---
Laughing Gull	109	44387	98.2	1	800	1.8	---	---	---	---	---	---	---	---	---
Terns															
Gull-billed Tern	29	604	88.7	---	---	---	---	---	---	---	---	---	1	2	0.3
Caspian Tern	4	7	87.5	1	1	12.5	---	---	---	---	---	---	---	---	---
Royal Tern	2	3250	52.0	1	3000	48.0	---	---	---	---	---	---	---	---	---
Sandwich Tern	2	30	100.0	---	---	---	---	---	---	---	---	---	---	---	---
Forster's Tern	69	2169	73.8	3	770	26.2	---	---	---	---	---	---	---	---	---
Common Tern	38	3247	47.9	1	400	5.9	1	3134	46.2	---	---	---	---	---	---
Least Tern	24	747	63.8	---	---	---	2	424	36.2	---	---	---	---	---	---
Others															
Black Skimmer	23	2549	82.3	1	350	11.3	1	199	6.4	---	---	---	---	---	---
Double-crested Cormorant	---	---	---	1	6	1.7	1	141	39.8	2	207	58.5	---	---	---
Brown Pelican	1	324	88.0	1	44	12.0	---	---	---	---	---	---	---	---	---
Total	235	69968	73.7	25	9800	10.3	44	5084	5.4	113	7325	7.7	29	2770	2.9

Table 2. Summary of species distributions across geographic regions. "Col." refers to the number of colonies within the respective regions that include each species. "Prs" indicates the estimated number of breeding pairs within each region. "%" indicates the percentage of the total population found within each region.

southside region supported substantial populations of both Great Blue Herons and Great Egrets.

DISCUSSION

During the 1993 breeding season, coastal Virginia supported a substantial community of colonial waterbirds. The size of this community exceeded previous estimates by more than 70% (Erwin and Korschgen 1979). The increase in the collective population estimate is likely due to several factors including: (1) an increase in the area surveyed, (2) an increase in the populations of selected species, and (3) colonization of coastal Virginia by three new species. All of these factors also contributed to > 100% increase in the number of colonies detected.

This study confirms previous indications that the seaside of the Eastern Shore is the single most important region for colonial waterbirds in coastal Virginia. This small area supported > 70% of all breeding pairs and was the dominant region for 18 of 24 species surveyed. The Bay region also supported a diversity of species but considerably fewer individuals. Urban areas of the lower Chesapeake Bay were found to support substantial populations of selected species. None of these populations were known in the mid-1970's. An increase in survey and research activities in these urban areas from the mid-1980's to the present has resulted in better estimates of these urban populations. The western shore and southside regions were most significant for supporting a large number of Great Blue Heron and Great Egret colonies.

Recent Population Trends

Although the lack of previous coast-wide surveys prevents a direct assessment of population changes, some recent trends are evident from comparisons to historical data. The most obvious of these trends result from recent colonization events. Three species included in the 1993 survey have colonized coastal Virginia in the 20 years or so since the broad surveys of the mid 1970's (Custer and Osborn 1977, Erwin and Korschgen 1979). These include the White Ibis, the Double-crested Cormorant, and the Brown Pelican. Nesting of the White Ibis was first confirmed in Virginia in 1977 on Fishermans Island (Frohring and Beck 1978). Breeding has been restricted to the barrier islands. Breeding areas have been surveyed every year since 1975 as part of the annual survey of the barrier islands (see Williams et al. 1990). Adult White Ibises have been present in the same mixed-species colony during most years since 1977 but there appears to be no indication that they are increasing (Williams et al. 1992). Breeding of the Double-crested Cormorant was first confirmed in 1978 on a small vegetated island in the James River (Scott 1978). Breeding was sporadic there until 1984 when 8 pairs nested. Since this time, the coastal population has increased rapidly with an additional colony located in 1991 and two others during the 1993 survey (Watts and Bradshaw 1996). Since the survey in 1993, a fifth colony has been located near Chincoteague on the seaside of the Eastern Shore (Watts and Bradshaw 1996). Nesting of Brown Pelicans was first documented in two locations on the barrier islands in 1987 (Williams 1989). Since 1989, the breeding

population seems to have stabilized. A third breeding location was documented on one of the Bay islands during the 1993 survey.

During the 20 years (1955-1975) prior to the surveys of the mid-1970's, three additional species colonized Virginia. The Glossy This was found breeding on Hog Island in 1956 (Bock and Terborgh 1957). The breeding population of this species increased dramatically throughout the 1960's reaching a high by the mid-1970's (Custer and Osborn 1977). Since this time the species has steadily declined on the barrier islands (Williams et al. 1990). By 1993, the coastal plain population had been reduced > 50% from historic highs. The Cattle Egret was found breeding on the seaside of the Eastern Shore in 1961 (Scott and Cutler 1961). Like the Glossy Ibis, this species increased dramatically throughout the 1960's. Also like the Glossy Ibis, this species has gradually declined on the barrier islands (Williams et al. 1990). However, on the Coastal Plain, as a whole, Cattle Egrets have remained relatively stable since the mid-1970's. In 1970, the Great Blackbacked Gull was found breeding on Fishermans Island (Scott and Cutler 1970). Since the 1970's, this species has rapidly colonized other locations on both the seaside and Bay islands. Small numbers of individuals now nest in the majority of Herring Gull colonies. The breeding population has increased > 20-fold since the mid-1970's.

Some recent, negative population trends are evident for selected species that , historically, have nested in or colonized Virginia prior to 1955. For example, Tricolored Herons were first found nesting in Virginia in 1941 (Murray 1952). This species increased in the state, evidently reaching highs from the mid 1950's to the mid 1970's (Erwin and Korschgen 1979). The species has declined on the barrier islands (Williams et al. 1990) and the 1993 coastal population is > 50% reduced from that of the mid-1970's (Custer and Osborn 1977). Little Blue Herons were one of the most abundant waders along the Atlantic Coast from the 1930's to the 1950's (Ogden 1978). Historic breeding records for this species exist for all of the geographic regions surveyed (Grey 1950, Murray 1952, Abbot 1955). The species declined drastically from the 1950's to the 1970's (Erwin and Korschgen 1979) and is now found only on the seaside of the Eastern Shore and from two locations on Bay islands. The Black-crowned Night Heron has decreased considerably on both the barrier islands and on the coastal plain in general. The 1993 population estimate is 80% lower than the 1975 estimate (Custer and Osborn 1977). Both Gull-billed Terns and Black Skimmers have shown dramatic declines on the barrier islands (Williams et al. 1990). These species have dropped to < 20% and 30% of their population levels in the mid-1970's. However, adequate historical data is not available to assess trends for the Coastal Plain as a whole.

Some positive population trends are also evident for selected species that have bred in Virginia historically. Great Blue Herons appear to have increased dramatically over the past 30 years. As recently as 1964, only 5 colonies were reported for the Coastal Plain (Scott 1964). In 1975, 15 colonies were reported containing > 2,400 pairs (Custer and Osborn 1977). In 1984, 31 colonies were known containing nearly 3,600 pairs (Beck unpubl. data). The 1993 survey detected 156 colonies supporting > 9,000 pairs.

Although some of the increase over time must be attributed to an increase in survey coverage and intensity, it seems unlikely that the large increase would be explained on this basis alone. Great Egrets appear to have increased three-fold

over the past 20 years. This species is most abundant on the coast but is increasingly moving toward the fall line and breeding in colonies with Great Blue Herons. More than 20% of Great Blue Heron colonies now contain Great Egrets. The Herring Gull population has also increased over the past 40 years. A single nest was located on the Eastern Shore near Cobb Island in 1948 (Murray 1952). By 1977, 9 colonies containing > 2,600 pairs were reported (Erwin and Horschgen 1979). The 1993 survey located 35 colonies supporting an estimated 8,800 pairs. The first comprehensive survey of Forster's Terns was in 1977 (Erwin and Korschgen 1979). The species appears to have increased by > 100% since that date. The first documented record of Yellow-crowned Night Herons breeding in Virginia was in 1947 (Darden 1947). This species has declined in recent years on the barrier islands (Williams et al. 1990) but appears to be increasing slowly elsewhere, particularly in urban areas (Watts unpubl. data). Population changes in this species have been difficult to document due to the lack of adequate historic data.

Population trends of remaining species either appear to be relatively stable or are difficult to assess. Sandwich and Caspian Terns are near the limits of their respective breeding ranges. These species have small populations that appear to be relatively stable on the barrier islands over the past 20 years. The population estimate for Royal Terns is comparable to that reported in 1977 (Erwin and Horschgen 1979). Because this species moves over large areas of coastal Virginia, year to year patterns may appear sporadic. Although Common Terns have declined in recent years on the barrier islands (Williams et al. 1990), they have increased elsewhere such that the total Coastal Plain population is comparable over the past 20 years. From the mid-1970's the Least Tern increased to a high in the early 1980's and has shown a gradual decline to the present (Beck et al. 1990). The 1993 population estimate is comparable to those of the mid-1970's. The Snowy Egret was found nesting on the seaside of the Eastern Shore in 1941 (Murray 1952). The population increased substantially during the following 30 years. Numbers have declined steadily on the barrier islands but on the Coastal Plain, numbers are comparable to those of the mid-1970's. Laughing Gulls were the most abundant colonial species in 1977 (Erwin and Korschgen 1979) and in 1993. The latter survey shows a noticeable increase in both numbers and distribution. A single colony was detected on a marsh island in the Bay where none were known to nest beyond the seaside in 1977. Green-backed Herons nest widely in many different situations. No survey to date has produced an adequate population estimate for this species.

The population changes indicated above must be viewed in a broader context. As indicated, many of the population increases have followed colonization events where populations do not appear to have reached stable levels (e.g., Double-crested Cormorants, Great Black-backed Gull). Similarly, many of the recent population declines have followed population increases associated with earlier colonization events (e.g., Glossy Ibis, Tricolored Heron). Many of these species have undergone substantial range expansions (Post 1961, Ogden 1978) in recent decades. For these species, it remains difficult to separate the relative influences of local conditions from regional population phenomena on population trends incoastal Virginia. Caution should be used when attempting to attribute declines to local factors.

Sources of Error in Estimates

There are numerous sources of potential error associated with the survey techniques and the population estimates presented above. The first is that some colonies may have gone undetected, leading to an underestimate of population size. The magnitude of this error varies among species but is most severe in species that are widely distributed, nest singly or in small colonies, and are difficult to detect from the air. Population estimates for these species would be greatly improved by extensive ground surveys. For example, extensive ground surveys of Yellow-crowned Night Herons in urban areas increased the known Virginia population by 500 % in just 3 years (Watts 1995). However, broad surveys of similar species have not been practical, probably resulting in gross underestimates of population size. For the majority of species examined here, the influence of this source of error is likely small.

A second source of error inherent to the population estimates is observer bias. Number estimates vary among individual observers. Because the same observer may repeatedly make the same errors, variability in the overall estimate is reduced by using the same observer. As mentioned above, all aerial estimates were made by the same individual. Even though several individuals participated in ground surveys, the majority of colonies were surveyed by relatively few individuals. No attempt was made to adjust estimates for observer bias.

A third source of error is the timing of surveys. Ideally, surveys should be timed to reflect peak breeding activity within colonies. However, peak breeding differs between species and may vary considerably between years and between colonies within years. This uncertainty may be overcome by conducting multiple surveys. Multiple surveys were not practical due to the extent of this study and for many species may be detrimental to breeding success. As mentioned above, nesting phenology was taken into account when designing the survey and when generating population estimates. It is not possible, at this time, to assess the significance of this source of error on overall population estimates.

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APPENDIX I

List of colonial waterbird species observed in coastal Virginia.

Species	Scientific Name
Great Black-backed Gull	*Larus marinus*
Herring Gull	*Larus argentatus*
Laughing Gull	*Larus atricilla*
Gull-billed Tern	*Sterna nilotica*
Caspian Tern	*Sterna caspia*
Royal Tern	*Sterna maxima*
Sandwich Tern	*Sterna sandvicensis*
Forster's Tern	*Sterna forsteri*
Common Tern	*Sterna hirundo*
Least Tern	*Sterna antillarum*
Black Skimmer	*Rynchops niger*
Double-crested Cormorant	*Phalacrocorax auritus*
Brown Pelican	*Pelecanus occidentalis*
White This	*Eudocimus albus*
Glossy This	*Plegadis falcinellus*
Great Blue Heron	*Ardea herodias*
Great Egret	*Casmerodius albus*
Snowy Egret	*Egretta thula*
Tricolored Heron	*Egretta tricolor*
Little Blue Heron	*Egretta caerulea*
Cattle Egret	*Bubulcus ibis*
Green-backed Heron	*Butorides striatus*
Black-crowned Night Heron	*Nycticorax nycticorax*
Yellow-crowned Night Heron	*Nyctanassa violacea*

MISSISSIPPI KITES BREED IN WOODBRIDGE, VIRGINIA, DURING SUMMER 1997

A.J. QUEZON
11691 Yates Ford Road
Fairfax Station, Virginia 22039

For at least the third consecutive year Mississippi Kites (*Ictinia mississippiensis*) have successfully bred in Woodbridge, Virginia (Prince William County), near the Potomac River approximately 30 mi. south of Washington, D. C. On 2 July 1997, James and Jane Parker, Suzanne Miller, and A.J. Quezon discovered an active nest approximately 10-15 m above the ground in a tulip poplar (*Liriodendron tulipifera*) located in the backyard of a suburban house. The nest tree was within 100 m of a silver maple (*Acer saccharinum*) used in 1996 to produce one juvenile, the first breeding record of Mississippi Kite in Virginia (Quezon, 1997). The nest was located in a central crotch of the tree and was loosely constructed of small twigs and branches. A mirror pole was used to observe the nest. As the mirror approached the elevation of the nest, the adult female took flight, revealing a single nestling judged to be approximately 5-7 days of age.

Over the course of the summer, Quezon and Miller followed the progress of the Mississippi Kites on a regular basis, usually visiting the nesting site at least once a week. While flying insects, e.g., periodical cicadas (*Magicicada* spp.), appeared to be the primary prey item delivered to the nest, avian prey, including Chimney Swifts (*Chaetura pelagica*) delivered by the adult male and two other unidentified species, also were captured. At the nest, the adults would tear the swift to bite-sized pieces and pass the morsels to the nestling. Curiously, several of the Chimney Swifts head's were not eaten, but were found discarded beneath the nest or nearby perch trees. The adults were also seen chasing Blue Jays (*Cyanocitta cristata*) on several occasions and many Blue Jay feathers were found beneath the nest, but their capture or consumption was never witnessed. Along with the many feathers found beneath the nest, castings and insect parts were discovered.

The juvenile flew from the nest for the first time during the early hours of 1 August, spending several hours hopping and taking short flights from branch to branch in an adjacent black locust (*Robinia pseudoacacia*). During the next week, the fledgling's flights grew gradually longer, but it never wandered more than about 50 m from the nest. Although its flights gradually lengthened in both duration and distance, the fledgling continued to return to the nest periodically

to be fed by an adult and to rest. By the end of August, the juvenile was soaring at high altitudes and chasing and stooping on other birds and flying insects. However, it continued to be fed by the adult male. The adult female was last seen in the vicinity about a week after the juvenile's fledging. The adult male and juvenile were last seen in their territory on 2 September (Lula Fasold, pers. comm.).

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THE FIRST RECORD OF THE SHINY COWBIRD FOR VIRGINIA

BILL WILLIAMS
154 Lakewood Drive
Williamsburg, Virginia 23185

The arrival and subsequent dispersal of the Shiny Cowbird *(Molothrus bonariensis)* in the United States were foreshadowed by its range expansion through the West Indies from South America during the latter half of this century (Post and Wiley 1977; Arendt and Vargas 1984; Bond 1984; Cruz et al. 1985). The species was first recorded in the United States on 14 June 1985, when a single male was discovered on Lower Matecumbe Key, Florida (Paul 1985; Smith and Sprunt 1987). The bird remained six weeks as part of a mixed flock of Red-winged Blackbirds *(Agelaius phoeniceus)* and Common Grackles *(Quiscalus quiscula)*. The following year 3 males were recorded at Islamorada, Florida (Paul 1986; Smith and Sprunt 1987). In 1987 the species posted its "3rd consecutive year" in Florida with one at Islamorada and six more "of both sexes at Flamingo since May" (Paul 1987). By 1988 it had extended its range in Florida into the Everglades (Atherton and Atherton 1988), as far north as Ft. Desoto by May (Langridge 1988), and to Jacksonville by July (Paul 1988).

In 1989 the Shiny Cowbird was recorded for the first time outside of Florida with birds appearing in Georgia, South Carolina, and North Carolina (LeGrand 1989; LeGrand 1990a; LeGrand 1990b). Meanwhile, in Florida one observer commented that Shiny Cowbirds were "too numerous to track" (Paul 1989).

Ogden (1990) described the species status in 1990 as "rapidly becoming regular in southeast Florida and spreading". Established pairs were found on Islamorada on 5 May (Langridge 1990). From May through July, Shiny Cowbirds in Florida were "seen at both ends of the state" (Paul 1991) and reported through the fall at "various locations" (West 1991). Two males were reported 3-26 June 1990, in South Carolina (LeGrand 1991a). North Carolina had its second record, a male, at New Bern in October (LeGrand 1991b).

By 1991, the species was noted at its usual Homestead to Flamingo locations throughout the winter (Ogden 1991) and in South Carolina from 30 April-13 July (LeGrand 1991c). During the 1991-1992 winter, 30-40 Shiny Cowbirds were recorded at Rookery Bay, Florida, and the species was described as "peripatetic" (Ogden 1992).

The following year, Shiny Cowbirds were again reported from Rookery Bay, Florida (West and Warner 1993), and noted "regularly" at Key West through the

spring (Langridge 1993). In North Carolina an adult male was present from mid-May-June (Davis 1993).

The Shiny Cowbird underwent little reported change in distribution and status in 1994. It was noted in Collier County, Florida, on 11 January (West et al. 1994), at Key West on 12 May (Langridge 1994) and in Tallahassee on 7 June (Paul and Schnapf 1994). In North Carolina 1-2 birds were reported at Wilmington in January and February (Davis 1994).

Shiny Cowbirds were reported from the Dry Tortugas and at Key West during the spring of 1995 (Langridge 1995). On 25 October 1995, an adult male Shiny Cowbird reported at St. Marks National Wildlife Refuge, Florida, was considered "an apparent migrant as none had been see there earlier" (Warner and Pranty 1995). The species was reported from Calhoun County, South Carolina, 25 March and on Cedar Island, North Carolina, 26 May (Davis 1995).

Georgia had its fourth sighting on 1 June 1996, prompting Davis (1996) to speculate the species "may not be spreading as fast as once feared." In 1997, this thought was repeated after only one Shiny Cowbird was reported from South Carolina. "The prediction of rapid colonization into the southeast states has not materialized" (Davis 1997).

At approximately 09:00 on 18 August 1996, Brian Taber and I encountered a flock of "blackbirds" feeding in a milo field at the junction of Route 634 and Route 633 in Surry County, Virginia. The flock of 400+ individuals was predominately Brown-headed Cowbirds *(Molothrus ater)* of both sexes in a wide variety of plumages/molts. We stopped to scan them briefly. I noticed a single bird 20 m to my left perched about 1.5 m above the ground near the stalk of a milo plant. Its back was to me with its head turned to its left. The bird was entirely black, including the eye, bill and legs. There was no evidence of streaking or molt. It was the same size as nearby male Brown-headed Cowbirds, differing from them by its all black head and the shape of its bill which, though clearly cowbird-like, was not as stout as the Brown-headed Cowbird bill, being more slightly tapered, though not to the extent of Red-winged, Rusty *(Euphagus carolinus)* or Brewer's *(Euphagus cyanocephalus)* blackbirds' bills. The bird's tail was slightly longer than that of the Brown-headed Cowbirds and squared at the tip.

The bird flew about 30 m, joining a densely bunched group of Brown-headed Cowbirds, actively fed, flew again a short distance to feed, then disappeared. We were unable to find the bird again despite diligent searching. At no time during any of these views of the bird did we see any trace of color on it. Even in the light of the overcast sky the bird showed a glossy, deep purplish sheen. Its short-wings, rounded backed, rounded chest, and short, thick neck were quite obvious. Our assessment of the bird's identification was that it was an adult male Shiny Cowbird.

At one point the bird was sitting in the same field of view as a Common Grackle providing easy size and body feature comparisons. The grackle was substantially larger in all body proportions especially tail length to body length ratio, longer neck to head size, and larger, more narrow, and tapered bill. In the feeding flock were male Red-winged Blackbirds in a variety of plumages. All of them were readily identifiable by their body streaking and characteristic red shoulder epaulet. None of them appeared as black as the Shiny Cowbird.
A cowbird-sized, all black icterid in southside Virginia in mid-August presents a noteworthy identification problem, because of the similarities among the

following species: Brown-headed Cowbird, Shiny Cowbird, Bronzed Cowbird *(Molothrus aeneus)*, Brewer's Blackbird, Red-winged Blackbird, Rusty Blackbird, Common Grackle, and Boat-tailed *(Quiscalus major)* and Great-tailed Grackle *(Quiscalus mexicanus)*.

The bird in question was certainly a male, in clean, fresh plumage, showing no signs of molt or feather wear. Its short, squared tail and black/dark brown eyes eliminated all species except Brown-headed Cowbird, Shiny Cowbird, female Brewer's Blackbird and Red-winged Blackbird. Its complete, definitive black coloration and short conical bill eliminated Red-winged Blackbird and female Brewer's Blackbird from consideration. In direct comparison with Brown-headed Cowbirds in the same field of view, in several optimal lighting and background color situations, the bird showed no indication of brown on the head or neck. This, added to the subtle, though noticeably slight, taper to its bill, eliminated Brown-headed Cowbird.

The bird might have been a Bronzed Cowbird for which the eye color, especially one which may not have reached the red color of an adult, was not observed, except for the fact that at the distance we observed the bird, a light brown or red-brown eye would have been easy to notice and was not. Also, unlike a Bronzed Cowbird, this bird had a squared tail. Finally, though short-necked, this bird did not have the bold, shaggy, thick neck and large-headed features of a Bronzed Cowbird.

A Shiny Cowbird was observed later the same day in the same vicinity by Ned Brinkley. Brian Patteson saw a Shiny Cowbird in a nearby field on Route 633 the following day. A bird of this species was seen by Don Schwab at this location on 20 August and by Grayson Pearce on 27 August .

The Shiny Cowbird was added to the American Birding Association checklist in 1988 (Gill 1988).

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FIRST HERRING GULL NEST ON THE VIRGINIA WESTERN SHORE

JOHN B. BAZUIN, JR.
7451 Little River Turnpike, #202
Annandale, Virginia 22003

For almost 50 years the Herring Gull has been expanding its breeding range and numbers southward along the East Coast of the United States into the central and southern Atlantic states. This movement of nesting Herring Gulls into our region began slowly. The first nesting was reported by Buckalew (1948) in the Gould Marsh island group near Cobb Island, a Virginia barrier island. Subsequently, small colonies were found in 1955 and 1956 on Sharps Island, in the center of Chesapeake Bay, west of Cambridge (Potter and Murray 1955, 1956, Stewart and Robbins 1958). Nesting on Hogg Island was noted in 1957 and 1958 and on the present day Fishermans Island by 1958 (Hailman 1963). These islands are also both Virginia barrier islands. Additionally in 1958, a colony of Herring Gulls was observed on a small island in Chincoteague Bay, Maryland (Scott and Potter 1958, Stewart 1958). Small colonies were found near Ocean City, Maryland, and Chincoteague, Virginia, again in 1960 (Scott and Cutler 1960). North Carolina's earliest Herring Gull nesting records are for 1962 on Gull Island (Hailman (1963) and 1963 on Beacon Island (Ames 1963), both in Pamlico Sound about 15 miles north of Cape Hatteras.

