

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 ast 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 issue.

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

In additions, 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 Paul R. Cabe, Biology Department, Washington & Lee University, Lexington, VA 24450.

OFFICERS OF THE VSO

President: Larry Lynch, 9430 Tuxford Road, Richmond, Virginia 23236
Vice President: Teta Kain, 7085 Caffee Creek Lane, Gloucester, Virginia 23061
Secretary: Lauren Scott, 11838 Chase Wellesley Drive #425, Richmond, Virginia 23233

Treasurer: Barbara Thrasher, 120 Woodbine Drive, Lynchburg, Virginia 24502 Raven Editor: Paul R. Cabe, Biology Dept., Washington & Lee University, Lexington,

Virginia 24450.

Newsletter Editor: Linda Fields and Alan Schreck, 1573 21st Ct. N., Arlington, Virginia 22209

The Raven

JOURNAL OF THE VIRGINIA SOCIETY OF ORNITHOLOGY

Editor Paul R. Cabe



Volume 72, No. 1

Published by THE VIRGINIA SOCIETY OF ORNITHOLOGY

Spring 2001

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ISSN 0034-0146

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THE 2000 GREAT DISMAL SWAMP NATIONAL WILDLIFE REFUGE FORAY

JOSHUA E. LECLERC College of William and Mary Williamsburg, VA

The Virginia Society of Ornithology's 2000 Breeding Bird Foray was conducted from 4 June through 9 June on the Virginia portion of the Great Dismal Swamp National Wildlife Refuge. The 10 participants recorded 80 bird species, 68 of which had already been confirmed to nest on or near the refuge. The refuge comprises 107,000 acres of forested wetlands in southeastern Virginia and northeastern North Carolina. At the center of the swamp is 3,100-acre Lake Drummond, the largest natural lake in Virginia.

Foray routes followed a series of ditches that transect the refuge. Ditches covered were East Ditch (4 km, from Norfolk and Western Railroad south), Williamson Ditch, New Ditch, Hudnell Ditch, Jericho Ditch (south to the intersection with Camp Ditch), Jericho Lane, Lynn Ditch, Washington Ditch, Railroad Ditch (west of West Ditch), West Ditch (north of Interior Ditch), Interior Ditch, Feeder Ditch, and the entire shoreline of Lake Drummond. The total distance of 65.2 km was covered on foot, on bicycle, by canoe, and, to a very limited extent, by automobile.

The Great Dismal Swamp National Wildlife Refuge is centered at 36E36' N, 76E27' W. It is bordered by US Routes 13/460/58, the Norfolk and Western Railroad, and Big Entry Ditch on the north, US Route 17 and the Dismal Swamp Canal on the east, US Route 158 on the south (in North Carolina), and VA Routes 642 and 604 on the west. The refuge is within the City of Suffolk and the City of Chesapeake in Virginia and is in within the counties of Gates, Pasquotank, and Camden in North Carolina.

Forest types of the Great Dismal Swamp include pine, Atlantic white cedar, maple-blackgum, tupelo-bald cypress, and sweetgum-oak-poplar. The swamp was designated as a National Wildlife Refuge in 1974, but for over two centuries before, it was heavily exploited by logging operations. The entire swamp has been logged at least once, and the impact has been significant. Currently, the most common tree in the Dismal Swamp is red maple (*Acer rubrum*). Prior to logging, however, bald cypress (*Taxodium distichum*) and Atlantic white cedar (*Chamaecyparis thyoides*) were predominant. Efforts are now underway to restore the biological diversity that existed in the swamp before modern human disturbance. Tactics include water management through control structures in the ditches, forest management through simulation of the effects of wildfires, and wildlife management through hunting.

Despite the centuries of intrusion, the Dismal Swamp is currently host to a wide variety of animal life. Over two hundred bird species have been identified in the refuge, with ninety-six species recorded as breeding there by refuge personnel. Of particular interest, the Swainson's Warbler (*Limnothlypis swainsonii*) and the southern coastal subspecies of the Black-throated Green Warbler (Wayne's Warbler, *Dendroica virens waynei*), breed in the swamp. Mammals living in the swamp include otter, bats, raccoon, nutria (exotic), mink, gray and red foxes, gray squirrel, bobcat, and black bear (two black bears were seen by participants on the 2000 Foray). Twenty-one species of snake inhabit the swamp, including the poisonous cottonmouth, canebrake rattlesnake, and copperhead. Spotted turtles are common, and several other species of turtle, lizard, frog, toad, and salamander were observed by foray participants.

Participants in the 2000 Foray were provided copies of a site prospectus, refuge map, and checklists. Foray sector assignments were rotated among participants over the six-day period to compensate for variables in weather conditions, time of day, and ability of observers. A total of 22 sector reports are compiled in this account. As duplication can arise from the same sector being searched on successive days, only the high count of a species by one party on one day was used in tabulating the results for each sector. There was insufficient field work between 21:00 and 05:30 EST to accurately assess the abundance of nocturnal species. With the exception of light rain on 5 and 6 June, weather during the Foray was ideal for birding.

Thanks to all Foray participants: Mary Arginteanu (MA), Ben and Mary Copeland (B&MC), Dan Cristol (DC), Bob and Kathy Loomis (B&KL), Matt O'Donnell (MO'D), John Porter (JP), Larry Robinson (LR), Char Weise (CW) and in particular, Don Schwab (DS), who organized the entire undertaking.

An annotated list of species reported on the 2000 Foray follows in the Appendix. Species marked "previously confirmed breeder" are known to nest on or near the refuge according to the 1994 U.S. Fish and Wildlife Service checklist of birds for the Great Dismal Swamp National Wildlife Refuge. Any evidence of breeding gathered during the Foray is also noted. Initials denote observers of high counts.

LITERATURE CITED

JOHNSTON, D. W. 1997. A Birder's Guide to Virginia. American Birding Association, Inc., Colorado Springs, Colorado.

Appendix

ANNOTATED SPECIES LIST

Pied-billed Grebe (*Podilymbus podiceps*). Not a known breeder in the refuge. One, presumably a late migrant, was seen on Lake Drummond on 7 June (DC, CW).

Doubled Crested Cormorant (*Phalacrocorax auritus*). Not a known breeder in the refuge. Six were seen from the shore of Lake Drummond on 7 June (DC, CW). The breeding population in Virginia has increased in the last decade (Johnston 1997), but there was no evidence of breeding found on the Foray.

Great Blue Heron (*Ardea herodias*). Previously confirmed breeder. A total of 19 were reported, with a high count of 7 at Lynn Ditch on 8 June (MA, LR).

Green Heron (*Butorides virescens*). Previously confirmed breeder. Thirty-three were reported, with a high of 13 at Lynn Ditch on 8 June (MA, LR).

Little Blue Heron (*Egretta caerulea*). Previously confirmed breeder. One adult was seen flying over Feeder Ditch on 7 June (DC, CW).

Yellow-crowned Night-heron (*Nyctanassa violacea*). Previously confirmed breeder. One immature was seen on the shore of Lake Drummond on 7 June (DC, CW).

Black Vulture (*Coragyps atratus*). Previously confirmed breeder. Two were reported at Williamson Ditch on 6 June (DC, MO'D).

Turkey Vulture (*Cathartes aura*). Previously confirmed breeder. Thirty-six were reported on the Foray, with a high count of 10 at West Ditch (DS). Numbers for this species may be inflated as individual vultures range over great distances and could have been counted by multiple parties.

Wood Duck (*Aix sponsa*). Previously confirmed breeder. Sixteen were reported, with a high count of 6 on the shoreline of Lake Drummond where birds were seen feeding young (DC, CW).

Osprey (*Pandion haliaetus*). Not a known breeder in the refuge. One was seen on the shoreline of Lake Drummond, but no nest was observed (DC, CW).

Red-shouldered Hawk (*Buteo lineatus*). Previously confirmed breeder. Twelve were seen on the Foray, with high counts of 3 at both Williamson Ditch on 6 June and Washington Ditch on 7 June (DC, MO'D, MA, LR).

Northern Bobwhite (*Colinus virginianus*). Previously confirmed breeder. Two were reported on 7 June, one at Washington Ditch and the other at Feeder Ditch (MA, LR, DC, CW).

Spotted Sandpiper (*Actitis macularia*). Not a known breeder in the refuge. Two were seen on the shore of Lake Drummond with no evidence of breeding behavior on 7 June (DC, CW).

Laughing Gull (*Larus atricillia*). Not a known breeder in the refuge. Seven were seen flying over the forest, with a high count of 5 at Hudnell Ditch on 9 June (MA, LR).

Mourning Dove (Zenaida macroura). Previously confirmed breeder. Thirty-three

were reported, with a high count of 9 at Interior Ditch on 5 June (MA, LR).

Yellow-billed Cuckoo (*Coccyzus americanus*). Previously confirmed breeder. Twenty-seven were seen on the Foray, with a high count of 11 at Lynn Ditch on 8 June (MA, LR).

Barred Owl (*Strix varia*). Previously confirmed breeder. One was reported at Lynn Ditch on 8 June (MA, LR). No owling was attempted on this Foray.

Chimney Swift (*Chaetura pelagica*). Not a known breeder in the refuge. A total of twelve were seen feeding over wetlands at Interior Ditch, Railroad Ditch, Williamson Ditch, and East Ditch (MA, LR, DC, MO'D) on 5 and 6 June.

Ruby-throated Hummingbird (*Archilochus colubris*). Previously confirmed breeder. Sixteen were seen, with a high count of 8 at Williamson Ditch on 6 June (DC, MO'D).

Belted Kingfisher (*Ceryle alcyon*). Previously confirmed breeder. Twelve were seen, with a high count of 3 at Hudnell Ditch (DS).

Red-headed Woodpecker (*Melanerpes erythrocephalus*). Previously confirmed breeder. Three were reported at Williamson Ditch on 6 June (DC, MO'D).

Red-bellied Woodpecker (*Melanerpes carolinus*). Previously confirmed breeder. Sixty were seen, with a high count of 11 at West Ditch on 4 June (MA, LR).

Downy Woodpecker (*Picoides pubescens*). Previously confirmed breeder. Fifty-two were reported, with a high count of 13 at Williamson Ditch on 6 June (DC, MO'D). Observed feeding young at East Ditch the same day.

Hairy Woodpecker (*Picoides villosus*). Previously confirmed breeder. Four were seen, with a high count of 2 at Jericho Ditch North on 8 June (B&KL, JP).

Northern Flicker (*Colaptes auratus*). Previously confirmed breeder. Sixteen were seen, with a high count of 4 at Lynn Ditch on 8 June (MA, LR).

Pileated Woodpecker (*Dryocopus pileatus*). Previously confirmed breeder. Thirty-five were reported, with a high count of 7 at Lynn Ditch on 8 June (MA, LR).

Eastern Wood-pewee (*Contopus virens*). Previously confirmed breeder. One hundred were reported, with a high count of 16 at Williamson Ditch on 6 June (DC, MO'D).

Acadian Flycatcher (*Empidonax virescens*). Previously confirmed breeder. One hundred and three were seen, with a high count of 33 at Washington Ditch on 7 June (MA, LR).

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Eastern Phoebe (*Sayornis phoebe*). Previously confirmed breeder. One was seen on the shoreline of Lake Drummond (DS).

Great Crested Flycatcher (*Myiarchus crinitus*). Previously confirmed breeder. One hundred and seven were seen, with a high count of 22 at Hudnell Ditch on 9 June (MA, LR). Birds were seen gathering nest material and behaving territorially.

White-eyed Vireo (*Vireo griseus*). Previously confirmed breeder. One hundred and fifty-five were reported, with a high count of 26 at Lynn Ditch on 8 June (MA, LR). Nesting was observed at Jericho Ditch South on the same day (B&KL, JP).

Yellow-throated Vireo (*Vireo flavifrons*). Previously confirmed breeder. Eighteen were reported, with a high count of 12 on the shore of Lake Drummond on 7 June (DC, CW).

Blue-headed Vireo (*Vireo solitarius*). Not a known breeder in the refuge. One was singing at East Ditch on 6 June and was found independently by two parties (DC, MO'D, JP, B&MC).

Red-eyed Vireo (*Vireo olivaceus*). Previously confirmed breeder. Twenty-three were reported, with a high count of 7 on the shore of Lake Drummond on 7 June (DC, CW).

Warbling Vireo (*Vireo gilvus*). Not a known breeder in the refuge. One was singing at Feeder Ditch in good nesting habitat on 7 June (DC, CW).

Blue Jay (*Cyanocitta cristata*). Previously confirmed breeder. Forty-one were seen, with a high count of 10 at Williamson Ditch on 6 June (DC, MO'D).

American Crow (*Corvus brachyrhynchos*). Previously confirmed breeder. Fifty-seven were seen, with a high count of 16 at Lynn Ditch on 8 June (MA, LR). Birds were seen feeding young at East Ditch on 6 June.

Fish Crow (*Corvus ossifragus*). Previously confirmed breeder. Three were seen, with a high count of 2 at Feeder Ditch on 7 June (DC, CW).

Purple Martin (*Progne subis*). Not a known breeder in the refuge. Thirteen were reported, with a high count of 6 at Williamson Ditch on 6 June (DC, MO'D).

Northern Rough-winged Swallow (*Stelgidopteryx serripennis*). Previously confirmed breeder. One was seen at Feeder Ditch on 7 June (DC, CW).

Barn Swallow (*Hirundo rustica*). Previously confirmed breeder. Two were seen on 7 June, one at Jericho Lane (MO'D) and the other over Lake Drummond (DC, CW).

Carolina Chickadee (*Poecile carolinensis*). Previously confirmed breeder. One hundred and twenty-six were reported, with a high count of 23 at Williamson Ditch on 6 June, including birds feeding young (DC, MO'D).

Tufted Titmouse (*Baeolophus bicolor*). Previously confirmed breeder. Eighty-nine were reported, with a high count of 17 at Lynn Ditch on 8 June (MA, LR).

White-breasted Nuthatch (*Sitta carolinensis*). Previously confirmed breeder. Forty-three were seen, with a high count of 10 at Williamson Ditch on 6 June (DC, MO'D).

Carolina Wren (*Thryothorus ludovicianus*). Previously confirmed breeder. Ninety were seen, with a high count of 26 at Railroad Ditch on 6 June (MA, LR).

House Wren (*Troglodytes aedon*). Previously confirmed breeder. One was seen at Feeder Ditch on 7 June (DC, CW).

Blue-gray Gnatcatcher (*Polioptila caerulea*). Previously confirmed breeder. Twentyeight were reported, with a high count of 5 at Feeder Ditch on 7 June (DC, CW).

Wood Thrush (*Hylocichla mustelina*). Previously confirmed breeder. Fifty-three were seen, with a high count of 11 at Williamson Ditch on 6 June (DC, MO'D).

Swainson's Thrush (*Catharus ustulatus*) Not a known breeder in the refuge. One was seen at West Ditch on 4 June (MA, LR), presumably a late migrant.

American Robin (*Turdus migratorius*). Previously confirmed breeder. Two were seen on 7 June, one at Jericho Lane (MO'D) and the other at Washington Ditch (MA, LR).

Gray Catbird (*Dumettella carolinensis*). Previously confirmed breeder. One hundred and eighty-two were seen, with two high counts of 37 at Interior Ditch and Hudnell Ditch on 5 and 9 June, respectively (MA, LR).

Brown Thrasher (*Toxostoma rufum*). Previously confirmed breeder. Three were seen on the Foray, with 2 at East Ditch on 6 June (DC, MO'D).

Cedar Waxwing (*Bombycilla cedrorum*). Not a known breeder in the refuge. Seven were reported without evidence of breeding. The high count was 3 at Feeder Ditch on 7 June (DC, CW).

Northern Parula (*Parula americana*). Previously confirmed breeder. Four were seen, with a high count of 2 at Washington Ditch on 7 June (MA, LR).

Black-throated Green Warbler (Dendroica virens). Previously confirmed breeder.

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Five were reported at Hudnell Ditch (DS). It is not known if these were the local "Wayne's" subspecies (*D. v. waynei*) or very late migrants.

Yellow-throated Warbler (*Dendroica dominica*). Previously confirmed breeder. Eleven were reported, with a high count of 4 at the shore of Lake Drummond on 7 June (DC, CW).

Pine Warbler (*Dendroica pinus*). Previously confirmed breeder. Thirty-six were reported, with a high count of 10 at Hudnell Ditch on 9 June (MA, LR). Birds were seen feeding young at Williamson Ditch on 6 June.

Prairie Warbler (*Dendroica discolor*). Previously confirmed breeder. Seventy-nine were seen, with a high count of 26 at Lynn Ditch on 8 June (MA, LR).

Black and White Warbler (*Mniotilia varia*). Previously confirmed breeder. Twentyeight were seen, with a high count of 8 at Williamson Ditch on 6 June, where birds were seen feeding young (DC, MO'D).

American Redstart (*Setophaga ruticilla*). Previously confirmed breeder. Forty-seven were seen, with a high count of 22 at Interior Ditch on 5 June (MA, LR).

Prothonotary Warbler (*Protonotaria citrea*). Previously confirmed breeder. Three hundred sixty-six were reported, making this the most abundant bird on the Foray! The high count of 108 birds was at Lynn Ditch on 8 June (MA, LR). Birds were seen carrying food, behaving territorially, and feeding young at several locations including East Ditch on 9 June.

Worm-eating Warbler (*Helmitheros vermivorus*). Previously confirmed breeder. Twenty-six were seen, with a high count of 9 at Hudnell Ditch on 9 June (MA, LR). Birds were seen feeding young at East Ditch on 6 June.

Swainson's Warbler (*Limnothlypis swainsonii*). Previously confirmed breeder. Sixteen were reported, with high counts of 3 at both Williamson Ditch and East Ditch on 9 June (JP, B&MC).

Ovenbird (*Seiurus aurocapillus*). Previously confirmed breeder. One hundred ninetyfour were reported, making this the third-most common bird on the Foray. The high count was 29 at Railroad Ditch on 6 June (MA, LR). Birds were seen copulating and feeding young at Jericho Ditch North and East Ditch.

Louisiana Waterthrush (*Seiurus motacilla*). Previously confirmed breeder. Twentynine were seen, with a high count of 7 at Railroad Ditch on 6 June (MA, LR). Common Yellowthroat (*Geothlypis trichas*). Previously confirmed breeder. One hundred seventy-seven were seen, with a high count of 38 at Williamson Ditch on 6 June (DC, MO'D).

Hooded Warbler (*Wilsonia citrina*). Previously confirmed breeder. Thirty-six were seen, with a high count of 8 at Lynn Ditch on 8 June (MA, LR). Birds were observed feeding young at Jericho Lane on 7 June.

Yellow-breasted Chat (*Icteria virens*). Previously confirmed breeder. Two were seen at East Ditch on 6 June (DC, MO'D).

Summer Tanager (*Piranga rubra*). Previously confirmed breeder. Six were seen, with a high count of 4 at Railroad Ditch on 6 June (MA, LR).

Scarlet Tanager (*Piranga olivacea*). Previously confirmed breeder. Two were seen at Lynn Ditch on 8 June (MA, LR).

Eastern Towhee (*Pipilo erthrophthalmus*). Previously confirmed breeder. One hundred fifteen were reported, with a high count of 23 at Lynn Ditch on 8 June (MA, LR).

Northern Cardinal (*Cardinalis cardinalis*). Previously confirmed breeder. Eightysix were seen, with a high count of 18 at Feeder Ditch on 7 June (DC, CW). Birds were observed feeding young at East Ditch on 6 June.

Blue Grosbeak (*Guiraca caerulea*). Previously confirmed breeder. Two were seen, one at Jericho Lane on 7 June (MO'D) and the other, which was feeding young, at East Ditch on 6 June (DC, MO'D).

Indigo Bunting (*Passerina cyanea*). Previously confirmed breeder. Forty-four were seen, with a high count of 20 at Feeder Ditch on 7 June (DC, CW).

Red-winged Blackbird (*Agelaius phoeniceus*). Previously confirmed breeder. Two were seen at East Ditch on 6 June (DC, MO'D).