During the 1960's and early 1970's, Herring Gull breeding continued to expand in the region. Small nesting colonies were reported annually on islands east of the Delmarva Peninsula beginning in 1962. Colonies on Fishermans Island grew from five active nests in 1964 to 51 in 1967 (Scott and Cutler 1964, 1967; Russell 1966). From 1969 to 1972, colonies with up to 28 active nests were present at Robins Marsh, Maryland, along the western edge of Chincoteague Bay (Scott and Cutler 1969, 1970, 1971, 1972). In North Carolina, north of the lower Cape Fear River, nest totals increased to 81 at 2 sites in 1972 and 98 at six sites in 1973 (Parnell and Soots 1975).

A rapid expansion of Herring Gull breeding populations began in 1973; illustrative of this are the numbers reported for Smith Island, Maryland, in the Chesapeake Bay: 543 breeding pairs in 1973 (Scott and Cutler 1973) increased to 2800 by 1975 (Scott 1975) and 4050 pairs by 1977 (Scott 1977, Erwin and Korschgen 1979). This colony was within 3 miles of the Virginia border. Similarly, the nesting colony on Fishermans Island increased from 50 pairs in 1973 (Scott and Cutler 1973) to 1250 pairs in 1977 (Scott 1977, Erwin and Korschgen 1978) and in Chincoteague Bay, Maryland, breeding pairs numbered 300 in four

colonies in 1975 (Scott 1975). Scott (1976) reported 25 breeding pairs on Little Fox Island, northeast of Tangier Island, in 1976, the first colony recorded in the Virginia section of Chesapeake Bay. A comprehensive survey of Herring Gull breeding from Maine to Virginia in 1977 reported 4586 pairs at 10 sites in Maryland (>88% at two sites on Smith Island) and 2624 pairs at 10 sites in Virginia (>47% in one colony on Fishermans Island; Erwin and Korschgen 1978). By 1977, the breeding population in North Carolina had risen to about 500 pairs (Potter et al. 1980).

Since 1977, it is not apparent that overall Herring Gull breeding populations in Maryland and Virginia have changed greatly, although substantial annual fluctuations have been noted, particularly on Virginia's barrier islands (Armistead 1980, 1981, 1982, 1984, 1986, 1991; Blom et al. 1993, 1994; Brinker pers. comm.; Scott 1979; Williams et al. 1991, 1993, 1996). However, Herring Gull nesting continued to expand during this time, reaching South Carolina by 1983 (American Ornithologists' Union 1983). Encroachment of nesting Herring Gulls on the Western Shore of Chesapeake Bay began in 1985 east of Baltimore, Maryland (Armistead 1986). Over 500 pairs were noted by 1993 (Blom et al. 1993) on Maryland Western Shore sites. Not until 1996 did the Herring Gull expand its breeding range onto the Virginia Western Shore. One nest, described below, was found in Mathews County in June of 1996.

The Mathews County nesting occurred on a sand island that covered between 0.4 and 0.8 ha and lay near the center of the northern lagoon of Winter Harbor in the extreme east-central part of the county. The island is part of Bethel Beach Natural Area Preserve, which is owned by the Virginia Division of Natural Heritage. The lagoon has a maximum length of about 2.6 km and a maximum width of ca. 1.0 km; it is connected to the Chesapeake Bay by a storm cut east of the island and is otherwise completely surrounded by high salt marsh. The island's habitats were a northernmost area of bare sand, bordered to the south by a large vegetated area that partially consisted of sand that was about 50% covered by clumps of bitter panic grass (*Panicum amarulum*) and switch grass (*P. virgatum*), and was otherwise dominated by dense stands of salt meadow grass (*Spartina patens*) and several species of forbs. The southern two-thirds of the island contained an extensive stand of sea-rocket (*Cakile edentula*) about 15 cm tall; the rest was bare sand. None of the island was higher than ca. 0.6 m above mean sea level.

The nest was first found by Joyce McKelvey on 17 June 1996, near the east edge of the expanse of sea-rocket, but she was not sure what kind of nest it was. From 20 to 22 June, Joyce, Sandra Erdle, and I looked at the nest daily and remained puzzled by it. I examined it in detail on 23 June, finally confirming it to be a Herring Gull nest. On 30 June, Boleyn and Kenny Dale, and Mary Pulley also assessed the nest. On each of these visits the nest contained two eggs. On 21 and 22 June, an adult Herring Gull was standing in the sea-rocket not far from the nest when we reached the island and departed soon thereafter. On 22 June, I also noted that all bare sand immediately around the nest was covered with Herring Gull tracks. On 23 June, I was mildly harassed by two adult Herring Gulls while I was on the island. Other than the characteristics of the nest and eggs themselves, these were the only clues that the nest was that of Herring Gulls. A check of the island on 8 July found the nest empty and no evidence of eggs or young anywhere on the island. Further checks on 14 July and 4 August

also produced no further breeding evidence, so the nesting attempt likely failed.

The particulars of the nest and eggs follow. The nest was a scrape that was rather heavily lined with dead eelgrass (*Zostera marina*) leaves and short, dead pieces of the roots and stems of marsh grasses such as salt meadow grass, all of which could have been obtained from wrack on the island. The lining was about 3 to 5 mm thick. The nest was about 6.1 m from the east side of the island; its top was about 38 cm above the mean high tide level. It was 33 cm in diameter across the lining and almost round. The eggs were long-elliptical in shape. They had a dull or flat, light pea-soup green ground color in which were scattered, irregular blotches of pale lavender. Overlaid on this were round to elliptical spots of medium sepia brown that were generally not over 2 to 3 mm in greatest dimension. One egg had a lack of brown spots in the area around its greatest width but the spots were otherwise fairly evenly distributed across each egg. The eggs measured about 75 by 48 and 73 by 47 mm in size.

Adult Herring Gulls have routinely been present in eastern and southern Mathews County, Virginia, throughout the breeding season each year since at least the early 1980's, so the "raw material" to produce such a nesting has long existed. If it continues and expands, negative consequences may result for other local beach-nesting bird species.

ACKNOWLEDGMENTS

I am indebted to Roger B. Clapp for recommending and procuring for me a number of historical references of which I was unaware and to which I had no access. I also appreciate information on Herring Gull nesting in Maryland that was provided by James L. Stasz and David Brinker.

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FRANKLIN'S GULL AT ASSATEAGUE ISLAND, VIRGINIA

CHARLES O. HANDLEY, JR.
Smithsonian Institution
Washington, D.C. 20560

BENJAMIN R. HANDLEY
304 Apartment Heights, #F-7
Blacksburg, Virginia 24060

On 14 March 1995 at 5 PM, we observed a lone adult Franklin's Gull (*Larus pipixcan*) on Parking Lot 2 at Assateague Island National Seashore, Accomack County, Virginia. It was resting on the black macadam surface with about thirty Ring-billed Gulls (*L. delawarensis*) and two Herring Gulls (*L. argentatus*). It was even more tame and unsuspicious than the larger gulls. We observed it for several minutes in excellent light, with the sun at our backs and a little to our right, at a distance of 25 feet from our car window with Trinovid 7x35 and 8x32 binoculars. We then approached on foot to within six feet of it before it flushed and disappeared over the dune toward the ocean.

We first assumed the bird to be a Laughing Gull (*Larus atricilla*). We had observed some of these a few minutes earlier, on our approach to Assateague Island. However, we checked this one out because it seemed odd for it to be alone with the large gulls at this season. Immediately we noticed the conspicuous white tips of the primaries and white bar at the base of the black wing tip while the gull was at rest with its wings folded. When it extended its wings in stretching, which it did several times, we observed the white tip/black bar/white bar wing tip pattern. Realizing the bird was a Franklin's Gull (COH is familiar with this species in the West and in Panama), we opened the National Geographic Society Field Guide to the Birds of North America 1983 to be sure we did not miss any diagnostic characters. Then we noted the unusually prominent white crescents above and below the eye and the reddish cast of bill, legs, and feet. When the gull flew we observed the uniformly pale coloration of the underside of the secondaries and primary bases. However, we failed to check for gray central tail feathers because we only realized later that that is a field mark.

According to Larner (1979) and Kain (1987) Franklin's Gull has been recorded as a rare summer visitor and fall transient at Blacksburg, Alexandria, and Norfolk. There are no previous spring records of this gull in Virginia. This

sighting extends the extreme early occurrence date for this species from 12 June to 14 March (see VARCOM accepted records, this issue of Raven).

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1997 REPORT OF THE VIRGINIA AVIAN RECORDS COMMITTEE

TETA KAIN
VARCOM CHAIRMAN
7083 Caffee Creek Lane
Gloucester, VA 23061

In an attempt to synchronize reports of the Virginia Avian Records Committee (VARCOM) with its regular calendar year of activity (terms of members begin on 1 January of each year), the annual report of the committee will now appear in the spring issue of each Raven. To accomplish that change, this report includes all committee actions that have taken place since the last annual report (Raven 67:101-106).

No meetings of the committee have been held since the last report. The committee did, however, reject a proposal, by mail vote, that would require more than one observer for category 2 records to be accepted. The VSO Board concurred with the committee's decision not to adopt the proposal.

In recent years, with several species split into one or more individual species, it has become apparent that the present species numbering system used by VSO cannot easily be adapted to incorporate the new additions to the Virginia list stemming from taxonomic splits. At the November 1997 VSO Board meeting, the following new numbering system was proposed: use the American Ornithologist Union (AOU) numbering system, but modify it by eliminating decimals and using a 5-digit system, and adding a zero both before and after the number (e.g., Field Sparrow: The AOU number for this species is 563. The VSO 5-digit system changes this to 05630). This modification allows several "splits" of a species, but maintains the whole-digit integrity. It is much more conducive to computer use and it also is less confusing to use the same numbering system as other recognized bodies of ornithology, including the Breeding Bird Survey office which adopted the system in 1997. VARCOM will convert to the system in the near future and the new numbers will be used when the annotated Virginia checklist is updated.

In November 1996, three new members were elected to VARCOM by the VSO Board of Directors to incorporate the new four-year term policy of the committee adopted in mid-1996. VARCOM in 1997 was made up of the following individuals:

Non-voting members:
Chair: Teta Kain (one-year term)
Secretary-compiler: Charlotte Friend (one-year term)
Voting members:
Four-year term: Larry Lynch
Two-year term: John Bazuin, Bob Cross, Bill Williams
One-year term: Ned Brinkley, John Dalmas (to replace Grayson Pearce who resigned in November 1996), Dick Peake (to replace David Abbott who resigned in November 1996)

At the November 1997 meeting of the VSO, the Board elected four new members to the committee. The 1998 VARCOM members are:

Non-voting members:
Chair: Bob Cross (one-year term)
Secretary-compiler: Charlotte Friend (one-year term)
Voting members:
Four-year term: Brian Taber, Gary Williamson, George (Cricket) Barlow
Three-year term: Larry Lynch
One-year term: John Bazuin, Bill Williams, Dick Peak (to replace Bob Cross who was elected chairman)

The following is a summary of records evaluated by VARCOM from 1 August 1996 through 31 December 1997. If the status of the species has changed in either the state or the region in which it occurs, the new category is given:

ACCEPTED RECORDS:
[Name(s) of observer(s) submitting documentation and/or photographs in brackets.]

PACIFIC LOON (*Gavia pacifica*). One individual. Wise Point, Northampton County, 6 December 1994. Second State and second Coastal Plain record [Ned Brinkley, Don Schwab].

PACIFIC LOON (*Gavia pacifica*). One individual. 1995 Back Bay Christmas Bird Count (CBC), at the border of False Cape State Park and Back Bay NWR, 29 December 1995. Third State and third Coastal Plain record [Ned Brinkley].

PACIFIC LOON (*Gavia pacifica*). One individual. 1996 Back Bay CBC, 29 December 1996. Fourth State and fourth Coastal Plain record [Ned Brinkley].

ARCTIC/PACIFIC LOON (*Gavia arctica/pacifica*). One individual. Assateague Island, Accomack County, 3 April 1976. The account of this sighting appeared in Raven 48:25-26, but was not included in the 1987 edition of Virginia's Birdlife, an Annotated Checklist (Bluebook) because, at that time, it was felt that Arctic Loon could not be positively identified in the field. The committee now considers details of the write-up to be complete enough to accept the record as Arctic/Pacific loon [Jackson Abbott].

WESTERN GREBE (*Aechmophorus occidentalis*). One individual. 1994 Nansemond River CBC, north of Craney Island, Portsmouth, 1 January 1995. Category 2. This is the first sighting to be definitely identified as this species since the species was split into Western and Clark's (*A. clarkii*) Grebes in 1985 [Ned Brinkley].

GREATER SHEARWATER (*Puffinus gravis*). One individual. Photographed. Seven miles south of the Maryland/Virginia line in the Chesapeake Bay, 17 July 1996. Northernmost record of this species in the waters of the Bay [Bill Portlock].

CAPE VERDE PETREL (*Pterodroma feae*). One individual. About 55 nautical miles off the coast, 9 September 1995. Photographs not considered adequate for identification. First State and first Coastal Plain record [Ned Brinkley, Brian Patteson].

WHITE-TAILED TROPICBIRD (*Phaethon lepturus*). One individual. Pelagic trip at Norfolk Canyon, 21 August 1993. Second State and first Coastal Plain record [Ned Brinkley]. The second record listed in the Bluebook (p. 5) is not valid because it was found 300 miles offshore, which is outside the state boundary of 200 statute miles as defined by VARCOM in 1996.

EURASIAN WIGEON (*Anas penelope*). One individual. Airlie Sanctuary, Fauquier County, 13-14 October 1996. Second Piedmont record. Category 2 [Joanna Taylor, Valerie Kitchens, Danny Crookston, Glen Richardson].

TUFTED DUCK (*Aythya fuligula*). One individual. Chincoteague NWR, 27 January 1996. First State and first Coastal Plain record. Category 2 [Valerie Kitchens, Frances Wood, Martha Wood, Danny Crookston].

BARROW'S GOLDENEYE (*Bucephala islandica*). Although other write-ups were received about individuals, seen at Chesapeake Bay Bridge-Tunnel (CBBT) from 29 January to 5 March 1994, this documentation was the only submission construed by the committee to support identification as a Barrow's Goldeneye. The committee felt that the other write-ups were not necessarily of the same bird. Second State and second Coastal Plain record. Category 2 [M. Mathieson].

MISSISSIPPI KITE (*Ictinia mississippiensis*). Active nest. Photographs. Woodbridge, Prince William County, between 14 July and 25 August 1996. First state breeding record. Raven 68:85 [A. J. Quezon].

MISSISSIPPI KITE (*Ictinia mississippiensis*). One individual. Photographed. Greensville County, 8 June 1991. Sixth Coastal Plain record [Mike Boatwright, John Dalmas, Thelma Dalmas, Dick Peake, Valerie Kitchens].

MARSH HARRIER (*Circus aeruginosus*). One individual.Written documentation by several birders accepted, but photographs taken were not clear enough for positive identification. Chincoteague NWR, 4 December 1994. First State and first Coastal Plain record. Category 2 [James Flynn, Jim Ayers, Mike Smith, Woody Middleton, C. Weems, M. Weems, K. Weems].

SWAINSON'S HAWK (*Buteo swainsoni*). One individual. Beaverdam, Loudoun County, 16 October 1995. First Piedmont record. Category 2 [David Abbott].

FERRUGINOUS HAWK (*Buteo regalis*). An old record of an individual in Washington County, 14 January 1973 had not been previously evaluated. VARCOM accepted the account (Raven 67:103), therefore, the record remains the first State and first Mountains and Valleys record. Documentation of a later sighting of a Ferruginous Hawk that included an identifiable photograph was accepted by VARCOM, allowing the species to be placed in Category 1 [Lee Herndon].

AMERICAN GOLDEN-PLOVER (*Pluvialis dominicus*). One individual. Dulles Greenway Wetlands Mitigation Project, Oatland Mills Pond, Loudoun County, 4 May 1997. Third Piedmont spring record [David Abbott].

AMERICAN AVOCET (*Recurvirostra americana*). Young. Photographed. Craney Island, Portsmouth, 20 and 21 July 1991. First state breeding record [David Hughes].

RED-NECKED STINT (*Calidris ruficollis*). One individual. Craney Island, Portsmouth, 23 July 1994. First State and first Coastal Plain record. Category 2 [David Abbott].

FRANKLIN'S GULL (*Larus pipixcan*).One individual. Assateague Island, Accomack County, 14 March 1995. Extends the previous (12 June) early date of occurrence [C. Handley, Jr., B. Handley].

FRANKLIN'S GULL (*Larus pipixcan*). One individual. Photographed. Dulles Airport, Loudoun County, 12 April 1997. First Piedmont record. Category 1 [David Abbott].

MEW GULL (*Larus canus*). One individual. Southeastern Public Service Authority, Suffolk, 2 January 1996. Third State and third Coastal Plain record. Category 2 [Ned Brinkley].

CALIFORNIA GULL (*Larus californicus*). One individual. 1995 Little Creek CBC, west Lynnhaven Inlet flats, Virginia Beach, 31 December 1995. Fifth State and fifth Coastal Plain record [Ned Brinkley].

BLACK-TAILED GULL (*Larus crassirostris*). One individual. Photographed. Island #4, CBBT, 27 December 1996. First State and first Coastal Plain record. Category 1 [Ned Brinkley].

HERRING GULL (*Larus argentatus*). Nest with eggs. Photographed. Mathews County, 17-30 June 1996. First breeding record in the state west of the Chesapeake Bay [John Bazuin, Jr.].

THAYER'S GULL (*Larus thayeri*). One individual. CBBT, 21 March 1988. Fourth State and fourth Coastal Plain record [Ned Brinkley, Brian Patteson, Brian Moore].

THAYER'S GULL (*Larus thayeri*). One individual. 1994 Little Creek CBC Lake Christopher, Virginia Beach, 31 December 1994. Fifth State and fifth Coastal Plain record [Ned Brinkley].

ICELAND GULL (*Larus glaucoides*). One individual. Photographed. Henrico County, 22 January 1994. Fifth Piedmont record. Category 1 [Brent Tarter].

ATLANTIC PUFFIN (*Fratercula arctica*). One individual. Photographed. Off Virginia Beach, 13 February 1994. Fifth State and fifth Coastal Plain record. Category 1 [Ned Brinkley].

BURROWING OWL (*Speotyto cunicularia*).One individual. Fishermans Island NWR, 11 January 1994. Origin of the bird could not be determined with certainty. Third State and second Coastal Plain record [Don Schwab, Tom Gwynn].

NORTHERN SAW-WHET OWL (*Aegolius acadicus*). Breeding activity, Highland County, observered 13 March and 11 May 1995. First nesting evidence for the state [John F. Pagels].

RUFOUS HUMMINGBIRD (*Selasphorus rufus*). One individual. Chesapeake, 16, 18 and 21 October 1995. Fifth Coastal Plain record [Valerie Kitchens, Martha Woods].

RUFOUS HUMMINGBIRD (*Selasphorus rufus*). One individual. Photographed. Staunton, Augusta County, 13 November 1996 - 3 January 1997. The documentation was accepted, but photos submitted were judged as insufficient to definitely identify the bird as a Rufuous Hummingbird. Second Mountains & Valleys record. Category 2 [YuLee Larner, Ned Brinkley, John Spahr].

RUFOUS/ALLEN'S HUMMINGBIRD (*Selasphorus, sp.*) One individual. Photographed. Bowling Green, Caroline County, 14 January and 13 February 1996. Although slides and photos were good, none show the tail details and the submission was accepted as *Selasphorus, sp.* only [Bill Portlock].

RED-COCKADED WOODPECKER (*Picoides borealis*). One individual. White Stone, Lancaster County, 10 March 1996, and again on 12 additional days. Photographed. Only the second record of this species occurring north of the James River [B.J. Norris, Tom Norris, Carro Seay].

NORTHERN WHEATEAR (*Oenanthe oenanthe*). One individual. Photographed. Kiptopeke State Park, 15 October 1995. Fifth State and fourth Coastal Plain record [Ned Brinkley].

PAINTED BUNTING (*Passerina ciris*). One individual, Manakin Water and Sewerage Treatment Plant, Goochland County, 18 May 1994. Second Piedmont record [Mathieson].

BOBOLINK (*Dolichonyx oryzivorus*). Breeding activity. Near Groseclose, Smyth County, 29 May, 3-6 June and 9 June 1995. The documentation was accepted, but

photos submitted were judged as insufficient to identify definite breeding activity [J. N. Howard].

SHINY COWBIRD (*Molothrus bonariensis*). One individual. Surry County, 18 August 1996. First State and first Coastal Plain record. Category 2 [Bill Williams, Brian Taber].

UNACCEPTED SUBMISSIONS:

PACIFIC LOON (*Gavia pacifica*). CBBT, 27 Nov 1993.

BARROW'S GOLDENEYE (*Bucephala islandica*). CBBT. 29 January 1994, 2 February 1994, and 13 February 1994. Documentation for a Barrow's Goldeneye seen on 5 March 1994 was accepted (see above).

TEMMINCK'S STINT (*Calidris temminckii*). Details (Raven 47:46) written about a bird seen at Dyke Marsh on 5 October 1974 were not consistent with the identification of this species. The record had not previously been reviewed. This was the only documentation concerning this species ever recorded in Virginia; consequently, the species is removed from the Virginia list.

PARASITIC JAEGER (*Stercorarius parasiticus*). Smith Mountain Lake, Franklin County, September 5-6, 1993.

GREAT SKUA (*Catharacta skua*). Gull Marsh Channel, Northampton County, 20 September 1996.

COMMON GULL (*Larus c. canus*). Virginia Beach, 29 January 1994.

THAYER'S GULL (*Larus thayeri*). Henrico County, 16 January 1994.

THAYER'S GULL (*Larus thayeri*). CBBT, 26 December 1994.

SCISSOR-TAILED FLYCATCHER (*Tyrannus forficatus*). Nottoway County, 2 June 1993.

BEWICK'S WREN (*Thryomanes bewickii*). CBBT, 8 May 1994.

BLACK-THROATED GRAY WARBLER (*Dendroica nigrescens*). Milepost 45, Shenandoah National Park, 18 May 1996.

KIRTLAND'S WARBLER (*Dendroica kirtlandii*). Hog Island Wildlife Management Area, Surry County, 24 September 1995.

KIRTLAND'S WARBLER (*Dendroica kirtlandii*). Arlington County, 30 September 1996.

SUMMER TANAGER (*Piranga rubra*). Nokesville, Prince William County, 19 December 1993.

WHITE-WINGED JUNCO (*Junco hyemalis*). James City County, 8 January 1996. (Documentation withdrawn by observer).

SMITH'S LONGSPUR (*Calcarius pictus*). Winchester, 24 November 1995.

SUBMISSIONS NOW UNDER EVALUATION BY VARCOM:

YELLOW-CROWNED NIGHT-HERON (*Nyctanassa violacea*). Blacksburg, October 1996 - 15 January 1997.

THAYER'S GULL (*Larus thayeri*). Southeastern Public Service Authority, Suffolk, 2 January 1996.

BLACK-TAILED GULL (*Larus crassirostris*). Grandview Park, Hampton, 22 March-15 April 1995.

YELLOW-LEGGED GULL (*Larus cachinnans*). CBBT island #4, 2 March 1997.

AMERICAN GOLDEN-PLOVER (*Pluvialis dominicus*). Dulles Greenway Wetlands Mitigation Project, Oatland Mills Pond, Loudoun County, 26 April 1997.

BAR-TAILED GODWIT (*Limosa lapponica*). Photo evaluation only. Chincoteague NWR, 7 September 1991.

HENSLOW'S SPARROW (*Ammodramus henslowii*). Lorton, Fairfax County, 6 October 1996.

SALTMARSH SHARP-TAILED SPARROW (*Ammodramus caudacutus*). 1996 Mathews CBC, Mathews County, 5 January 1997.

A final note: please remember, for a bird to be to be included on the official Virginia list, written documentation, and photographs and/or videos, if any were taken, must be submitted to VARCOM for evaluation and acceptance. It makes no difference how many people saw the species in question. The record is not official until written details from at least one observer are accepted.

Species that need to be documented are those whose occurrence constitute a first through fifth state record and/or a first through fifth regional (Coastal Plain, Piedmont, or Mountains and Valleys) record. Send all documentation to: Charlotte Friend, VARCOM secretary/compiler, 6078 N. 9th St., Arlington, VA 22205. She will acknowledge receiving your materials and will notify you of the outcome of VARCOM's evaluation when it is completed.