Common Grackle (*Quiscalus quiscula*). Previously confirmed breeder. One hundred and ninety-five were reported, making this the second-most common bird on the Foray. The high count of 45 was at East Ditch on 6 June (DC, MO'D).

Brown-headed Cowbird (*Molothrus ater*). Previously confirmed breeder. Thirtytwo were seen, with a high count of 7 at Interior Ditch on 5 June (MA, LR). This species is now widespread in the interior of the swamp. Spring 2001

Baltimore Oriole (*Icterus galbula*). Not a known breeder in the refuge. One was singing at East Ditch on 6 June (DC, MO'D).

Orchard Oriole (*Icterus spurius*). Previously confirmed breeder. One was seen at West Ditch on 5 June (MA, LR).

American Goldfinch (*Carduelis tristis*). Previously confirmed breeder. Two were seen at Williamson Ditch on 9 June (JP, B&MC).

A SUMMARY OF THE TWENTY-FIFTH ANNUAL BEACH-NESTING AND COLONIAL WATERBIRDS SURVEY OF THE VIRGINIA BARRIER ISLANDS-1999

BILL WILLIAMS 154 Lakewood Drive Williamsburg, Virginia 23185

BILL AKERS 3265 Laurel Drive Blacksburg, Virginia 24060

MICHAEL BECK 101 Charles Street, Apt #1 Annapolis, Maryland 21401

RUTH BECK P.O. Box 270 Barhamsville, Virginia 23011

JERRY VIA 3265 Laurel Drive Blacksburg, Virginia 24060

The twenty-fifth consecutive annual survey of the beach-nesting and colonial waterbirds of the Virginia barrier islands was conducted 20-23 June 1999. All of the barrier islands, with the exception of Parramore Island, from Assawoman Island on the north through Fishermans Island on the south, were surveyed. Survey techniques were consistent with those described previously (Williams et al. 1990). Table 1 presents an island-by-island summary of the survey results, including a longitudinal survey mean calculated for data through 1999. All of the data gathered in Northampton County for this season's survey were incorporated into the Virginia Society of Ornithology Breeding Bird Foray results (Brinkley 2000).

A storm system 14-17 May delivered strong winds and beach/lagoonal flooding to the area, delaying and disrupting early season nesting attempts.

Brown Pelicans (*Pelecanus occidentalis*) continued to thrive at their only barrier island nesting site on the northeast corner of Fishermans Island. Numbers of adults were little changed from the previous year (Williams et al. 2000), possibly indicating a leveling of the breeding population at that location.

For the second consecutive year, Double-crested Cormorants (*Phalocrocorax auritus*) were nesting on Chimney Pole Marsh. Eight nests were located 23 June. Two were empty. One had 3 downy, ambulatory young. Two nests had 2 and 3

| Survey mean | 823 | 14 | 19 | 397 | 531 | 127 | 443 | 175 | 27 | 775 | 48 | 7 | 499 | 20 | 113 | 872 | 10646 | 3164 | 206 | 644 | e | 4935 | 31 | 3124 | 110 | 725 | 4400 |
|----------------|---------|---------|---------|---------|---------|----------|---------|---------|---------|---------|---------|----------|-----------|----------|----------|--------|----------|----------|----------|---------|----------|----------|----------|----------|----------|----------|----------|
| Total | 1822 | 16 | 28 | 351 | 191 | 97 | 200 | 37 | ß | 251 | 15 | 26 | 150 | 52 | 136 | 509 | 4196 | 2983 | 261 | 106 | | 3105 | 11 | 742 | 102 | 122 | 1221 |
| Fisher | 1822 | | 28 | 155 | 12 | 33 | 15 | 14 | | 89 | 2 | 26 | 32 | | | 17 | 4100 | 899 | 99 | | | 3100 | 11 | | 30 | | |
| Smith | | | | | | | | | | | | | | | 2 | 38 | | | | | | | | | | | |
| Myrtle | | | | | | | | | | | | | | 2 | 9 | 28 | | | | | | | | | | 4 | |
| Mink | | | | | | | | | | | | | | | | | 12 | | | | | | | | 30 | | |
| Gdwn | | | | | | | | | | | | | | | | | | | | | | | | | 42 | | |
| Shp Shl | | | | | | | | | | | | | | | | 26 | | | | 18 | | | | 16 | | 34 | 20 |
| Wreck | | | | 42 | 21 | 14 | 73 | 7 | - | 82 | 1 | | 32 | | 4 | 41 | 84 | 816 | 108 | 64 | | 2 | | 290 | | 9 | 355 |
| L. Cobb | | | | | | | | | | | | | | | | 13 | | 162 | 24 | | | 3 | | 16 | | | 84 |
| Cobb | | | | 100 | 120 | 50 | 90 | 16 | 4 | 80 | 12 | | 68 | | | 17 | | 240 | 10 | | | | | | | 10 | |
| Rogue | | | | Γ | | | | | | | | | | | | | | | | | | | | | | | |
| Нод | | | | | | | | | | | | | | | 2 | 72 | | | | | | | | | | 22 | |
| Chm Pol | | 16 | | 54 | 38 | | 22 | | | | | | 18 | | | 12 | | 558 | 38 | | | | | | | | |
| Sandy | | | | | | | | | | | | | | | | 18 | | 308 | 15 | | | | | 39 | | | ÷ |
| Parra | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Das Sh | | | | | | | | | | | | | | | | 7 | | | | | | | | 269 | | | 480 |
| Cedar | | | | | | | | | | | | | | 18 | 28 | 94 | | | | 16 | | | | 101 | | 34 | 267 |
| Metom | | | | | | | | | | | | | | 12 | 58 | 117 | | | | 8 | | | | ÷ | | 9 | 4 |
| Assa | | | | | | | | | | | | | | 20 | 32 | 6 | | | | | | | | | | 9 | |
| | Brn Pel | DC Corm | GBI Her | Grt Eat | Sny Egt | LtBI Her | Tri Her | Cat Egt | Grn Her | BCN Her | YCN Her | Wht Ibis | GISY Ibis | Wil Plvr | Pip Plvr | Am Ovs | Lgh Gull | Her Gull | GBb Gull | Gb Tern | Cas Tern | Rvl Tern | Snd Tern | Com Tern | For Tern | Lst Tern | BIK Skim |

Table 1. Summary of survey results; survey mean includes data from 1975-1999.

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hatchlings respectively. There was one 2-egg nest, one 5-egg nest, and one nest with 2 hatchlings and 2 eggs.

Among the long-legged waders there were some noteworthy trends. Great Blue Heron (Ardea herodius) numbers reversed a two-year decline, increasing by almost 3 fold over the previous year (Williams et al. 2000) from 10 to 28. Although higher than the survey mean of 19, this count was reflective of 1994-1996 (Williams et al. 1995; 1996; 1997) totals. The Great Egret (Ardea alba) count was consistent with the 25-year survey mean, though it was down 28% from the previous year (Williams et al. 2000). Three species, Snowy Egret (Egretta thula), Little Blue Heron (E. caerulea), and Tricolored Heron (E. tricolor) posted significant increases over totals from 1997 (Williams et al. 1998) and 1998 (Williams et al. 2000). However, these totals were significantly below their longitudinal survey means. Cattle Egret (Bubulcus ibis) numbers were the second lowest in the survey history. The lowest was 35 in 1983 (Williams et al. 1990). Green Heron (Butorides virescens) numbers were also low, continuing an 80% decline over the last 5 years. Black-crowned Night-Heron (Nyticorax nyticorax) numbers were up by 53% over 1998 (Williams et al. 2000). Nevertheless, this year's results were only 30% of the historical mean. Likewise, the Yellow-crowned Night-Heron (Nyctanassa violacea) count of 15 was ~ 30% of the 25-year mean. White Ibis (Eudocimus alba) numbers were consistent with survey results of the last two years (Williams et al. 1998, 2000). A modest increase of 39 Glossy Ibis (Plegadis falcinellus) over 1998 (Williams et al. 2000) was tempered by the fact that the total of 150 was 30% of the longitudinal survey mean.

Two of the solitary beach-nesting species, Wilson's Plover (*Charadrius wilsonia*) and Piping Plover (*C. melodus*) registered totals indicative of stable breeding populations when taken within the survey's historical context. Assawoman, Metompkin, and Cedar continued to be the most heavily populated islands for these birds with 96% of the Wilson's Plovers and 87% of the Piping Plovers found there. The American Oystercatcher (*Haematopus palliatus*), however, continued its marked decline, posting the lowest total since a concerted effort to count the species was begun in 1979 (Williams et al. 1990). The total of 509 was 42% below the survey mean. Forty-three percent of the birds counted during this year's survey were on Assawoman, Metompkin, and Cedar islands.

The Laughing Gull (*Larus atricilla*) count was the fourth lowest in the history of the survey. One colony each was found on Wreck, Mink, and Fishermans islands. The latter colony, adjacent to the Brown Pelican nesting site, comprised 98% of the birds of this species found this survey. Herring (*L. argentatus*) and Great Black-backed (*L. marinus*) gull numbers were consistent with recent years and with their historical means.

The number of adult Gull-billed Terns (*Sterna nilotica*) was slightly more than double their all-time low of 51 in 1998 (Williams et al. 2000). However, the increase to 106 amounted to only 16% of their 25-year mean. For the third consecutive year no nesting Caspian Terns (*S. caspia*) were located. The Royal Tern (*S. maxima*) count of 3105 adults was the second lowest in the history of the survey and was 37% below the 25-year mean. The season's total of 11 Sandwich Terns (*S. sandvicensis*)

was not inconsistent with historical results. Over the course of the 25-year survey, annual count totals have ranged from a high of 140 in 1983 (Williams et al. 1990) to 2 in 1979 (Williams et al. 1990) and 1996 (Williams et al. 1997) respectively. Common (*S. hirundo*) and Least (*S. antillarum*) tern numbers continued downward trends. Both species registered their second all-time lowest counts and both were significantly below their historical means; Least Terns by 86%, Common Terns by 76%. Forster's Tern (*S. forsteri*) numbers were consistent with their historical mean. Colonies were found on both Mink and Godwin islands for the first time since 1979 (Williams et al. 1990). The Black Skimmer count of 1221 was 27% of the historical mean and was the lowest recorded since the survey began. This species has declined significantly since 1993 when 2532 breeding adults were counted (Williams et al. 1994).

Additional species of note for this survey included a dead Greater Shearwater (*Puffinus gravis*) found on Cedar Island 22 June and 23 Black Scoters (*Oidemia nigra*) the same date off Assawoman (10) and Metompkin (13) islands. Two broods of Barn Owls (*Tyto alba*) with 4 young each were found at the Machipongo Station on Hog Island 21 June.

ACKNOWLEDGMENTS

Our quarter of a century of field work would have been impossible without the generous logistical support of The Virginia Coast Reserve of The Nature Conservancy. Barry Truitt's expert guidance, seamanship, and lively conversation keep our island hopping efficient and productive. Barry, Coast Reserve Director, John Hall, and the staff of the Machipongo Station, Jackie and Charlie Farlow, Richard Ayers and Rick Kellam, have made our annual visits worry-free, gastronomically superb, and loaded with very special companionship. We are grateful to Susan Rice, Manager of the Eastern Shore of Virginia National Wildlife Refuge, for access to Fisherman's Island and the logistical support she provided while we were on the island.

We were assisted in the field this year by Susan Rice and Erika Peterson.

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VIRGINIA CHRISTMAS BIRD COUNTS: 2000-2001 SEASON

TETA KAIN 7083 Caffee Creek Lane Gloucester, VA 23061-3374 teta@vims.edu

Forty-eight Christmas bird counts were held in Virginia in 2000-01. Three counts held this year that were not on the roster last year were Lake Anna, Giles County, and Mount Rogers. Lake Anna returns after a lapse of seven years. This big inland lake country yields some unusual species from time to time and this year was no exception.

Giles County is again in the line-up, after an absence of one year. The count was held in 1999, but data were not received in time to include in last year's tables. Formerly known as the Mountain Lake count, the name has been changed to Giles County to better reflect the much larger territory the census now covers. Instead of encompassing the usual 15-mile-diameter circle that is standard for most counts, it covers the entire area of Giles County.

The Mount-Rogers Whitetop count is a very welcomed addition to the line-up as it represents one of those rare, but important, high-elevation censuses. Our knowledge of winter bird populations in those lofty regions is scant compared to other more accessible and comfortable count areas and much valuable information can be gathered from observations in those high places. The last time this count was conducted was in 1971, and coverage was much more restricted than this year's effort by eight observers.

The total number of 210 species recorded this year is 11 less than last year's total. This is a rather low number compared to the past several years, but nevertheless, some very unusual birds turned up in various spots around the state. No new species were added to the cumulative total.

Three especially cooperative Sandhill Cranes (*Grus canadensis*) were easily found at Bristol since they had been in the area for some time and were being carefully tracked by observers. Bristol encompasses parts of both Tennesse and Virginia with the center situated on the Virginia section. The cranes fed in Virginia for part of the day, then moved to Tennessee for rest and recuperation, allowing both states to count them in their state totals.

Unfortunately, no documentation was received on a possible Calliope Hummingbird (*Stellula calliope*) banded during count week at Nansemond River and was not included in this account. Hopefully, materials will be sent to the Virginia Avian Records Committee (VARCOM) in the near future, for review and possible inclusion on the state list as the first record of this species occurring in Virginia.

Some rarities are becoming not so rare on Christmas counts in the past few years. Not too long ago, birders were agog when they found such unbelievable species as Pacific Loon (*Gavia pacifica*), Anhinga (*Anhinga anhinga*), Ross's Goose (*Chen rossii*), Black-tailed Gull (*Larus crassirostris*) or Painted Bunting (*Passerina ciris*). All except the Black-tailed Gull put an appearance somewhere in the state this year with five Ross's Geese showing up at three places, a Pacific Loon on the Chesapeake Bay Bridge-Tunnel, a first for that count, a Painted Bunting at Cape Charles, and an Anhinga was again at Back Bay for about the fifth time in recent years.

Other unusual species were an American Avocet (*Recurvirostra americana*) at Chincoteague, an Audubon's Warbler (*Dendroica coronata auduboni*) at Cape Charles, Wilson's Warbler (*Wilsonia pusilla*) at Hopewell, and an American Redstart (*Setophaga ruticilla*) at Lake Anna. Two Nashville Warblers (*Vermivora ruficapilla*) were at Cape Charles, and a Grasshopper Sparrow (*Ammodramus savannarum*) at Cape Charles was the first found on a Virginia Christmas count since 1992.

Compiler/observer Robert Riggs was understandably astonished during the Blackford count, when a flock of 18 Common Redpolls (*Carduelis flammea*) flew in to join some American Goldfinches he was counting. Those were the only redpolls seen in Virginia this count season. On that same snowy, cold day, Riggs also found a Lincoln's Sparrow, a very rare find for the far western part of the state. Another exciting find was a Laughing Gull on the Shenandoah-Luray count. Distant photos along with written documentation suggest the identification is correct, making this the first Christmas count record for the Mountains and Valleys region.

Species setting all-time-high counts were as follows: 18,042 Northern Gannets (*Morus bassanus*) eclipsed the previous high of 11,847 set in 1991; Brown Pelican (*Pelecanus occidentalis*) numbers continue to steadily increase with 371 birds recorded on six counts; huge numbers of Lesser Scaup (*Aythya affinis*) on the Potomac accounted for most of the 25,748 total, an increase of almost 4500 over the previous high set in 1988; Willets (*Catoptrophorus semipalmatus*) showed up in surprising numbers, beating out the old record of 262 set in 1982 by 125 birds; the yearly state-wide count average of Cedar Waxwings (*Bombycilla cedrorum*) over the last two decades has been around 8,000, and never more than 16,500, so this years total of 24,309 birds was a noticeable increase in numbers; the most significant showing, however, was the tremendous influx of Bonaparte's Gulls (*Larus philadelphia*). The most seen in one count season previously was about 8,000, but the massive numbers counted at Chesapeake Bay Bridge-Tunnel, Little Creek, and Back Bay mushroomed this year's total to a whooping 29,386 individuals, a 367% increase!

The Christmas count table is arranged as follows: the four Eastern Shore and Chesapeake Bay counts are listed first and the rest are 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 48 are in the Mountains and Valleys region of the state. The tables follow the order and names of species as set forth in the latest supplement of the American Ornithologists' Union. A description of each count circle center, along with the names and addresses of compilers, can be found in the article entitled Christmas Count Descriptions. In addition, names of observers for the Darlington Heights, Lynchburg, Danville, Peaks of Otter, Roanoke, Giles County, and Bristol counts are listed because the results of those counts do not appear in the Christmas count book of the National Audubon Society.

Codes used in table:

| CLR=ClearCTC=Clear to CloudyCW=Count weekFOG=FoggyHVR=Heavy rainHVS=Heavy snowLGR=Light rainLGS=Light snowLMR=Light to moderate rainMMO=Moving water mostly openMPF=Moving water partly frozenMPO=Moving water openMWF=None to light to heavy rainNLR=None to light snowNR=Not reportedPCC=Partly cloudy to clearPCD=Partly cloudyPCR=Snow flurriesSPF=Still water partly frozenSWF=Still water frozenV=VariableWOP=Water open | CLD | = | Cloudy |
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| | Red-throated Loon | Pacific Loon | Common Loon | Pied-billed Grebe | Horned Grebe | Red-necked Grebe | Eared Grebe | grebe, sp. | Northern Gannet | 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 |
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| 1. Chincoteague 2. Wachapreague 3. Cape Charles/Kiptopeke 4. CBBT 5. Little Creek 6. Back Bay | 10 14 51 19 546 | 1 | 56 68 39 29 12 177 | 11 22 106 11 | 38 2 11 9 30 | cw | | | 2 15 220 9,400 8,400 | 1 19 8 | 18 1 53 1 4,400 122 | 30 42 9 | ï | 2 1 1 5 | 183 33 52 208 65 | 81 49 9 | 4 | 1 | 9 1 6 | ···· ···· ···· | 37 22 7 2 |
| 7. Nansemond River 8. Dismal Swamp 9. Newport News 10. Mathews County 11. Williamsburg 12. Hopewell | 4 4 | | 3 42 77 1 | 4 36 1 40 5 | 212 3 41 1 | 3 | | | 32 | 12 327 CW 4 | 1,859 676 5 869 1,423 | ···· ···· ··· | | ···· ···· ···· | 16 46 59 72 90 | 6 | | | | 1 | 6 |
| 13. Walkerton 14. Washington's Birthplace 15. Brooke 16. Fort Belvoir 17. Central Loudoun 18. The Plains | 3 | ···· ···· ··· | 25 3 3 1 | 4 16 2 | 12 8 9 | ···· ··· ··· | ···· ···· ··· | | ···· ···· ··· | ···· ··· ··· | 26 15 2 | ···· | ···· ···· ··· | | 47 62 180 3 12 | | | | | | 1 |
| Manassas-Bull Run Chancellorsville Lake Anna Gordonsville Charlottesville Warren | 1 | | 1 9 | 10 8 10 1 8 2 | 6 | ···· ··· ··· | | | | ···· ··· ··· | 1 | | | | 4 17 4 8 11 | | | | | | |
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| Total individuals: | 652 | 1 | 549 | 378 | 387 | 3 | CW | 1 | 18,042 | 371 | 9,474 | 81 | 1 | 9 | 1,452 | 148 | 5 | 1 | 17 | 1 | 77 |

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night-heron, sp.