SHORT COMMUNICATIONS

Merlin Migration at Kiptopeke, Virginia, September through November 1995-1997. Merlin (*Falco columbarius)* migration patterns for late summer and fall, 1992-1994, have been examined using data from the Kiptopeke Hawk Watch (Taber 1995). The total numbers of Merlins recorded for 1995, 1996, and 1997 were 2,124; 2,282, and 2,780 respectively, leading to an average (2,395) that was more than five times the average for 1992-1994 (475). The total number of Merlins recorded for 1992, 1993, and 1994 was 423, 366, and 635, respectively (Taber 1995).

The addition of a highly skilled professional hawk counter and a 36% increase in average hours of observation no doubt contributed to the increase in the total number of counted Merlins for 1995-1997 compared to 1992-1994.

Despite the great increase in Merlins recorded, the daily migration rhythm found in 1995 was remarkably similar to that for 1992-1994 (Table 1; Taber 1995). Migrant Merlins are generally thought of as late-day flyers and 65% passed the observation station after 13:00 hours in 1995, compared to 58% for that period in 1992-1994. The peak time of passage was 14:00-15:00 hours in 1995 and 15:00-16:00 hours for 1992-1994.

ACKNOWLEDGMENTS

I would like to thank Bill Williams the Kiptopeke Hawk Watch Coordinator, for allowing me to examine the daily tally sheets, Brian Sullivan, the hawk counter

Table 1. Daily migration times at Merlins at Kiptopeke, Virginia; times are Eastern Standard Time.

Time	Total No. Merlins 1995	% of Total 1995	Total No. of Merlins 1992-94	% of Total 1992-94
0500-0600	1	0.1	0	0.0
0600-0700	19	0.9	23	1.6
0700-0800	3	1.6	50	3.5
0800-0900	75	3.5	69	4.8
0900-1000	112	5.3	108	7.6
1000-1100	123	5.8	107	7.5
1100-1200	154	7.3	123	8.6
1200-1300	233	11.0	112	7.9
1300-1400	308	14.5	177	12.4
1400-1500	356	16.8	188	13.2
1500-1600	322	15.2	201	14.1
1600-1700	265	12.5	175	12.3
1700-1800	117	5.5	89	6.3
1800-1900	6	0.3	1	0.1
Total	2,124		1,423	

employed in 1995-1997 by K.E.S.T.R.E.L. (Kiptopeke Environmental Station, Research and Education Laboratory) and the dedicated volunteer hawk watch assistants, who have provided many hours of observation.

LITERATURE CITED

TABER, B. 1995. Migration patterns of Merlins at Kiptopeke, Virginia, September through November, 1992-1994. Raven 66:11-16.

Submitted by Brian Taber, *103 Exeter Court, Williamsburg, Virginia, 23185*

Tree Swallows in the Piedmont of Virginia. The first known breeding record of Tree Swallows (*Iridoprocene bicolor*) in recent years in the Piedmont of Virginia was in Madison County on 12 May 1976 (Kain 1987). Since then, several nesting records have been recorded from at least six counties in the northern and central areas of the region.

In 1985, a new bluebird trail was started in Albemarle County with six nest boxes and gradually increased until now there are 319 in the trail. In 1990, a tree swallow brood was observed in a nest box along the edge of Mallard Lake in Earlysville, Virginia. D. Bieker (pers. comm.) identified the birds. Since then there has been a steady increase in the number of successful broods. In 1997, there were 61 nesting pairs that fledged 270 birds (Table 1).

Tree swallows are cavity nesters that readily accept bluebird nest boxes as a place to nest. They are more aggressive than Eastern Bluebirds (*Sialia sialis*) and often win the battle of which uses the box. Tree swallows are territorial but will

Table 1. Tree swallow nesting pairs, broods raised, and birds fledged from 1900 to 1997 in nest box trail in Albemarle County, Virginia.

Year	Nesting Pairs	Broods	Fledged	*Attempts
1990	1	1	4	—
1991	3	3	17	—
1992	6	6	24	—
1993	15	15	63	2
1994	19	19	101	2
1995	20	18	85	5
1996	27	26	125	4
1997	61	57	270	8

*An attempt is when the nest is built, at least one egg is laid, but no birds are fledged.

nest about seventy five meters from each other while bluebirds desire at least one hundred meters. However, tree swallows and bluebirds will live in harmony with each other in nest boxes as close as six or eight meters. Erecting a second box about seven meters from the first one will allow tree swallows and bluebirds to nest at the same time. An added advantage of this arrangement is that the tree swallows will aggressively defend both nests.

A tree swallow nest, usually built of dead grasses, is quite shallow and lined with feathers. It deteriorates rapidly as the fledglings develop. Since the nests are shallow, the tree swallows often have trouble fledging from bluebird boxes with the standard eight inch drop from the hole. A three or four inch wooden or hardware cloth ladder under the hole on the inside solves the problem.

Tree swallows live almost entirely on flying insects, catching them easily in midair. This makes them vulnerable to unfavorable weather; such as cold, rainy, wet periods in the spring, or hot, very dry periods during the summer. The first broods observed were nesting near small lakes or ponds. Recently, as the numbers have increased, they have been found nesting several hundred meters from water. At Mallard Lake, tree swallows nest within forty meters of a Purple Martin (*Progne subis*) colony without any problem.

Why have tree swallows moved into our area so rapidly ? Has their habitat in another area been eliminated ? Is it a part of changing weather patterns? Is it an increase in the availability of nest boxes in our area ? It will take time and study to ascertain the reasons. Future research may provide answers to these questions.

LITERATURE CITED

KAIN, T. (ed.) 1987. Virginia's birdlife: an annotated checklist. Virginia Soc. Ornithol. Virginia Avifauna No. 3, Lynchburg, Virginia

Submitted by Robert C. Hammond, *425 Mallard Lake Drive, Earlysville, Virginia 22936*

NOTE FROM THE EDITORS

First record of a Western Marsh Harrier (*Circus aeruginosis*) in Virginia. At approximately 10:10, on 4 December 1994, James L. Ayers, James. F. Flynn, Jr., Thomas Johnson, Norwood C. Middleton, and Michael. L. Smith discovered a female Western Marsh Harrier (*Circus aeruginosis*) in the Chincoteague National Wildlife Refuge near the south end of the Tom's Cove parking lot on Assateague Island (Accomack County). The bird was observed, both while perched and flying, for a total of about an hour at distances ranging from 25-200 yards. While the harrier was being observed, the sky was overcast, the wind speed was approximately 6 mph, and the temperature was 60-65°F. In addition to the five original discoverers, Kenneth, Molly, Charles, and Jeannette Weems saw the bird. The bird was last seen flying over Swan Cove in the direction of the wildlife loop road.

During the observation period, a female Northern Harrier (*Circus cyaneus*) intermittently dived on the Western Marsh Harrier, providing opportunities to compare the two birds. In flight, the Western Marsh Harrier was noticeably larger and stockier, with longer and proportionately broader wings, and slower, more labored wing beats. In general, the Western Marsh Harrier was a uniform, unmarked chocolate brown in color. Its most notable field mark, however, was a uniform cream-colored cap extending from its beak, above its eyes, to the back of its neck. The observers also noted a golden sheen to the bird's dark rump area, which contrasted slightly with the rest of its back and tail, and a silvery gloss at the base of its primaries.

The Western Marsh Harrier was observed using various types of binoculars, a Kowa TSN-2 77 mm spotting scope (20-60x eyepiece), and a Bushnell Spacemaster 60 mm spotting scope (20-40x eyepiece). The bird was also photographed, but with very limited success.

This Western Marsh Harrier is a European species. This sighting is not only of the species seen in Virginia, but may also represent the first occurrence of this species in North America.

[Editor's Note: This record was accepted by the Virginia Avian Records Committee, becoming the first State record for this species.]

ACKNOWLEDGMENTS

This account was prepared by the editors of *The Raven* from the reports submitted to the Virginia Avian Records Committee by James L. Ayers, James F. Flynn, Jr., Norwood C. Middleton, Michael L. Smith, Charles M. Weems, Kenneth Weems, and Molly Weems.

CORRECTIONS: RAVEN – VOLUMES 67 AND 68

67(2): 103 – Seven (not one) individuals were seen off Virginia Beach in 1988.

68(2): 120 – Black-tailed Gull was seen on 27 December, but not prior to the Christmas Bird Count.

68(2): 124 – Change; Banister WMA: one Red-throated Loon to one Common Loon.

68(2): 124 – Change; Lynchburg: seven Red-throated Loons to seven Pied-billed Grebes.

INFORMATION FOR CONTRIBUTORS

The Raven, the official journal of the Virginia Society of Ornithology (VSO), functions to publish original contributions and review articles in ornithology, not published elsewhere, mostly relating to Virginia birdlife. Manuscripts should be send to the editor (D. H. Shedd, Department of Biology, Randolph-Macon Woman's College, Lynchburg, Virginia, 24503, 804-947-8493, dshedd@rmwc.edu).

Most manuscripts published in *The Raven* concern the distribution, abundance, and migration of birds in Virginia. Manuscripts on other ornithological topics, such as Virginia-based historical reviews, bibliographical reviews, life history notes, and behavioral observations are also welcomed. In addition, the journal serves to publish the official proceedings of the VSO and other formal items pertaining to all aspects of the Society's activities. *The Raven* may also publish articles pertaining to the activities of VSO chapters and the various public and private organizations engaged in biological and conservation work in Virginia.

Format of *The Raven* generally follows guidelines set by the Council for Biology Editors as outlined in the *CBE Style Manual*, 5th edition (Council of Biology Editors, Inc., Bethesda, Maryland 20814). All manuscripts should be typewritten and double-spaced. Tables, table legends, and figure legends must also be typewritten and should be submitted on separate pages at the end of the manuscript. At this time, only black-and-white photographs, graphs, maps, illustrations, figures, etc., may be used in *The Raven*. The original size for these items should not exceed 5 x 7 inches. Vernacular and scientific names of birds should be those published in the Sixth edition of the A.O.U. Check-list of North American Birds and subsequent supplements. Linear measurements and weights should be in metric units.

Authors are strongly encouraged to send diskette, as well as, paper copies of their manuscripts. Copies typed in Word 7.0 (IBM compatible or Macintosh) are preferred, but other versions of Word, or WordPerfect (up to 5.1) are also acceptable.

Authors should consult recent editions of *The Raven* for additional information about style and format, or consult with the editor.

Deadlines for submission of articles are 15 December for the spring issue and 15 July for the fall issue.


VIRGINIA SOCIETY of ORNITHOLOGY
VSO

The Raven

JOURNAL OF THE VIRGINIA SOCIETY OF ORNITHOLOGY

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The Virginia Society of Ornithology, Inc. exists to encourage the systematic study of birds in Virginia, to stimulate interest in birds, and to assist the conservation of wildlife and other natural resources. All persons interested in those objectives are welcome as members. Present membership includes every level of interest, from professional scientific ornithologists to enthusiastic amateurs.

Activities undertaken by the Society include the following:

1. An annual meeting (usually in the spring), held in a different part of the state each year, featuring talks on ornithological subjects and field trips to nearby areas.

2. Other forays or field trips lasting a day or more and scheduled throughout the year so as to include all seasons and to cover the major physiographic regions of the state.

3. A journal, *The Raven*, published twice yearly, containing articles relevant to Virginia ornithology, as well as news of the activities of the Society and its chapters.

4. A newsletter, published quarterly, containing current news items of interest to members and information about upcoming events and pertinent conservation issues.

5. Study projects (nesting studies, winter bird population surveys, etc.) aimed at making genuine contributions to ornithological knowledge.

In addition, local chapters of the Society, located in some of the larger cities and towns of Virginia, conduct their own programs of meetings, field trips and other projects.

Those wishing to participate in any of the above activities, or to cooperate in advancing the objectives of the Society, are cordially invited to join. Annual dues are $15.00 for active members, $25.00 for sustaining members, $50.00 or more for contributing members, $400.00 for life members, and $20.00 for family members (limited to husband, wife and their dependent children).

Editorial queries and comments may be directed to C. Michael Stinson, Department of Biology, Box 174, Hampden-Sydney College, Hampden-Sydney, Virginia 23934.

Published in the spring and autumn of each year at Lynchburg, Virginia. Membership includes a subscription to *The Raven*. Individual annual issues (1984 through 1989) are priced at $8.00. Semiannual issues (1990 onward) are $3.00 each. All issues (quarterlies) prior to 1984 are $3.00 each. Available issues may be obtained by sending a check for the correct amount (payable to Virginia Society of Ornithology) to VSO Membership Services, 1230 Viewmont Drive, Evington, Virginia 24550.

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DISTRIBUTION OF THREE THREATENED GRASSLAND BIRD SPECIES IN VIRGINIA: 1997 CENSUS OF RECENTLY OCCUPIED SITES

RUSSELL C. TITUS
CAROLA A. HAAS
PETER JOHNSON
Department of Fisheries and Wildlife Sciences
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061-0321

MICHAEL E. POWERS
Deparment of Biological Sciences
University of Arkansas
Fayetteville, Arkansas 72701-1201

INTRODUCTION

Grassland bird species as a group have shown a greater recent decline in numbers than have woodland species (Askins 1993). Although the amount of grassland habitat available for breeding birds has certainly decreased, sites that appear suitable often remain unoccupied. Most existing grasslands have been created by humans and there is evidence that similar ecosystems occurred commonly in Virginia before the advent of modern agriculture. Annual burning of grasslands by Native Americans and later widespread clearing of land by settlers resulted in an abundance of open habitats (Smith 1994). Because grasslands are still numerous in Virginia, changes in agricultural practices such as early mowing and planting of row crops may have contributed to the observed decline of grassland species (Bollinger et al. 1990, Capel 1992).

An important first step in management is to monitor existing populations. During the 1997 breeding season we surveyed recently occupied sites for the presence of three state-threatened species (Upland Sandpiper, *Bartramia longicauda*; Bachman's Sparrow, *Aimophila aestivalis*; Henslow's Sparrow, *Ammodramus henslowii*). Results are presented along with a review of sightings reported in journals during the last 15 years.

METHODS

Our primary goal was to survey sites recently occupied during the breeding season ("historic sites") by Upland Sandpiper, Bachman's Sparrow and Henslow's

Sparrow. These included sites identified during the Virginia Society of Ornithology's Breeding Bird Atlas (1984-1989, VDGIF 1994) and reports of sightings from the birding community. To facilitate communication of reports we listed a reporting number in the Virginia Society of Ornithology (VSO) newsletter and in two postings to the Valley Birds listserver (run by Wallace Coffey, Bristol, TN). Other recently occupied locations were communicated directly by state employees and private individuals who had observed the target species within the last few years (1990-1997).

Song point counts (Reynolds et al. 1980) and spot checks were used to estimate numbers of grassland birds at 101 sites during the 1997 breeding season. Thirty historic sites and 71 non-historic sites (appropriate-looking habitat, but no known records) were surveyed. Not all historical sites could be checked because it was sometimes difficult or impossible to obtain landowner permission to access sites. Because some individuals of the study species migrate through Virginia, established "safe dates" were followed to increase the likelihood that only breeding birds would be counted. These were 20 May-25 June for Upland Sandpiper, 1 June-31 July for Bachman's Sparrow, and 15 May-31 August for Henslow's Sparrow (VSO 1989). Since these dates differ, number of sites checked for breeding individuals of each species varied (Upland Sandpiper 43 sites, Bachman's Sparrow 62 sites, Henslow's Sparrow 101 sites).

Point counts ($N = 64$) were conducted between 0600-1000 h EST from 1 June-31 July 1997. For each count, the observer (PJ) recorded the number of birds seen or heard within 50 m of a central count point. Counts were not conducted during rain or windy (estimated 10 mph) conditions. Historic sites where point counts were conducted were located in Accomack (8 sites), Brunswick, Clarke (4), Fauquier (2), Gloucester (4), Loudoun (4), Prince William, Pulaski, Rockingham, Russell, Shenandoah, Smyth, and York counties. Non-historic sites were in Accomack (2), Appomattox, Brunswick (2), Carroll (2), Charlotte (5), Clarke (2), Cumberland, Dinwiddie, Halifax (2), Mecklenberg (2), Nottoway (3), Prince William, Russell (4), Smyth (2), and Wythe (4) counties.

During spot checks ($N = 37$) non-historic sites were briefly checked (average 21 min, range 10-125 min) for the target species. Spot checks were conducted from public roadsides from 15-31 May. These checks were made at non-historic sites in Bath (5), Highland (8), Lee (5), Rockbridge (4), Scott (9), Washington (5), and Wise counties.

RESULTS

Of the three state-threatened species, Upland Sandpiper and Bachman's Sparrow were detected during our surveys (Table 1). Two Upland Sandpipers were seen in Daphna (Rockingham County) on 19 June 1997 and eight were in Remington (Fauquier County) at a turf farm on 24 June. Three Upland Sandpipers were found near the latter site at the Virginia Turf Farm during a 1996 survey (Dalmas 1997). Nine male and one female Bachman's Sparrow were detected near Blackstone in Nottoway and Dinwiddie counties. Henslow's Sparrows were not seen during point counts or spot checks, but were reported from one site in Pulaski County by Shay Garriock (pers. comm., Table 1) of the Virginia Department of Game and In-

land Fisheries (VDGIF). Three Bachman's Sparrows were reported singing at a site in Brunswick County by Michael Stinson (pers. comm.) No additional reports of the three target species were received.

Our literature review found that the three species were reported in low numbers through the last 15 years. For the Upland Sandpiper and Bachman's Sparrow, the maximum number of occupied sites per year was 5, while for the Henslow's Sparrow it was only 3.

Table 1. Number of adults reported during the breeding season in *American Birds* (later *Field Notes*), *The Raven*, Bazuin 1990, Dalmas 1994, Garriock pers. comm., and Stinson pers. comm.

year	Upland Sandpiper		Bachman's Sparrow		Henslow's Sparrow	
	adults	sites	adults	sites	adults	sites
1983	2	1	0	0	5	1
1984	6	2	0	0	0	0
1985	0	0	0	0	4	1
1986	7	5	5	2	2	1
1987	4	3	2	2	1	1
1988	0	0	0	0	2	2
1989	8	3	5	4	3	3
1990	0	0	7	3	14	2
1991	0	0	16	3	8	3
1992	0	0	6	2	4	1
1993	2	1	13	2	0	0
1994	0	0	6	2	8	1
1995	0	0	8	3	2	2
1996	3	1	9	5	2	2
1997	6	2	12	2	10	1

DISCUSSION

Two of three target species were detected during the 1997 surveys, while a non-survey report was received for the third species. Upland Sandpipers were located at two sites (10 birds). Nine male Bachman's Sparrows were detected at Fort Pickett (but at no other site, although they are known to occur at another military installation, Fort A. P. Hill, which was not surveyed). Surveys for Henslow's Sparrows failed to turn up any individuals, although one newly discovered population was known to be present during 1997 in Pulaski County (S. Garriock, pers. comm.). Similar numbers of these species had been reported in 1996 (three Upland Sandpiper, seven Bachman's Sparrow and two Henslow's Sparrow; Iliff 1997, Haas and Meehan 1996, Watts et al. 1998).

The American Birding Association 1997 Membership Directory lists 568 members in Virginia, many of whom are undoubtedly interested in locating the three

study species, yet no reports of individuals or sites unknown to us were received from the phone hotline or e-mail list during 1997. Because the study species are rare in Virginia, some birders may be inexperienced in recognizing their calls. The Upland Sandpiper is readily identified by its distinctive four-note whistle given from elevated perches and a whinnying flight call. In addition, few other sandpipers are normally found away from water during the summer. The two sparrows are inconspicuous except when singing, but fortunately they do so persistently (Dunning 1993, Heller and Hughes 1997). The song of Bachman's Sparrow is distinctive but birders should be aware that Field Sparrows (*Spizella pusilla*) may mimic these. Bachman's Sparrows normally switch to a different song type after 1-4 repetitions (Borror 1971), while Field Sparrows do not switch song types nearly as often (pers. obs.). Henslow's Sparrows have an insect-like far-carrying song that is diagnostic once learned.

Given current population levels, the likelihood that the three target species will increase or persist in the state even with management efforts may be low. While it is likely that lack of suitable habitats contributes to the low numbers, such a relationship cannot be tested because all three species are so rare in Virginia that controlled studies are impossible. As a result, exactly what habitat features should be preserved or created cannot be known directly. Application of the findings from nearby states offers one potentially useful solution.

Additional factors beyond the availability of suitable habitat are likely to limit population sizes. One potentially important factor is the low number of nearby source populations. Of the three study species, Bachman's and Henslow's sparrows are locally fairly common in only one adjacent state, North Carolina (Fussell 1994, Pruitt 1996). All three species are rare in other bordering states (Buckelew and Hall 1994, Fussell 1994, Monroe et al. 1988, Pruitt 1996, Robbins and Bloom 1996). Because Upland Sandpipers are rare in the surrounding states, nearest large populations (i.e., potential sources) are often several hundred miles away. Habitat patches >1 km from established populations are unlikely to be occupied by Bachman's Sparrows, and computer simulations suggest that sparrows will become extinct in landscapes composed only of isolated patches (Dunning 1993). The effects of distance of nearest populations seem likely to be important for the other two species as well.

The following recommendations are offered based on current and historical population sizes in Virginia, and habitat and population data from other states.

Upland Sandpiper This species prefers very large fields (> 200 ha), which are now unusual in the eastern United States (Vickery et al. 1994). Airports represent prime habitat for Upland Sandpipers in some states but do not appear to be utilized for breeding in Virginia or nearby states (Jones and Vickery 1995). It is possible that mowing schedules at Virginia airports could be adjusted to increase the suitability of these sites for Upland Sandpipers and other grassland species (e.g., delay mowing until after the breeding season, Askins 1995). Given the lack of suitable habitat and low numbers in nearby states, it seems unlikely that the population in Virginia will persist. Earlier in the 20th Century, this species was a more common breeder in the western part of the state (Kain 1987) but has decreased since the 1950s (Bazuin 1990). During the last 15 years numbers have remained low (Table 1). Our count of Upland Sandpipers is considerably lower than the

estimated state population reported by Bazuin (1993).

Because so few individuals were observed, habitat features were difficult to relate to abundance. Upland Sandpipers were observed at sites that had low average height of vegetation and low horizontal diversity, although statistical comparisons could not be made because of small sample size. It is possible that this species is simply more conspicuous among lower vegetation, as suitable habitat is believed to include both low vegetation for foraging areas and taller vegetation for nesting (Carter 1992, Bazuin 1993, Jones and Vickery 1995).

Bachman's Sparrow Bachman's Sparrows were originally found in pine woodlands with high vegetation density from 0-1 m off the ground and low vegetation density at 2-4 m (Dunning and Watts 1990). Fire suppression allows vegetation in the latter range to become established, making the habitat unsuitable for Bachman's Sparrows (Dunning 1993, Watts et al. 1998). Only small scattered populations currently exist in Virginia (Watts et al. 1998), most in clear-cuts or young grassy pine stands (Dunning and Watts 1990, Hilton 1990, Watts et al. 1998). These habitats are suitable for Bachman's sparrows for only a few years (Dunning and Watts 1990) and, with the loss of old-growth pine savannas, more stable habitats with open midstories are rare.

Specific management for Bachman's Sparrow would increase the likelihood of the survival of this species in Virginia. In southeastern Virginia this species seems to prefer sites that are burned annually or recently clear-cut (Watts et al. 1998). In South Carolina management techniques include short burn rotations (e.g., 3-year burn schedule recommended), which reduce understory growth and promote the growth of grasses (Dunning 1993). Site preparation techniques that leave some vegetation (for example burning prior to replanting) result in faster recolonization by sparrows than techniques that destroy most vegetation (e.g., roller-chopping; Dunning 1993). On a landscape scale, it may be possible to reduce isolation of habitat disturbances (i.e., new suitable patches) to promote recolonization (Dunning 1993, Dunning et al. 1995).