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|---|---------------------|---------------------------------|---|---|---------------------------------|--|--|--------------------|--|--------------------|--------------|--|---------------------------|---|---|--|---|---|-------------------------|------------------------------|---|------|
| | White Ibis | Glossy Ibis | Black Vulture | Turkey Vulture | Greater White- fronted Goose | Snow Goose (blue form) | Snow Goose | Ross's Goose | Canada Goose | Hutchin's apose | | Brant | Mute Swan | Tundra Swan | Wood Duck | Gadwall | American Wigeon | American Black Duck | black duck/mallard, sp. | black duck/mallard hvbrid | Mallard | |
| Chincoteague Wachapreague Cape Charles/Kiptopeke CBBT Little Creek Back Bay Nansemond River Dismal Swamp Newport News Mathews County Williamsburg Hopewell | 24 | ···· 1 ···· ··· ··· | 97 5 20 146 75 12 48 20 35 129 | 381 116 245 84 170 184 212 4 57 245 180 | | 24 9 36 1 6 480 | 5,073 14,655 6,709 684 6,850 23,000 38 40 | 3 1 1 | 1,730 891 1,808 566 948 2,501 62 562 1,241 1,542 8,177 | 1 | 6 | 6,271 265 1,390 4 122 52 64 8 | 2 5 5 11 | 82 3 177 39 166 26 580 808 46 | 1 16 94 11 126 2 4 8 | 120 19 734 488 310 204 31 2 50 | 101 10 642 455 96 36 4 257 11 24 | 1,548 274 402 60 488 103 15 28 32 13 | 2 | 5 | 1,158 490 625 721 1,020 202 111 614 444 147 236 | |
| 13. Walkerton 14. Washington's Birthplace 15. Brooke 16. Fort Belvoir 17. Central Loudoun 18. The Plains | | | 50 20 61 61 185 372 | 84 7 95 148 520 588 | | | 1 24 | | 4,576 6,948 2,600 15,363 4,832 9,303 | | | | 35 1 | 7 663 515 275 | 35 6 2 22 9 | 107 569 5 2 | 300 1 13 33 4 | 207 207 175 1,616 58 72 | ···· ··· ··· | | 230 241 601 784 3,018 407 272 | |
| 19. Manassas-Bull Run 20. Chancellorsville 21. Lake Anna 22. Gordonsville 23. Charlottesville 24. Warren | | ··· ··· ··· | 37 15 22 88 223 224 | 141 69 78 103 368 291 | 1 | ···· ··· ··· | 7 | ···· ··· ··· | 5,282 1,067 368 3,014 1,188 956 | ···· ··· ··· | | | 5 10 2 | 73 1 3 | 5 3 | 17 17 | 97 | 2 1 6 33 | ···· ···· ··· | | 417 94 76 2 61 | |
| 25. Darlington Heights 26. Banister WMA 27. Lynchburg 28. Danville 29. Calmes Neck 30. N. Shenandoah Valley | | ··· ··· ··· | 38 21 64 2 37 14 | 183 64 106 14 116 43 | | | | | 100 22 375 71 4,390 2,153 | | | | | 1 1 | 2 3 2 1 | 20 | 3 | 6 8 44 | ···· ··· ··· | | 2 4 300 63 334 870 | |
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| 37. Peaks of Otter 38. Fincastle 39. Roanoke 40. Blacksburg 41. Giles County 42. Tazewell | ···· ··· ··· | | 29 12 408 8 | 2 152 10 22 2 1 | | | | | 210 100 363 273 14 | | | | | | 4 2 7 2 | 14 31 89 13 | 13 16 1 | 3 21 54 20 | | | 33 479 572 165 82 | |
| 43. Mount Rogers/Whitetop 44. Glade Spring 45. Blackford 46. Bristol 47. Breaks Interstate Park 48. Wise County | ···· ···· ··· | | 2 56 | 5 12 1 29 1 | | *** | | | 245 47 440 | | | | | | 4 2 2 4 | 8 5 46 | 91 | 12 7 22 | | | 16 230 92 1,349 1 | |
| Total individuals: | 24 | 1 3 | ,123 | 6,376 | 4 | 562 | 57,635 | 5 | 86,558 | | | 9 176 | 83 | 3 470 | | 3 282 | 2 230 | 5 736 | 2 | | 17 841 | |

Blue-winged Teal

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| Openande Openande | Page 24 | 1 | Vol. 72(| 1) The l | RAVEN | 4 | | | Sprin | ng 2001 | Spr | ing 20 | 01 | | | Vol. | 72(1) The | RAVEN | | | Р | age 25 |
|---|--|------------------------|-----------------------|--------------------------------|--------------------|-------------------------------|--------------------|--------------------------------|------------------|--------------------------------|-----|------------|--------------|----------------|------------------------------|-----------------------|---------------------------|----------------------|--------------------------------|---|-----------------------|----------------------------|
| 1. Chinocheague 31 164 27 1 3 3 16 7 2. Workingsague 39 172 20 1 8 22 - 1 2 2 0 382 23 16 7 2 0 382 23 10 382 23 10 382 23 10 382 23 10 382 23 10 382 23 10 382 23 10 382 23 10 382 23 10 382 23 12 | | Northern Shoveler | Northern Pintail | American Green- winged Teal | dabbling duck, sp. | Canvasback | Redhead | Ring-necked Duck | Greater Scaup | Lesser Scaup | | scaup, sp. | Common Eider | Harlequin Duck | Surf Scoter | White-winged Scoter | Black Scoter | scoter, sp. | Long-tailed Duck | Bufflehead | Common Goldeneye | Hooded Merganser |
| 7. Nameword River 26 2 18 1.027 4 47 15 77 10 1 | 1. Chincoteague 2. Wachapreague 3. Cape Charles/Kiptopeke 4. CBBT 5. Little Creek 6. Back Bay | 31 138 288 40 | 164 172 2 73 | 27 52 60 154 52 | 25 | 1 66 | 3 18 28 2 | 3 29 274 57 5 | 16 4 3 | 7 1 2 7 17 | | 5 | | 3 | 600 2 776 770 22 | 8 54 1 3 | 260 20 2 6 25 | 42 65 | 23 10 38 7 29 2 | 1,699 382 1,485 5 866 20 | 10 23 1 | 13 10 35 99 |
| 13 Walkerforn | 7. Nansemond River 8. Dismal Swamp 9. Newport News 10. Mathews County 11. Williamsburg 12. Hopewell | 26 28 18 | 2 4 2 3 | 18 56 11 21 | | 1,027 32 103 839 | 4 112 2 | 47 91 89 536 821 | 15 25 | 77 5 11 4 | | | | | 26 124 | 1 | | | 184 | 455 2 565 1,814 193 51 | 5 112 4 | 74 19 24 10: 2 |
| a Manasas-Bull Run 3 | 3. Walkerton 4. Washington's Birthplace 5. Brooke 5. Fort Belvoir 7. Central Loudoun 8. The Plains | 2 7 | 370 4 8 14 | 3 1 9 132 41 | | 2,027 8 825 CW 23 | 3 29 4 | 68 20 494 37 1,230 | 300 538 CW | 6,600 8 18,950 8 4 | | | | | 353 4 | 2 | 2 | | 120 2 | 47 735 209 223 140 | 335 86 6 2 | 102 20 16 11 |
| 5. Darlington Heights 1 | 9. Manassas-Bull Run 0. Chancellorsville 1. Lake Anna 2. Gordonsville 3. Charlottesville 4. Warren | 3 | | | | 7 | 1 | 3 38 14 | | 2 4 6 | | | | | | | | | ··· ··· ··· | 11 46 177 2 5 | 2 17 | 2: 4: 3: 1: |
| 0. N. ohenandodah Valley 1 2 1 1 2 CW 1. Shenandodah NP-Luray 6 2 4 18 4 1 | 5. Darlington Heights 6. Banister WMA 7. Lynchburg 8. Danville 9. Calmes Neck 0. N. Shenandrash Vallay | | | 1 2 | | 1 1 | | 73 2 | | | | | | | 2 | | | | | 15 12 | | 6 |
| 7. Peaks of Otter | 1. Shenandoah NP-Luray 2. Big Flat Mountain 3. Rockingham County 4. Augusta County 5. Waynesboro 6. Lexington | 5 | 6 | 2 11 4 2 | 4 | | 4 | 18 4 | | 4 | | | | ···· | | | ···· ···· ··· | | 1 | 2 | | |
| 3. Mount Rogers/Whitetop 4. Glade Spring 5. Blackford 3. Bristol 7. Breaks Interstate Park 3. Wise County | 7. Peaks of Otter 3. Fincastle 9. Roanoke 0. Blacksburg 1. Giles County 2. Tazewell | 3 2 7 | 1 1 | 7 17 5 | | | | 4 4 25 | 1 | 23 | | | | | | | ···· ···· ··· | | | 1 264 1 | | 7 |
| | 3. Mount Rogers/Whitetop 4. Glade Spring 5. Blackford 5. Bristol 7. Breaks Interstate Park 8. Wise County | | 3 | | | | 9 | 30 | 3 | 6 | | | | ···· | | | | ···· ···· ···· | | 93 | 1 | 3 |
| Total individuals: 598 830 713 29 4.961 230 4.016 905 25.748 30 2 3 2.783 60 315 145 416 9.520 610 | Total individuals: | 598 | 830 | 713 | 29 | 4,961 | 230 | 4.016 | 905 | 25,748 | | 30 | 2 | 3 | 2 783 | 69 | 315 | 145 | 416 | 9 520 | 610 | 3 14 |

Hooded Merganser

66

3,146

| Page 26 | | Vol. 7 | 2(1) Ti | HE RAVEN | 4 | | | Sprin | g 2001 |
|--|-------------------------------------|--------------------------------------|---------------------|-------------------------------------|-----------|--------------------|--------------------------------|-----------------------------|------------------------------|
| | Common Merganser | Red-breasted Merganser | merganser, sp. | Ruddy Duck | duck, sp. | Osprey | Bald Eagle | Northern Harrier | Sharp-shinned Hawk |
| 1. Chincoteague 2. Wachapreague 3. Cape Charles/Kiptopeke 4. CBBT 5. Little Creek 6. Back Bay | 21 2 1 | 177 50 87 820 362 356 | | 55 60 3 666 11 | 25 | | 16 4 20 2 6 | 27 15 37 3 37 | 14 3 18 9 17 |
| 7. Nansemond River 8. Dismal Swamp 9. Newport News 10. Mathews County 11. Williamsburg 12. Hopewell | 16 9 58 | 103 28 332 19 56 | | 866 6 299 528 488 44 | 222 | 2 | 9 32 3 9 53 58 | 9 2 1 7 2 6 | 3 4 1 12 4 8 |
| 13. Walkerton 14. Washington's Birthplace 15. Brooke 16. Fort Belvoir 17. Central Loudoun 18. The Plains | 6 61 30 2,898 25 312 | 1 56 2 207 | 937 | 3,587 41 279 1 18 | | ···· ··· ··· | 7 70 24 256 13 | 4 14 2 4 7 5 | 3 2 3 19 9 16 |
| 19. Manassas-Bull Run 20. Chancellorsville 21. Lake Anna 22. Gordonsville 23. Charlottesville 24. Warren | | | ···· ··· ··· | 60 2 | 5 | | 9 3 2 1 | 14 2 5 1 5 | 11 3 1 5 3 |
| 25. Darlington Heights 26. Banister WMA 27. Lynchburg 28. Danville 29. Calmes Neck 30. N. Shenandoah Valley | 3 1 | | | 5 CW | | | 3 3 CW 5 3 | 21 4 CW 3 4 | 4 1 4 6 16 |
| 31. Shenandoah NP-Luray 32. Big Flat Mountain 33. Rockingham County 34. Augusta County 35. Waynesboro 36. Lexington | | | ···· ···· ··· | 2 2 1 | | | 1 CW | 5 2 8 2 1 | 12 4 2 2 |
| 37. Peaks of Otter 38. Fincastle 39. Roanoke 40. Blacksburg 41. Giles County 22. Tazewell | 5 | 2 | | 1 2 | | | 2 | 2 | 1 4 2 6 4 |
| Mount Rogers/Whitetop Glade Spring Blackford Bristol Breaks Interstate Park Wise County | | 2 | | 7 | | | | 1 | 2 2 1 |
| Fotal individuals: | 3,449 | 2,660 | 937 | 7,035 | 252 | 5 | 614 | 264 | 249 |

| Sprin | ng 20 | 01 | | | Vol. 72 | 2(1) The | RAVEN | | | | Page | 27 |
|-------|---------------|------------------|----------------|---------------------|-----------------|-------------------|------------|--------------|------------------|--------|------------------|-----------|
| | Cooper's Hawk | Northern Goshawk | Accipiter, sp. | Red-shouldered Hawk | Red-tailed Hawk | Rough-legged Hawk | Buteo, sp. | Golden Eagle | American Kestrel | Merlin | Peregrine Falcon | hawk, sp. |
| | 3 | | | 3 | 39 | 1 | | | 13 | 2 | 2 | 2 |
| | 1 | | | 1 | 5 | | | | 33 | 1 | A | |
| | 1 | | | 3 | 40 | | | | | | | |
| | 4 | | | 1 | 16 | | | | 11 | 3 | 1 | |
| | 5 | | | 4 | 39 | 12.15 | | | 33 | | | |
| | 4 | 1 | | 10 | 16 | 1 | | | 11 | | 1 | |
| | 8 | | | 3 | 6 | | 1 | | 11 | | | 1 |
| | 6 | | | 7 | 14 | | | | 1 | CIAL | | |
| | 4 | | | 5 | 26 | | | | 21 | CVV | 1 | |
| | 1 | | | 10 | 13 | | | 1 | 5 | | | |
| | 1 | | | 4 | 10 | | | | 7 | | | |
| | 4 | | E | 11 | 15 | 1 | | | 4 | 2 | | |
| | с 8 | 1 | 5 | 18 | 68 | | 2 | | 18 | | | |
| | 7 | | 25112 | 28 | 87 | | | | 26 | | | |
| | 3 | | | 39 | 34 | | | | 10 | | | |
| | 1 | | | 3 | 9 | (1) (| | | 3 | | | 111 |
| | 4 | | | 5 | 22 | | 2 | | 18 | | | |
| | 4 | | | 8 | 40 | | | | 6 | | | |
| | 2 | | | 9 | 38 | | | | 9 | 1.1.1 | | |
| | 2 | | | 1 | 33 | | | | 17 | | | |
| | 5 | | | 2 | 10 | | | 4.4.4 | 3 | | | |
| | 3 | | | | 19 | | *** | | 4 | | | |
| | 10 | | | 11 | 79 | | | | 26 | | | |
| | 5 | CW | | 4 | 94 | 2 | | 111 | 34 | | | |
| | 8 | | | 4 | 84 | 2 | | | 27 | CW | | |
| | 6 | CW | | | 14 | | | | 29 | | | |
| | 5 | | | 1 | 67 | 100 | | | 46 | | | |
| | 5 | | | 4 | 24 | | | 2 | 20 | | ••• | 124 |
| | 3 | | | 4 | 29 | | | | 1 | | | |
| | 5 | | | 4 | 55 | | 100 | | 22 | 3 | | |
| | 1 | | | 1 | 17 | | | | 6 | | 1922 | |
| | 2 | | 1 | 2 | 15 | | 2 | | 12 | 922 | | |
| | 2 | | | 3 | 12 | | 1 | | 10 | | | |
| | 2 | 2000 | | | 6 | | | | 3 | | | |
| | 2 | | | | 24 | | | | 14 | | | |
| | 2 | | | | 10 | | | 5 | 12 | | | |
| | 8 | | | 2 | 26 | | | | 20 | 1 | | 1 |
| | | | | 3 | 7 | | | 100 | 5 | | | |
| 1 | 64 | 3 | 6 | 273 | 1,341 | 7 | 8 | 8 | 659 | 16 | 10 | 4 |
| | | ~ | - | | | | | | 1000 | | | |

| Page 28 | V | ol. 72(1 |) The F | RAVEN | | | S | pring 20 | 001 |
|--|----------------------|---------------------|--------------------------|---------------------------|-------------------------|---------------|----------------------|-------------------------|----------------|
| | Ring-necked Pheasant | Ruffed Grouse | Wild Turkey | Northern Bobwhite | Clapper Rail | Virginia Rail | Sora | American Coot | Sandhill Crane |
| 1. Chincoteague 2. Wachapreague 3. Cape Charles/Kiptopeke 4. CBBT 5. Little Creek 6. Back Bay 7. Nansemond River 8. Dismal Swamp | | | 18 | 22 5 4 1 | 1 13 8 10 1 | 1 2 9 | 1 | 22 186 8 1 | |
| 9. Newport News 10. Mathews County 11. Williamsburg 12. Hopewell | | ···· ···· ··· | 17 12 13 | 6 2 | 4 2 | | | 90 201 | |
| Walkerton Washington's Birthplace Brooke Fort Belvoir Central Loudoun The Plains | | | 55 44 9 35 1 | 4 9 1 16 | | | | 757 1 3 | |
| 19. Manassas-Bull Run 20. Chancellorsville 21. Lake Anna 22. Gordonsville 23. Charlottesville 24. Warren | | 1 | 5 13 1 | 2 26 12 | | | ···· ···· ··· | 3 127 5 | |
| 25. Darlington Heights 26. Banister WMA 27. Lynchburg 28. Danville 29. Calmes Neck 30. N. Shenandoah Valley | | ···· ··· ··· | 3 93 4 12 | 13 1 | | | ···· ···· ···· | 36 14 12 | |
| Shenandoah NP-Luray Big Flat Mountain Rockingham County Augusta County Waynesboro Lexington | | 3 9 CW | 12 1 | 5 | | | | 20 5 5 4 | |
| Peaks of Otter Fincastle Roanoke Blacksburg Glies County Tazewell | | 1 1 1 4 | 36 11 72 2 | 4 2 | | | | 29 8 | |
| Mount Rogers/Whitetop Glade Spring Blackford Bristol Bristol Breaks Interstate Park Wise County | ···· ··· ··· | 1 1 | 12 6 2 | | | | | 7 14 2 | 3 |
| Total individuals: | 3 | 23 | 491 | 138 | 39 | 14 | 1 | 1,567 | 3 |

| Spring 200 | 01 | | | Vol. 72 | 2(1) The | RAVEN | | | | Page | 29 |
|----------------------|---------------------|------------------------------|------------------------------|---------------------|----------------------|-------------------|-----------------|----------|----------------|-------------------------|------------------------------|
| Black-bellied Plover | Semipalmated Plover | Killdeer | American Oystercatcher | American Avocet | Greater Yellowlegs | Lesser Yellowlegs | Willet | Whimbrel | Marbled Godwit | Ruddy Turnstone | Sanderling |
| 35 21 282 | 2 | 39 23 171 45 | 128 229 144 1 48 | 1 | 60 37 97 11 | 3 4 18 2 | 28 40 319 | 2 | 34 3 34 | 9 2 40 9 12 | 580 31 173 1 238 |
| 1 | 1 | 271 | | | | 3 | 2020 | 111 | | | 11 |
| 34 2 | | 172 58 111 29 88 | ···· ···· ···· | ···· ···· ··· | 8 21 3 | 1 | | | | 21 14 | 137 164 |
| | | 104 | | | | | | | | | |
| | | 157 | 1.1.1.1 | 166.31 | | 111 | | | | | |
| | | 24 | | | 1 | | | | | | |
| | | 10 | | | | | | | | | |
| | | 19 | | *** | | | | | | | |
| | | 5 | | | | | | | | | |
| | | 3 | | | | 100 | | | | | |
| | | 10 | | | | | | | | | |
| | | 1 | | | | | | | | | |
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| | | 5 | | | | | | | | | |
| | | 5 | | | | | | | *** | | |
| | | 4 | | | | | | | | | |
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| | | 29 | | | | 2221 | | | | | |
| | | | | | | | *** | | | | |
| | | 1 | | | | | | | | | |
| | | 2 | | | | | | | | | |
| | | 6 | | 11.10 | *** | 222 | | •••• | | | |
| (11) | | | | | | | | | | | |
| | | 29 | | | | | | | | | |
| | | 62 | | | | | | | | | |
| 1.12 | | 3 | | | | | | | | | |
| | | | | | | | | | | | |
| | | 12 | | | | | | *** | 1000 | | |
| | | 2 | | | | | | | | | |
| | | 14 | | | | | | | | | |
| | | | | | | | | | | | |
| | | | | | | | | | | 4.07 | 4.000 |
| 375 | 17 | 1,594 | 550 | 1 | 238 | 34 | 387 | 2 | 71 | 10/ | 1,336 |

| Page 30 | 1 | Vol. 72(1 | l) The | RAVEN | | | S | pring | 2001 |
|-------------------------|--------------------|-----------------|------------------|--------|-----------|------------------------|-----------------------|----------------|--------------|
| | Western Ssandpiper | Least Sandpiper | Purple Sandpiper | Dunlin | peep, sp. | Short-billed Dowitcher | Long-billed Dowitcher | dowitcher, sp. | Common Snipe |
| Chincoteague | 46 | 88 | | 1,353 | | 12 | 43 | | 1 |
| Wachapreague | 4 | | 40 | 110 | | 1 | | | 4 |
| Cape Charles/Kiptopeke | 240 | 11 | 12 | 5,953 | | 113 | | | 4 |
| Little Creek | 1 | | 12 | 75 | | | | 1 | |
| Back Bay | | | · · · · | | | | | | 51 |
| Nansemond River | 1 | 9 | | | | | | | |
| Dismal Swamp | 1 | 5 | | | | | | | |
| Newport News | | | | 67 | | 9 | | | 6 |
| Mathews County | | | | 332 | 2 | | | | |
| Williamsburg | | | | | 16 | | | | |
| Hopeweil | 102.0 | | | | | | | | 100 |
| Walkerton | | | | | | | | | 3 |
| Washington's Birthplace | | | | | | | | | |
| STOOKE | | | | CW | | | | | 2 |
| Central Loudoun | | | | | | | | | 2 |
| The Plains | | | | | | | | | 8 |
| Manassas-Bull Run | | | | | | | | | 1 |
| Chancellorsville | | | | | | | | | |
| ake Anna | | | | | | | | | |
| Gordonsville | | | | | | | | | |
| Charlottesville | | | | | | | | | 2 |
| vvarien | | | | 1.1.1 | | | | | 2 |
| Darlington Heights | | | | • • • | | | | | |
| Banister WMA | | | | | | | | | |
| Danville | | | | | | | | | |
| Calmes Neck | | | | | | | | | 8 |
| N. Shenandoah Valley | | | | | | | | | 6 |
| Shenandoah NP-Lurav | | | | | | | | | 2 |
| Big Flat Mountain | | | | | | 111 | | | |
| Rockingham County | | | | 111 | | 575 | | | 2 |
| Augusta County | | | | | | | | | 1 |
| exington | | | | | | 212 | | | 2 |
| Dealess | | | | | | | | | - |
| Peaks of Otter | | | | | | *** | | | 1 |
| Roanoke | | | | | | | | | 2 |
| Blacksburg | | | | | | | | | 2 |
| Giles County | | | 0.000 | | | | | | |
| Tazewell | | | | | | | | | 1 |
| Jount Rogers/Whiteton | | | | | | | | | |
| Glade Spring | | | | | | | | | 16 |
| Blackford | | | 111 | 1912 | | | | | |
| Bristol | | CW | | | 1 | | | | 12 |
| Breaks Interstate Park | | | | | | | | | |
| wise county | | | | | | | | | |
| al individuals: | 292 | 108 | 41 | 7,890 | 19 | 135 | 43 | 1 | 139 |

| Spring 2 | .001 | | | Vol. 72 | 1) The Ray | VEN | | | I | 'age 31 |
|--------------------------|------------------|-----------------------|-------------|--------------------------------|---|---|--------------------|------------------------------|--------------------|--|
| American Woodcock | Parasitic Jaeger | Laughing Gull | Little Gull | Bonaparte's Gull | Ring-billed Gull | Herring Gull | Iceland Gull | Lesser Black- backed Gull | Glaucous Gull | Great Black- backed Gull |
| 28 1 106 1 2 | 1 | | | 4 12,400 14,000 2,425 | 1,546 1,280 1,818 325 14,040 1,600 | 765 1,740 1,020 70 1,790 199 | | 1 2 4 6 | | 93 95 370 20 333 241 |
| 6 4 | | 277 20 34 40 | 1 | 50 13 167 46 235 | 26,053 13,578 2,985 1,077 1,581 13,932 | 10,645 1,031 257 770 137 382 | 1 | 8 3 | | 2,156 160 264 61 72 123 |
| 2 | | 14 2 1 | | 18 8 | 212 173 5,700 4,570 95 1,440 | 20 543 426 5 122 | | 1 | ···· ··· ··· | 5 128 140 3 |
| 1 1 | | | | 4 | 381 120 2,484 4 9 | 2 1 166 | | | ···· ··· | 90 |
| 1 | | | | | 260 93 23 | | ···· ··· ··· | ···· | ···· ···· | ••• |
| | | 1 | | | 1 3 250 | | | | ···· ···· | |
| | | | | | 266 | | | | | |
| | | | | 1 | 329 273 | | | | | |
| | | ···· | | 11 | 202 | | | | | |
| 155 | 1 | 389 | 1 | 29,386 | 96,704 | 20,091 | 1 | 25 | 1 | 4,354 |

| Page 32 | 1 | /ol. 72(1 | l) The I | RAVEN | | | S | pring 2 | 2001 | Spring 2 | 001 | | | Vol. | 72(1) T | HE RAVEN | i | | | Pa | ge |
|--|------------------------|---------------|----------------------|----------------------|--|--|----------------|----------------------------|------------------------|--------------------------------|--------------------|---------------------|-----------------------|---------------------|--------------------------------|-----------------------------|--------------------------------------|----------------------------------|-------------------------------------|------------------------------|----|
| | Black-legged Kittiwake | gull, sp. | Royal Tern | Forster's Tern | Rock Dove | Mourning Dove | Barn Owl | Eastern Screech-Owl | Great Horned Owl | Barred Owl | Long-eared Owl | Short-eared Owl | Northern Saw-whet Owl | Rufous Hummingbird | Belted Kingfisher | Red-headed Woodpecker | Red-bellied Woodpecker | Yellow-bellied Sapsucker | Downy Woodpecker | Hairy Woodpecker | |
| 1. Chincoteague 2. Wachapreague 3. Cape Charles/Kiptopeke 4. CBBT 5. Little Creek 6. Back Back | 1 | 35 157 | | | 302 39 406 1 1,222 | 286 572 627 402 | 1 | 18 2 17 | 13 2 3 12 | | | | cw | | 24 28 19 27 | | 44 16 84 49 | 6 6 18 3 | 65 7 29 48 | 18 5 | : |
| 7. Nansemond River 8. Dismal Swamp 9. Newport News 10. Mathews County 11. Williamsburg 12. Hopewell | | 5 | 1 | 102 10 43 9 | 218 188 1,467 12 116 45 | 70 278 821 268 149 210 | | 5 1 36 7 1 | 8 5 2 11 1 | 2 1 6 2 1 2 | | | | 1 | 9 4 34 25 20 13 | 1 6 2 | 23 131 35 64 52 53 | 5 49 11 23 6 26 | 22 137 28 34 17 26 | 33 2 2 2 | |
| 13. Walkerton 14. Washington's Birthplace 15. Brooke 16. Fort Belvoir 17. Central Loudoun 18. The Plains | | 46 201 | ···· ···· | 1 | 12 30 32 264 216 321 | 149 214 422 928 439 534 | CW 1 | 1 20 2 3 | 2 1 15 1 6 | 4 1 25 2 1 | | | | ··· ··· ··· | 6 5 7 38 13 16 | 12 1 8 5 2 3 | 28 50 101 526 185 156 | 25 20 19 58 36 51 | 26 17 42 339 141 101 | 6 11 65 18 21 | |
| 19. Manassas-Bull Run 20. Chancellorsville 21. Lake Anna 22. Gordonsville 23. Charlottesville 24. Warren | | ···· ···· | | ···· | 143 14 38 136 229 103 | 188 67 20 98 259 268 | | 1 1 1 5 | 2 | 5 | 3 | 1 | | | 13 3 7 CW 18 11 | 1 | 111 20 21 36 96 81 | 22 4 3 15 29 84 | 70 17 25 54 59 | 15 2 1 6 8 | |
| 25. Darlington Heights 26. Banister WMA 27. Lynchburg 28. Danville 29. Calmes Neck 30. N. Shenandoah Valley | | | ···· ··· ··· | ···· ···· ··· | 177 6 147 80 342 1,951 | 181 77 499 83 467 1,480 | 1 1 | 7 8 6 7 21 | 5 2 1 2 | 1 1 2 | | ···· ···· ··· | | | 7 10 4 12 50 | 38 1 9 12 | 42 25 89 19 199 125 | 18 20 38 2 32 31 | 32 27 53 11 163 138 | 5 2 9 3 11 18 | |
| Shenandoah NP-Luray Big Flat Mountain Rockingham County Augusta County Augusta County So. Waynesboro Lexington | | | ···· ···· ···· | | 572 877 376 186 167 | 485 412 629 177 292 | 1 | 7 3 1 1 1 | 1 1 1 | CW 1 | ···· ··· ··· | | | ···· ···· ··· | 19 15 10 9 6 | 2 | 29 24 27 43 22 35 | 14 33 4 9 6 28 | 45 32 25 44 29 34 | 8 5 2 3 5 8 | |
| 37. Peaks of Otter 38. Fincastle 39. Roanoke 40. Blacksburg 41. Giles County 42. Tazewell | | ···· ···· | | | 162 980 68 20 214 | 353 568 1,069 19 185 | 2 | 1 3 7 5 2 | 1 1 | | | ··· ··· ··· | | | 21 17 27 7 4 | 1 1 | 15 21 41 54 26 11 | 16 15 19 22 10 10 | 14 40 55 116 23 24 | 4 2 3 20 1 3 | |
| Mount Rogers/Whitetop Glade Spring Blackford Bristol Breaks Interstate Park Wise County | | | | | 55 252 123 369 54 | 61 309 132 477 44 92 | | 1 3 3 10 | 2 | 1 | | | ···· | | 6 1 9 | 1 1 | 8 21 7 38 10 8 | 1 6 13 3 | 7 26 11 47 1 20 | 1 2 16 13 5 | |
| Catel individuele: | | | | 405 | 40 707 | 10.101 | | - | | | | | 0144 | | 500 | 407 | 0.040 | 000 | 0.060 | 202 | 2 |

| Page 34 Vol. 72(1) THE RAVEN Sprin | | | | | Spring | 2001 | Spring 2 | 2001 | | | Vol | . 72(1) Ti | HE RAVE | EN | | | Pa | ge 35 | | | |
|--|----------------------------------|------------------------------|----------------------|----------------------|---------------------|----------------------|--------------------------------------|--|-----------------------------|---------------------------|-----------------------|-----------------------------|--------------------|--|---------------------------|----------------|--|--------------------------|-----------------------------------|---------------------------|-----------------------------|
| | Pileated Woodpecker | Eastern Phoebe | Western Kingbird | Loggerhead Shrike | White-eyed Vireo | Blue-headed Vireo | Blue Jay | American Crow | 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 | Brown Creeper |
| 1. Chincoteague 2. Wachapreague 3. Cape Charles/Kiptopeke 4. CBBT 5. Little Creek 6. Back Bay | 9 1 10 22 22 | 6 1 10 1 10 | | | | 4 | 65 48 55 85 81 | 187 279 364 3,034 604 | 6 8 1,775 5 | 17 | | 57 153 | 4 254 | 167 103 137 181 157 | | | 63 11 22 96 105 | 1 9 2 | 1 1 1 16 19 | 61 16 4 49 44 | 8 2 18 11 3 |
| 7. Nansemond River 8. Dismal Swamp 9. Newport News 10. Mathews County 11. Williamsburg 12. Hopewell | 2 78 4 8 14 5 | 7 12 1 4 4 14 | 1 | ···· ···· ···· | 2 | 6 1 | 55 133 246 124 40 41 | 205 180 301 1,093 80 209 | 53 1,002 8 1 CW | 4 40 | | 11 | 1 | 82 252 175 181 124 120 | | | 43 92 51 106 51 77 | ···· ··· ··· | 4 60 7 27 19 | 5 2 5 22 7 | 1 7 4 2 1 5 |
| Walkerton Washington's Birthplace Brooke Fort Belvoir Central Loudoun The Plains | 14 12 18 99 30 35 | 10 5 9 16 1 | ···· | 1 | ···· ··· ··· | ···· ···· ···· | 26 60 178 647 325 603 | 534 398 472 3,394 837 2,279 | 33 439 18 23 | 42 2,132 166 647 | 2 13 | 65 25 35 10 2 | ···· ··· ··· | 68 46 231 1,220 439 528 | ··· ··· ··· | ···· ···· | 66 45 196 1,126 331 317 | 1 2 3 1 8 | 11 6 59 325 162 99 | ··· ··· ··· | 2 4 26 6 9 |
| 19. Manassas-Bull Run 20. Chancellorsville 21. Lake Anna 22. Gordonsville 23. Charlottesville 24. Warren | 15 8 2 35 29 | 3 3 4 5 9 16 | ···· ···· ···· | 1 | | ···· ··· ··· | 316 25 107 74 283 228 | 641 216 204 233 1,992 724 | 33 1 2 309 3 | 467 | 6 7 | 6 | | 302 71 47 54 290 206 | | | 223 50 19 41 216 113 | 1 | 92 23 6 19 47 36 | | 8 3 2 3 2 3 |
| 25. Darlington Heights 26. Banister WMA 27. Lynchburg 28. Danville 29. Calmes Neck 30. N. Shenandoah Valley | 23 29 1 31 56 | 6 1 9 4 3 | | 1 5 | ···· ···· ··· | | 91 57 248 35 375 724 | 680 210 673 176 893 2,090 | 13 5 | | 2 | 31 20 | | 74 57 220 75 558 552 | 1 2 | | 46 48 184 38 457 295 | 2 | 10 4 54 9 169 136 | 1 | 1 3 7 11 |
| Shenandoah NP-Luray Big Flat Mountain Rockingham County Augusta County Augusta County Waynesboro Lexington | 27 30 10 11 13 25 | 9 1 4 6 6 | ···· ··· ··· | 1 | | | 166 18 144 387 62 242 | 1,415 36 397 938 563 518 | 8 9 41 CW | 6 | 21 9 1 7 | 75 180 21 24 31 | | 219 76 50 156 134 105 | 1 2 23 | 66 | 130 33 37 119 97 112 | 1 CW | 42 33 18 47 18 25 | | 6 1 1 2 |
| Peaks of Otter Fincastle Roanoke Blacksburg Giles County Tazewell | 15 13 15 25 6 5 | 3 3 4 20 5 1 | | 1 | | 1 1 | 55 262 150 382 95 131 | 79 637 522 658 228 417 | | | 8 4 5 1 | 75 | | 33 116 170 191 28 65 | 6 3 11 2 | 104 57 | 36 77 108 184 43 80 | 1 | 29 22 27 82 37 24 | | 1 10 8 |
| Mount Rogers/Whitetop Glade Spring Blackford Bristol Breaks Interstate Park Wise County | 5 1 20 12 8 | 4 8 2 14 8 | | | | ···· ··· ··· | 44 117 60 269 6 69 | 304 692 589 1,307 32 556 | | | 4 1 2 3 5 | 20 CW | | 28 36 23 158 14 90 | | | 43 38 24 66 21 66 | 1 | 12 8 23 17 47 | | 1 |
| Total individuals: | 855 | 284 | 1 | 11 | 2 | 13 | 8,034 | 33,070 | 3,795 | 3,521 | 128 | 843 | 261 | 8,409 | 52 | 227 | 5,842 | 43 | 1,941 | 221 | 199 |

| | Carolina Wren | House Wren | Winter Wren | Sedge Wren | Marsh Wren | Golden-crowned Kinglet | Ruby-crowned Kinglet | kinglet, sp. | Blue-gray Gnatcatcher | Eastern Bluebird | Hermit Thrush | American Robin | Gray Catbird | Northern Mockingbird | Brown Thrasher | European Starling | American Pipit | Cedar Waxwing |
|--|--------------------------------------|-------------------|------------------------------|-----------------|------------------|-------------------------------------|-----------------------------------|--------------|--------------------------|--|-----------------------------------|---|--------------------------|-------------------------------------|-------------------------------|--|-----------------------------|--|
| Chincoteague Wachapreague Cape Charles/Kiptopeke CBBT Little Creek Back Bay | 155 97 285 95 122 | 2 23 3 1 | 22 2 22 13 6 | 2 5 1 | 2 8 3 8 | 170 62 90 27 | 27 1 29 55 37 | | | 162 153 149 6 | 151 12 122 42 26 | 3,065 210 160 1,990 252 | 22 4 12 5 15 | 48 50 72 62 60 | 54 3 18 15 17 | 1,291 3,019 1,873 3,015 1,300 | 724 56 2 52 | 9 255 131 30 |
| Nansemond River Dismal Swamp Newport News Mathews County Williamsburg Hopewell | 39 127 82 88 39 106 | 1 3 1 2 | 3 72 2 3 8 14 | 2 | 2 | 26 52 19 97 38 62 | 34 98 22 55 48 83 | | 1 | 46 71 46 655 161 297 | 14 352 1 41 5 12 | 322 1,526 462 3,712 159 309 | 5 143 4 | 32 32 75 99 30 36 | 9 22 14 24 2 4 | 947 1,779 2,295 1,990 1,234 2,564 | 2 601 1 55 | 81 364 157 745 529 1,043 |
| Walkerton Washington's Birthplace Brooke Fort Belvoir Central Loudoun The Plains | 29 52 100 552 122 226 | ï | 6 4 2 50 3 4 | | 2 | 61 111 22 418 44 138 | 43 70 38 133 18 40 | | | 107 221 216 517 373 456 | 29 33 12 115 33 24 | 1,642 1,683 130 898 876 794 | 1 1 3 CW 1 | 29 28 85 192 166 189 | 13 8 2 5 | 453 2,435 1,400 6,838 2,530 2,596 | 33 132 25 15 15 | 656 1,270 427 1,052 607 1,934 |
| 19. Manassas-Bull Run 20. Chancellorsville 21. Lake Anna 22. Gordonsville 23. Charlottesville 24. Warren | 123 27 24 20 255 102 | | 4 2 6 12 | | | 148 29 47 9 76 69 | 22 18 19 10 63 71 | | | 242 92 80 138 314 298 | 16 5 12 8 24 50 | 832 251 864 783 418 3,140 | 1 | 86 13 23 41 89 85 | 1 | 2,178 209 611 1,303 1,226 316 | 73 | 734 256 250 20 873 844 |
| Darlington Heights Banister WMA Lynchburg Danville Calmes Neck Shenandoah Valley | 41 36 131 20 93 166 | | 7 9 10 7 | | | 36 22 40 4 93 155 | 66 23 24 10 24 47 | | | 427 110 213 60 514 434 | 16 16 24 27 25 | 1,057 294 888 198 109 1,369 | 2 1 2 2 | 51 14 89 32 151 337 | 2 2 1 | 618 579 1,452 436 11,122 24,688 | | 354 67 1,524 183 176 1,958 |
| Shenandoah NP-Luray Big Flat Mountain Rockingham County Augusta County Waynesboro Lexington | 91 19 29 60 44 55 | | 11 14 1 3 7 | | | 74 35 20 19 13 81 | 35 7 4 7 11 | | | 236 23 123 372 126 161 | 18 24 CW 7 2 39 | 1,447 100 278 1,767 69 3,775 | 1 | 48 1 29 167 49 61 | | 4,174 2,074 6,554 1,488 3,098 | 90 | 327 53 176 423 489 367 |
| 37. Peaks of Otter 38. Fincastle 39. Roanoke 40. Blacksburg 41. Giles County 42. Tazewell | 26 74 101 200 17 13 | | 7 4 8 14 5 | | | 15 19 55 152 11 5 | 5 6 21 19 2 | 5 | | 32 199 132 168 83 53 | 9 9 13 18 5 3 | 66 601 257 42 279 51 | 1 | 5 105 84 144 22 11 | 2 | 1,284 1,084 4,305 66 1,487 | | 49 258 980 327 250 35 |
| 43. Mount Rogers/Whitetop 44. Glade Spring 45. Blackford 46. Bristol 47. Breaks Interstate Park | 13 26 64 | | 1 2 4 | | | 6 16 4 45 | 2 | | | 7 28 15 112 | 2 2 14 1 | 1 4 173 186 4 | ···· ···· | 9 28 8 102 21 | 3 | 218 3,426 931 1,456 | 3 | 37 1,050 20 2,830 |
| 48. Wise County | 42 | 3.8 | 301 | 10 | 25 | 24 | 1 | 5 | 1 | 8,535 | 1,418 | 37,537 | 226 | 3,190 | 229 | 114,469 | 1,881 | 24,309 |
| rotal multiludis. | 4,204 | 50 | 001 | 10 | 20 | 2,109 | 1,000 | 0 | 1 | | | | | | | | | |