Henslow's Sparrow The one report of this species in 1997 indicates that Henslow's Sparrows currently breed in Virginia at very low numbers. Despite this being a species sought by birders, no additional sightings occurred in 1997, and previously occupied sites on the Eastern Shore were not active. In addition, from 1991-1996 fewer than 10 of these sparrows were reported in the state annually (Table 1). Modern farming practices (row crops and frequent mowing) do not result in the idle fields with few invading trees or shrubs that this species prefers. Early in the 20th Century, the abandonment of farm fields allowed the species to become common in southeastern Virginia (Smith 1992) and locally common in the Piedmont (Kain 1987). Wet fields, another important habitat type in Virginia, have been lost through drainage (Brindza 1991). Suitable nesting habitat containing a dense litter layer, standing dead vegetation, and little woody vegetation could be created by mowing during the non-breeding season or less ideally by burning on a 4-5 year cycle (Smith 1992, Pruitt 1996). Composition of grasslands may effect suitability. Those dominated by warm-season grasses are mowed later in the year, giving birds a longer window in which to complete nesting. Fields dominated by warm-season grasses had higher average height at this time of year and greater horizontal diver-

sity (unpub. data). As with Upland Sandpipers, size of grasslands is also important, with those >30 ha more likely to be occupied (Smith and Smith 1992, Herkert 1994).

Smith (1992) suggested that widespread changes in habitat would make it difficult to restore or maintain viable populations of this species in the northeastern United States, including Virginia. Given the current low populations in Virginia, management to increase populations of Henslow's Sparrows statewide may be difficult. Since eastern North Carolina hosts the only large nearby populations, sites in southeastern Virginia may have the most chance of being colonized and when feasible should be mowed late in the season or every 2-3 years (Swengel 1996) or lightly grazed. The existence of a population (discovered by VDGIF personnel) farther west in Pulaski County also merits attention. Management at this site (fire suppression and infrequent mowing or grazing) appears to create appropriate conditions for Henslow's Sparrow. These management regimes could be extended to larger areas. Perhaps implementing such management practices elsewhere would promote establishment of additional populations. The species has recently colonized suitable habitat in North Carolina following an absence of many years (Pruitt 1996).

Future studies should also gather data on the possible microhabitat-related causes of declines of grassland species. Recent efforts to increase Northern Bobwhite (*Colinus virginianus*) productivity in Virginia have focused on the composition rather than on the general appearance of the grassland. In the past 30 years the majority of southeastern grasslands have been converted to mostly non-native cool-season grasses (Holleran 1997). Replanting fields with native warm-season grasses appears to improve survival of Bobwhite, and the same may be true for non-game species. Cool-season grasses form thick mats that impede chick movement, decreasing access to food and increasing vulnerability to predators (Askins 1993, Holleran 1997). In addition, sites dominated by cool-season grasses may not support densities of insects necessary for young birds to survive (Rand 1986, Capel 1992). Similar factors may limit the reproductive success of non-game species and contribute to the declines in Virginia's grassland species.

Landscape scale effects are also likely to be important. Several grassland species, including Upland Sandpiper and Henslow's Sparrow, are known to prefer larger grasslands (Smith 1992, Askins 1993, Watts et al. 1997). Haas and Titus (1998) found that composition of grasses at sites (i.e., predominately warm-season or cool-season grasses) influenced nesting success of Grasshopper Sparrows populations in southeastern Virginia. A study involving more sites occupied by these state-threatened species would prove more informative but is not currently feasible in Virginia because of the low population size (e.g., only two known sites for Upland Sandpiper). Studies of habitat requirements of Henslow's and Bachman's sparrows have been made outside of Virginia (Hardin et al. 1982, Zimmerman 1988, Dunning and Watts 1990, Smith 1992, Smith and Smith 1992, Dunning et al. 1995, Haggerty 1998). Few have focused on grass species composition and its effects on insect abundance, foraging behavior and predation rates.

ACKNOWLEDGMENTS

This paper is based on a report to the Virginia Department of Game and Inland Fisheries. We appreciate the information and logistical support provided by VDGIF staff. The U.S. Army through the USDI National Biological Service also supported our work on grassland birds in Virginia. Many private landowners granted permission to work on their land. John Bazuin Jr., Fenton Day, Shay Garriock, Mike Stinson, Brian Watts, Dave Worley and others provided locations of recent sightings. Amy Meehan helped organize the project and data. Chris D'Orgeix, Jill Jackson and Christine Proctor assisted with the field work and the development of protocols. We thank the staff of Fort Pickett for their support, especially Bob Wheeler, Josh Delmonico, and Paul Clarke. Additional funding was provided by the Federal Aid in Wildlife Restoration Program and by the Virginia Department of Game and Inland Fisheries - Nongame & Endangered Wildlife Program.

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BACHMAN'S SPARROW NEST AND CENSUS AT FORT PICKETT, BLACKSTONE, VIRGINIA

CAROLA A. HAAS
RUSSELL C. TITUS

Department of Fisheries and Wildlife Sciences
Virginia Polytechnic Institute and State University
Blacksburg, Virginia 24061

INTRODUCTION

From June-August 1997 we surveyed suitable habitat on Fort Pickett, Nottoway and Dinwiddie counties, Virginia for Bachman's Sparrow (*Aimophila aestivalis*). This active military base is home to the largest known population of this species in the state. First located here in 1993, knowledge that this population exists has contributed to the species being downlisted from state endangered (Ridd 1991) to state threatened (Virginia Department of Game and Inland Fisheries (VDGIF) 1993).

Bachman's Sparrows are thought historically to have inhabited mature pine woodlands having minimal shrub component and a grass layer maintained by nearly annual fires (Dunning 1993). Across their range, these sparrows prefer high vegetation density from 0-1 m off the ground and low vegetation density at 2-4 m (Dunning and Watts 1990). Following the abandonment of agricultural lands in the late 1800s and early 1900s, the species expanded its range northward to include most of Virginia. Formerly occupying pine stands characterized by frequent fires, the species moved into regrowing abandoned farms. Because much of this land has reverted to unsuitable forest, only small scattered populations of Bachman's Sparrows currently exist in Virginia (VDGIF 1994, Watts et al. 1998). Most known locations are in clear-cuts or young grassy pine stands (Watts et al. 1998). These habitats are temporarily suitable for Bachman's Sparrows but after 3-5 years the shrub layer becomes too dense and sparrows disappear (Dunning and Watts 1990). More stable early successional habitats are rare as fire suppression in almost all areas of the state allows an undesirable shrub layer to grow. Human activities such as those occurring on Fort Pickett provide the only relatively secure breeding grounds for this species in Virginia.

METHODS

Three methods were used to assess populations of Bachman's Sparrows on Fort Pickett. All focused on habitat types that appeared suitable for sparrows based on published information of the species' requirements (Hardin et al. 1982, Dunning

1993). No sparrows were detected outside these areas. Burn history of sites was determined by staff at Fort Pickett using data in their Geographic Information System. First, standardized song playback was performed along two roadside routes (at a total of 38 locations). Every 0.3 miles, we listened for 2 minutes before playing a 60 sec endless loop cassette that contained either 6 or 8 Bachman's sparrows songs ("before playback" period). Songs used to make this tape were from the Borror Library of Natural Sounds, University of Ohio. Tapes were played for 2 minutes ("during playback" period) and observers continued to listen for two minutes after tapes ended ("after playback" period). Only male Bachman's Sparrows sing (Dunning 1993) although females may respond to playback with calls or approach behavior (pers. obs.). Each singing Bachman's Sparrow can be considered to represent a territorial pair (Verner 1985). One playback route was run on 2, 3 and 25 June and a second on 12, 24 and 26 June.

In our second method, 10-minute 50-m fixed radius song point counts (Reynolds et al. 1980) were used to determine the presence of birds at suitable locations away from the two roadside playback routes. Point counts ($N = 4$) were conducted on 5 and 6 June.

The third method, spot checks, included observations of Bachman's Sparrows made without the use of playback or point counts. These observations were made while walking away from roads (e.g., to point count locations) or while stopping alongside appropriate-looking roadside habitat not located at playback stops. Spot checks were made at approximately 20 locations not surveyed using the previous two methods.

RESULTS AND DISCUSSION

A total of 9 singing male Bachman's Sparrows were located at 7 sites on Fort Pickett during the 1997 breeding season. At one of these sites a female and active nest were also located (see below). Of the males, three were located during the playback trials, three during point counts and three during spot checks. During previous surveys in August and October 1994 (Dalmas 1994), two of these same sites were occupied by Bachman's Sparrows. Another 1997 site was within 0.5 miles of a 1994 site (listed in Table 1 as occupied during both years). We surveyed five other 1994 sites 1-5 times and did not detect Bachman's Sparrows at any. There were no Bachman's Sparrows detected at the one site on Pickett where they had been located during 1996 (2 pairs, Haas and Meehan 1996).

All of the sites occupied by Bachman's Sparrows during the 1997 breeding season had been burned within the past year (Table 1). Some sites active in 1994 were unoccupied in 1997; about half of these had been burned in 1997 and the other half had not been burned. The three 1994 sites that were still occupied by Bachman's Sparrows had been burned in 1997.

Response to song playback

Too few males were singing to determine whether time of day or of season affected detectability. Unlike many species, Bachman's Sparrows and some other grassland birds have breeding seasons that extend into the late summer (Dunning 1993). Temperatures in late May and early June 1997 were cool and may have

Table 1. Burn history of sites where Bachman's Sparrows were detected in 1994 (Dalmas) and 1997 (this study). X = occupied, B = burned. The one known 1996 site (not listed) had been burned in 1996. No Bachman's Sparrows were detected at this site in 1994 or 1997.

	occupied		burned
Site Number	1994	1997	Jan.- May 1997
1	X	X	B
2	X		B
3	X		B
4	X	X	B
5	X		B
6	X		
7	X		
8	X	X	B
9		X	B
10		X	B
11		X	B
12		X	B

caused a late breeding season, which could explain the low response to playback. Previous workers have had mixed results with response to playback by this species (Dunning 1993). The widely dispersed territories of Bachman's Sparrows may also decrease detectability, as males occupying non-contiguous territories had reduced song rates in a Missouri study (Hardin et al. 1982). Despite more effort being devoted to playbacks, the same number of singing Bachman's Sparrows were detected using all three methods (playback, point counts and spot checks). This suggests that playback may not be an efficient method of detecting Bachman's Sparrows.

Confirmation of breeding on Fort Pickett

One active nest of Bachman's Sparrows was found during a spot check on 27 June. It was discovered by inadvertently flushing the female off of the nest, which contained 5 eggs. The nest was partially domed and constructed of dead grass, and was located in a recently burned pine savanna with a grassy understory. This is the first confirmed nesting of Bachman's Sparrow on Ft. Pickett. Previous workers had found juveniles during censuses in fall 1994 (Dalmas 1994) and summer 1996 (Haas and Meehan 1996). Clapp (1997) lists only three nests with eggs for Virginia, all earlier in the year than this one.

Summary

The population of state-threatened Bachman's Sparrows at Fort Pickett is the largest known population in the state and appears to be stable. Despite movement of territory locations over years, total numbers remained relatively constant. In addition, these numbers are probably low estimates of the actual population size because access to areas of suitable habitat was limited in all years. Frequent fire appears to be important in the maintenance of suitable habitat. Nearby counties

probably continue to support small numbers of Bachman's Sparrows in transitional habitats. The number of individuals and the persistence of occupancy at Pickett indicate that continuation of current land use patterns would maintain a stable population of Bachman's Sparrows in Virginia.

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VIRGINIA CHRISTMAS BIRD COUNTS: 1997-98 SEASON

TETA KAIN
7083 Caffee Creek Lane
Gloucester, VA 23061-3374

Only 45 Christmas counts were held in Virginia during the 1997-98 season, the fewest since 1992. There were many changes in the lineup this year in terms of counts held, counts discontinued, and different compilers conducting the counts.

One new count was added to the roster, that of Central Loudoun County. The count circle is centered at the junction of routes 704 and 769 near Woodburn in Loudoun County. The area covered on the Greenways Wetlands count last year is included in this new count. The circle extends from Waterford in the north to Aldie in the south and Purcellville in the west to Ashburn in the east. In its very first year of existence, this count attracted 43 participants who came up with 96 species, including some highly unusual winter visitors.

After a hiatus of one year, Walkerton was back on the roster, with compiler Fred Atwood enlisting the help of 15 observers, a good number for a rather remote section of the state. This section of Virginia will be under close scrutiny in the coming years because of controversial plans to build a dam and reservoir on Cohoke Creek, an action strongly opposed by the Sierra Club and the Alliance to Save the Mattaponi because of its probable negative impacts on the Mattaponi River by changing its salinity and flow changes. Also, the area known as Pamunkey River Shores includes certain sections that are planned as mitigation sites if the Cohoke reservoir is approved and urban sprawl from the Richmond area is expected to heavily impact sites along the Pamunkey River in coming years. The count center was moved to a point 1.5 miles southwest of Walkerton Bridge just west of Whitebank, in order to include these important areas. This is a change of about six miles due south of the original count circle center.

Missing this year were reports from Philpott Reservoir (held every year from 1983 through 1996), Clifton Forge (held every year from 1973 through 1996), Claytor Lake (held every year from 1989 through 1996), Giles County (the modern-day count was held only in 1996), Tazewell (held every year from 1971 through 1996) and Breaks Interstate Park (held every year from 1981 through 1996, except 1986, 1988, and 1989). It is disappointing to loose so many long-standing counts and it is hoped that the cessation for most, if not all, is temporary.

Results from seven counts were submitted to *The Raven* but not to *Audubon Field Notes*. They were: Darlington Heights, Lynchburg, Danville, Highland County, Peaks of Otter, Roanoke, and Bristol. It should be noted that, as in years past, two of these counts deviated from the standard count rules. Darlington Heights was held six days after the official count period, and Highland County encompasses an area

twice the size of the normal 15-mile-in-diameter count circle. The Chesapeake Bay Bridge-Tunnel count results were submitted to *Audubon Field Notes* for the first time this year. In the previous three years of its existence, reports were published only in *The Raven*. On the other hand, Danville results were submitted only to *The Raven* this year, whereas that count had been published in the Audubon Christmas count publication since 1970.

Two counts saw the end of an era when their long-term compilers stepped down this year. Max Carpenter compiled the Rockingham count every year from 1954 through 1996, a noteworthy span of 46 years. Chuck Auckerman will take over the count. Dick Peake, who founded the Wise County count in 1971 served as the only compiler until this year when he retired and will be living in Texas during the winter months. Randy Stanley replaces him. Five other counts also experienced a change of compilers in 1997.

As in previous years, the counts in Appendix I are arranged geographically, with the three Eastern Shore counts listed first and the rest listed generally in an east to west and north to south configuration. Counts 1 through 16 are on the Coastal Plain, counts 17 through 28 are in the Piedmont, and counts 29 through 45 are in the Mountains and Valleys region of the state. Appendix I reflects changes as set forth in the American Ornithologists' Union 7th edition of the A.O.U. *Check-list of North American Birds*. See Appendix II for Christmas Count Descriptions.

Although there was much ado about El Niño, it was not possible to discern any definite patterns in bird occurrences around the state that were directly related to that weather phenomenon. The lowest temperature recorded was 18° F. at Blackford in Russell County and several counts reported highs of 68°F., Six counts registered varying amounts of snow up to 5 inches at Big Flat Mountain and for the most part, winds were reasonably light, and very few experienced any precipitation. The total number of species found on all counts was 210, down slightly from last year's total, but there were some noteworthy "firsts" on that list. The documentation of a very rare winter occurrence of a Black-throated Green Warbler (*Dendroica virens*) on the Blacksburg count has been accepted by the Virginia Avian Records Committee (VARCOM). It is the only authenticated record of this species on a Virginia Christmas count. A Yellow-legged Gull (*Larus cachinnans*) at Back Bay and an Allen's Hummingbird (*Selasphorus sasin*) are under review by VARCOM as of this writing and must be accepted by that panel before they can be officially added to the cumulative list. A Sandhill Crane (*Grus canadensis*) was identified by sound only on the Central Loudoun count and is another first occurrence on Virginia counts.

Eared Grebes (*Podiceps nigricollis*) showed up for the second time at Bristol. In fact, they have occurred so regularly on South Holston Lake and in such large numbers over the past couple of years, that they have become almost common in that area. It will be interesting to see whether they continue to appear there because historically, that species was almost unknown in the western part of the state. Individuals were also seen at Chincoteague and Nansemond River.

Again, an American White Pelican (*Pelecanus erythrorhynchos*) showed up on one of the Eastern Shore counts, this time at Cape Charles. It seems likely that this is the same individual that has haunted that area for several years, but that assumption is difficult to prove. The Anhinga (*Anhinga anhinga*) found at Little Creek was the second record for a Christmas count, the first one recorded on that same count in 1981.

The 105 White Ibises (*Eudocimus albus*), seen by three different parties at Cape Charles, far outstripped all previous Christmas count totals. This is another species that has been showing up around the state more and more often in recent years and it will be interesting to see if the trend continues.

Common Eiders (*Somateria mollissima*) and Harlequin Ducks (*Histrionicus histrionicus*) shattered all previous Christmas count highs with a total of 61 eiders at four locations and 10 Harlequins at two sites reported. Previous highs were 4 eiders and 6 Harlequins in 1996. King Eider (*S. spectabilis*) numbers were also at an all-time high (11), equaling state count all-time high totals set in 1971 and 1985.

Astonishing numbers of Tree Swallows (*Tachycineta bicolor*) were found on all the Eastern Shore counts and at Back Bay. The total of 4,416 individuals more than doubled the previous state high count of 2539 set in 1970. Both Wachapreague and Back Bay recorded record numbers.

Unusual warblers turned up in sparse numbers around the state. A well-described Cape May Warbler (*Dendroica tigrina*) was discovered at Washington's Birthplace, and seven Prairie Warblers (*D. discolor*) turned up on six Coastal Plain counts. Although Prairies are regularly found somewhere on the Christmas counts most years, the total this year almost doubles previous all-time highs. Both Red (*Loxia curvirostra*) and White-winged (*L. leucoptera*) crossbills were recorded this year, and a single Common Redpoll (*Carduelis flammea*) was seen in Loudoun County. A highly unusual Pine Grosbeak (*Pinicola enucleator*) was also recorded there, but it was seen only during count week period, not on count day.

One final note on an unusual field experience as related by Gordonsville compiler Donald Ober: "While driving beside a tangled growth along side the road, a pile of feathers was observed within the 30-foot wide hedgerow. Upon closer inspection, the still warm body of Sharp-shinned Hawk (*Accipiter striatus*) was found, minus its head and breast meat. When we started the pickup and moved about 20 feet ahead, a Cooper's Hawk (*A. cooperii*) flew out of the hedgerow about 50 feet in front of us."

Weather and wind codes:

CLD - cloudy
CLR - clear
FOG - foggy
HSW - heavy snow
HVR - heavy rain
LRS - light rain and snow
MCD - mostly cloudy
PCD - partly cloudy
PCR - partly clear
PFG - partly foggy
V - variable

Water codes:

MPF - moving water partly frozen
MWO - moving water open
SMF - still water mostly frozen
SPF - still water partly frozen
SWF - still water frozen
WOP - water open

APPENDIX I

	Red-throated Loon	Common Loon	loon, sp.	Pied-billed Grebe	Horned Grebe	Red-necked Grebe	Eared Grebe	Northern Gannet	American White Pelican
1. Chincoteague	3	122	...	67	117	...	1	...	...
2. Wachapreague	165	105	...	9	68	...	...	...	...
3. Cape Charles	271	233	6	60	43	...	...	141	1
4. CBBT	661	26	...	...	...	1	...	66	...
5. Little Creek	1,375	152	...	56	11	4	...	40	...
6. Back Bay	264	241	30	25	...	...	...	2,640	...
7. Nansemond River	8	2	...	29	425	...	1	...	...
8. Dismal Swamp	...	...	...	13	...	...	...	...	...
9. Newport News	8	39	...	83	10	...	...	...	...
10. Mathews	14	123	...	9	73	2	...	...	...
11. Williamsburg	...	6	...	23	22	...	...	...	...
12. Hopewell	...	...	...	7	...	...	...	...	...
13. Walkerton	...	...	...	5	...	...	...	...	...
14. Wash. Birthplace	12	150	...	1	1	...	...	...	...
15. Brooke	...	1	...	63	6	...	...	...	...
16. Fort Belvoir	...	9	...	12	4	1	...	...	...
17. Central Loudoun	...	...	...	1	...	...	...	...	...
18. Manassas-B.R.	...	...	...	2	...	...	...	...	...
19 Chancellorsville	...	2	...	17	...	...	...	...	...
20. Gordonsville	...	...	...	...	...	...	...	...	...
21. Charlottesville	...	...	...	...	...	...	...	...	...
22. Warren	...	...	...	10	...	...	...	...	...
23. Darlington Heights	...	...	...	4	...	...	...	...	...
24. Kerr Reservoir	1	47	...	45	11	...	...	...	...
25. Banister WMA		...	...	2	...	...	...	...	...
26. Lynchburg	...	...	...	12	...	...	...	...	...
27. Danville	...	...	...	2	2	...	...	...	...
28. Martinsville	...	1	...	8	...	...	...	...	...
29. Calmes Neck	...	...	...	7	...	...	...	...	...
30. N. Shen. Valley	...	CW	...	1	...	...	...	...	...
31. Shen. NP-Luray	...	...	...	4	...	...	...	...	...
32. Big Flat Mtn.	...	...	...	...	...	...	...	...	...
33. Rockingham Co.	...	...	...	1	...	...	...	...	...
34. Highland County	...	...	...	...	...	...	...	...	...
35. Augusta Co.	...	...	...	1	CW	...	...	...	...
36. Waynesboro	...	...	...	...	...	...	...	...	...
37. Lexington	...	...	...	...	...	...	...	...	...
38. Peaks of Otter	...	...	...	...	...	...	...	...	...
39. Fincastle	...	...	...	...	...	...	...	...	...
40. Roanoke	...	...	...	6	...	...	...	...	...
41. Blacksburg	...	...	...	8	...	...	...	...	...
42. Glade Spring	...	...	...	1	...	...	...	...	...
43. Blackford	...	...	...	...	...	...	...	...	...
44. Bristol	...	3	...	49	3	...	3	...	...
45. Wise County	...	...	...	...	...	...	...	...	...
Total individuals	2,782	1,262	36	643	796	8	5	2,887	1

Brown Pelican	Double-crested Cormorant	Great Cormorant	Anhinga	American Bittern	Great Blue Heron	Great Egret	Snowy Egret	Little Blue Heron	Tricolored Heron	Green Heron	Black-crowned Night-Heron
1	15	...	...	...	123	58	18	1	11	1	39
...	8	...	...	...	74	1	...	...	12	1	24
10	21	56	...	2	58	2	6	2	43	...	5
15	4	18	...	...	...	...	...	...	...	...	...
12	615	9	1	...	88	124	...	...	...	...	2
3	30	...	...	7	36	6	...	...	...	...	...
18	989	...	...	...	34	...	...	...	...	...	...
...	8	...	...	...	8	1	...	...	...	...	...
2	306	...	...	...	78	30	...	...	...	...	9
CW	1	...	...	...	72	3	...	...	...	...	1
...	1,029	...	...	...	77	2	...	...	...	...	1
...	555	...	...	...	168	...	...	...	...	...	...
...	...	...	...	...	22	...	...	...	...	...	...
...	...	...	...	...	29	...	...	...	...	...	...
...	5	...	...	...	63	...	...	...	...	...	...
...	9	...	...	...	217	1	...	...	...	...	2
...	...	...	...	...	13	...	...	...	...	...	...
...	...	...	...	...	18	...	...	...	...	...	...
...	...	...	...	...	2	...	...	...	...	...	...
...	...	...	...	...	12	...	...	...	...	...	...
...	...	...	...	...	8	...	...	...	...	...	...
...	...	...	...	...	13	...	...	...	...	...	...
...	...	...	...	...	6	...	...	...	...	...	...
...	20	...	...	...	52	...	...	...	...	...	...
...	...	...	...	...	12	...	...	...	...	...	...
...	...	...	...	...	9	...	...	...	...	...	...
...	1	...	...	...	9	...	...	...	...	...	...
...	...	...	...	...	4	...	...	...	...	...	...
...	...	...	...	...	21	...	...	...	...	...	...
...	...	...	...	...	39	...	...	...	...	...	...
...	...	...	...	...	15	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	9	...	...	...	...	...	...
...	...	...	...	...	30	...	...	...	...	...	...
...	...	...	...	...	8	...	...	...	...	...	...
...	...	...	...	...	6	...	...	...	...	...	...
...	...	...	...	...	6	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	9	...	...	...	...	...	...
...	...	...	...	...	18	...	...	...	...	...	...
...	...	...	...	...	6	...	...	...	...	...	...
...	...	...	...	...	18	...	...	...	...	...	...
...	...	...	...	...	4	...	...	...	...	...	...
...	1	...	...	...	28	...	...	...	...	...	...
...	...	...	...	...	1	...	...	...	...	...	...
61	3,617	83	1	9	1,523	228	24	3	66	2	83