Nashville Warbler

Orange-crowned Warbler

2

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| Page 38 | V | ol. 72(1) T | HE RAVI | EN | | | Sp | ring 20 | 001 | Spring | 2001 | | | Vol. | 72(1) T | HE RAVE! |
|--|--------------------------------------|--|------------------------------|-------------------------------|---------------------|-----------------------|---------------------|----------------------|--------------|----------------------------------|-----------------------|-----------------------------------|------------------------------------|-------------------|-------------------------------|---------------------------------|
| | Yellow-rumped (Audubon's) Warbier | Yellow-rumped Warbler | Pine Warbler | Palm Warbler | American Redstart | Common Yellowthroat | Wilson's Warbler | Yellow-breasted Chat | warbler, sp. | Eastern Towhee | American Tree Sparrow | Chipping Sparrow | Field Sparrow | Vesper Sparrow | Savannah (Ipswich) Sparrow | Savannah Sparrow |
| 1. Chincoteague 2. Wachapreague 3. Cape Charles/Kiptopeke 4. CBBT 5. Little Creek 6. Back Bay | | 1,992 504 2,948 1 546 2,520 | 34 2 16 21 9 | 7 11 62 11 31 | | 2 2 1 10 | | 2 | | 61 1 86 27 32 | | 59 41 167 34 31 | 173 13 199 CW 6 | 9 | 1 3 2 1 | 287 22 441 59 170 |
| 7. Nansemond River 8. Dismal Swamp 9. Newport News 10. Mathews County 11. Williamsburg 12. Hopewell | | 162 196 774 1,602 248 320 | 24 11 30 15 5 | 13 2 5 2 | ···· ···· ··· | 2 5 3 2 | 1 | 1 | 1 | 9 225 14 78 32 24 | | 12 170 16 222 15 3 | 23 16 33 4 22 | | ···· ···· ···· | 112 41 27 2 1 13 |
| 13. Walkerton 14. Washington's Birthplace 15. Brooke 16. Fort Belvoir 17. Central Loudoun 18. The Plains | | 199 304 327 494 281 381 | 2 16 7 7 2 | 1 | | 1 1 | | | | 21 33 14 63 14 19 | 1 29 21 9 | 13 4 1 19 | 16 29 49 113 75 95 | ··· ··· ··· | | 36 37 7 4 CW 44 |
| 19. Manassas-Bull Run 20. Chancellorsville 21. Lake Anna 22. Gordonsville 23. Charlottesville 24. Warren | | 425 67 194 80 197 456 | 1 1 1 | | 1 | 1 | | ···· ··· ··· | | 26 7 6 3 47 29 | 19 1 2 | 3 1 2 3 33 | 67 17 22 15 150 158 | | ···· ··· ··· | 3 2 |
| 25. Darlington Heights 26. Banister WMA 27. Lynchburg 28. Danville 29. Calmes Neck 30. N. Shenandoah Valley | | 247 49 123 4 108 326 | 10 40 1 | | | | ···· ···· ··· | | | 11 38 29 1 | 2 1 9 28 | CW 2 | 16 1 34 4 50 62 | | ···· ···· ···· | 17 9 1 2 12 |
| Shenandoah NP-Luray Big Flat Mountain Rockingham County Augusta County Waynesboro Lexington | | 89 26 207 37 284 | 3 | | | | | | 4 | 1 2 5 5 22 | 1 2 9 | | 17 5 30 9 50 | | ···· ··· ··· | 3 2 |
| 37. Peaks of Otter 38. Fincastle 39. Roanoke 40. Blacksburg 41. Giles County 42. Tazewell | | 4 267 83 212 74 | 1 7 1 | | | | | | | 9 24 56 11 29 | 2 | 1 6 12 | 5 39 91 55 47 18 | | | 4 |
| 43. Mount Rogers/Whitetop 44. Glade Spring 45. Blackford 46. Bristol 47. Breaks Interstate Park 48. Wise Country | | 7 40 46 145 | | 1 | | | | | | 2 25 6 57 | | 17 | 11 37 14 17 | | | |
| Total individuale | 1 | 17 605 | 268 | 147 | 1 | 30 | 1 | 4 | 5 | 1 236 | 138 | 887 | 1,919 | 9 | 7 | 1,358 |
| Total individuals. | 1 | 17,005 | 200 | 147 | 1 | 50 | | ** | 5 | 1,200 | 150 | 001 | 1,010 | | | |

sharp-tailed sparrow, sp.

Saltmarsh Sharptailed Sparrow

Nelson's Sharptailed Sparrow

...

Grasshopper Sparrow

.... LeConte's Sparrow

| | Seaside Sparrow | Fox Sparrow | Song Sparrow | Lincoln's Sparrow | Swamp Sparrow | White-throated Sparrow | White-crowned Sparrow | sparrow, sp. | Dark-eyed Junco | | apland Longspur | Snow Bunting | Northern Cardinal | ainted Bunting | Red-winged Blackbird | astern Meadowlark | Rusty Blackbird | 3rewer's Blackbird | Common Grackle | 3oat-tailed Grackle | Srown-headed Cowbird | olackbird, sp. |
|--|---------------------|-------------------------------|--|-------------------|----------------------------------|--|-----------------------------------|----------------------|--|---|--------------------|--------------|---------------------------------------|----------------|--|----------------------------------|----------------------|----------------------|--|-------------------------------|-------------------------------------|------------------|
| 1. Chincoteague 2. Wachapreague 3. Cape Charles/Kiptopeke 4. CBBT 5. Little Creek 6. Back Bay | 6 2 1 | 58 7 139 12 7 | 497 195 753 95 195 | 1 | 438 19 395 19 235 | 1,691 288 1,282 473 433 | 5 | | 310 149 65 CW 140 113 | _ | | 4 | 167 70 272 79 78 | 1 | 2,627 1,928 1,894 720 7 480 | 271 29 351 4 223 | 8 3 3 | | 455 204 227 395 364 | 612 401 2 184 813 | 8 127 371 31 21 | 75 |
| 7. Nansemond River 8. Dismal Swamp 9. Newport News 10. Mathews County 11. Williamsburg 12. Hopewell | 1 | 13 152 1 5 4 3 | 194 260 85 133 75 153 | ···· | 41 226 10 9 19 7 | 175 978 279 578 277 486 | | 4 | 54 265 103 759 182 395 | | | 17 | 80 77 123 189 104 130 | | 2,838 279 523 747 2,715 3,698 | 30 88 316 32 26 | 16 2 | 1 | 684 156 141 189 1,720 59 | 18 46 58 | 143 200 50 78 147 83 | |
| 13. Walkerton 14. Washington's Birthplace 15. Brooke 16. Fort Belvoir 17. Central Loudoun 18. The Plains | | 3 14 2 3 | 194 190 200 1,349 161 530 | 1 | 72 83 16 174 9 42 | 1,098 608 374 1,719 701 968 | 22 1 16 96 134 | | 378 445 511 1,558 701 1,542 | | | | 109 97 144 833 534 561 | | 7,288 3,984 1,200 589 105 701 | 94 27 14 10 2 106 | 1. 3 11 | | 167,452 15,178 160 642 300 67 | | 31 9 73 50 96 | 155 1,610 |
| 19. Manassas-Bull Run 20. Chancellorsville 21. Lake Anna 22. Gordonsville 23. Charlottesville 24. Warren | ···· ···· ··· | 6 2 2 5 4 | 318 58 154 141 362 490 | | 5 1 10 13 24 82 | 450 113 280 175 982 887 | 11 1 27 5 14 60 | | 799 132 380 313 723 511 | | ···· ··· ··· | | 270 25 43 55 398 283 | | 11 26 2 1 23 | 7 3 2 44 | | | 2 100 48 23 11 | ···· ···· ··· | 17 2 | |
| 25. Darlington Heights 26. Banister WMA 27. Lynchburg 28. Danville 29. Calmes Neck 30. N. Shenandoah Valley | | 2 2 7 | 51 32 135 32 123 297 | ···· ···· | 7 17 4 9 | 127 176 451 141 487 741 | 26 18 5 CW 109 358 | | 244 115 431 136 832 1,150 | | | | 86 53 339 135 498 501 | | 229 158 10 67 57 | 277 18 4 22 3 | 24 20 2 | | 429 13 4 2,068 | | 349 2 123 82 | |
| Shenandoah NP-Luray Big Flat Mountain Rockingham County Augusta County Maynesboro Lexington | | 1 5 7 | 110 7 87 106 65 95 | ··· ··· ··· | 2 1 2 5 | 392 177 236 677 247 471 | 69 196 238 117 52 | 3 | 332 142 168 492 209 419 | | 1 | | 134 49 57 238 94 139 | | 188 1 17 12 2 | 41 9 52 5 39 | 1 2 34 | ···· ···· ···· | 274 18 352 45 | | 180 1 23 452 | 900 |
| Peaks of Otter Fincastle Roanoke Blacksburg Giles County Tazewell | ···· ···· ··· | 343 1 3 | 14 117 215 439 71 74 | ···· ··· | 1 9 12 | 97 420 292 545 97 45 | 145 6 178 30 22 | ···· ···· ···· | 192 346 210 313 215 58 | | | | 54 187 171 305 55 54 | | 1 | 32 24 | 11 | | 5 | | 27 | |
| 43. Mount Rogers/Whitetop 44. Glade Spring 45. Blackford 46. Bristol 47. Breaks Interstate Park 48. Wise County | | 2 2 4 | 91 118 58 207 | 1 | 1 | 14 155 43 281 3 38 | 24 345 28 233 3 | | 213 140 224 157 57 35 | | ···· ··· ··· | | 62 133 28 188 58 | | 19 11 | 29 18 76 | | ···· ···· ···· | 2 6 25 | | 128 | 100 |
| Total individuals: | 10 | 489 | 9,415 | 6 | 2,021 | 21,648 | 2,612 | 7 | 17,358 | - | 1 | 21 | 8,339 | 1 | 40,151 | 2,421 | 141 | 3 | 191,827 | 2,134 | 2,904 | 2,840 |

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| | Baltimore Oriole | Purple Finch | House Finch | Red Crossbill | Common Redpoll | Pine Siskin | American Goldfinch | Evening Grosbeak | House Sparrow | Total number | of species | Total number of individuals | Dates counts held | Time in the field (a.m. to p.m.) | Temperatures (⁶ Fahrenheit) | Skies (a.m.) | Skies (p.m.) | Water conditions |
|--|------------------|------------------------|-------------------------------------|--------------------|--------------------|----------------|--------------------------------------|------------------|-------------------------------------|---------------------------------|---------------------------------|---|--|--|--|--|---|--|
| 1. Chincoteague 2. Wachapreague 3. Cape Charles/Kiptopeke 4. CBBT 5. Little Creek 6. Back Bay | | 2 | 65 57 101 108 114 | ···· ··· ··· | ···· ··· ··· | | 103 41 262 125 61 | | 44 27 46 238 28 | 14 10 15 3 13 12 | 4 17 14 13 11 29 | 42,964 30,373 43,459 14,870 68,132 42,592 | 29 Dec 16 Dec 30 Dec 5 Jan 31 Dec 29 Dec | 0545-1845 0700-1700 0600-1800 0645-1430 0530-1730 0530-1700 | 21-31 39-60 24-31 28-40 20-45 22-35 | CLD CLD, HVR CLR CLD CLR PCD | PCD FOG, LGR CLR CLD CLR PCD | SWF, MPF WOP SPO, MWO WOP SPF, MWO SPF, MWO |
| 7. Nansemond River 8. Dismal Swamp 9. Newport News 10. Mathews County 11. Williamsburg 12. Hopewell | 1 CW 2 | 1 30 | 22 87 151 259 101 94 | | | 1 | 31 84 112 73 118 68 | | 1 9 55 71 55 3 | 11 9 11 11 10 10 | 5 1 1 3 4 | 54,844 50,982 17,315 24,191 16,487 38,882 | 2 Jan 1 Jan 16 Dec 31 Dec 17 Dec 17 Dec | 0500-1800 0600-1730 0545-1700 0100-1715 0700-1530 0630-1715 | 29-37 28-35 43-55 20-32 50-62 30-60 | PCD CLD CLD, LGR CLR CLD, HVR CLD, LGR | CLR CLD FOG CLR PCD PCD | SPF, MWO SPF, MWO WOP SPF, MWO WOP WOP |
| 13. Walkerton 14. Washington's Birthplace 15. Brooke 16. Fort Belvoir 17. Central Loudoun 18. The Plains | | 6 11 10 | 10 5 97 519 207 295 | | ···· ··· ··· | 1 4 | 49 86 155 819 188 488 | | 15 32 245 550 211 63 | 8 10 9 12 8 10 | 2 10 14 10 11 | 187,519 51,956 20,512 86,295 18,298 33,239 | 31 Dec 16 Dec 15 Dec 31 Dec 30 Dec 17 Dec | 0500-1730 0645-1730 0700-1700 0400-1700 0645-1730 0300-2000 | 18-28 36-40 29-41 14-38 15-30 30-51 | PCD CLD, HVR PCD CLR PCR CLD, HVR | PCD FOG, LGR CLR PCD PCR PCD, LGR, LGS | SWF, MPO SPF, MPO SPF, MWO SPF, MPO SWF, MPF WOP |
| 19. Manassas-Bull Run 20. Chancellorsville 21. Lake Anna 22. Gordonsville 23. Charlottesville 24. Warren | | 4 12 41 | 327 36 29 92 206 113 | | ··· ··· ··· | 4 | 173 17 20 44 200 216 | | 173 5 21 25 62 33 | 8 7 6 8 6 | 4 1 4 0 3 9 | 16,724 3,888 7,280 7,430 12,815 12,159 | 23 Dec 17 Dec 5 Jan 31 Dec 14 Dec 31 Dec | 0500-1700 0700-1700 0715-1700 0700-1700 0630-1915 0630-2045 | 14-28 45-59 29-39 23-35 28-50 13-39 | PCD PCR, LGR CLD, HVS CLR PCD, LGR CLR | PCD PCR, HVR PCR, LGS CLR PCD CLR | SPF, MWO WOP SPO, MPF SWF, MPF SPF, MWO SPO, MPF |
| 25. Darlington Heights 26. Banister WMA 27. Lynchburg 28. Danville 29. Calmes Neck 30. N. Shenandoah Valley | | 4 2 5 7 22 | 44 28 384 13 130 558 | | | 3 1 | 88 4 117 4 177 170 | | 12 12 91 40 101 67 | 6 6 8 5 8 9 | 6 9 1 1 1 | 6,805 2,997 10,255 2,242 24,186 46,972 | 7 Jan 31 Dec 16 Dec 16 Dec 31 Dec 16 Dec | 0500-1700 0700-1730 0500-1700 0800-1700 0730-1700 0400-1800 | 22-55 15-28 32-37 20-30 18-28 26-42 | PCC CLR LGR FOG, LGR PCD CLD, LGR | CTC CLR LGR LMR PCD CLD | SMF, MMO SPF, MWF WOP WOP SWF, MPF SPF, MWO |
| 31. Shenandoah NP-Luray 32. Big Flat Mountain 33. Rockingham County 34. Augusta County 35. Waynesboro 36. Lexington | | 3 CW 13 1 | 141 67 212 50 123 | | | 10 | 77 43 53 180 40 80 | | 41 150 198 62 5 | 8 3 6 7 7 7 7 | 4 3 6 2 1 2 | 13,803 1,058 6,760 17,203 6,149 13,147 | 17 Dec 29 Dec 16 Dec 30 Dec 17 Dec 26 Dec | 0630-1745 0630-1800 0600-1600 0545-1700 0730-1600 0500-1630 | 21-55 12-29 24-48 18-32 32-54 5-30 | PCR, LGR, LGS CLD CLD, LGR PCD PCD, NHR CLR | PCR, LGS CLD CLD PCD CLD, NLR, LGS PCD | SPF, MWO SPF, MPF SPF, MWO MPO, MPO SPF, MWO SWF, MPF |
| 37. Peaks of Otter 38. Fincastle 39. Roanoke 40. Blacksburg 41. Giles County 42. Tazewell | | 1 3 1 2 | 2 141 265 230 66 40 | | | 1 7 | 21 95 82 192 87 83 | | 31 84 298 31 95 | 4 7 7 9 6 5 | 2 4 8 0 6 2 | 991 7,081 8,244 13,869 2,749 3,514 | 21 Dec 17 Dec 16 Dec 16 Dec 31 Dec 29 Dec | 0700-1500 0600-1800 0700-1630 0530-1715 0645-1730 0700-1700 | 15-35 30-55 32-42 30-43 16-19 12-29 | PCD PCD, LGR CLD, RAI CLD, NLR CLD, SNF PCD | PCD PCD CLD, RAI FOG,NLR CLD, SNF PCD | SWF, MPF SPO, MWO SMO, MWO SPF, MWO NR SPF, MPO |
| 43. Mount Rogers/Whitetop 44. Glade Spring 45. Blackford 46. Bristol 47. Breaks Interstate Park 48. Wise County | | 2 1 | 21 198 103 152 22 | 8 | 18 | 2 50 1 | 44 334 150 292 8 64 | | 58 62 2 63 92 | 4 6 5 8 2 5 | 7 5 6 3 6 0 | 1,479 8,439 3,238 12,188 359 2,361 | 27 Dec 30 Dec 30 Dec 31 Dec 16 Dec 16 Dec | 0900-1700 0600-1800 0700-1745 0700-1800 0800-1700 0730-1600 | 18-28 13-24 11-13 17-24 35-65 25-35 | CLD, LGS CLD, LGS PCD, LGS CLD, LGS CLD, LGR CLD, LGR | CLD, LGS PCD PCD, LGS CLD CLD CLD, LGR | SWF, MPF SWF, MPO SWF, MPF SPZ, MPF WOP WOP |
| Total individuals: | 5 | 203 | 6,085 | 8 | 18 | 86 | 6,018 | 8 | 3,607 | 21 | 0 1,1 | 119,295 | | | 5-65 | | | |

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| Page 44 | Vol. 72(1) The Raven | | | | | | | Sprin | ng 2001 | Spring 2 | 001 | | | Vol. 72(1) | THE RAVE | N | | | Page 45 |
|--|---------------------------------------|---|-----------------------------------|-----------------------------------|--|-------------------------------|----------------------------------|--|--|---|--|----------------------|----------------------|---|--|---|---------------------|---------------------|---|
| | Wind direction | Wind speed (miles/hour) | Inches of snow on the ground | Number of field observers | Minimum-maximum number of field parties (non-owling) | Number of feeder observers | Hours at feeders | Hours owling | Miles owling | Hours on foot | Hours by car | Hours by bwatercraft | Hours by plane | Total hours (excluding owling & feeder hours) | Miles on foot | Miles by car | Miles by watercraft | Miles by plane | Total miles (excluding owling miles) |
| 1. Chincoteague 2. Wachapreague 3. Cape Charles/Kiptopeke 4. CBBT 5. Little Creek 6. Back Bay | N E NW NW SE W N | 9-10 5-20 20-30 10-20 0-25 10-20 | 0.2 | 26 20 37 3 17 26 | 13-21 10 9-13 1 9-11 11-17 | | 1.00 | 3.00 0.50 2.00 5.25 2.75 | 13.00 0.25 6.00 23.50 18.00 | 65.75 24.50 95.00 6.50 74.00 86.00 | 34.50 35.00 32.00 1.00 12.00 23.00 | 4.00 2.00 | | 100.25 63.50 129.00 7.50 86.00 109.00 | 56.75 19.25 63.00 1.00 40.00 35.00 | 214.00 269.00 286.00 15.00 285.00 405.00 | 10.00 10.00 | ···· ··· ··· | 270.75 298.25 359.00 16.00 325.00 440.00 |
| Nansemond River Dismal Swamp Newport News Mathews County Williamsburg Hopewell | NW N calm W SW NE | 0-5 0-10 10-25 5-25 10-40 | ···· ··· ··· | 12 20 32 48 22 34 | 5 8 13 13 9 9-13 | | | 4.00 2.00 1.75 9.50 1.50 2.75 | 8.00 10.00 1.00 42.00 8.00 2.00 | 35.00 51.50 53.25 47.00 28.50 58.50 | 15.00 21.50 53.75 64.25 46.50 35.75 | | | 50.00 73.00 107.00 111.25 75.00 94.25 | 16.00 32.00 28.50 30.50 19.00 32.50 | 96.00 155.00 455.00 403.50 385.00 375.00 | | ···· ··· ··· | 112.00 187.00 483.50 434.00 404.00 407.50 |
| 13. Walkerton 14. Washington's Birthplace 15. Brooke 16. Fort Belvoir 17. Central Loudoun 18. The Plains | NR E NW NW V | 0-15 4-6 0-5 0-15 0-16 5-30 | 0-2 | 23 22 22 167 45 56 | 5-7 8-9 9-10 54-57 19-20 17-20 | 9 2 | 13.50 4.50 | 1.75 1.50 1.00 27.75 3.50 12.50 | 6.00 3.00 10.00 74.75 16.50 99.00 | 30.25 24.50 44.00 311.00 64.00 73.00 | 22.75 26.50 34.00 29.25 53.00 63.25 | 7.50 | ···· ···· ··· | 53.00 58.50 78.00 340.25 117.00 136.25 | 24.00 8.00 41.00 233.25 65.50 67.00 | 292.00 275.00 211.00 305.50 445.00 578.00 | 54.00 | ···· ···· ··· | 316.00 337.00 252.00 538.75 510.50 645.00 |
| 19. Manassas-Bull Run 20. Chancellorsville 21. Lake Anna 22. Gordonsville 23. Charlottesville 24. Warren | V SW W calm W | 0-10 12-25 0-10 2-25 0-20 | 0-0.5 | 60 10 9 10 22 17 | 10-19 5 4-5 5 18 13 | | | 5.25 1.75 0.50 1.50 1.50 | 17.25 15.00 0.00 11.50 7.00 | 90.00 22.75 6.00 21.00 98.00 76.00 | 13.00 17.25 30.00 24.50 21.00 23.50 | | ···· ···· ···· | 103.00 40.00 36.00 45.50 130.00 99.50 | 76.00 12.25 6.00 12.50 95.50 67.00 | 127.00 260.75 206.00 173.00 245.00 228.00 | | ···· ···· ··· | 203.00 273.00 212.00 185.50 340.50 295.00 |
| 25. Darlington Heights 26. Banister WMA 27. Lynchburg 28. Danville 29. Calmes Neck 30. N. Shenandoah Valley | WSW NW calm calm NW SW | 0-10 10-35 15-20 0-15 | 1-2 | 21 6 31 15 41 77 | 6 5 12 9 12 25 | 2 1 4 4 | 4.00 3.00 17.00 7.00 | 2.00 2.00 5.00 9.00 | 22.00 10.00 29.00 46.00 | 19.50 21.50 26.00 16.50 14.75 54.00 | 28.50 6.50 47.00 17.00 77.00 123.00 | 26.00 | 4.50 | 48.00 28.00 73.00 33.50 96.25 203.00 | 14.50 14.00 25.00 7.00 40.50 64.00 | 248.00 152.50 348.00 114.50 610.00 1019.00 | 27.00 | 15.50 | 262.50 166.50 373.00 121.50 666.00 1110.00 |
| Shenandoah NP-Luray Big Flat Mountain Rockingham County Augusta County Augusta County Waynesboro Lexington | NW NE calm NW SW SW | 5-26 0-5 0-12 5-40 0-10 | 0-0.5 0-5 0-0.25 2-5 | 36 4 27 32 23 15 | 16 3 1-9 11 9 6-9 | 5 1 2 2 | 7.50 1.00 2.00 3.00 | 1.50 0.50 1.00 | 2.00 0.50 12.00 8.00 | 52.25 24.00 11.75 15.25 18.50 27.00 | 48.50 0.50 32.00 64.25 32.50 16.00 | 4.00 | ···· ··· ··· | 104.75 24.50 43.75 79.50 51.00 43.00 | 30.25 33.00 15.50 11.50 14.50 23.00 | 387.50 2.00 335.50 523.50 300.50 131.00 | 4.00 | | 421.75 35.00 351.00 535.00 315.00 154.00 |
| Peaks of Otter Fincastle Roanoke Blacksburg Glies County Tazewell | calm NW calm SE WNW SW | 5-45 0-18 12-20 8-15 | 2 1 | 9 24 29 42 14 9 | 4 13 13 17-22 NR 5 | 7 2 4 2 | 11.50 2.00 NR 8.00 | 1.00 8.25 | 4.00 22.25 | 9.00 28.00 43.00 90.00 NR 5.00 | 14.00 38.00 27.50 45.25 NR 37.00 | | ···· ···· ···· | 23.00 66.00 70.50 135.25 56.75 42.00 | 8.00 24.00 44.00 77.50 6.50 4.00 | 33.00 240.00 225.00 340.75 79.00 286.00 | | | 41.00 264.00 269.00 418.25 85.50 290.00 |
| 43. Mount Rogers/Whitetop 44. Glade Spring 45. Blackford 46. Bristol 47. Breaks Interstate Park 48. Wise County | V NW V NW V V | 1-5 10-20 0-8 0-8 5-20 5-20 | 1-36 2-4 3-6 1-3 | 8 12 6 16 4 17 | 1-5 6 4 6 1-2 9 | 2 | 6.00 | 2.00 5.00 | 6.00 35.00 | 7.75 27.25 1.00 16.00 15.00 15.50 | 14.00 17.75 20.00 39.00 3.00 33.75 | | ···· | 21.75 45.00 21.00 55.00 18.00 49.25 | 11.00 8.00 2.00 9.50 20.00 16.25 | 75.00 272.00 261.00 397.00 24.00 193.00 | | | 86.00 280.00 263.00 406.50 44.00 209.25 |
| Total individuals: | | | | 1,270 | 468-534 | 50 | 91.00 | 132.75 | 588.50 | 2,044.50 | 1,525.25 | 43.50 | 4.50 | 3,674.50 | 1,605.00 | 13,287.00 | 105.00 | 15.50 | 15,013.00 |

2000-01 CHRISTMAS COUNT DESCRIPTIONS

The number appearing before each count coincides with the numbered counts in the table. Observers are listed below for Darlington Heights, Lynchburg, Danville, Peaks of Otter, Roanoke, Giles County, and Bristol—counts which do not appear in the one-hundredth Christmas bird counts book published by The National Audubon Society.

- CHINCOTEAGUE NATIONAL WILDLIFE REFUGE. 37°58'N 75°22'W Center: 2 miles north of center of Chinoteague in Accomack County. Compilers: Richard and Nancy Roberts (7212 Fiddler Bay Lane, Chincoteague, VA 23336) (nroberts@intercom.net).
- WACHAPREAGUE. 37°40'N 75°42'W Center: Jct. 789 and 715 in Accomack County. Compiler: Irvin Ailes (6479 Myrtle Lane, Chincoteague, VA 23336-3825) (imailes@intercom.net).
- CAPE CHARLES/KIPTOPEKE. 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) (74077.3176@compuserve.com).
- CHESAPEAKE BAY BRIDGE-TUNNEL (CBBT). 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 (21238 Huntington Rd., Cape Charles, VA 23310) (phoebetria@aol.com).

- 5. LITTLE CREEK. 36°51'N 76°06'W Center: 3.8 miles northeast of Kempsville in Virginia Beach. Compiler: Paul Sykes (1080 Forest Rd., Watkinsville, GA 30677) (paul_sykes@usgs.gov).
- 6. BACK BAY NATIONAL WILDLIFE REFUGE. 36°39'N 76°00'W Center: 1.5 miles east of Back Bay NWR. Compiler: Paul Sykes (1080 Forest Rd., Watkinsville, GA 30677 (paul_sykes@usgs.gov)).
- NANSEMOND RIVER. 36°52'N 76°26'W Center: Jct. 17 and 626 in Pughsville, Suffolk. Compiler: Les Willis (P.O. Box 6063, Suffolk, VA 23433) (leswillis@clwillis.com).

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| DISMAL SWAMP. 36°40'N 76°29'W Center: Intersections of Middle and Jericho Ditches in Dismal Swamp National Wildlife Refuge. Compiler: Thomas Gwynn III (1640 Morris Ave., Norfolk, VA 23509) (tomgwynn@bigfoot.com). |
|--|
| 9. NEWPORT NEWS. 37°05'N 76°25'W Center: Northern corner of Magruder & Cmdr. Shepard boulevards in Hampton. Compiler: Hayes Williams (P.O. Box 95, White Marsh, VA 23183-0095) (joycewms@inna.net). |
| MATHEWS COUNTY. 37°25'N 76°18'W Center: 0.5 mile east of Beaverlett Post Office in Mathews County. Compiler: Mary Pulley (HC 75, Box 2750, Hudgins, VA 23076). |
| WILLIAMSBURG. 37°17'N 76°42'W Center: Colonial Wiliiamsburg Information Center in Williamsburg. Compiler: Bill Holcombe (4705 Lady Slipper Path, Williamsburg, VA 23188) (bowljack@aol.com). |
| 12. HOPEWELL. 37°46'N 77°17'W Center: Curles Neck in Henrico County. Compiler:Lauren Scott (11838 Chase Wellesley Dr., Apt. 425, Richmond, VA) (rosedalevt@yahoo.com) |
| WALKERTON. 37°46'N 77°02'W Center: 1.5 miles southwest of Walkerton bridge, just west of Whitebank. Compiler: Fred Atwood (Flint Hill School, 10409 Academic Dr., Oakton, VA 22124) (fredatwood@yahoo.com). |
| 14. WASHINGTON'S BIRTHPLACE. 38°07'N 76°57'W Center: Horners in Westmoreland County. Compiler: William Portlock (23195 Mt. Cloud Rd., Bowling Green, VA 22427) (portlock@bealenet.com). |
| 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 20191) (o.b.james@worldnet.att.net). |
| 16. FORT BELVOIR. 38°41'N 77°12'W Center: Pohick Episcopal Church, Fort Belvoir, in eastern Fairfax County. Compiler: Kurt Gaskill (4101 Komes Ct., Alexandria, VA 22306) (kurtcapt87@aol.com). |
| |
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 Road. Round Hill, VA 20141) (jandkcoleman@erols.com). 18. THE PLAINS. 38°48'N 77°52'W Center: 7 miles northwest of Warrenton on the west side of Watery Mountain along Carter Creek in Fauguier County. Compiler: Todd Day (5118 Deaver Dam Rd., Jeffersonton, VA 22724 (blkvulture@aol.com). 19. MANASSAS-BULL RUN. 38°50'N 77°26'W Center: Centreville in western Fairfax County Compiler: John Dent (6804 Langley Springs Court, McLean, VA 22101) (jdent@cervantes-associates.com). 20. CHANCELLORSVILLE, 38°16'N 77°40'W Center: Chancellorsville Battlefield, 10 miles west of Fredericksburg in Spotsylvania County. Compiler: Joella Killian (Dept. Of Biology, Mary Washington College, Fredericksburg, VA 22401) (jkillian@mwc.edu). 21. LAKE ANNA. 38° 05'N 77° 49'W Center: center of bridge over Lake Anna on rt. 208. Compiler: Betty Floyd (7300 Lookout Dr., Richmond, VA 23225) (hfloyd@vcu.org) 22. GORDONSVILLE, 38°09'N 78°12' W Center: Jct. of 15 and 33 north of the town of Gordonsville in Orange County. Compiler: Donald Ober (P.O. Box 6, Orange, VA 22960) (ober@ns.gemlink.com). 23. CHARLOTTESVILLE, 38°04'N 78°34'W Center: Near Ivy in Albemarle County. Compiler: Charles Stevens (615 Preston Place, Charlottesville, VA 22903). 24. WARREN. 37°51'N 78°33'W Center: At Keene in Albemarle County. Compiler: Charles Stevens (615 Preston Place, Charlottesville, VA 22903). 25. DARLINGTON HEIGHTS. 37°12'N 78°37'W Center: Darlington Heights Post Office in Price Edward County. Compiler: Carolyn Wells (204 Fayette St, Farmville, VA 23901) (bbsmith@hovac.com). Observers: Rexanne Bruno, John Dalmas, Thelma Dalmas, Damien Fehrer, Deanna Fehrer, Jimmy Gates, Jane Holman, Ann Ingram, Judy McCann, Kathy Menold, Peter Menold, Velmont Miller, Tom Price, Chris Register, Katie Register, George Shorter, May Shorter, Brent Slaughter, Laura Slaughter, David Spears, Randy

Thrasher, Sue Thrasher, and Carolyn Wells.

26. 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) (jblalock@dimon.com).

27. LYNCHBURG. 37°24'N 79°11'W

Center: Lynchburg College in Lynchburg. Compilers: John and Thelma Dalmas (1230 Viewmont Dr., Evington, VA 24550-2006) (jtdalmas@juno.com).

Observers: Dorothy Bard, Rexanne Bruno, Glenn Buck, Ed Calvert, John Dalmas, Thelma Dalmas, Virginia Delaney, Betty Epperson, Robert Epperson, Bob Eubank, Robert Ferrell, Charles Hansrote, Melva Hansrote, Mike Hayslett, Mark Johnson, Dick Miller, RuthAnn Miller, Gene Moore, Myriam Moore, Claudia Puckette, Dan Puckette, Daniel Puckette, Norma Jean Rist, Gene Sattler, Doug Shedd, Macon Smith, Susan Stanton, Randy Thrasher, Sue Thrasher, Margaret Wenning, Lisa Wilkins, Susan Wingfield, and Jo Wood.

28. DANVILLE. 36°34'N 79°25'W

Center: Ballou Park in Danville.

Compiler: Llaura D. Meder (Dept. Of Biology, Averett College, Danville, VA 24541) (Imeder@averett.edu).

Observers: Jane Bond, Pat Brachman, Barbara Clark, Edward Fisher, Sr., Patt Fisher, Ken Flora, Martha Foster, Mary Foster, Rebecca Foster, Sarah Foster, Vickie Fuguay, Ann Garbett, Gary Grant, Bob Knowles, Laura Meder, Geoff Smith, Sue Urbanik, Larry Wilburn, and Nultie Wiseman.

29. CALMES NECK. 39°07'N 77°54'W

Center: Casteman's Fery Bridge, State Route 7 and and the Shenandoah River in Clarke County.

Compilers: Frances Endicott (3355 Calmes Neck Lane, Boyce, VA 22620). and Margaret Wester (181 Little River Lane, Boyce, VA 22620) (margaretwester@hotmail.com).

30. NORTHERN SHENANDOAH VALLEY. 39°03'N 78°10'W

Center: Jct. Crooked Run and Rt. 606 in Frederick County. Compiler: Rob and Ann Simpson (1932 E. Refuge Church Rd., Stephens City, VA 22655) (snphotos@visuallink.com).

31. SHENANDOAH NATIONAL PARK—LURAY. 38°35'N 78°28'W Center: Hershberger Hill near Stanley in Page County. Compiler: Mara 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 Aukerman (301 West Bank Street, Bridgewater, VA 22812-1005) (chuckauckerman@aol.com).
- 34. AUGUSTA COUNTY. 38°12'N 78°59'W Center: Jct. 780 and 781 in Augusta County. Compiler: John Spahr (613 Locust Ave., Waynesboro, VA 22980) (spahrj@cfw.com)
- 35. 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) (ccabe@mbc.edu).
- 36. LEXINGTON. 37°51'N 79°29'W Center: Big Spring Pond in Rockbridge County. Compilers: Bob Paxton (460 Riverside Dr. #72, New York, NY 10027) (rop1@columbia.edu); and George Tolley (492 Greenhouse Rd., Lexington, VA 24450) (gtolley@rockbridge.net).
- 37. PEAKS OF OTTER. 37°27'N 79°36'W Center: Peaks of Otter Visitor Center in Bedford County. Compiler: Barry Kinzie (P.O. Box 446, Troutville, VA 24175). Observers: Charles Hansrote, Melva Hansrote, Eunice Hudgins, john Hudgins, Bill Hunley, Rachel Hunley Barry Kinzie, Katrina Knight, and Jessica Vaughn.
- 38. FINCASTLE. 37°31'N 79°52'W Center: North of Fincastle near Jct. 220 and 679 in Botetourt County. Compiler: Barry Kinzie (P.O. Box 446, Troutville, VA 24175).
- 39. ROANOKE. 37°18'N 79°56'W

Center: Oakland Blvd. And Williamson Rd. In Roanoke.
Compiler: Michael Donahue (4814 Bandy Rd. SE, Apt 4, Roanoke, VA 24014).
Observers: Mary Lou Agee, Andy Biggs, Bruce Cody, John Cutler, Rupert Cutler, Marshall Daniels, Mike Donahue, Tad Finnell, Dawn Gill, Loren Graham, Bob Hogan, David Holt, Joyce Holt, Eunice Hudgins, John Hudgins, Bill Hunley, Barry Kinzie, Katrina Knight, Connie Marsh, Mike Purdy, Alice Quinn, Tim Quinn, Mike Smith, Kathy Summers, Kent Sumers, Jessica Vaughn, Liz Williams, Guy Winterbotham, and Holly Woodson.

- 40. BLACKSBURG. 37°14'N 80°25'W
 - Center: Jct. Merrimac Rd. (657) and Prices Fork Rd. (685) in Montgomery County.
 - Compilers: Patricia A. Polentz (915 Coal Hollow Rd., Christiansburg, VA 24073) (polentz@vt.edu) and Bruce Grimes (2306 Terra Bella St., Blacksburg, VA 24060).

41. GILES COUNTY. 37°19'N 80°38'W

Center: Pembroke in Giles County.

Compiler: David A. Brady (P.O Box 70, Newport, VA 24128) (flyngcow@swva.net). Observers: Joan Ashcroft, David Brady, Tom Brobson, Sue Daniels, Bruce Grimes, Butch Heilig, Jonathon Lancaster, Susie Leslie, Jim Lyons, Bill Opengari, Peggy Speigel, Eric Wilhelm, and Lori Williams.

42. TAZEWELL. 37°08'N 81°30'W

Center: Fourway in Tazewell County. Compiler: Sarah Cromer (P.O. Box 98, North Tazewell, VA 24630) (scromer@netscope.net).

43. MOUNT ROGERS-WHITE TOP MOUNTAIN. 36° 39' N 81° 35' W Center: Jct. 600 and 603.

Compiler: Allen Boynton (658 Rocky Hollow Rd., Trout Dale, VA 24378) (aboynton@smyth.net)

44. GLADE SPRING. 36°47'N 81°47'W

Center: Jct. 750 and 609 in Glad Spring. Compiler: Ron Harrington (20435 Carson Ln., Bristol, VA 24202) (roneharrin@aol.com).

45. BLACKFORD. 37°00 N'81°55'W

Center: Confluence of the Clinch and Little rivers in Russell County. Compiler: Robert Riggs (Rt. 2, Box 27B, Lebanon, VA 24266) (sheba@mounet.com).

46. BRISTOL. 36°36'N 82°07'W

Center: Jct. 647 and 654, east of Bristol TN in Washington County, VA. Compiler: Richard Lewis (407 V.I. Ranch Rd., Bristol, TN 37620) (mountainbirds@email.com).