	Yellow-crowned Night-Heron	White Ibis	Black Vulture	Turkey Vulture	Greater White-fronted Goose	Snow Goose (blue form)	Snow Goose	Ross's Goose	Canada Goose
1. Chincoteague	...	...	52	384	...	145	42,272	...	1,124
2. Wachapreague	...	...	8	420	...	...	...	...	2,632
3. Cape Charles	1	105	33	125	...	2	670	...	1,057
4. CBBT	...	...	...	...	...	...	...	...	...
5. Little Creek	...	...	...	10	...	...	...	...	179
6. Back Bay	...	...	109	181	...	3	6560	1	442
7. Nansemond River	...	...	26	46	...	...	...	...	545
8. Dismal Swamp	...	...	23	326	...	...	100	...	161
9. Newport News	...	...	8	11	...	...	7	...	149
10. Mathews	...	...	37	76	...	...	2	...	1,036
11. Williamsburg	...	...	47	242	...	...	1	...	1,698
12. Hopewell	...	...	51	177	...	320	114	...	8,294
13. Walkerton	...	...	50	169	...	...	...	...	1,413
14. Wash. Birthplace	...	...	26	218	...	...	...	...	9,621
15. Brooke	...	...	20	72	...	...	...	...	1,247
16. Fort Belvoir	...	...	15	89	...	...	6	...	8,333
17. Central Loudoun	...	...	31	720	...	...	...	...	5,310
18. Manassas-B.R.	...	...	20	231	...	...	...	...	2,050
19 Chancellorsville	...	...	26	100	...	...	...	...	1,234
20. Gordonsville	...	...	15	46	...	...	1	...	2,474
21. Charlottesville	...	...	227	599	...	...	...	...	600
22. Warren	...	...	60	126	...	...	...	...	690
23. Darlington Heights	...	...	20	151	...	...	...	...	73
24. Kerr Reservoir	...	...	12	59	...	...	...	...	143
25. Banister WMA	...	...	8	37	...	...	2	...	180
26. Lynchburg	...	...	129	523	...	...	...	...	163
27. Danville	...	...	41	68	...	...	...	...	83
28. Martinsville	...	...	39	80	...	...	...	...	289
29. Calmes Neck	...	...	42	184	...	...	1	...	1,607
30. N. Shen. Valley	...	...	39	99	...	...	CW	...	2,680
31. Shen. NP-Luray	...	...	67	114	...	...	...	...	407
32. Big Flat Mtn.	...	...	...	7	...	...	...	...	...
33. Rockingham Co.	...	...	58	549	...	...	...	...	189
34. Highland County	...	...	7	...	...	...	...	...	286
35. Augusta Co.	...	...	121	694	1	...	...	...	704
36. Waynesboro	...	...	2	27	...	...	...	...	227
37. Lexington	...	...	93	159	...	...	...	...	86
38. Peaks of Otter	...	...	13	21	...	...	...	...	...
39. Fincastle	...	...	28	179	...	...	...	...	150
40. Roanoke	...	...	118	142	...	...	...	...	23
41. Blacksburg	...	...	526	108	...	...	...	...	652
42. Glade Spring	...	...	47	37	...	...	4	...	553
43. Blackford	...	...	...	...	...	...	...	...	25
44. Bristol	...	...	27	13	...	...	...	...	541
45. Wise County	...	...	...	...	...	...	...	...	...
Total Individuals	1	105	2,321	7,619	1	470	49,740	1	59,350

	Canada Goose (small form)	Brant	Mute Swan	Tundra Swan	Wood Duck	Gadwall	American Wigeon	American Black Duck	Mallard	Mallard hybrid	Blue-winged Teal
1. Chincoteague	...	2,993	45	124	...	1,876	301	1,853	1,024	...	...
2. Wachapreague	...	3,805	...	51	19	43	42	346	357	...	...
3. Cape Charles	...	512	...	41	1	252	772	343	706	...	...
4. CBBT	...	2	...	9	...	...	...	...	5	...	...
5. Little Creek	...	...	1	13	64	147	197	48	600	...	1
6. Back Bay	...	7	...	670	7	376	186	397	712	...	...
7. Nansemond River	...	...	...	83	3	97	102	74	127	...	...
8. Dismal Swamp	...	...	...	348	84	...	2	47	30	...	...
9. Newport News	...	270	...	...	3	56	345	15	1,263	...	2
10. Mathews	...	...	...	963	...	...	...	92	446	...	...
11. Williamsburg	...	...	14	114	10	32	18	132	259	...	...
12. Hopewell	...	...	...	2	4	232	63	10	538	...	6
13. Walkerton	...	...	...	2	1	33	...	27	93	...	...
14. Wash. Birthplace	...	...	...	377	7	66	6	305	463	...	...
15. Brooke	...	...	14	208	...	346	24	25	707	...	...
16. Fort Belvoir	...	...	...	340	57	771	120	1,822	2,795	...	3
17. Central Loudoun	1	...	...	6	...	40	5	142	562	...	...
18. Manassas-B.R.	...	...	2	...	6	...	...	4	214	...	...
19 Chancellorsville	...	...	CW	...	14	...	...	...	70	...	...
20. Gordonsville	...	...	...	CW	CW	...	...	3	27	...	...
21. Charlottesville	...	...	2	...	...	...	...	17	77	...	...
22. Warren	...	...	...	3	8	...	...	60	132	...	2
23. Darlington Heights	...	...	...	...	...	...	...	...	12	...	...
24. Kerr Reservoir	...	...	...	...	1	155	115	3	200	1	1
25. Banister WMA	...	...	...	...	8	...	...	5	41	...	...
26. Lynchburg	...	...	...	...	14	5	...	27	155	...	...
27. Danville	...	...	...	...	1	...	...	...	90	...	...
28. Martinsville	...	...	...	...	...	1	...	...	47	...	...
29. Calmes Neck	...	...	2	5	...	4	5	47	429	...	...
30. N. Shen. Valley	...	...	...	1	3	17	10	31	1,147	1	...
31. Shen. NP-Luray	...	...	...	...	...	4	...	2	368	...	...
32. Big Flat Mtn.	...	...	...	...	...	...	...	...	...	...	...
33. Rockingham Co.	...	...	...	5	...	...	41	...	298	...	...
34. Highland County	...	...	...	...	1	20	CW	2	89	...	...
35. Augusta Co.	...	...	...	CW	1	13	...	...	309	...	...
36. Waynesboro	...	...	...	...	...	...	...	2	88	...	...
37. Lexington	...	...	...	3	...	...	...	6	187	...	...
38. Peaks of Otter	...	...	...	...	...	...	...	...	...	...	...
39. Fincastle	...	...	...	...	2	...	...	21	92	...	...
40. Roanoke	...	...	...	...	...	14	7	6	380	...	...
41. Blacksburg	...	...	...	...	...	19	35	124	525	...	11
42. Glade Spring	...	...	...	...	...	3	...	10	381	...	...
43. Blackford	...	...	...	...	...	...	...	...	52	...	2
44. Bristol	...	...	...	...	...	28	98	9	700	...	...
45. Wise County	...	...	...	...	...	...	...	...	...	...	...
Total individuals	1	7,589	80	3,368	319	4,650	2,494	6,057	16,797	2	28

	Northern Shoveler	Northern Pintail	Green-winged Teal	Canvasback	Redhead	Ring-necked Duck	Greater Scaup	Lesser Scaup	scaup, sp.
1. Chincoteague	233	652	286	...	...	58	50	93	9
2. Wachapreague	...	...	89	...	...	70	...	23	...
3. Cape Charles	33	22	69	...	...	78	36	...	56
4. CBBT	...	...	...	...	...	...	5	...	...
5. Little Creek	234	...	75	...	...	71	1	4	...
6. Back Bay	133	444	132	65	...	1	1	...	...
7. Nansemond River	53	...	3	557	...	36	...	26	...
8. Dismal Swamp	...	...	4	...	...	17	...	1	...
9. Newport News	51	...	2	269	332	122	16	351	...
10. Mathews	...	...	...	102	10	...	...	50	...
11. Williamsburg	...	3	73	7,537	79	873	...	4	93
12. Hopewell	...	...	2	...	...	125	...	2	...
13. Walkerton	...	...	42	...	3	3	...	...	...
14. Wash. Birthplace	...	...	...	3,680	...	16	525	193	...
15. Brooke	2	2	13	21	4	117	...	6	...
16. Fort Belvoir	103	29	343	412	5	314	180	9,352	1,200
17. Central Loudoun	...	2	82	...	...	4	...	...	...
18. Manassas-B.R.	...	...	...	...	...	...	...	...	...
19 Chancellorsville	...	...	...	...	...	72	...	6	...
20. Gordonsville	...	...	5	...	...	30	...	...	...
21. Charlottesville	...	...	...	...	...	...	...	...	...
22. Warren	...	...	10	...	...	17	...	...	...
23. Darlington Heights	...	...	...	...	...	...	...	...	...
24. Kerr Reservoir	...	2	24	...	...	500	8	1	...
25. Banister WMA	...	...	...	1	3	20	...	...	...
26. Lynchburg	...	1	2	...	...	96	...	1	...
27. Danville	...	...	...	...	...	...	...	...	...
28. Martinsville	...	...	1	...	...	...	...	...	...
29. Calmes Neck	2	...	6	...	...	125	...	6	...
30. N. Shen. Valley	...	5	40	1	...	5	...	...	...
31. Shen. NP-Luray	...	1	...	...	...	...	...	...	...
32. Big Flat Mtn.	...	...	...	...	...	...	...	...	...
33. Rockingham Co.	4	...	3	...	...	...	...	...	...
34. Highland County	...	1	CW	...	...	2	...	...	...
35. Augusta Co.	...	...	...	CW	1	...	...	...	...
36. Waynesboro	...	...	...	...	...	...	...	...	...
37. Lexington	...	...	...	...	...	...	1	...	...
38. Peaks of Otter	...	...	...	...	...	...	...	...	...
39. Fincastle	...	...	5	...	...	...	...	...	...
40. Roanoke	...	...	5	...	...	7	...	1	...
41. Blacksburg	1	9	...	...	...	41	4	50	...
42. Glade Spring	4	...	6	...	...	5	...	...	...
43. Blackford	1	...	...	...	...	...	...	...	...
44. Bristol	2	...	...	...	...	97	...	1	...
45. Wise County	...	...	...	...	...	...	...	...	...
Total individuals	856	1,173	1,322	12,645	437	2,922	827	10,171	1,358

King Eider	Common Eider	Harlequin Duck	Surf Scoter	White-winged Scoter	Black Scoter	scoter, sp.	Oldsquaw	Bufflehead	Common Goldeneye	Hooded Merganser	Common Merganser
...	1	...	169	30	64	65	36	690	4	290	1
...	2	...	145	6	2	...	51	679	1	212	...
...	...	...	759	13	76	720	3	694	1	223	...
7	24	4	601	14	72	46	41	...	...	...	...
3	34	6	1,755	1	895	...	24	496	2	610	...
...	...	...	170	3	150	145	...	2	...	66	...
...	...	...	15	...	...	...	...	705	18	83	2
...	...	...	...	...	...	...	...	2	...	20	...
1	...	...	205	20	6	...	27	475	1	306	20
...	...	...	390	15	100	3	296	1,750	382	21	19
...	...	...	...	...	...	...	...	166	16	211	...
...	...	...	...	...	...	...	...	68	...	159	30
...	...	...	...	...	...	...	...	2	...	16	...
...	...	...	67	...	...	...	11	415	176	22	38
...	...	...	1	...	...	...	1	139	17	31	34
...	...	...	1	2	...	...	1	395	2	270	661
...	...	...	...	...	...	...	...	2	...	17	...
...	...	...	...	...	...	...	...	6	...	3	...
...	...	...	...	...	...	...	...	192	...	22	...
...	...	...	...	...	...	...	...	3	...	34	...
...	...	...	...	...	...	...	...	...	1	8	...
...	...	...	...	...	...	...	...	...	...	1	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	49	...	7	...
...	...	...	...	...	...	...	...	17	2	14	...
...	...	...	...	...	...	...	...	6	...	25	...
...	...	...	...	...	...	...	...	...	...	6	CW
...	...	...	...	...	...	...	...	22	...	9	...
...	...	...	...	...	...	...	...	CW	...	10	37
...	...	...	...	...	...	...	...	1	...	4	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	1	...
...	...	...	...	...	...	...	...	...	...	43	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	1	...	...	...
...	...	...	...	...	...	...	...	4	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	5	...
...	...	...	...	...	...	...	...	3	...	11	...
...	...	...	...	...	...	...	...	91	...	121	...
...	...	...	...	...	...	...	...	...	...	8	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	1	227	1	63	...
...	...	...	...	...	...	...	...	...	...	...	...
11	61	10	4,278	104	1,365	979	492	7,302	624	2,952	842

	Red-breasted Merganser	merganser, sp.	Ruddy Duck	duck, sp.	Osprey	Bald Eagle	Northern Harrier	Sharp-shinned Hawk	Cooper's Hawk
1. Chincoteague	272	...	907	1,340	...	13	36	26	5
2. Wachapreague	314	...	34	...	2	5	39	10	9
3. Cape Charles	1,117	...	341	45	...	3	37	12	9
4. CBBT	99	...	...	...	...	...	...	...	...
5. Little Creek	580	...	209	...	1	6	5	3	1
6. Back Bay	970	...	6	...	...	3	43	5	7
7. Nansemond River	265	...	849	...	4	5	7	8	5
8. Dismal Swamp	...	...	18	...	...	30	1	10	3
9. Newport News	137	...	1,973	12	...	3	6	10	2
10. Mathews	547	...	1,493	200	...	2	8	5	5
11. Williamsburg	3	...	11,476	350	...	26	7	2	3
12. Hopewell	...	1	58	...	...	108	9	9	5
13. Walkerton	...	...	3	...	...	10	9	5	1
14. Wash. Birthplace	40	...	1,188	...	1	49	13	6	...
15. Brooke	15	...	222	...	...	18	6	1	1
16. Fort Belvoir	57	...	3,496	...	1	124	2	18	5
17. Central Loudoun	...	...	6	...	...	CW	CW	8	2
18. Manassas-B.R.	...	...	2	...	...	4	7	7	9
19 Chancellorsville	...	...	234	...	...	2	1	...	...
20. Gordonsville	...	...	5	...	...	...	1	5	3
21. Charlottesville	...	...	...	...	...	...	...	2	2
22. Warren	...	...	2	...	...	1	3	4	2
23. Darlington Heights	...	...	...	...	...	...	6	...	...
24. Kerr Reservoir	...	...	9	...	...	3	7	2	1
25. Banister WMA	...	...	3	...	...	1	2	2	2
26. Lynchburg	...	...	10	...	...	3	...	5	2
27. Danville	...	...	CW	...	...	...	1	4	4
28. Martinsville	...	...	25	...	...	...	...	1	1
29. Calmes Neck	...	...	8	...	...	1	3	2	4
30. N. Shen. Valley	...	...	CW	...	...	5	4	15	5
31. Shen. NP-Luray	...	...	5	...	...	...	2	7	7
32. Big Flat Mtn.	...	...	...	...	...	...	...	...	...
33. Rockingham Co.	...	...	...	...	...	...	2	1	7
34. Highland County	...	...	...	...	...	5	2	1	2
35. Augusta Co.	...	...	4	...	...	1	4	5	1
36. Waynesboro	...	...	4	...	...	...	...	3	2
37. Lexington	...	...	...	...	...	...	...	2	CW
38. Peaks of Otter	...	...	...	...	...	1	...	...	...
39. Fincastle	...	...	...	...	...	...	...	4	3
40. Roanoke	...	...	2	...	...	...	...	6	1
41. Blacksburg	...	...	...	...	...	...	1	7	5
42. Glade Spring	...	...	...	...	...	...	...	3	1
43. Blackford	...	...	...	...	...	...	1	1	...
44. Bristol	...	...	3	...	...	1	...	3	8
45. Wise County	...	...	...	...	...	...	1	2	2
Total individuals	4,416	1	22,595	1,947	9	433	276	232	137

	Northern Goshawk	*Accipiter*, sp.	Red-shouldered Hawk	Red-tailed Hawk	Rough-legged Hawk	*Buteo*, sp.	Golden Eagle	American Kestrel	Merlin	Peregrine Falcon	falcon, sp.	hawk, sp.
1. Chincoteague	...	...	5	34	...	...	...	19	6	3	...	1
2. Wachapreague	...	...	...	50	...	...	...	41	1	6	...	...
3. Cape Charles	...	...	4	35	...	1	...	20	2	4	...	...
4. CBBT	...	...	...	...	...	...	...	...	...	1	...	...
5. Little Creek	...	...	1	17	...	...	...	19	...	...	...	...
6. Back Bay	...	...	14	39	...	...	...	46	...	...	...	...
7. Nansemond River	...	...	2	38	...	...	...	16	...	1	...	...
8. Dismal Swamp	...	...	8	23	...	...	...	21	1	...	...	...
9. Newport News	...	...	2	22	...	...	...	12	1	1	...	...
10. Mathews	...	...	3	10	...	...	...	4	...	...	...	...
11. Williamsburg	...	...	17	20	...	...	...	2	1	...	1	1
12. Hopewell	...	...	20	31	...	...	...	18	...	...	...	...
13. Walkerton	...	...	18	20	...	...	...	5	...	...	...	1
14. Wash. Birthplace	...	...	9	35	...	...	...	6	...	...	...	...
15. Brooke	...	...	22	19	1	...	...	7	...	...	...	...
16. Fort Belvoir	1	...	65	50	...	...	...	7	...	...	...	...
17. Central Loudoun	...	1	10	28	CW	1	...	12	1	...	...	...
18. Manassas-B.R.	...	6	43	56	...	...	...	16	1	...	...	...
19 Chancellorsville	...	1	7	9	...	...	...	3	...	...	...	...
20. Gordonsville	...	...	1	14	...	...	...	6	...	...	...	...
21. Charlottesville	...	...	11	25	...	...	...	5	...	...	...	...
22. Warren	...	...	6	37	...	...	...	14	...	...	...	...
23. Darlington Heights	...	...	6	15	...	...	...	8	...	...	...	...
24. Kerr Reservoir	...	...	7	25	1	...	...	10	...	...	...	...
25. Banister WMA	...	...	6	11	...	...	...	6	...	...	...	...
26. Lynchburg	...	...	...	45	...	...	...	8	...	...	...	...
27. Danville	...	...	2	33	...	...	...	6	...	...	...	...
28. Martinsville	...	...	1	4	...	...	...	4	...	...	...	...
29. Calmes Neck	...	...	8	50	...	...	...	26	...	...	...	...
30. N. Shen. Valley	CW	...	11	81	1	...	...	36	...	...	...	...
31. Shen. NP-Luray	...	...	3	39	...	...	...	12	...	...	...	...
32. Big Flat Mtn.	...	...	...	1	...	...	...	...	...	...	...	...
33. Rockingham Co.	...	...	...	38	...	...	...	24	...	...	...	...
34. Highland County	...	...	5	21	1	...	8	6	...	...	...	...
35. Augusta Co.	...	...	2	35	...	...	...	56	...	...	...	...
36. Waynesboro	...	...	5	16	...	...	...	12	...	...	...	...
37. Lexington	...	...	2	20	...	...	...	11	...	...	...	...
38. Peaks of Otter	...	...	...	12	...	...	...	...	...	...	...	...
39. Fincastle	...	...	1	24	...	...	...	21	...	...	...	...
40. Roanoke	...	...	1	19	...	...	1	10	...	...	...	...
41. Blacksburg	...	1	...	12	...	1	...	13	...	...	...	...
42. Glade Spring	...	...	...	30	...	...	...	24	...	...	...	...
43. Blackford	...	...	2	18	1	2	5	14	...	...	...	...
44. Bristol	...	...	...	29	...	...	...	27	...	...	...	...
45. Wise County	...	...	3	6	...	...	...	2	...	...	...	...
Total individuals	1	9	333	1,196	5	5	14	635	14	16	1	3

	Ring-necked Pheasant	Ruffed Grouse	Wild Turkey	Northern Bobwhite	Clapper Rail	clapper/king rail, sp.	King Rail	Virginia Rail	rail, sp
1. Chincoteague	...	...	...	59	5	3	...	3	...
2. Wachapreague	...	...	3	20	8	...	...	...	...
3. Cape Charles	...	...	...	16	89	...	...	10	2
4. CBBT	...	...	...	...	...	...	...	...	...
5. Little Creek	...	...	...	16	5	...	...	1	...
6. Back Bay	...	...	...	9	...	...	6	21	...
7. Nansemond River	...	...	...	3	12	...	...	...	...
8. Dismal Swamp	...	...	1	...	...	...	...	1	...
9. Newport News	...	...	14	10	12	...	...	...	...
10. Mathews	...	...	CW	...	12	...	...	...	...
11. Williamsburg	...	...	19	35	...	...	...	...	...
12. Hopewell	...	...	11	13	...	...	...	...	...
13. Walkerton	...	...	35	2	...	...	...	...	...
14. Wash. Birthplace	...	...	46	1	...	...	...	...	...
15. Brooke	...	...	3	11	...	...	...	...	...
16. Fort Belvoir	...	...	...	42	...	...	3	...	...
17. Central Loudoun	1	...	12	1	...	...	...	...	...
18. Manassas-B.R.	...	...	...	...	...	...	...	...	...
19 Chancellorsville	...	...	...	8	...	...	...	...	...
20. Gordonsville	...	...	7	13	...	...	...	...	...
21. Charlottesville	...	...	5	...	...	...	...	...	...
22. Warren	...	...	64	17	...	...	...	...	...
23. Darlington Heights	...	...	...	...	...	...	...	...	...
24. Kerr Reservoir	...	...	12	4	...	...	...	...	...
25. Banister WMA	...	...	8	10	...	...	...	...	...
26. Lynchburg	...	1	20	9	...	...	...	...	...
27. Danville	...	...	25	36	...	...	...	...	...
28. Martinsville	...	...	...	1	...	...	...	...	...
29. Calmes Neck	...	7	1	4	...	...	...	...	...
30. N. Shen. Valley	...	...	17	12	...	...	...	...	...
31. Shen. NP-Luray	...	10	11	...	...	...	...	...	...
32. Big Flat Mtn.	...	5	...	...	...	...	...	...	...
33. Rockingham Co.	...	1	2	1	...	...	...	...	...
34. Highland County	...	3	6	...	...	...	...	...	...
35. Augusta Co.	...	...	...	1	...	...	...	...	...
36. Waynesboro	...	1	CW	...	...	...	...	...	...
37. Lexington	...	3	5	...	...	...	...	...	...
38. Peaks of Otter	...	1	...	...	...	...	...	...	...
39. Fincastle	...	1	77	...	...	...	...	...	...
40. Roanoke	...	...	1	...	...	...	...	...	...
41. Blacksburg	...	1	5	CW	...	...	...	...	...
42. Glade Spring	...	...	...	...	...	...	...	...	...
43. Blackford	...	8	10	...	...	...	...	...	...
44. Bristol	...	2	...	...	...	...	...	...	...
45. Wise County	...	1	13	...	...	...	...	...	...
Total individuals	1	45	433	354	143	3	9	36	2

	Sora	Common Moorhen	American Coot	Sandhill Crane	Black-bellied Plover	Semipalmated Plover	Killdeer	American Oystercatcher	Greater Yellowlegs	Lesser Yellowlegs	Willet	Ruddy Turnstone
1. Chincoteague	...	...	6	...	67	7	40	214	145	11	40	53
2. Wachapreague	...	...	2	...	178	...	48	71	191	...	20	7
3. Cape Charles	...	...	76	...	513	...	40	87	82	1	10	30
4. CBBT	...	...	...	...	...	...	...	35	...	...	...	4
5. Little Creek	...	...	167	...	12	...	33	9	7	...	...	24
6. Back Bay	2	1	297	...	...	...	169	...	7	1	5	...
7. Nansemond River	...	...	19	...	...	...	56	...	...	...	...	...
8. Dismal Swamp	...	...	29	...	...	...	113	...	...	...	...	...
9. Newport News	...	...	627	...	11	...	117	...	43	...	...	1
10. Mathews	...	...	...	...	2	...	130	...	14	...	...	...
11. Williamsburg	...	...	25	...	...	...	7	...	1	...	...	...
12. Hopewell	...	...	...	...	...	...	355	...	...	...	...	...
13. Walkerton	...	...	...	...	...	...	60	...	3	...	...	...
14. Wash. Birthplace	...	...	...	...	...	...	38	...	...	...	...	...
15. Brooke	...	...	1,230	...	...	...	93	...	...	...	...	...
16. Fort Belvoir	1	...	1,085	...	...	...	134	...	9	4	...	...
17. Central Loudoun	...	...	9	1	...	...	1	...	...	...	...	...
18. Manassas-B.R.	...	...	21	...	...	...	36	...	...	...	...	...
19 Chancellorsville	...	...	89	...	...	...	8	...	...	...	...	...
20. Gordonsville	...	...	...	...	...	...	...	...	...	...	...	...
21. Charlottesville	...	...	...	...	...	...	8	...	...	...	...	...
22. Warren	...	...	11	...	...	...	12	...	...	...	...	...
23. Darlington Heights	...	...	...	...	...	...	22	...	...	...	...	...
24. Kerr Reservoir	...	...	257	...	...	...	4	...	...	...	...	...
25. Banister WMA	...	...	2	...	...	...	24	...	...	...	...	...
26. Lynchburg	...	...	22	...	...	...	12	...	...	...	...	...
27. Danville	...	...	6	...	...	...	22	...	...	...	...	...
28. Martinsville	...	...	51	...	...	...	25	...	...	...	...	...
29. Calmes Neck	...	...	33	...	...	...	3	...	...	...	...	...
30. N. Shen. Valley	...	...	23	...	...	...	25	...	...	...	...	...
31. Shen. NP-Luray	...	...	65	...	...	...	19	...	...	...	...	...
32. Big Flat Mtn.	...	...	...	...	...	...	...	...	...	...	...	...
33. Rockingham Co.	...	...	21	...	...	...	6	...	...	...	...	...
34. Highland County	...	...	28	...	...	...	7	...	...	...	...	...
35. Augusta Co.	...	...	...	...	...	...	26	...	...	...	...	...
36. Waynesboro	...	...	1	...	...	...	2	...	...	...	...	...
37. Lexington	...	...	1	...	...	...	...	...	...	...	...	...
38. Peaks of Otter	...	...	...	...	...	...	...	...	...	...	...	...
39. Fincastle	...	...	...	...	...	...	CW	...	...	...	...	...
40. Roanoke	...	...	50	...	...	...	39	...	...	...	...	...
41. Blacksburg	...	...	22	...	...	...	10	...	...	...	...	...
42. Glade Spring	...	...	16	...	...	...	6	...	...	...	...	...
43. Blackford	...	...	...	...	...	...	...	...	...	...	...	...
44. Bristol	...	...	127	...	...	...	17	...	...	...	...	...
45. Wise County	...	...	...	...	...	...	...	...	...	...	...	...
Total individuals	3	1	4,418	1	783	7	1,767	416	502	17	75	119

	Sanderling	Western Sandpiper	Least Sandpiper	Purple Sandpiper	Dunlin	peep, sp	Short-billed Dowitcher	dowitcher, sp.	Common Snipe
1. Chincoteague	590	14	5	...	3,540	...	2	...	4
2. Wachapreague	52	9	...	...	2,117	500	22	100	...
3. Cape Charles	296	114	3	...	3,824	...	32	...	20
4. CBBT	4	...	...	9	...	...	...	...	...
5. Little Creek	345	1	...	...	100	...	...	...	...
6. Back Bay	54	...	...	...	1	...	...	...	21
7. Nansemond River	66	2	70	...	71	...	...	...	1
8. Dismal Swamp	...	...	...	...	...	...	...	...	2
9. Newport News	140	...	...	...	220	...	35	...	2
10. Mathews	82	86	...	...	624	19	CW	16	2
11. Williamsburg	...	...	2	...	...	...	...	...	...
12. Hopewell	...	...	...	...	...	...	...	...	38
13. Walkerton	...	...	...	...	...	...	...	...	7
14. Wash. Birthplace	...	...	...	...	...	...	...	...	7
15. Brooke	...	...	...	...	...	...	...	...	3
16. Fort Belvoir	...	...	...	...	...	...	...	...	17
17. Central Loudoun	...	...	...	...	...	...	...	...	3
18. Manassas-B.R.	...	...	...	...	...	...	...	...	...
19 Chancellorsville	...	...	...	...	...	...	...	...	...
20. Gordonsville	...	...	...	...	...	...	...	...	1
21. Charlottesville		...	...	...	...	...	...	...	5
22. Warren	...	...	...	...	...	...	...	...	11
23. Darlington Heights	...	...	...	...	...	...	...	...	...
24. Kerr Reservoir	...	...	...	...	...	...	...	...	6
25. Banister WMA	...	...	...	...	...	...	...	...	4
26. Lynchburg	...	...	...	...	...	...	...	...	1
27. Danville	...	...	...	...	...	...	...	...	...
28. Martinsville	...	...	...	...	...	...	...	...	...
29. Calmes Neck	...	...	...	...	...	...	...	...	7
30. N. Shen. Valley	...	...	...	...	...	...	...	...	25
31. Shen. NP-Luray	...	...	...	...	...	...	...	...	3
32. Big Flat Mtn.	...	...	...	...	...	...	...	...	...
33. Rockingham Co.	...	...	...	...	...	...	...	...	7
34. Highland County	...	...	...	...	...	...	...	...	5
35. Augusta Co.	...	...	...	...	...	...	...	...	2
36. Waynesboro	...	...	...	...	...	...	...	...	2
37. Lexington	...	...	...	...	...	...	...	...	1
38. Peaks of Otter	...	...	...	...	...	...	...	...	...
39. Fincastle	...	...	...	...	...	...	...	...	1
40. Roanoke	...	...	...	...	...	...	...	...	3
41. Blacksburg	...	...	...	...	...	...	...	...	3
42. Glade Spring	...	...	...	...	...	...	...	...	21
43. Blackford	...	...	...	...	...	...	...	...	1
44. Bristol	...	...	...	...	...	...	...	...	2
45. Wise County	...	...	...	...	...	...	...	...	...
Total individuals	1,629	226	80	9	10,497	519	91	116	238

American Woodcock	Pomarine Jaeger	Parasitic Jaeger	Laughing Gull	Little Gull	Bonaparte's Gull	Ring-billed Gull	Herring Gull	Yellow-legged Gull	Iceland Gull	Lesser Black-backed Gull	Great Black-backed Gull
7	...	...	...	...	75	633	1,483	...	...	...	214
1	...	...	1	...	1	1,485	1,728	...	...	...	68
12	...	...	4	1	711	3,908	1,970	...	...	1	938
...	...	...	24	1	2,529	297	126	...	...	...	38
2	1	...	554	...	1,865	7,610	3,260	...	...	4	665
14	...	1	1	...	82	6,360	328	1	1	3	254
3	...	...	1	...	12	13,511	15,410	...	...	7	876
2	...	...	1	...	...	6,365	3,014	...	...	...	2,002
...	...	...	14	...	3	3,661	1,650	...	...	...	199
5	...	...	...	...	120	2,113	2,452	...	...	...	50
3	...	...	12	...	46	1,261	141	...	...	...	46
...	...	...	74	...	10	5,976	353	...	...	...	120
3	...	...	...	...	...	84	...	...	...	...	...
...	...	...	1	...	...	621	42	...	...	...	21
1	...	...	...	...	...	1,550	242	...	...	...	189
7	...	...	2	...	2	4,833	3,566	...	...	...	476
4	...	...	...	...	...	51	...	...	...	...	...
...	...	...	...	...	...	370	28	...	...	...	...
2	...	...	...	...	...	84	9	...	...	...	...
1	...	...	...	...	...	1	...	...	...	...	...
1	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	3	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	220	4,500	21	...	...	...	1
2	...	...	...	...	4	1,352	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	1	1,186	16	...	...	...	...
...	...	...	...	...	...	12	...	...	...	...	...
...	...	...	...	...	...	CW	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	2	...	...	...	...	...
...	...	...	...	...	2	764	...	...	...	...	...
...	...	...	...	...	...	720	...	...	...	...	...
...	...	...	...	...	...	9	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	4	227	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...	...	...
70	1	1	689	2	5,674	69,549	35,839	1	1	15	6,157

	gull, sp.	Forster's Tern	tern, sp.	Black Skimmer	Rock Dove	Mourning Dove	Barn Owl	Eastern Screech-Owl	Great Horned Owl
1. Chincoteague	...	...	...	...	159	543	...	15	16
2. Wachapreague	391	...	...	...	180	375	...	4	4
3. Cape Charles	...	1	...	...	249	203	CW	10	12
4. CBBT	...	1	...	...	...	...	...	...	...
5. Little Creek	...	79	...	...	590	374	...	20	3
6. Back Bay	...	71	...	1	46	475	...	4	5
7. Nansemond River	...	...	...	...	709	216	...	7	4
8. Dismal Swamp	...	...	...	...	123	304	...	18	4
9. Newport News	1,400	2	...	...	994	313	...	2	6
10. Mathews	150	40	50	...	49	190	...	22	14
11. Williamsburg	...	...	...	...	129	241	...	10	3
12. Hopewell	...	2	...	...	127	277	...	3	17
13. Walkerton	12	...	...	...	10	39	...	1	6
14. Wash. Birthplace	...	...	...	...	33	208	1	4	16
15. Brooke	...	...	...	...	67	299	...	...	...
16. Fort Belvoir	...	...	...	...	304	576	3	12	40
17. Central Loudoun	...	...	...	...	234	225	5	4	4
18. Manassas-B.R.	...	...	...	...	213	358	...	...	1
19 Chancellorsville	...	...	...	...	23	114	...	7	3
20. Gordonsville	...	...	...	...	285	219	2	...	1
21. Charlottesville	...	...	...	...	309	200	...	5	1
22. Warren	...	...	...	...	89	453	...	3	2
23. Darlington Heights	...	...	...	...	34	134	...	12	1
24. Kerr Reservoir	...	...	...	...	69	40	...	1	15
25. Banister WMA	...	...	...	...	171	142	...	5	8
26. Lynchburg	1	...	...	...	202	298	...	15	5
27. Danville	...	...	...	...	169	627	...	1	1
28. Martinsville	...	...	...	...	250	253	...	1	4
29. Calmes Neck	...	...	...	...	684	661	...	18	9
30. N. Shen. Valley	...	...	...	...	1,284	1,536	...	33	4
31. Shen. NP-Luray	...	...	...	...	279	730	...	14	8
32. Big Flat Mtn.	...	...	...	...	8	...	...	...	1
33. Rockingham Co.	...	...	...	...	628	353	...	1	3
34. Highland County	...	...	...	...	12	48	...	1	4
35. Augusta Co.	...	...	...	...	658	728	...	1	...
36. Waynesboro	...	...	...	...	122	526	...	...	...
37. Lexington	...	...	...	...	514	82	...	10	7
38. Peaks of Otter	...	...	...	...	...	10	...	2	1
39. Fincastle	...	...	...	...	297	354	...	5	2
40. Roanoke	...	...	...	...	733	293	...	1	4
41. Blacksburg	...	...	...	...	566	349	...	4	8
42. Glade Spring	...	...	...	...	233	316	...	6	9
43. Blackford	...	...	...	...	16	149	...	2	...
44. Bristol	...	...	...	...	471	357	...	12	16
45. Wise County	...	...	...	...	46	112	...	3	1
Total Individuals	1,954	196	50	1	12,368	14,300	11	299	273

Barred Owl	Long-eared Owl	Short-eared Owl	Northern Saw-whet Owl	owl, sp.	Allen's Hummingbird	Belted Kingfisher	Red-headed Woodpecker	Red-bellied Woodpecker	Yellow-bellied Sapsucker	Downy Woodpecker	Hairy Woodpecker
...	...	...	...	...	...	36	...	50	3	51	19
...	...	...	...	...	...	38	...	32	20	39	5
...	...	...	...	...	...	26	1	35	3	20	5
...	...	...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	25	1	44	4	37	2
5	...	...	...	...	...	17	...	62	7	45	6
3	...	4	...	...	...	15	...	41	2	35	5
8	...	...	...	...	...	13	2	93	25	69	31
...	...	...	...	...	...	37	...	68	6	43	3
3	...	...	...	...	...	25	...	57	10	48	5
3	...	...	...	...	...	17	1	37	12	48	6
9	...	1	...	...	...	19	1	140	40	73	8
8	...	...	...	1	...	13	2	35	10	29	4
1	...	...	...	...	...	15	2	40	14	31	3
1	...	...	...	...	...	31	2	73	12	52	9
17	1	...	2	...	...	69	17	325	30	292	49
4	7	3	11	...	...	12	4	132	17	78	12
1	...	...	...	...	...	8	5	137	8	101	15
1	...	...	...	...	...	8	...	43	8	27	4
...	...	...	...	...	...	6	2	32	10	14	7
1	...	...	...	...	...	20	...	135	47	81	10
...	...	...	...	...	...	12	9	116	44	79	7
...	...	...	...	...	...	1	...	19	7	17	1
2	...	...	...	...	...	9	4	27	12	22	8
9	...	...	...	...	...	8	32	30	8	17	4
1	...	...	...	...	...	11	...	72	35	58	9
3	...	...	...	...	...	4	2	43	13	16	4
...	...	...	...	...	...	4	...	13	1	11	5
6	...	...	...	...	...	31	33	168	62	203	19
2	...	2	...	...	...	58	1	178	42	202	37
1	...	...	...	...	...	18	...	39	14	84	8
...	...	...	...	...	...	...	...	6	6	6	1
...	...	...	...	...	...	6	...	23	4	42	2
...	...	...	...	...	...	11	1	13	8	29	10
1	...	...	...	...	...	14	...	49	10	52	2
...	...	...	...	...	...	8	...	31	20	44	2
...	...	...	...	...	...	13	...	25	8	34	5
...	...	...	...	...	...	1	...	12	5	11	5
...	...	...	...	...	...	17	1	27	16	30	8
...	...	...	...	...	...	21	...	22	11	49	6
...	...	...	...	...	...	18	1	27	5	80	18
...	1	...	...	...	...	19	...	23	3	22	1
1	1	...	...	...	...	4	...	4	1	12	1
...	...	...	...	...	1	12	...	17	7	18	...
...	...	...	...	...	...	4	...	9	1	34	4
91	10	10	13	1	1	754	124	2,604	631	2,385	375

	Northern Flicker	Pileated Woodpecker	Eastern Phoebe	Northern Shrike	Loggerhead Shrike	White-eyed Vireo	Blue-headed Vireo	Blue Jay	American Crow
1. Chincoteague	158	10	15	...	...	...	...	54	367
2. Wachapreague	54	5	19	...	...	...	...	81	569
3. Cape Charles	81	2	2	...	...	...	1	96	695
4. CBBT	...	...	...	...	...	...	...	...	...
5. Little Creek	60	7	1	...	...	1	1	108	442
6. Back Bay	63	10	8	...	...	...	2	87	280
7. Nansemond River	32	10	6	...	...	...	1	128	313
8. Dismal Swamp	85	61	13	...	...	...	3	113	1,815
9. Newport News	63	5	2	...	...	...	...	171	758
10. Mathews	89	17	5	...	...	...	...	229	877
11. Williamsburg	35	33	5	...	...	...	1	54	170
12. Hopewell	154	36	9	...	1	...	...	142	478
13. Walkerton	56	27	9	...	...	...	...	39	467
14. Wash. Birthplace	77	21	6	...	...	...	...	109	380
15. Brooke	70	52	2	...	...	...	...	218	533
16. Fort Belvoir	243	108	7	...	...	...	...	641	2,044
17. Central Loudoun	66	19	...	...	1	...	...	331	668
18. Manassas-B.R.	120	26	2	...	...	...	...	384	921
19 Chancellorsville	31	25	11	...	...	...	...	101	227
20. Gordonsville	19	18	1	...	...	...	...	22	325
21. Charlottesville	109	45	11	...	...	...	...	300	1,671
22. Warren	60	39	12	...	...	...	...	113	1,093
23. Darlington Heights	6	9	4	...	1	...	...	33	385
24. Kerr Reservoir	35	7	20	...	1	...	...	62	260
25. Banister WMA	14	6	6	...	2	...	...	221	201
26. Lynchburg	64	45	11	...	...	...	...	155	740
27. Danville	30	7	1	...	...	...	...	118	440
28. Martinsville	6	4	3	...	...	...	...	15	274
29. Calmes Neck	71	60	2	1	2	...	...	301	873
30. N. Shen. Valley	77	47	2	...	5	...	...	407	1,497
31. Shen. NP-Luray	20	33	1	...	...	...	...	151	1,242
32. Big Flat Mtn.	7	7	...	...	...	...	...	2	14
33. Rockingham Co.	9	12	1	...	...	...	...	46	386
34. Highland County	9	28	3	...	...	...	...	23	271
35. Augusta Co.	13	9	...	...	...	...	...	109	1,249
36. Waynesboro	22	39	2	...	1	...	...	96	726
37. Lexington	14	17	5	...	...	...	...	67	708
38. Peaks of Otter	12	19	3	...	...	...	...	5	66
39. Fincastle	46	27	4	...	1	...	2	187	1,766
40. Roanoke	27	17	5	...	...	...	2	66	884
41. Blacksburg	28	22	5	...	...	...	...	142	1,021
42. Glade Spring	11	14	5	...	1	...	...	106	685
43. Blackford	2	5	...	...	...	...	...	30	675
44. Bristol	9	12	4	...	1	...	1	104	1,597
45. Wise County	4	15	1	...	...	...	...	33	437
Total individuals	2,261	1,037	234	1	17	1	14	6,000	31,490

Fish Crow	crow, sp.	Common Raven	Horned Lark	Tree Swallow	Carolina Chickadee	Black-capped Chickadee	chickadee, sp.	Tufted Titmouse	Red-breasted Nuthatch	White-breasted Nuthatch	Brown-headed Nuthatch
14	52	...	10	677	240	...	...	46	9	...	48
12	...	...	9	246	117	...	...	33	10	1	28
627	30	...	64	67	136	...	...	27	10	1	6
...	...	...	...	26	...	...	...	...	...	...	...
405	...	...	...	...	241	...	...	111	5	26	20
9	...	...	...	3400	196	...	...	64	5	20	56
45	...	...	9	...	202	...	...	99	1	7	24
103	...	...	...	...	309	...	...	171	...	61	2
5	...	...	...	...	266	...	...	120	...	2	...
3	...	...	...	...	255	...	...	186	8	3	35
...	17	...	...	...	185	...	...	109	2	50	12
339	260	...	2	...	287	...	...	180	2	49	...
...	...	...	6	...	155	...	...	47	3	23	...
...	...	...	1	...	68	...	...	69	5	13	...
19	...	...	...	...	280	...	...	199	1	54	...
421	767	...	14	...	1,023	...	...	918	6	226	...
69	106	1	2	...	256	CW	...	140	3	74	...
26	367	...	...	...	581	...	...	481	2	106	...
CW	...	...	...	...	131	...	...	64	1	34	...
1	...	...	...	...	77	...	...	44	...	23	...
735	...	8	...	...	341	...	...	293	20	139	13
3	...	2	...	...	182	...	...	104	9	63	...
...	...	...	20	...	53	...	...	19	2	8	...
8	...	...	2	...	74	...	...	56	7	5	15
2	...	...	...	...	48	...	...	98	6	33	4
8	...	6	4	...	187	...	...	151	8	74	...
...	...	...	...	...	108	...	...	77	...	32	4
...	...	2	...	...	44	...	...	11	8	14	13
1	...	3	7	...	671	2	...	400	3	263	...
4	...	10	2	...	923	5	...	444	4	209	...
25	...	44	110	...	264	16	...	256	8	117	...
...	...	4	...	...	25	...	...	8	2	4	...
1	...	13	29	...	59	8	19	101	2	51	...
...	...	46	3	...	6	341	...	152	16	77	...
52	97	2	6	...	184	18	...	155	2	57	...
7	...	3	219	...	141	...	...	139	5	39	...
4	...	6	...	...	85	12	104	136	3	47	...
...	...	27	...	...	39	11	...	23	8	23	...
...	...	10	...	...	218	8	...	136	11	36	...
...	...	1	...	...	158	6	...	88	9	35	...
...	...	17	...	...	160	22	104	144	25	88	...
...	...	2	...	...	122	...	...	96	3	27	...
...	...	15	...	...	20	...	...	23	...	11	...
...	...	3	...	...	92	...	...	79	10	46	...
...	...	2	26	...	125	...	...	103	6	64	...
2,945	1,696	227	545	4,416	9,334	449	227	6,400	250	2,335	280

	Brown Creeper	Carolina Wren	House Wren	Winter Wren	Sedge Wren	Marsh Wren	Golden-crowned Kinglet	Ruby-crowned Kinglet	Blue-gray Gnatcatcher
1. Chincoteague	10	77	10	37	5	3	61	17	...
2. Wachapreague	2	99	7	2	...	3	25	6	...
3. Cape Charles	6	80	8	5	4	4	53	19	...
4. CBBT	...	...	...	...	...	...	...	...	...
5. Little Creek	6	66	1	4	...	1	78	37	...
6. Back Bay	9	121	5	4	13	3	20	21	...
7. Nansemond River	3	141	5	7	1	5	68	64	...
8. Dismal Swamp	6	203	2	30	...	...	50	86	...
9. Newport News	8	106	3	...	...	1	34	22	...
10. Mathews	6	161	1	1	...	...	33	24	...
11. Williamsburg	1	90	...	12	...	...	32	44	1
12. Hopewell	6	129	...	5	...	...	64	55	...
13. Walkerton	2	52	...	5	...	...	41	28	...
14. Wash. Birthplace	1	37	...	2	...	...	49	28	...
15. Brooke	6	56	...	5	...	...	17	22	...
16. Fort Belvoir	31	435	5	17	...	1	49	31	1
17. Central Loudoun	11	69	1	6	...	...	15	...	...
18. Manassas-B.R.	19	95	...	2	...	...	22	6	...
19 Chancellorsville	2	24	...	1	...	...	46	14	...
20. Gordonsville	2	21	...	1	...	...	22	2	...
21. Charlottesville	...	162	...	5	...	...	53	23	...
22. Warren	7	97	...	8	...	...	27	24	...
23. Darlington Heights	...	26	...	...	...	...	21	7	...
24. Kerr Reservoir	2	49	1	16	...	...	32	31	...
25. Banister WMA	6	40	...	7	...	...	19	11	...
26. Lynchburg	5	130	...	8	...	...	30	12	...
27. Danville	...	62	...	2	...	...	8	...	...
28. Martinsville	...	46	...	1	...	...	13	10	...
29. Calmes Neck	23	151	...	9	...	...	19	4	...
30. N. Shen. Valley	43	128	2	9	...	...	63	3	...
31. Shen. NP-Luray	14	77	...	8	...	...	40	2	...
32. Big Flat Mtn.	...	2	...	...	...	...	4	2	...
33. Rockingham Co.	5	32	...	4	...	...	30	1	...
34. Highland County	18	25	...	2	...	...	53	...	...
35. Augusta Co.	3	40	...	2	...	...	16	...	...
36. Waynesboro	5	35	...	1	...	...	17	9	...
37. Lexington	6	51	...	4	...	...	51	2	...
38. Peaks of Otter	3	22	...	2	...	...	14	3	...
39. Fincastle	3	91	...	2	...	...	58	7	...
40. Roanoke	5	108	...	3	...	...	30	11	...
41. Blacksburg	12	100	...	10	...	...	43	4	...
42. Glade Spring	...	66	...	1	...	...	7	...	...
43. Blackford	...	1	...	...	...	...	5	...	...
44. Bristol	1	54	2	2	...	...	60	11	...
45. Wise County	1	42	...	8	...	...	6	...	...
Total individuals	299	3,699	53	260	23	21	1,498	703	2