- Observers: Rob Biller, Ron Carrico, Wallace Coffey, Bert Hale, Ken Hale, Loraine Hale, Kevin Hamed, Andy Jones, Richard Knight, Geoff Larsen, Richard Lewis, Janice Martin, Larry McDaniel, Bob Quillen, and Anthony Whited.
- 47. BREAKS INTERSTATE PARK. 37°15'N 82°13'W Center: 4.5 miles n.e. of Haysi in Buchanan County. Compiler: Terry Owens (PO Box 100, Breaks, VA 24607).

48. 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) (randyst@compunet.net).

WINTER ABUNDANCE OF WATERFOWL IN VIRGINIA: 1965-1999

CHARLES R. BLEM

TERRANCE L. KING

JENNIFER M. KING

Department of Biology Virginia Commonwealth University 1000 W. Cary St. Richmond, Virginia 23284-2012

INTRODUCTION

Abundance of waterfowl in Virginia is of considerable interest for numerous reasons, both heuristic and practical. Expansion of the breeding range of Canada Geese (see Table 1 for all scientific names), the decline of American Black Ducks through hybridization with Mallards (Ankney et al., 1987), and state-sanctioned hunting of Tundra Swans are some prominent examples of situations in which quantitative analysis of trends would be informative. In the present paper we examine the Christmas Bird Count data for the 28 most common species of Anseriform birds wintering in Virginia and test the hypotheses that such counts are changing in a statistically significant manner.

METHODS

We extracted Christmas Bird Counts (CBC) from the literature (reported annually in *The Raven* volumes 36-71) and summarized the data for all geographic regions within the state. We obtained counts of all species of waterfowl that have occurred regularly in Virginia over the past three decades (see Table 1) and excluded rare, irregular, or introduced species including Eurasian Wigeon (*Anas penelope*), Harlequin Duck (*Histrionicus histrionicus*), Common Eider (*Somateria mollissima*), King Eider (*S. spectabilis*), and Mute Swan (*Cygnus olor*). Data analyses otherwise follow Butcher (1990), Butcher and McCulloch (1990), Blem (1995), and Blem and Vandenberg (1996).

The resulting data set (28 species X 35 years X numerous sites) was entered into the mainframe computer and analyzed by the Statistical Analysis System (SAS, 1992). As in previous studies (Blem, 1995; Blem and Vandenberg, 1996), we tested for significant change in waterfowl numbers over time by use of regression analyses (Proc GLM, SAS Institute, 1992). In these computations we calculated equations of the form: Y = bX + a, where Y is a measure of the number of birds, X is year (1965 =1; 1999=35) and *a* is the intercept. Slopes of these equations were tested for significance (i.e., b = 0; SAS Institute, 1992). We also tested for effects of ambient temperature and precipitation around the count period. Mean October, November, and December temperatures and mean low temperatures for those months were included as independent variables, and we tested their effect on bird abundance by regression analyses. Significance values of P < 0.05 were used throughout statistical testing.

The majority of waterfowl in Virginia Christmas Bird Counts is concentrated in a relatively few coastal plain locations, and may be affected by what Butcher and McCulloch (1990) called the "national wildlife refuge effect." Some of the first CBC organizers selected sites that were particularly attractive to birds and sometimes also may have chosen them for their proximity to centers of human populations. Both choices can bias data, especially when corrected for count effort. In the present data set, the increase of counts from 18 in 1965 to 46 in 1999 has been largely through the addition of sites that are not particularly rich in waterfowl, at least not in comparison with the older count sites. Several traditional count sites that have been censussed throughout the entire period include wildlife refuges or extensive aquatic habitat on which waterfowl always are abundant (e.g., Chincoteague and Back Bay). Counts added in recent years are not centered on major waterfowl refuges and probably do not support waterfowl populations similar to those of traditional sites where counts have been made each of the 35 years. Correcting the entire data set for count area or party hours therefore may be biased-dividing the total data set by area of count sites containing low numbers of waterfowl can make stable populations appear to be declining. Some investigators have corrected for this by only analyzing counts in which the species occurs commonly (e.g., Sauer et al., 1996). To test the hypothesis that newer counts were skewing the analyses, we chose six coastal plain sites that traditionally have had large numbers of waterfowl and have been censused every year over the entire period. These were: (1) Back Bay, (2) Cape Charles, (3) Chincoteague, (4) Little Creek, (5) Hopewell, and (6) Newport News. These sites often have accounted for more than 75% of all individuals counted statewide.

RESULTS AND DISCUSSION

To determine the extent of bias due to variations in counting effort, we analyzed Christmas Bird Counts for correlations between number of birds and number of counts and/or party-hours (effort) in the count. We found that the annual number of counts (total count area) almost always was a significant predictor of waterfowl numbers even if one first considered the total party-hours involved. That is, count area almost always was more important than party-hours on prediction of counts in regression analyses. In no instance was number of party-hours more influential than count area.

Three sets of data were generated from the analyses. These included: (1) Raw counts--uncorrected counts for all waterfowl observed in Christmas Bird Counts, (2) Corrected counts—total numbers of each species divided by the number of counts, and (3) Coastal Plain corrected counts—total number of each species at the six selected coastal plain sites.

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| | Raw totals | Per Christmas Count | |
|---|------------|---------------------|---------------|
| | | Statewide | Coastal Plain |
| Tundra Swan (Cygnus columbianus) | ns | -5.1* | -4.2* |
| Snow Goose (Chen caerulescens) | ns | -25.0*** | ns |
| Canada Goose (Branta canadensis) | 873.7** | ns | ns |
| Brant (B. bernicla) | -239.6** | -16.6* | -9.9** |
| Wood Duck (Aix sponsa) | ns | -0.8*** | -0.8* |
| Green-winged Teal (Anas crecca) | ns | -1.3* | ns |
| American Black Duck (Anas rubripes) | -145.6** | -12.1** | -6.3*** |
| Mallard (Anas platyrhynchos) | 444.8*** | 6.0* | ns |
| Northern Pintail (Anas acuta) | ns | ns | -2.9** |
| Blue-winged Teal (Anas discors) | ns | -0.3* | ns |
| Northern Shoveller (Anas clypeata) | 26.9** | ns | ns |
| Gadwall (Anas strepera) | ns | ns | ns |
| American Wigeon (Anas americana) | -739.0** | -32.6** | -20.2** |
| Canvasback (Aythya valisineria) | 269.0** | 4.7* | ns |
| Redhead (A. americana) | ns | ns | ns |
| Ring-necked Duck (A. collaris) | 87.2** | 1.6*** | 0.6*** |
| Greater Scaup (A. marila) | 23.8** | 0.5* | ns |
| Lesser Scaup (A. affinis) | 333.6** | 6.1*** | ns |
| Black Scoter (Melanitta nigrans) | ns | ns | ns |
| Surf Scoter (M. perspicillata) | ns | ns | ns |
| White-winged Scoter (M. fusca) | ns | ns | ns |
| Long-tailed Duck (Clangula hyemalis) | ns | -1.1* | ns |
| Common Goldeneye (Bucephala clangula) | ns | -0.7* | ns |
| Bufflehead (B. albeola) | ns | ns | ns |
| Common Merganser (Mergus merganser) | ns | ns | ns |
| Red-breasted Merganser (M. serrator) | 127.2** | 2.0* | 1.5* |
| Hooded Merganser (Lophodytes cucullatus | s) 95.1** | 1.8*** | 1.4*** |
| Ruddy Duck (Oxyura jamaicensis) | ns | ns | ns |
| Total waterfowl | 2417.5** | -66.7** | -57.1** |

 Table 1. Slopes of equations for annual changes in Christmas Bird Count data, 1965-1999.

*P < 0.05; **P < 0.01; ***P < 0.001; ns = not statistically significant.

Total, uncorrected, numbers of birds increased in nine species (Table 1) and decreased in three. Since the number of counts increased from 18 to 46 over the 35-year data set, increases in raw numbers are not surprising because of the increased area of coverage. On the other hand, negative slopes probably indicate substantial declines. Considering all Virginia areas, the number of birds calculated per Christmas Bird Count declined in 10 species and increased in seven (Table 1). On the six selected coastal plain sites, five species declined (four also declined over the statewide data set). Three species increased on the coastal plain (these also increased statewide). Brant, Black Ducks, and American Wigeon showed impressive declines. The statistical level of significance of their decreases on the selected coastal plain sites were even more striking than that in the statewide data set.

Nine species that appeared to change statewide (in the data set corrected for number of counts) did not do so significantly in the coastal plain data set. As a result of such different results and because there are differences between count sites, we have little confidence in the statewide data set and could determine no unbiased way of correcting it without rejecting sites with low waterfowl abundance. The coastal plain sites therefore appear to be more reliable indicators of waterfowl abundance, and the majority of waterfowl counted in CBC activities occurred at these sites.



FIGURE 1. Changes in total Christmas Bird Counts of waterfowl in Virginia, 1965-1999. Solid circles represent number of birds per count in six selected coastal plain sites; hollow circles indicate number of birds per count in all census areas (see methods).

Without question, total waterfowl numbers have declined over the past 35 years in Virginia (Fig. 1, Table 1). The cause of this decrease is not obvious. We found no significant effect on any count that could be attributed to average winter December temperature, winter temperature computed as several combinations of October, November, December averages and lows, or precipitation. While the slope of the change is not steep, the constancy of the change is a bit disquieting. Furthermore, some individual species show trends that are of special concern.

Examination of the three kinds of data provides some insight into changes of abundance of individual species. For example, American Black Ducks appear to be declining severely (Fig. 2), while Mallards are increasing. American Black Ducks



FIGURE 2. Changes in counts of Mallards and Black Ducks in Virginia, 1965-1999. Solid circles represent number of birds per count in six selected coastal plain sites; hollow circles indicate number of birds per count in all census areas (see methods).

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may be suffering from introgressive hybridization and/or competitive exclusion with increased Mallard populations (Johnsgard and DiSilverstro, 1976; Ankney et al., 1987). However, it should be noted that Mallards did not increase significantly in the coastal plain counts. American Wigeon also show alarming population decreases. Again, the cause of this decline is uncertain, but the bird has been declining on the breeding grounds in Canada for several decades (Sauer et al., 2000).

Tundra Swans and Brant mostly winter on a few coastal refuges and few of these birds typically appear far inland. At the coastal plain sites these species all declined significantly over the study period, and deserve closer scrutiny. Tundra Swans have been hunted for several years in an attempt to control their numbers in order to reduce purported damage to winter wheat and oyster beds. Tundra Swan





numbers, while highly irregular from year to year, show a downward trend over the entire 35-year sampling period, but have significantly increased over the past decade. (Fig. 3) Clearly, hunting of this species on a regional (coastal plain) basis appears to have had little impact and may not be justified as a control measure. Brant numbers are highly variable, possibly because their breeding success in the high Arctic fluctuates greatly from year to year.

Canada Geese have established breeding populations over much of the state in recent years and are common summer residents. Oddly, winter Canada Goose counts do not show expected signs of increase (Fig. 4), possibly because of the effects of large fluctuations in numbers of migratory birds.

Six species show no significant trend in any measurement. These include the Gadwall, Redhead, Oldsquaw, Black Scoter, Bufflehead, and Common Merganser. It is noteworthy that all of these birds tend to be either estuarine species or are found commonly on the ocean or other large bodies of water. Impact of hunting might be relatively low in such species. Addition of many upland sites that rarely have several of these species in even modest numbers makes a general decline of some species appear to be less severe. On the other hand, addition of upland sites probably has contributed to apparent increases in Mallards, Ring-necked Ducks, and Hooded Mergansers, because these species are more abundant at some inland localities. Declines of Blue-winged Teal, Green-winged Teal, and Common Goldeneye, detected over the entire data set, are questionable. They do not appear to be significantly declining in the coastal plain subset where they are always more abundant.



FIGURE 4. Changes in total counts of Canada Geese in Virginia, 1965-1999. Solid circles represent number of birds per count in six selected coastal plain sites; hollow circles indicate number of birds per count in all census areas (see methods).

ACKNOWLEDGMENTS

This paper is part of an on-going series of Virginia avian population analyses that are part of a university course in student research. We thank Leann Blem for her comments on an earlier version of the manuscript. We also thank the Virginia State Climatology Office for providing weather data for these analyses.

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THE KIRTLAND'S WARBLER AS A SPRING MIGRANT IN VIRGINIA

RICHARD H. PEAKE P. 0. Box 28 Wise, Virginia 24293

The appearance of a Kirtland's Warbler (*Dendroicha kirtlandii*) in Wise County in the spring of 1994 was unexpected but welcome to the author, whose previous experience with the species had been limited to a late April record of a singing male in Athens, Georgia, on April 29, 1967. The Virginia bird proved elusive and avoided efforts to photograph it, but finally it permitted a taping of its song, a recording that has since been approved by the Virginia Society of Ornithology's Records Committee as the first spring record for Virginia.

The bird was first located early in the morning on a heavily overcast Saturday, May 7,1994, the weather being a holdover from a storm the night before. It was singing strongly as it moved about hawking insects in an autumn olive bush just above the dam at Wise Reservoir. The field marks of the bird were noted repeatedly before the author rushed home and made a sketch without consulting any field guides. The resulting sketch coincided perfectly with the representations of the bird in both text and picture in the standard field guides consulted. The bird's dark upper parts and tail, its yellow throat and unmarked yellow breast and belly with striping on the flanks, its clear but broken eye-ring, its lack of wing bars or tail markings, and its large size separated this bird from Magnolia Warbler and Canada Warbler-the species with which it apparently is most often confused-as did its song.

A number of people and the VSO hotline were informed about this find. Sarah Cromer and Wallace Coffey appeared next day in the afternoon to look for the bird. Other warblers were present, but not the Kirtland's Warbler.

Again early Monday morning the author tried to find the bird. Luckily, it was singing and was found rather easily, but it eluded efforts to photograph it. During attempts to record or photograph the bird, it moved to the pines on the strip-mined area on the other side of the road above the reservoir in addition to the scrub where it had first been found. The author finally managed to record its song. When the song was played back to the bird, however, it ceased singing, and there was no further contact with it that day or the next. Copies of the tape and the sketch were submitted to the VSO Records Committee, which acted favorably on the record.

After the excitement of this first discovery, the author was led to wonder whether or not there might be a repetition in future years. This record coincided with several others from farther north listed that year in American Birds for the spring migration. Is southwestern Virginia is on the migration path of Kirtland's Warbler? If one draws a straight line from the wintering grounds of *Dendroica*

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kirtlandii in the Bahamas to the breeding grounds in Michigan, the line intersects with Wise County in Virginia. Having ascertained that the migration path should pass through far southwestern Virginia, the author prepared to seek out the bird again the next year.

As luck would have it, a Kirtland's Warbler showed up in the same spot the next year at approximately the same time (May 10,1995). Again the bird was singing, although it allowed only a brief (but definitive) glimpse. This observation was made around ten a.m., later in the day than the first 1994 observation. All of the field marks detailed above for the 1994 bird were noted on this bird. This 1995 bird sang a few times more that morning, but it eluded further efforts of discovery.

The following years proved less rewarding. No records of Kirtland's Warbler were obtained from the spring of 1996 through the spring of 1999. However, this might have been partially a matter of bad timing, as the author was unable to work the Wise Reservoir location before May 12 in 1998 or 1999.

In 2000, however, the author's field work began earlier in May. On May 8, between 7:20 and 7:40 a.m. there were two singing Kirtland's Warblers at Wise Reservoir. They were in the area where the 1994 bird was recorded. One allowed some definitive views in an observation that lasted about one minute or a little longer. Its large size, its all dark crown, its dark upper face and nape extending into dark back, wings and tail were noted. The tail and wings showed no white. The lower parts of the bird were yellow from throat to vent with dark stripes along the flanks. It also had a broken eye ring. This bird sang five times and was answered twice by another. Attempts to record or photograph these birds met with no success, and the birds did not reveal themselves the next morning.

Later in the week Bob Riggs and Dave Worley attempted to find the bird and saw what might have been a Kirtland's Warbler fly from the pines on the slope above the road down to the area where it had appeared previously. That afternoon they contacted the author. With them and Lisa Nutt, the author attempted to locate a Kirtland's Warbler by playing the tape made in 1994. These efforts were unsuccessful.

Early on the morning (from 6:30 to 7:30 a.m.) of May 11, the author made another effort to locate a Kirtland's Warbler in the area along the road above the reservoir. About 100 yards further up the road in similar habitat there was a singing Kirtland's Warbler hawking insects in an autumn olive bush at 6:55 a.m. All that was visible was movement and a few parts of the bird. It proved quite shy, however, and again efforts to record or photograph the bird failed.

These records suggest that southwestern Virginia is indeed on the spring migration path of Kirtland's Warbler and that the bird is likely to occur between May 7 to May 11 in suitable habitat. That being the case, the habitat where the bird has been found would seem to be of interest. The western side of Wise Reservoir above the dam has a stream running through it, and this stream is bounded by a mixed stand of small trees, autumn olive, and multiflora rose on an area that was disturbed when a road to Wise Airport was built. Above this area and across the road, there is strip-mined land reclaimed in grasses and pines. Both the first bird in

1994 and the most recent birds seemed to use both the area below the road and the pines above the road. The 1995 bird was found only in the autumn olive-multiflora rose tangles below the road, and no determination of whether or not it used the pines above the road could be made.

Similar habitat exists elsewhere in southwestern Virginia. Although this habitat is not what most birders tend to work in the spring, it would seem worthwhile to spend more time exploring such spots during the short window in early May when the Kirtland's Warbler has been appearing at Wise Reservoir. The key to finding all these spring Kirtland's Warblers has been hearing the song during the morning, so anyone searching for this species in spring would do well to learn the song and search early in the morning in appropriate habitat.

SPRING MIGRATION OF TURKEY VULTURES AT COLLEGE CREEK

BRIAN TABER Coastal Virginia Wildlife Observatory P.O. Box 912 Eastville, VA 23347

Turkey Vultures (*Cathartes aura*) become numerous during late winter and spring as they concentrate and migrate across the James River, from Hog Island Wildlife Management Area (HIWMA) north toward Williamsburg, on Virginia's coastal plain (Taber, 2000). This paper presents data collected by the College Creek Hawkwatch, sponsored by the Coastal Virginia Wildlife Observatory. Turkey Vultures comprise about two-thirds of the migrant hawks and vultures at this site between February and early May. Virtually all of the February migrants are Turkey Vultures. I am not aware of any other migration concentration points in Virginia for this species during the spring.

The birds cross from a northward-pointing finger of land, the only such feature in the area, where the river bends sharply and provides a convenient 2.5 km water-crossing. Visibility at the site is excellent, with a nearly 360 degree unobstructed view, half of which is over water. The site produces a steady stream of birds with excellent variety, though in modest numbers compared to fall sites; sixteen species have been recorded (Taber 1992 and 1997). With regular coverage, I estimate that several thousand hawks and vultures would be recorded each season.

Though Turkey Vultures can be found in the area in every month (Sheehan 1998), they are much more noticeable in February and March, as their passage through the area peaks. Totals at the site for Turkey Vultures were 947, 516, 479, 578, and 679 for 1997-2001, respectively, with an average of only two hours of observation per day and about 40 days per season. The lower 1999 total was due to no February coverage. By comparison, the Fort Smallwood, Maryland hawk watch, 210 km due north, with complete late winter and spring coverage, averages more than 3,000 Turkey Vultures, out of season totals that regularly average 10,000 birds (HMANA 1999). Hawk watch sites at the southern tip of the Delmarva Peninsula, only 50 km due east, have recorded only a few dozen Turkey Vultures making the 27 km water-crossing at the mouth of the Chesapeake Bay, at this season, over the past several years (HMANA 1999). Turkey Vultures are clearly moving north just west of the Chesapeake Bay at this season.

Turkey Vultures and hawks generally use three flight lines to cross the water at College Creek: 1) an easterly line from the wooded area on HIWMA directly north toward the Kingsmill marina; 2) a the middle line, the shortest distance and the one most used, from the tip of the point of land, slightly northwestward and then over the mouth of College Creek on the north shore and ; 3) a westerly line, which bears farther to the northwest. Birds usually cross on the easterly line

when winds are strong from the west. Conversely, they use the westerly line when winds are strong from the east. Light and moderate winds, which are the rule, seem to encourage birds to take the most direct, middle route.