Eastern Bluebird	Hermit Thrush	American Robin	Gray Catbird	Northern Mockingbird	Brown Thrasher	European Starling	American Pipit	Cedar Waxwing	Orange-crowned Warbler	Cape May Warbler	Yellow-rumped Warbler
208	40	783	21	40	9	3,543	16	34	...	...	2,829
377	18	129	16	100	7	3,054	...	32	...	...	1,090
212	14	350	11	25	...	7,984	3	59	...	...	1,391
...	...	...	...	...	...	3	...	...	...	...	...
6	18	2,910	3	36	12	5,195	...	563	1	...	970
148	32	6,100	11	53	14	3,224	50	26	...	...	4,850
116	31	527	8	73	11	1,141	38	127	1	...	1,135
215	143	6,558	100	18	8	6,585	...	83	...	...	190
89	2	178	4	89	7	3,696	...	12	...	...	1,001
607	32	251	1	91	28	614	...	99	...	...	1,087
137	7	70	...	31	7	475	...	65	...	...	158
377	23	221	...	75	3	3,140	200	592	...	...	427
141	4	162	3	16	...	189	4	93	...	...	70
75	9	59	2	34	5	3,026	153	143	...	1	140
212	10	58	...	88	1	2,055	...	398	...	...	77
363	73	147	4	169	7	2,731	3	531	...	...	125
133	18	42	...	60	...	3,430	3	252	...	...	204
202	7	389	...	108	...	6,288	...	836	...	...	454
137	10	106	...	39	...	349	...	241	...	...	134
90	2	129	...	24	...	382	...	231	...	...	63
251	35	554	...	64	1	659	...	402	...	...	307
347	27	911	...	55	1	1,169	...	907	...	...	356
181	6	402	...	43	...	313	130	177	...	...	136
146	30	334	...	30	12	167	60	195	...	...	254
108	4	2,603	...	14	5	215	...	147	...	...	55
243	18	88	...	86	...	1,974	...	928	...	...	80
98	2	257	...	33	1	3,536	...	102	...	...	7
87	2	84	...	25	...	1,007	...	473	...	...	28
364	23	89	1	117	...	12,301	...	130	...	...	14
671	16	570	CW	196	...	7,755	...	297	...	...	436
320	15	9	1	77	...	16,939	...	142	...	...	218
...	2	...	...	...	...	...	...	33	...	...	...
152	...	29	...	44	...	1,476	...	46	...	...	59
81	1	1	...	5	...	388	...	34	...	...	7
294	4	54	...	110	...	5,190	...	107	...	...	215
77	9	32	...	38	...	1,175	1	217	...	...	55
130	27	212	...	47	1	282	...	176	...	...	364
44	6	4	...	5	...	55	...	...	...	...	24
338	24	172	1	123	...	2,152	2	774	...	...	499
123	6	69	...	107	...	3,480	...	81	...	...	28
155	3	6	...	77	...	1,615	...	5	...	...	32
71	1	...	...	48	...	1,670	...	...	...	...	4
63	...	3	...	15	...	305	...	...	...	...	18
77	5	5	...	69	...	2,621	...	...	...	...	24
25	1	16	...	9	...	436	...	5	...	...	1
8,291	760	25,673	187	2,606	140	123,984	663	9,765	2	1	19,616

	Black-throated Green Warbler	Pine Warbler	Prairie Warbler	Palm Warbler	Black-and-white Warbler	Common Yellowthroat	Eastern Towhee	American Tree Sparrow	Chipping Sparrow
1. Chincoteague	...	16	...	...	...	7	42	...	53
2. Wachapreague	...	13	...	1	...	1	3	3	188
3. Cape Charles	...	4	1	9	...	...	9	1	58
4. CBBT	...	...	...	...	...	...	...	...	...
5. Little Creek	...	22	...	1	...	...	20	...	...
6. Back Bay	...	16	1	3	...	4	53	2	14
7. Nansemond River	...	27	1	4	1	2	55	...	53
8. Dismal Swamp	...	11	2	1	...	4	139	1	4
9. Newport News	...	19	...	2	2	...	19	...	17
10. Mathews	...	13	...	1	...	...	49	...	50
11. Williamsburg	...	12	1	1	...	...	21	...	14
12. Hopewell	...	4	...	3	...	...	19	...	5
13. Walkerton	...	2	...	...	...	...	4	...	...
14. Wash. Birthplace	...	7	...	...	...	...	10	...	...
15. Brooke	...	...	...	...	...	...	7	5	1
16. Fort Belvoir	...	3	1	2	...	2	35	45	1
17. Central Loudoun	...	...	...	...	...	...	2	125	...
18. Manassas-B.R.	...	1	...	...	...	...	8	1	...
19 Chancellorsville	...	2	...	...	...	...	2	...	...
20. Gordonsville	...	2	...	...	...	...	2	1	...
21. Charlottesville	...	1	...	...	...	...	25	4	...
22. Warren	...	1	...	...	...	...	24	...	...
23. Darlington Heights	...	...	...	...	...	...	1	2	...
24. Kerr Reservoir	...	19	...	4	...	...	40	...	194
25. Banister WMA	...	2	...	...	...	...	44	...	...
26. Lynchburg	...	5	...	...	...	...	38	...	...
27. Danville	...	2	...	...	...	...	6	...	2
28. Martinsville	...	1	...	...	...	...	23	...	...
29. Calmes Neck	...	...	...	...	...	...	...	11	...
30. N. Shen. Valley	...	1	...	...	...	...	...	40	...
31. Shen. NP-Luray	...	...	...	1	...	...	1	1	...
32. Big Flat Mtn.	...	...	...	...	...	...	2	...	...
33. Rockingham Co.	...	...	...	...	...	...	...	12	...
34. Highland County	...	...	...	...	...	...	...	3	...
35. Augusta Co.	...	...	...	...	...	...	4	2	...
36. Waynesboro	...	CW	...	...	...	...	...	14	...
37. Lexington	...	...	...	...	...	...	4	2	...
38. Peaks of Otter	...	...	...	...	...	...	2	...	...
39. Fincastle	...	2	...	...	...	...	29	1	4
40. Roanoke	...	1	...	...	...	...	17	1	...
41. Blacksburg	1	2	...	...	1	...	12	...	1
42. Glade Spring	...	...	...	...	...	...	10	...	...
43. Blackford	...	...	...	...	...	...	3	...	...
44. Bristol	...	...	...	...	...	...	14	...	...
45. Wise County	...	...	...	...	...	...	6	...	...
Total individuals	1	211	7	33	4	20	804	277	659

Field Sparrow	Vesper Sparrow	Savannah Sparrow	Savannah (Ipswich) Sparrow	LeConte's Sparrow	Nelson's Sharp-tailed Sparrow	Saltmarsh Sharp-tailed Sparrow	sharp-tailed sparrow, sp.	Seaside Sparrow	Fox Sparrow	Song Sparrow	Lincoln's Sparrow	Swamp Sparrow
106	...	119	1	...	...	10	4	1	1	340	...	191
61	...	93	1	...	...	4	...	7	10	231	...	24
11	8	91	13	...	14	14	95	17	28	137	...	66
...	...	...	...	...	...	...	...	...	...	...	...	...
7	...	40	...	...	...	...	...	...	12	62	...	7
30	1	173	2	3	...	...	1	...	32	116	...	140
10	...	58	1	...	...	...	...	...	11	254	...	58
6	...	6	...	...	...	...	...	...	25	132	1	65
41	...	15	...	...	...	...	...	...	9	154	...	42
21	...	6	...	...	...	...	...	...	...	108	...	28
23	...	24	...	...	...	...	...	...	7	56	...	31
26	...	24	...	...	...	...	...	...	5	173	...	19
24	...	8	...	...	...	...	...	...	...	131	...	44
1	...	4	...	...	...	...	...	...	...	96	...	8
16	...	7	...	...	...	...	...	...	4	147	...	28
123	...	28	...	...	...	...	...	...	2	478	...	84
84	...	7	...	...	...	...	...	...	4	112	...	31
51	...	...	...	...	...	...	...	...	...	149	...	6
25	...	1	...	...	...	...	...	...	3	55	...	2
12	...	...	...	...	...	...	...	...	1	81	...	7
96	...	3	...	...	...	...	...	...	3	291	...	13
146	...	2	...	...	...	...	...	...	13	294	...	28
37	...	...	...	...	...	...	...	...	2	64	...	...
239	...	34	...	...	...	...	...	...	3	370	...	123
23	...	1	...	...	...	...	...	...	2	75	...	40
68	...	5	...	...	...	...	...	...	...	166	...	5
...	...	3	...	...	...	...	...	...	2	115	...	30
101	...	...	...	...	...	...	...	...	...	71	...	17
20	...	...	...	...	...	...	...	...	...	138	...	5
33	...	5	...	...	...	...	...	...	3	196	...	13
26	...	...	...	...	...	...	...	...	...	178	...	3
...	...	...	...	...	...	...	...	...	1	2	...	...
8	...	1	...	...	...	...	...	...	...	38	...	1
26	...	...	...	...	...	...	...	...	1	10	...	6
18	...	...	...	...	...	...	...	...	2	54	...	1
18	...	...	...	...	...	...	...	...	...	76	...	10
35	...	...	...	...	...	...	...	...	2	51	...	...
31	...	...	...	...	...	...	...	...	...	9	...	...
105	...	...	...	...	...	...	...	...	2	203	...	2
30	...	...	...	...	...	...	...	...	...	71	...	1
32	...	1	...	...	...	...	...	...	7	112	...	1
36	...	1	...	...	...	...	...	...	...	143	...	1
3	4	...	...	...	...	...	...	...	1	29	...	...
66	...	...	...	...	...	...	...	...	1	197	...	3
20	...	...	...	...	...	...	...	...	1	83	...	1
1,925	13	760	18	3	14	28	100	25	200	6,048	1	1,185

	White-throated Sparrow	White-crowned Sparrow	sparrow, sp.	Dark-eyed Junco	Dark-eyed (White-winged) Junco	Lapland Longspur	Snow Bunting	Northern Cardinal	Indigo Bunting
1. Chincoteague	982	5	...	482	...	...	...	194	...
2. Wachapreague	522	...	...	379	...	...	...	143	...
3. Cape Charles	530	...	...	179	...	...	6	148	...
4. CBBT	...	...	...	...	...	...	...	...	...
5. Little Creek	197	...	...	204	...	...	...	119	...
6. Back Bay	633	...	...	288	...	...	...	207	...
7. Nansemond River	516	...	...	233	...	...	...	138	CW
8. Dismal Swamp	994	...	...	614	1	...	...	116	...
9. Newport News	227	...	7	163	...	...	...	133	...
10. Mathews	285	...	...	694	...	...	...	180	...
11. Williamsburg	246	...	...	263	...	...	...	108	...
12. Hopewell	834	1	...	594	...	...	...	223	...
13. Walkerton	396	...	...	277	...	...	...	67	...
14. Wash. Birthplace	309	...	...	483	...	...	...	102	...
15. Brooke	392	...	...	970	...	...	...	176	...
16. Fort Belvoir	1,457	4	...	1,199	...	...	...	568	...
17. Central Loudoun	475	44	...	755	...	1	...	362	...
18. Manassas-B.R.	337	1	...	925	...	...	...	404	...
19 Chancellorsville	137	5	...	135	...	...	...	82	...
20. Gordonsville	135	12	...	329	...	...	...	82	...
21. Charlottesville	751	55	...	985	...	...	...	258	...
22. Warren	1,205	77	...	1,208	...	...	...	189	...
23. Darlington Heights	109	...	...	363	...	...	...	55	...
24. Kerr Reservoir	1,080	2	...	670	...	...	...	131	...
25. Banister WMA	156	2	...	465	...	...	...	55	...
26. Lynchburg	421	15	...	535	...	...	...	173	...
27. Danville	284	...	...	355	...	...	...	148	...
28. Martinsville	96	1	...	269	...	...	...	96	...
29. Calmes Neck	523	101	...	668	...	...	...	872	...
30. N. Shen. Valley	527	183	...	1,686	...	...	...	510	...
31. Shen. NP-Luray	352	197	...	833	...	...	...	206	...
32. Big Flat Mtn.	47	...	...	32	...	...	...	13	...
33. Rockingham Co.	144	107	...	284	...	...	...	121	...
34. Highland County	25	...	...	518	...	...	...	26	...
35. Augusta Co.	281	137	...	437	...	...	...	189	...
36. Waynesboro	308	109	...	478	...	2	...	153	...
37. Lexington	232	11	...	273	...	...	...	113	...
38. Peaks of Otter	30	...	...	102	...	...	...	13	...
39. Fincastle	316	129	...	358	...	...	1	241	...
40. Roanoke	123	10	...	147	...	...	...	159	...
41. Blacksburg	159	66	...	346	...	...	...	218	...
42. Glade Spring	66	64	...	41	...	...	...	192	...
43. Blackford	2	1	...	80	...	...	...	22	...
44. Bristol	120	44	...	160	...	...	...	153	...
45. Wise County	28	1	...	66	...	...	...	85	...
Total Individuals	16,989	1,384	7	20,525	1	3	7	7,943	CW

Red-winged Blackbird	Eastern Meadowlark	Rusty Blackbird	Brewer's Blackbird	Common Grackle	Boat-tailed Grackle	Brown-headed Cowbird	blackbird, sp.	Baltimore Oriole	Pine Grosbeak	Purple Finch	House Finch
27,496	226	51	...	103,328	395	486	300,000	...	...	1	84
2,780	205	1	...	3,264	164	180	5,028	...	...	2	185
3,042	24	9	...	4,282	8	331	115	...	...	...	175
...	...	...	...	...	...	...	...	...	...	...	...
535	...	...	...	1,035	164	25	...	...	...	...	171
5,330	266	23	...	1,970	376	217	...	1	...	...	66
4,014	21	6	...	59	...	49	100	...	...	2	51
3,907	39	10	...	1,182	...	3,088	...	1	...	6	5
260	21	...	...	1,418	99	...	200	...	...	...	72
448	98	28	...	12	59	5	...	1	...	2	219
900	22	1	...	60	...	9	...	...	...	2	38
652	56	4	...	32	...	...	...	2	...	2	36
866	9	...	...	8,036	...	14	1	...	...	...	19
882	56	2	...	108,051	...	2	109,258	...	...	2	26
69	6	...	...	516	...	2	...	...	...	...	129
799	29	63	...	301	...	261	...	...	...	34	426
193	8	75	...	5,286	...	95	...	...	CW	32	329
12	2	...	...	10	...	...	...	1	...	...	247
47	22	...	...	2	...	10	...	...	...	6	35
...	22	...	...	...	...	...	...	...	...	22	134
6	14	...	...	...	...	3	...	...	...	121	263
128	52	1	...	638	...	71	...	...	...	118	344
30	125	...	...	...	...	18	...	...	...	39	102
1,280	22	...	...	6	...	...	...	CW	...	5	18
27	48	...	...	2,065	...	12	...	...	...	19	94
7	16	...	...	104	...	...	...	...	...	26	369
200	17	...	...	91	...	31	...	...	...	14	41
...	1	...	...	...	...	...	...	...	...	3	27
500	19	26	...	2,013	...	103	...	...	...	3	65
335	9	32	...	56	...	107	...	...	...	101	534
8,158	144	150	...	4,651	...	12,036	...	...	...	...	88
...	...	...	...	...	...	...	...	...	...	...	...
4	1	2	...	3	...	18	...	...	...	6	112
...	3	...	...	...	...	...	...	...	...	4	13
200	1	150	...	1,566	...	260	...	...	...	10	311
1	1	...	...	8	...	64	...	...	...	11	123
...	...	...	...	...	...	...	...	...	...	59	283
...	...	...	...	...	...	...	...	...	...	21	...
...	9	...	...	7	...	...	...	...	...	85	533
...	...	3	...	2	...	...	...	...	...	1	268
...	...	...	...	5	...	...	...	...	...	9	164
...	54	...	...	...	...	...	...	...	...	...	43
16	23	...	...	2	...	2	...	...	...	...	58
1	161	...	1	...	...	...	...	...	...	CW	59
...	25	...	...	1	...	...	...	...	...	1	45
63,125	1,877	637	1	250,062	1,265	17,499	414,702	6	CW	769	6,404

	Red Crossbill	White-winged Crossbill	Common Redpoll	Pine Siskin	American Goldfinch	Evening Grosbeak	House Sparrow	Total number of species	Total number of individuals
1. Chincoteague	...	...	...	...	88	...	126	138	510,558
2. Wachapreague	...	...	...	2	99	...	78	127	37,524
3. Cape Charles	...	...	...	...	199	...	32	147	45,077
4. CBBT	...	...	...	...	...	...	...	33	4,818
5. Little Creek	...	...	...	...	265	...	53	127	38,936
6. Back Bay	...	...	...	...	116	...	24	135	52,773
7. Nansemond River	...	...	...	7	152	...	36	124	46,766
8. Dismal Swamp	...	...	...	16	297	...	2	101	41,218
9. Newport News	...	...	...	...	105	...	142	118	26,523
10. Mathews	...	...	...	1	265	...	52	110	22,123
11. Williamsburg	...	...	...	...	126	7	14	110	30,585
12. Hopewell	...	...	...	...	271	19	27	100	29,140
13. Walkerton	...	...	...	...	127	...	5	82	13,989
14. Wash. Birthplace	...	...	...	...	356	CW	11	97	243,096
15. Brooke	...	...	...	...	375	1	73	97	14,726
16. Fort Belvoir	3	3	...	23	882	8	296	132	61,921
17. Central Loudoun	1	CW	1	12	307	10	107	96	22,280
18. Manassas-B.R.	...	...	...	119	200	30	142	75	18,099
19 Chancellorsville	...	...	...	...	61	...	33	75	4,845
20. Gordonsville	...	...	...	7	57	12	39	72	5,742
21. Charlottesville	...	...	...	...	390	...	20	71	11,915
22. Warren	...	...	...	...	421	...	4	81	12,713
23. Darlington Heights	...	...	...	...	128	...	7	57	3,613
24. Kerr Reservoir	...	...	...	...	79	...	69	99	13,055
25. Banister WMA	...	...	...	4	60	...	30	87	9,324
26. Lynchburg	...	...	...	2	141	...	75	80	9,239
27. Danville	...	...	...	1	44	...	66	70	7,702
28. Martinsville	...	...	...	...	23	...	4	68	5,262
29. Calmes Neck	...	...	...	...	219	14	185	90	25,993
30. N. Shen. Valley	CW	...	...	18	444	CW	155	90	26,576
31. Shen. NP-Luray	...	...	...	...	234	13	79	76	49,860
32. Big Flat Mtn.	...	...	...	...	...	...	...	29	254
33. Rockingham Co.	...	...	...	...	30	...	248	73	6,085
34. Highland County	13	3	...	181	509	5	85	74	3,739
35. Augusta Co.	...	...	...	...	116	...	255	72	15,487
36. Waynesboro	7	...	...	CW	86	CW	135	68	5,868
37. Lexington	...	...	...	7	118	...	33	66	5,102
38. Peaks of Otter	...	...	...	...	8	...	...	43	729
39. Fincastle	...	...	...	1	122	CW	48	75	10,278
40. Roanoke	...	...	...	1	153	...	116	77	9,233
41. Blacksburg	...	...	...	6	167	...	397	80	9,755
42. Glade Spring	...	...	...	...	90	...	211	63	5,712
43. Blackford	...	...	...	...	134	...	...	55	1,909
44. Bristol	...	...	...	...	119	1	96	81	9,341
45. Wise County	...	...	...	2	98	...	150	56	2,224
Total individuals	24	6	1	410	8,281	120	3,760	210	1,531,707

Date	Time in field (a.m. to p.m.)	Temperatures (° Fahrenheit)	Wind direction	Wind speed (miles/hour)	Inches of snow on the ground	Water conditions
28 Dec	0600-1800	34-56	NE	5-20	...	WOP
20 Dec	0600-1700	38-58	NW	5-10	...	WOP
27 Dec	0500-1700	40-47	NE-NW	5-25	...	WOP
26 Dec	0715-1630	42-59	WSW	10-15	...	WOP
31 Dec	0530-1730	32-40	NW	10-25	...	WOP
28 Dec	0515-1715	35-44	N-NW	10-30	...	WOP
4 Jan	0530-1800	45-68	SW	0-10	...	WOP
3 Jan	0630-1730	35-65	S	10	...	WOP
20 Dac	0500-1700	38-50	V	0-5	...	WOP
4 Jan	0500-1730	44-65	SSW	0-5	...	WOP
21 Dec	0700-1630	32-48	W	10	...	WOP
21 Dec	0500-1730	32-48	NE	10	...	WOP
4 Jan	0500-1730	36-68	V	0-7	...	WOP
20 Dec	0500-1700	30-63	V	0-5	...	SPF, MWO
23 Dec	0630-1645	36-48	SW	0-5	...	WOP
4 Jan	0300-1800	37-64	calm	...	...	WOP
27 Dec	0300-1730	32-38	NE	0-6	trace	WOP
28 Dec	0500-1645	24-38	SW	10	1	WOP
4 Jan	0630-1700	40-65	S	0-5	...	WOP
21 Dec	0700-1700	34-46	calm	...	...	WOP
28 Dec	0600-1815	30-39	calm	...	2	WOP
21 Dec	0600-1730	34-45	N	0-8	...	WOP
11 Jan	0400-1700	31-50	W	0-5	...	WOP
21 Dec	0500-1730	33-52	NE	0-20	...	WOP
4 Jan	0700-1700	20-64	NW	0-5	...	WOP
20 Dec	0600-1030	30-60	NW	20	...	WOP
20 Dec	0730-1630	30-59	calm	...	...	WOP
21 Dec	0600-1600	35-45	V	light	...	SPF, MWO
4 Jan	0630-1800	38-65	calm	...	...	WOP
20 Dec	0500-1800	31-57	S	3	...	WOP
21 Dec	0630-1730	20-50	V	...	...	WOP
3 Jan	0645-1715	32-55	SW	0-20	2-5	WOP
20 Dec	0800-1630	28-59	calm	...	...	SPF, MWO
18 Dec	0645-1700	27-56	WSW	0-5	...	SMF, MWO
20 Dec	0700-1700	28-59	NW-SW	0-7	...	SPF, MWO
29 Dec	0700-1545	22-36	NW	0-10	0-4	SWF, MWO
26 Dec	0500-1800	42-51	SW	0-10	...	WOP
23 Dec	0800-1600	38-52	W	5-10	...	WOP
21 Dec	0600-1800	35-45	NW	1-5	...	SPF, MWO
20 Dec	0545-1645	30-60	WSW	0-15	...	SPF, MWO
20 Dec	0615-1730	28-58	N-NW	0-20	...	WOP
4 Jan	0430-1830	27-62	calm	...	...	SMF, MPF
20 Dec	0530-1830	18-54	NE	V	...	SPF, MPF
28 Dec	0530-1730	25-38	NW	0-5	1-2	WOP
20 Dec	0700-1700	25-56	calm	...	...	WOP
...	...	...	...	...	...	...

	Skies (a.m.)	Skies (p.m.)	Number of field observers	Number of field parties (non-owling)	Number of feeder observers	Hours at feeders
1. Chincoteague	CLR	CLR	29	15	...	...
2. Wachapreague	PCR	PCR	21	14	1	0.50
3. Cape Charles	CLD, FOG, HVR	CLD, HVR	30	8-18	...	...
4 CBBT	CLR	CLR	15	1	...	...
5. Little Creek	CLR	CLR	19	9-12	...	...
6. Back Bay	PCD	PCD	25	10-15	...	...
7. Nansemond River	CLR	CLR	19	10	...	...
8. Dismal Swamp NWR	CLR	CLR	30	11	...	...
9. Newport News	PCD	PCD	42	13	...	...
10. Mathews	CLR	CLR	44	12-14	...	...
11. Williamsburg	CLR	CLR	30	9	...	...
12. Hopewell	PCD	PCD	47	9-15	1	2.00
13. Walkerton	CLR	CLR	15	5	...	...
14. Wash. Birthplace	PCD	PCD	23	6-8	2	4.00
15. Brooke	PFG	PCD	20	10-11	...	...
16. Fort Belvoir	PCD	PCD	133	49	...	...
17. Central Loudoun Co.	CLD, LRS	CLD, FOG, LRS	43	13-17	...	...
18. Manassas-B.R.	PCD	CLR	98	25	...	...
19. Chancellorsville	CLR	CLR	13	6	...	...
20. Gordonsville	CLR	PCD	10	6	2	2.00
21. Charlottesville	PCR	CLR	19	17	...	...
22. Warren	PCR	CLD	16	11	...	...
23. Darlington Heights	PCD	CLR	18	4	2	1.00
24. Kerr Reservoir	CLD	CLR	5	4-5		...
25. Banister WMA	PCD	PCD	6	5		...
26. Lynchburg	CLR	CLR	44	12-14	2	10.00
27. Danville	PCD	PCD	17	9	3	6.00
28. Martinsville	CLD	CLD	4	2	...	...
29. Calmes Neck	CLR	CLR	31	17	...	...
30. N. Shen. Valley	PCD	PCD	52	23	...	...
31. Shen. NP-Luray	PCD	PCD	22	13	1	3.00
32. Big Flat Mtn.	CLR	PCD	1	1	...	...
33. Rockingham Co.	PCD	PCD	21	8-10	...	...
34. Highland County	CLR	CLR	13	7	...	...
35. Augusta Co.	CLR	CLD	22	11	2	3.00
36. Waynesboro	CLD	CLD, HSW	21	9	...	4.50
37. Lexington	PCD	CLR	19	9	2	3.00
38. Peaks of Otter	PCD	PCD	8	4	...	...
39. Fincastle	PCD	PCD	22	15	...	...
40. Roanoke	PCD	MCD	24	12	3	6.00
41. Blacksburg	PCD	CLD	37	15-17	6	29.00
42. Glade Spring	PCD	PCD	19	6	...	...
43. Blackford	PCD	CLD	8	4	...	...
44. Bristol	CLD	CLD	14	6	...	...
45. Wise County	CLD	PCD	12	10	1	6.00
Totals	...	...	1,177	475-515	28	80.00

Hours owling	Miles owling	Hours on foot	Hours by car	Hours by boat/canoe	Total hours (excludes owling & feeder hours	Miles on foot	Miles by car	Miles by boat/canoe	Total miles (excludes owling & feeder hours)
4.50	22.00	58.50	51.50	...	110.00	43.00	334.50	...	377.50
0.25	0.50	44.00	48.00	5.00	97.00	43.00	443.00	15.00	501.00
4.00	10.00	69.00	34.00	2.00	105.00	50.00	317.00	10.00	377.00
...	...	...	9.25	...	9.25	...	2.00	...	2.00
4.50	32.00	66.00	8.00	...	74.00	38.00	275.00	...	313.00
3.00	22.00	96.00	8.50	1.50	106.00	57.00	254.00	14.00	325.00
2.50	2.25	42.25	27.25	7.50	77.00	25.00	350.00	38.50	413.50
...	...	46.75	42.75	...	89.50	30.75	255.75	...	286.50
4.00	17.50	72.25	36.25	...	108.50	43.00	386.25	...	429.25
5.75	43.00	66.00	46.75	...	112.75	47.50	346.50	...	394.00
...	...	37.75	45.50	...	83.25	22.75	354.00	...	376.75
7.25	11.00	88.75	20.50	...	109.25	49.50	203.50	...	253.00
4.25	11.00	16.00	19.75	6.50	42.25	14.25	189.00	48.00	251.25
5.00	19.50	19.00	33.50	3.00	55.50	12.50	261.00	3.00	276.50
0.50	1.00	41.00	37.00	...	78.00	36.00	244.00	...	280.00
34.00	98.50	164.25	27.25	...	191.50	130.75	179.00	...	309.75
4.00	12.00	48.75	49.00	...	97.75	43.00	400.50	...	443.50
2.00	1.00	122.00	31.50	...	153.50	108.25	421.50	...	529.75
1.75	3.50	30.50	21.75	...	52.25	32.00	216.00	...	248.00
2.75	38.00	24.00	27.00	...	51.00	20.00	270.00	...	290.00
1.75	10.25	101.00	20.50	4.00	125.50	91.00	208.00	3.00	302.00
3.00	9.00	78.50	12.00	...	90.50	78.00	184.00	...	262.00
3.00	26.00	10.00	26.00	...	36.00	20.00	208.00	...	228.00
2.00	17.00	17.00	16.50	6.00	39.50	8.00	184.00	40.00	232.00
1.50	6.00	24.00	12.50	...	36.50	21.50	158.00	...	179.50
7.00	43.00	47.00	36.00	...	83.00	36.00	376.00	...	412.00
...	...	21.50	33.75	...	55.25	24.00	282.50	...	306.50
2.00	25.00	4.00	13.00	...	17.00	3.00	115.00	...	118.00
6.00	15.00	58.00	81.50	...	139.50	52.25	633.75	...	686.00
9.00	43.00	67.00	123.00	17.00	207.00	77.00	916.00	27.00	1020.00
3.50	20.00	55.50	54.75	...	110.25	50.75	533.50	...	584.25
0.25	0.50	10.25	...	...	10.25	17.00	...	...	17.00
2.25	7.00	24.00	33.25	...	57.25	14.00	290.00	...	304.00
...	...	19.25	38.00	...	57.25	10.25	468.00	...	478.25
1.00	24.00	25.50	55.50	...	81.00	15.75	518.00	...	533.75
0.25	0.25	28.00	29.00	...	57.00	19.25	267.50	...	286.75
2.00	13.00	30.00	18.00	...	48.00	25.00	159.00	...	184.00
...	...	11.00	7.00	...	18.00	8.00	31.00	...	39.00
3.00	6.00	29.00	42.00	...	71.00	34.00	370.00	...	404.00
1.50	1.00	45.00	84.50	...	129.50	37.50	454.00	...	491.50
0.75	4.00	80.00	22.25	...	102.25	71.00	239.50	...	310.50
8.25	...	17.50	35.50	...	53.00	14.00	348.50	...	362.50
2.00	15.00	14.00	9.00	...	23.00	10.00	255.00	...	265.00
5.00	35.00	23.00	30.00	...	53.00	11.00	377.00	...	388.00
...	...	30.75	24.25	...	55.00	22.00	269.50	...	291.50
147.75	664.75	2023.50	1482.78	52.50	3558.75	1616.00	13,526.50	198.50	15,341.00

APPENDIX II

CHRISTMAS COUNT DESCRIPTIONS

(Observers are listed for Darlington Heights, Lynchburg, Danville, Highland County, Peaks of Otter, Roanoke, and Bristol—counts which do not appear in *Audubon Field Notes.*)

1. CHINCOTEAGUE NATIONAL WILDLIFE REFUGE. 37°58'N 75°22'W
   Center: 2 miles north of center of Chincoteague in Accomack County.
   Compiler: Teta Kain (7083 Caffee Creek Lane, Gloucester VA 23061-3374)

2. WACHAPREAGUE. 37°40'N 75°42'W
   Center: Jct. 789 and 715 in Accomack County.
   Compilers: Irvin and Marilyn Ailes (6479 Myrtle Lane, Chincoteague VA 23336)

3. CAPE CHARLES. 37°12'N 75°56'W
   Center: 1.5 miles southeast of Capeville Post Office in Northampton County.
   Compiler: Henry Armistead (523 E. Durham St., Philadelphia PA 19119)

4. CHESAPEAKE BAY BRIDGE-TUNNEL. 37°05'N 76°07'W
   Center: The northern three islands of the bridge-tunnel complex and adjacent waters out to one mile.
   Compiler: Ned Brinkley (402 Altamont Circle, Charlottesville 22902)

5. LITTLE CREEK. 36°51'N 76°06'W
   Center: 3.8 miles northeast of Kempsville in Virginia Beach.
   Compiler: Paul Sykes, Jr. (1080 Forest Rd., Watkinsville GA 30677)

6. BACK BAY NATIO NAL WILDLIFE REFUGE. 36°39'N 76°00'W
   Center: 1.5 miles east of Back Bay NWR.
   Compiler: Paul Sykes, Jr. (1080 Forest Rd., Watkinsville GA 30677)

7. NANSEMOND RIVER. 36°52'N 76°26'W
   Center: Jct. 17 and 626 in Pughsville, Suffolk.
   Compiler: Les Willis (9193 Wigneil St., Suffolk, VA 23433)

8. DISMAL SWAMP. 36°40'N 76°29'W
   Center: Intersection of Middle and Jericho Ditches in Dismal Swamp National Wildlife Refuge.
   Compilers: Donald Schwab (1411 Planters Dr., Suffolk, VA 23434) and Thomas M Gwynn III (1640 Morris Ave., Norfolk, VA 23509)

9. NEWPORT NEWS. 37°05'N 76°25'W
   Center: Northern corner of Magruder & Cmdr. Shepard Blvds in Hampton.
   Compiler: Hayes Williams (PO Box 95, White Marsh, VA 23183-0095)

10. MATHEWS. 37°25'N 76°18'W
   Center: 0.5 mile east of Beaverlett Post Office in Mathews County.
   Compiler: Mary Pulley (HCR 75, Box 656, Hudgins, VA 23076)

11. WILLIAMSBURG. 37°17'N 76°42'W
Center: Colonial Williamsburg Information Center in Williamsburg.
Compiler: William A. Holcombe (4705 Lady Slipper Path, Williamsburg, VA 23188)

12. HOPEWELL. 37°23'N 77°17'W
Center: Curles Neck in Henrico County.
Compilers: Larry Robinson and Mary Arginteanu (3320 Landria Dr., Richmond, VA 23225)

13. WALKERTON. 37°46'N 77°02'W
Center: 1.5 miles southwest of Walderton bridge, just west of Whitebank.
Compiler: Frederick Atwood (Flint Hill School, 10409 Academic Dr., Oakton, VA 22124)

14 WASHINGTON'S BIRTHPLACE. 38°07'N 76°57'W
Center: Horners in Westmoreland County.
Compiler: Bill Portlock (23195 Mt. Cloud Rd., Bowling Green VA 22427)

15. BROOKE. 38°22'N 77°20'W
Center: At center road 3 miles east southeast of Brooke in Stafford County.
Compiler: David Stewart (10715 Midsummer Dr., Reston VA 22091)

16. FORT BELVOIR. 38°41'N 77°12'W
Center: Pohick Church at Colechester Rd. and Jefferson Davis Hwy. in eastern Fairfax County
Compiler: David F. Abbott (43579 Plantation Terr., Ashburn, VA 22011)

17. CENTRAL LOUDOUN. 39°06'N 77°38'W
Center: Near jct. of 704 and 769 in Loudoun County.
Compiler: Joseph Coleman (19499 Yellow Schoolhouse Rd., Round Hill, VA 20141)

18. MANASSAS-BULL RUN. 38°50'N 77°26'W
Center: Centreville in western Fairfax County.
Compiler: Stan Gray (7717 Shooting Star Dr., Springfield, VA 22152)

19. CHANCELLORSVILLE 38°16'N 77°40'W
Center: Chancellorsville Battlefield, 10 miles west of Fredericksburg in Spotsylvania County.
Compiler: Joella Killian (Dept. Biology, Mary Washington College, Fredericksburg, VA 22401)

20. GORDONSVILLE. 38°09'N 78°12'W
Center: Jct. of 15 and 33 north of the town of Gordonsville in Orange County.
Compiler: Donald R. Ober (PO Box 6, Orange, VA 22960)

21. CHARLOTTESVILLE. 38°04'N 78°34'W
Center: Near Ivy in Albemarle County.
Compiler: Charles Stevens (615 Preston Pl., Charlottesville VA 22903)

22. WARREN. 37°51'N 78°33'W
Center: At Keene in Albemarle County.
Compiler: Charles Stevens (615 Preston Pl., Charlottesville, VA 22903)

23. DARLINGTON HEIGHTS. 37°12'N 78°37'W
Center: Darlington Heights Post Office in Prince Edward County.
Compiler: Carolyn Wells (204 Fayette St., Farmville, VA 23901)
Observers: Sandra Breil, John Dalmas, Thelma Dalmas, Glen Eller, Jane Holman, Paige Guilliams, Ann Ingram, Judy McCann, Kathy Menold, Peter Menold, Tom Price, May Shorter, George Shorter, David Spears, Mike Stinson, Randy Thrasher, Sue Thrasher, and Carolyn Wells.

24. JOHN H. KERR RESERVOIR. 36°36'N 78°18'W
Center: East end of John H. Kerr Dam in Mecklenburg County.
Compiler: Brian Patteson (PO Box 1135, Amherst, VA 24521)

25. BANISTER RIVER WILDLIFE MANAGEMENT AREAS. 36°43'N 78°48'W
Center: At Banister River Wildlife Management Areas in Halifax County.
Compiler: Jeffrey Blalock (103 Elizabeth Court, South Boston VA 24592)

26. LYNCHBURG. 37°24'N 79°11'W
Center: Lynchburg College in Lynchburg.
Compiler: John Dalmas (502 Rainbow Forest Dr., Lynchburg VA 24502)
Observers: Ed Calvert, John Dalmas, Thelma Dalmas, Virginia Delaney, Kathie Driscoll, Glen Eller, Betty Epperson, Robert Epperson, Bob Eubank, Chris French, Charles Hansrote, Melva Hansrote, Mike Hayslett, Cinda Hurt, Mark Johnson, Phyllis Jones, Brenda Kalinchak, Mike Kelly, Gail McCormack, Richard Miller, Ruth Ann Miller, Melvin Mitchell, Gene Moore, Myriam Moore, Wyatt Murphy, Helen Norcross, Rick Norcross, Taylor Piephoff, Claudia Puckette, Dan Puckette, Daniel Puckette, Norma Jean Rist, Jean Sattler, James Scranton, Macon Smith, Susan Stanton, Mike Stinson, Randy Thrasher, Sue Thrasher, Margaret Wenning, Susan Wingfield, and Jo Wood

27. DANVILLE. 36°34'N 79°25'W
Center: Ballou Park in Danville.
Compiler: Russell C. Brachman (139 Pendleton Rd., Danville VA 24541)
Observers: Patricia Brachman, Russell Brachman, Barbara Clark, Edward Fisher, Patricia Fisher, Mary Foster, Vicki Fuquay, Laura Gardner, Gary Grant, Frank Ityppert, Audrey Jepson, George Jepson, Craig Robertson, Charlton Strange, Sue Urbanik, Margaret Wringo, Larry Wilburn, Nultie Wiseman, Gordon Woody, and Hugh Wyatt.

28. MARTINSVILLE. 36°44'N 79°49'W
Center: South end of dam at Martinsville Reservoir #2 in Henry County.
Compiler: James S. Beard (401 Hairston St., Martinsville, VA 24112)

29. CALMES NECK. 39°07'N 77°54'W
Center: Castlemans Ferry Bridge, SR 7 and the Shenandoah River in Clarke County.
Compiler: Frances Endicott (Rt. 1, Box 448, Boyce, VA 22620)

30. NORTHERN SHENANDOAH VALLEY. 39°03'N 78°10'W
Center: Jct. Crooked Run and Rt. 606 in Frederick County.
Compiler: Rob Simpson (1932 E. Refuge Church Rd., Stephens City, VA 22655)

31. SHENANDOAH NATIONAL PARK—LURAY. 38°35'N 78°28'W
Center: Hershberger Hill near Stanley in Page County.
Compiler: Mara L. Meisel (304 Trenton Ave., Shenandoah, VA 22849)

32. BIG FLAT MOUNTAIN. 38°11'N 78°43'W
Center: On Pasture Fence Mountain in Albemarle County.
Compiler: Charles Stevens (615 Preston Pl., Charlottesville, VA 22903)

33. ROCKINGHAM COUNTY. 38°26'N 79°02'W
Center: Ottobine in Rockingham County.
Compiler: Chuck Auckerman (301 West Bank St., Bridgewater, VA 22812-1005)

34. HIGHLAND COUNTY. 38°21'N 79°37'W
Center : Near Vanderpool Gap in Highland County.
Compiler: Ned Brinkley (108 Cocke Hall, University of Virginia, Charlottesville 22903)
Observers: Dan Bieker, Ned Brinkley, Bob Coles, Tad Finnell, Allen Hale, John Irvine, Greg Justice, William Lea, Larry Lynch, Jacob Malcom, John Rowlett, Richard Schiemann, Ann Simpson, and Rob Simpson.

35. AUGUSTA COUNTY. 38°12'N 78°59'W
Center: Jct. 780 and 781 in Augusta County.
Compiler: John Mehner (1036 Selma Blvd., Staunton, VA 24401)

36. WAYNESBORO. 37°59'N 78°57'W
Center: Sherando at Jct. 610 and 664 in Augusta County.
Compiler: Crista Cabe (404 DuPont Ave., Staunton, VA 24401)

37. LEXINGTON. 37°51'N 79°29'W
Center: Big Spring Pond in Rockbridge County.
Compilers: Robert O. Paxton (460 Riverside Dr., #72, New York NY 10027) and George Tolley (Rt. 7, Box 25, Lexington, VA 24450)

38. PEAKS OF OTTER. 37°27'N 79°36'W
Center: Peaks of Otter Visitor Center in Bedford County.
Compiler: Barry Kinzie (PO Box 446, Troutville VA 24175)
Observers: Peter Clyne, Mike Donahue, Eunice Hudgins, John Hudgins, Bill Hunley, Barry Kinzie, Katrina Knight, and Liz Williams.

39. FINCASTLE. 37°31'N 79°52'W
Center: North of Fincastle near Jct. 220 and 679 in Botetourt County.
Compiler: Barry Kinzie (PO Box 446, Troutville VA 24175)

40. ROANOKE 37°18'N 79°56'W

Center: Oakland Blvd. and Williamson Road in Roanoke.

Compiler: Michael Donahue (4814 Bandy Rd. SE, Apt. 4, Roanoke VA 24014)

Observers: Mary Lou Agee, Jim Ayers, Sherman Bamford, Linda Cory, John Cutler, John Cutler, Jr., Wilma Cutler, Kent Davis, Mike Donahue, Tad Finnell, Dawn Gill, Doris Gray, Joyce Holt, John Hudgins, Bill Hunley, Tina Kemper, Barry Kinzie, Katrina Knight, Connie Marsh, Mike Purdy, Mike Smith, Kathy Summers, Kent Summers, and Liz Williams.

41. BLACKSBURG. 37°14'N 80°25'W

Center: Jct.Merrimac Rd. (657) and Prices Fork Rd (685) in Montgomery County.

Compilers: Patricia Polentz (915 Coal Hollow Rd. Christiansburg, VA 24073) and Bruce Grimes (2306 Terra Bella St., Blacksburg, VA 24060)

42. GLADE SPRING. 36°47'N 81°47'W

Center: Jct. 750 and 609 in Glade Spring.

Compiler: Larry McDaniel (17 Crown Circle, Bristol, TN 37620)

43. BLACKFORD. 81°55'N 37°00'W

Center: Conflucence of the Clinch and Littler Rivers in Russell County.

Compiler: Robert Riggs (Rt 2, Box 27B, Lebanon, VA 24266)

44. BRISTOL. 36°36'N 82°07'W

Center: Jct. 647 and 654, east of Bristol TN in Washington County, VA.

Compiler: Richard P. Lewis (407 V. I. Ranch Road, Bristol, TN 37620)

Observers: Rob Biller, Janet Brown, Emily Burkey, Jennifer Burkey, Ron Carico, Wallace Coffey, Sarah Garrett, Ken Hale, Rick Knight, Tom Laughlin, Phillip Lewis, Richard Lewis, Amanda Martin, and Van Remsen.

45. WISE COUNTY 36°57'N 82°39'W

Center: At Dorchester in Norton City.

Compiler: Randy Stanley (2432 Egan Rd., Big Stone Gap, VA 24219)

NOTE FROM THE EDITOR

As the new editor of *The Raven*, I want to thank outgoing editor Doug Shedd on behalf of the Virginia Society of Ornithology for his recent work with the journal. The VSO appreciates his service in producing an interesting journal in a timely fashion for the past several years. I also would like to thank Teta Kain, who preceded Shedd as editor, for her continuing support, including her work on the lengthy Christmas Bird Count report that appears in this issue.

Readers should note that the Information for Contributors, printed on the inside of the back cover, has been slightly revised. Changes include a more explicit statement about the peer review process for *The Raven*. Although articles submitted to the journal have been reviewed for some time, it seemed appropriate to make this clear for those who are unfamiliar with the journal. Also, potential contributors should note that beginning with the next issue bird names in manuscripts should conform to those used in the new Seventh Edition of the A.O.U. *Check-list of North American Birds*.

C. Michael Stinson, Editor

CORRECTION: RAVEN Vol. 69 No. 1

On page 48 of Vol. 69, No. 1, the final sentence concerning the accepted record for Western Grebe, reading "This is the first sighting to be definitely identified as this species since the species was split into Western and Clark's (*A. clarkii*) grebes..." should read "This is the second sighting to be definitely identified as this species since the species was split...."

INFORMATION FOR CONTRIBUTORS

The Raven, the official journal of the Virginia Society of Ornithology (VSO), functions to publish original contributions and review articles in ornithology not published elsewhere, mostly relating to Virginia birdlife. Manuscripts should be sent to the editor, C. Michael Stinson, Department of Biology, Hampden-Sydney College, Box 174, Hampden-Sydney, VA, 23943.

Most manuscripts published in *The Raven* concern the distribution, abundance, and migration of birds in Virginia. Manuscripts on other ornithological topics, such as Virginia-based historical reviews, bibliographical reviews, life history notes, and behavioral observations, are also welcomed. In addition, the journal serves to publish the official proceedings of the VSO and other formal items pertaining to all aspects of the Society's activities. *The Raven* may also publish articles pertaining to the activities of the various public and private organizations engaged in biological and conservation work in Virginia. *The Raven* is a peer-reviewed journal; all feature articles and short communications are reviewed before acceptance for publication.

Format of *The Raven* generally follows guidelines set by the Council for Biology Editors as outlined in the CBE Style Manual, 6th edition, 1994 (Council of Biology Editors, Inc., 11250 Roger Bacon Dr., Reston, Virginia, 20190). All manuscripts should be typewritten or prepared with a word processor and double-spaced. Tables, table legends, and figure legends must be similarly prepared and should be submitted on separate pages at the end of the manuscript. Currently only black-and-white photographs, graphs, maps, or other illustrations may be used. The original size for these items should not exceed 5 x 7 inches. Authors may submit manuscripts for initial review with accompanying diskette or as paper copies only. Upon acceptance all manuscripts with revisions incorporated should send be sent on diskette or as e-mail attachments, preferably in Microsoft Word 97 format. Authors are welcome to consult with the editor on additional matters of format or style. Vernacular and scientific names of birds should be those published in the Seventh Edition of the *A.O.U. Check-list of North American Birds* and subsequent supplements. Linear measurements and weights should be in metric units.

Deadlines for submission of articles are 15 December for the spring issue and 15 July for the fall issue.


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