Several water-crossing strategies have been observed for Turkey Vultures at College Creek. Usually, they cross in groups of about 5-20, which circle first above the south shore, gaining altitude on thermal updrafts. When ready to cross, they turn northward simultaneously, set their wings and proceed across the river, rarely flapping. Sometimes the groups split, just after leaving the south shore, with some birds turning back. Those that turn back sometimes cross later and sometimes are not seen again that day. The groups tend to stay together while crossing, usually only a few dozen yards apart across the flock. Occasionally, single birds cross the water. Hawks and Bald Eagles are often seen circling with the Turkey Vulture flocks over the south shore, but perhaps because of the vultures' slower flight do not cross with the flocks.

Most of the birds are about 30-90 m high on the south shore and they lose considerable altitude during the water-crossing, sometimes being only 9-15 m high at arrival on the north shore. Rarely, birds are as low as 1 m above the water during a large part of the crossing and very rarely, they are above 90 m.

Timing the water-crossing of Turkey Vultures, using fixed referenced points, has been done on a limited basis, to allow estimates of flight speed. Results indicated leisurely speeds of about 2.4 km per hour on calm winds and up to about 13 km per hour on strong winds.

Though Turkey Vultures have been observed crossing throughout the day and on all wind and weather conditions, except heavy rain, the great majority cross on sunny days with light winds, from about 9 a.m. to noon (EST), presumably taking advantage of the initial warm updraft of the day. They are generally blown in the direction of the wind, but on strong winds, the Turkey Vultures turn more into the wind and flap more frequently. Turkey Vultures cross the river northward on an almost daily basis at the site in late February and March, becoming less regular and less numerous into April and May. During the past five seasons, only four Turkey Vultures out of more than 3000 have been observed crossing the river heading south.

The migration of Turkey Vultures in late winter and spring is not welldocumented. Eastern populations are variably or partially migratory (Kirk and Mossman 1998). They may even be overlooked as migrants at some hawk watch sites. It is not known where the migrant Turkey Vultures at College Creek are coming from or where they are going. They may represent birds that wintered in the southeastern United States, those that cross the Caribbean, those that come from Central or South America up the coast of the Gulf of Mexico, or maybe they are from all of these routes. Until more southern sites study late winter and spring migration, it may be impossible to determine the origin of the birds and their routes, though observations of tagged birds will help. There are apparently no sub-species from particular regions easily recognizable in flight to help answer the question.

ACKNOWLEDGMENTS

I would like to thank volunteer hawk-watchers Tom Armour, Charles McComb, Bill Williams and Tim Reid for their assistance.

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YELLOW-LEGGED GULL (*LARUS CACHINNANS* CF. *MICHAHELLIS*) AT BACK BAY NATIONAL WILDLIFE REFUGE, VIRGINIA BEACH

Edward S. Brinkley 9 Randolph Avenue Cape Charles, VA 23310

J. BRIAN PATTESON P. O. Box 772 Hatteras, NC 27943

On 28 December 1997, we observed a first-winter Yellow-legged Gull (*Larus cachinnans*) on the beach at Back Bay National Wildlife Refuge, Virginia, about 3.5 km south of the refuge Visitor Center, at about 10:30 a.m.; the bird was photographed by ESB. Observation was under clear skies, at distances of 5-25 m, for about 15 minutes (Iliff 1998). Because of other Christmas Bird Counts and holiday events only one local birder was able to search Back Bay beaches for this bird but did not relocate it. Rob and Ann Simpson (pers. comm.), who were doing banding work in this vicinity, noted this bird or one very like it in November 1997, which we learned subsequent to our observation.

FIELD OBSERVATIONS

To observers familiar with the region's first-winter plumages of Lesser Black-backed (*L. fuscus graellsii*) and Herring (*L. argentatus smithsonianus*) gulls, the first-winter plumage of Yellow-legged Gull immediately stands out as something unusual. The following characters were noted in the field, and most show up clearly on the photographs of the bird. References to photographs indicate file numbers of those slides archived with the Virginia Avian Records Committee, which voted to accept this record in Category 1 as an individual of the form *michahellis* or closely related western form, as opposed to the eastern nominate form (Cross 2000), which is now recognized by some authorities as a distinct species called Caspian Gull, Pontic Gull, or Steppe Gull (Klein and Gruber 1997, Klein and Buchheim 1997, Larsson 1998).

Size and shape. – In size and overall structure, the bird appeared intermediate between Lesser Black-backed and Herring gulls, both present on the beach on this date. It showed greater primary extension than the Herrings present but appeared deeper-chested, with more girth than Lessers (Photographs A, D, E). The bill was much more similar to that of Herring Gull than to that of Lesser Black-backed Gull: fairly deep, not elongate and shallow as in Yellow-legged Gulls of the form *cachinnans*. The forehead was steep and rounded, the hindcrown also rounded, and the crown appeared variably flattish (Photographs A, D). *Body plumage.* – One field character that stands out in this species, in contrast to virtually all first-winter Lessers in December, is the starkly whitish head (more like first-winter Great Black-backed Gull, *L. marinus*), with very little dusky pigmentation around the eye. This coloration was pronounced in the Back Bay bird. The breast and belly were white as well (in late December, by contrast, the adjacent Herrings looked very brown in the body plumage; Photographs A, C, D, E). The nape showed faint, gray-brown stippling in rows, producing typical "dirty neckerchief" discussed and illustrated in most European literature (Kightley et al. 1998; Gruber 1995). The hunkered position of the bird makes the nape-stippling difficult to see in the photographs, but it was noted well in the field. The sides were mottled indistinctly gray-brown from the bend of the wing toward the vent.

Legs. – The legs and feet were very pale pinkish, a character noted in all first-winter Yellow-legged Gulls (Photographs B, D, E). When not submerged in the surf, the legs looked long in comparison to those of the Herring Gulls.

Bill. – The bill was dark with a pale pinkish base (Photographs B, D). This seemed at first to present a problem for a first-winter bird to us, though it is seen in some first-winter Herring and Thayer's gulls. Garner and Quinn (1997, p. 47), however, specify that this character is regularly seen in first-winter *michahellis*. Because they are late-winter nesters, Yellow-legged Gulls are up to three months older than our *smithsonianus* Herrings of comparable age.

Upperparts. - The darkish upperparts contrasted strongly with the whitish underparts in a manner reminiscent of first-winter Great Black-backed Gull (Photographs A, D, E; the photographs are overexposed and wash out the pale plumage, thus heightening the apparent darkness of the bird's upperparts ["saddle"]; cf. plumages depicted in Gruber 1995). The bird's tertials were nearly solid medium brown, with fairly wide pale borders, a dark shaft streak and small dark crescent subterminally that together formed a broken anchor-shape (Photograph A; cf. third-from-left illustration, Garner and Quinn 1997, p. 44). The tertials seemed a bit worn, odd for our native gulls but normal for this early-nesting species. Though the upperparts were generally perceived as darker than the Herrings' nearby, some of this impression was due to the contrast with the underparts and some due to the progressively darker covert/primary area. The impression of the standing bird was the "tricolored" pattern typical of this form of Yellow-legged: palest in the mantle/scapulars, darker in the lesser and median coverts, with blackish primaries and tertials a bit darker than the coverts. Anchor-shaped markings were noted in mantle feathers at closest range. The barring in the scapulars, noted in the field, is not readily discernable in the photographs.

Upperwing in flight. – The flight feathers were all pretty much blackish above, and there was little by way of a "window" (paler inner primaries and outer secondaries) present in the dorsal surface of the wing, markedly less than in nearby *smithsonianus* Herring. The wing was darkest at the "hand" and secondary bar, with coverts darkish brown with pale edges (the greater secondary coverts not as dark as in Lesser). Together with the medium brown mantle, the impression of the upperwing in flight was overall a dark one, especially given the pigmentation of

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head and tail (see below). The pattern of the inner primaries, not noted well in the field, is important in distinguishing this form of Yellow-legged from other similar gulls: the outer webs are dark, the inner light, sharply contrasted across the shaft, with a blunt, "club" shape at the rectrix tip, clearly observable in photographs (Photographs B and C, a first-winter *smithsonianus* Herring Gull is present for comparison on the far right-hand side of Photograph C). (N. B.: the overexposure means that the upperwing in Photograph C appears notably lighter than it did in the field.) An absolutely perfect match in all respects is the juvenile/first-winter Yellow-leggeds Gull shown in flight in Beaman and Madge (1998) and Mullarney et al (1999). Further outstanding likenesses, both paintings and photographs, are reproduced in Larsson (1995), Gruber (1995), Garner and Quinn (1997) and Jonsson (1998).

Underwing. – The impression made by the underwing in the field was a dusky brown overall, with no strong primary window here either, but not, for instance, as dark as the underwing of first-winter Lesser Black-backed. The "dark parallel lines" discussed by Garner and Quinn (1997; termed dark "banding" in Gruber [1995]) are obvious in one photograph (Photograph C).

Tail. – The tail and associated coverts held an outstanding, arresting set of characters for the writers. The bird showed an essentially white tail, with whitish outer rectrices with very little barring, coverts with just a smattering of blackish "arrowheads" (otherwise white), and a very prominent internal, jet black tailband, considerably thicker than in *cachinnans*. The "framed in white" tailband (Garner and Quinn 1997, p. 46; Kightley et al. 1998), set off by the white tips of the rectrices (a bit worn but not considerably), is clearly observable in photographs (Photograph B). This should not be present in a hybrid between Lesser Black-backed and Herring Gulls, which should instead show some intermediacy between parental types. This tail pattern also handily rules out a large range of Herring Gull subspecies, currently recognized as full species by some authorities (cf. Mactavish 1995a; Sangster et al. 1998; cf. Millington and Garner 1998).

Behavior. - The Back Bay bird was found on the immediate shoreline, the species's preferred habitat, according to Garner and Quinn (1997). The bird was in association with Herring Gulls and a few Ring-billed Gulls (*L. delawarensis*), but the Herring Gulls singled it out for sustained harassment, so it was forced to be a "loner" of sorts. On a falling tide, it walked quickly into the receding waves and foot-pattered rapidly in the moist sand, presumably hunting for Mole Crabs (*Emerita talpoida*) with the other gulls. We have noted this behavior in most of the larger species present here (Ring-billed, Herring, Lesser Black-backed, Great Black-backed). The one Lesser Black-backed seen on 28 December here was in definitive basic plumage; others seen here in subsequent searches for this bird were of all age classes, including first-winter and second-winter. The species is quite common on these beaches from mid-September through March, with counts often exceeding 25 birds (pers. obs.).

DISCUSSION

"Larus cachinnans" is a complex of Old World gulls formerly considered to be conspecific with Herring Gull. Perhaps because its northward post-breeding expansion into the British Isles and elsewhere in northern Europe is a phenomenon of the 1980s and especially 1990s, the literature on identification of the various forms is relatively recent (Devillers 1983, van den Berg 1983, Dubois and Yésou 1984, De Mesel 1990, Dean 1994, Wilds and Czaplak 1994, Gruber 1995, Garner and Quinn 1997, Garner et al. 1997, Jonsson 1998, van Swelm, in ms.). The relationships among the taxa involved are being redefined at a rapid pace, as field and laboratory studies produce more data (cf. van Swelm, in ms.).

The nearest nesting Yellow-legged Gulls to North America, L. cachinnans atlantis, are found on the Azores, Canaries, and Madeiran Islands (Jonsson 1998). Although field studies of this form are in progress, field-identification literature has just begun to be published, and there are broad disagreements about the taxonomic placement of this form with regard to mainland Atlantic populations. The form nesting on the southerly Iberian Peninsula, described as L. c. lusitanius (Joiris 1978), has likewise been little researched, and little is known about its field identification (Teyssèdre 1983, Carrera et al. 1987, Dubois 1987, van Swelm, in ms.). It was described from birds seen at Peniche, which is the harbor close to the gull colonies of the Berlengas islands, on the central-southern coast of Portugal, quite far from the northern Iberian populations of Yellow-legged Gull. These birds on the central-southern coast of Portugal apparently look much like western Mediterranean Yellow-legged Gulls (michahellis), only smaller (P.-A. Crochet, in litt.). Yellow-legged Gulls from northern Spain are often informally called "Cantabrican Gull" and may also warrant subspecific status. It is not now known how birds of this complex that nest on the Atlantic shores of Morocco, especially around Agadir, fit into the complex, but research here and in western Europe is ongoing (P.-A. Crochet, in litt.). Jonsson (1998) argues that, based on plumage and morphology, the Atlantic populations, both in coastal Iberia and in Morocco, are best combined with atlantis.

Because *michahellis* has differences in nesting ecology, calls, and call-postures from the nominate form where the two are sympatric, several researchers have suggested that *michahellis* represents a full species (e.g., Klein and Gruber 1997, Klein and Buchheim 1997). Despite uncertainties in their relationships, these western forms of Yellow-legged Gull (*lusitanius, michahellis, atlantis*) are currently still designated by most authorities as subspecies of *cachinnans*, if only provision-ally. If *michahellis* is accorded specific status, then it is possible that these western forms would be grouped as subspecies under the species *michahellis* (D. Gruber, pers. comm.).

At present, it would be premature to assign the Back Bay individual to any of these western forms. Only the eastern form, nominate *cachinnans*, is ruled out on current knowledge. Identification of adults among the *atlantis-michahellis-lusitanius* group is still to be settled, and field separation of first-winter birds is still in its infancy. At least three birds documented in North America have considered probable *atlantis* (Wilds and Czaplak 1994, Mactavish 1996, Lewis 1996), though the last of these has also been suggested to have been a Cantabrican Gull, which has a streaked head, much like a Lesser Black-backed Gull, in definitive basic plumage (Jonsson 1998) and thus is theoretically more difficult to separate from hybrids of Lesser Black-backed and Herring Gulls. This situation will probably require that records of this complex be revisited by birders and by records committee on a regular basis, as the literature continues to redefine relationships in this "superspecies" group, and their field identification, more and more precisely. Some birds may not be conclusively identifiable to "species" in the near term.

Identification issues. – When considering a gull in the field that appears to share characters of plumage and structure with both Herring and Lesser Black-backed Gulls, observers should also consider the possibility of hybrids between the two, such as have been putatively recorded on the east coast, e. g., Virginia Beach City Landfill, 31 December 1989 (R. L. Moore, Patteson, Brinkley, ph., in litt.), at Spencer, New York, 1 November 1991 (ESB; Paxton et al. 1990), and with certainty in England (Harris 1970, Harris et al. 1978), and Holland (Tinbergen 1929, Voous 1946). Several other pitfalls to identification of Yellow-legged exist. Nesting of known-identity *michahellis* with both Herring and Lesser Black-backed Gulls in Holland (van Swelm, in ms.) suggests that some individuals encountered will not be assignable to a species.

Moreover, North American Herring Gulls with aberrantly pigmented (yellow) legs have been recorded infrequently (Dwight 1925), though dull yellowish is a far more frequent aberration than bright yellow (pers. obs.). One such bird with bright yellow legs was collected in Louisiana in spring 2002 (ph. published in *North American Birds* 56: 382). The nominate form of Herring Gull has a relict population in the Baltic Sea and southern Scandinavia that has yellow legs (known as the Marsh Gull, taxon "*omissus*"; Barth 1968, 1975, Mierauskas et al. 1991, Gruber 1995), and this form should be ruled out in considering a potential Yellow-legged Gull as well (this pertains mostly to birds in definitive plumage). In the case of juvenile birds, observers should consider the somewhat similar *argenteus* Herring Gulls as well (Mactavish 1995a).

When deciding between a vagrant form and a hybrid, one has little choice but to examine every character of the gull in great detail, with meticulous notes, or better, photographs, and to circulate that material amongst knowledgeable gull researchers. This requires a certain amount of preparation in learning the topography of gull plumage, morphology, the sequence of molts, ageing, and variation in local species, the effects of wear, and not least the "tricks" of light and other field factors. One of the best current ways to prepare for intensive gull study is by using recently published video instructional series (Rosche and Dunn 1997, Dunn et al. 1999).

Other North American records. – Yellow-legged Gull has had a modest presence in the mid-Atlantic region since the first was noted in 1990 at Washington, D. C. (Wilds and Czaplak 1994). In Virginia, the only record other than that at Back

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Bay refuge is of an adult carefully studied and documented on the Chesapeake Bay Bridge-Tunnel on 2 March 1996 (A. Johnson, J. Bangma; Iliff 1997). Though not accepted by the Virginia Avian Records Committee as referring unambiguously to Yellow-legged Gull (Cross 1999), the observers' notes rule out all other species, hybrids, and forms. Another probable adult was seen at Fisherman Island NWR, 24 February 1994 (D. J. Schwab), but in this case, a hybrid of Herring Gull and Lesser Black-backed Gull was not ruled out. Abbott (1980) suggested that a yellow-legged Herring Gull present at Hunting Creek, Alexandria, was a possible candidate for *L. c. michahellis*. That bird, however, was described as being identical except in leg color to nearby American Herring Gulls, which precludes its identification as *michahellis*.

Close to Virginia, the species was recorded at Georgetown Reservoir, in Washington, D. C., on many occasions between 1 February 1990 and 4 April 1991, 26 December 1991 and 23 February 1992, and 9 January 1993 and 6 March 1993 (presumably the same adult each winter; D. Czaplak, pers. comm.; Armistead 1990, 1991b, 1991c, 1992, 1993; photograph in Armistead 1991b; Wilds and Czaplak 1994).

Records from neighboring Maryland are from Sandy Point State Park, Anne Arundel County, 13 September 1990 (M. O'Brien; Armistead 1991a), Alpha Ridge Landfill, Howard County, 11 February 1995 (E. J. Scarpulla, pers. comm.), Laytonsville Landfill, Montgomery County, 5 January and 16 March 1991 (M. O'Brien, P. O'Brien, et al.; Armistead 1991b, 1991c), 25 January 1992 (D. Czaplak; Armistead 1992), and 16 January 1993 (M. O'Brien et al.; Armistead 1993). The Laytonsville records may be of the Georgetown Reservoir bird.

Farther afield, confirmed records from North America are still few. Of many likely candidates present over several winters, one adult at Cape Point, Buxton, North Carolina, 13 March 1995 (Lewis 1996) was accepted by the North Carolina Bird Records Committee (LeGrand 1997). Other individuals documented at Buxton that were believed to be Yellow-legged Gulls have not been accepted by the committee, largely on the basis of possible or probable hybrid origin (LeGrand 1998). There are no other firm records from the Southeast or mid-Atlantic states, but there are several photographic records from Newfoundland and one specimen from the Madeleine Islands, Quebec (16 August 1973 [Gosselin et al. 1986, Wilds and Czaplak 1994]). The first for Newfoundland was found at St. John's from 16 January to 15 April 1985 (Heil 1985, Mactavish 1997), with subsequent records at that locality from 26 December 1994 (Mactavish 1995), 26 January to 16 February 1995 (Cornell et al. 1995, Mactavish 1997), 24 October to 30 November 1996 (believed to be the 1995 individual; Mactavish 1997; Mactavish and Fifield 1997), 31 December 1997 to 1 January 1998 and 30 January to 4 February 1998 (McLaren 1998, both michahellis). Two additional records from St. John's probably refer to Yellow-legged, possibly atlantis (McLaren 1999), those being from 10 and 13 February (one bird) and 17 February 1999 (two birds). All of these Canadian birds were in definitive plumage. Another bird in definitive plumage was described and photographed at the landfill in Manchester, Hartford County, Connecticut from 18 to 30 January 1999 (Hunt 1999). A clear Yellow-legged Gull at Nantucket, Massachusetts 28 December 2000

was not accepted by its state bird records committee (Hunt 2002), despite being carefully documented by the most experienced authorities in gull identification in New England.

This bird fulfills the field criteria for *Larus cachinnans michahellis* or similar western form in first-winter plumage (both in terms of "hard" and "soft" features) and shows nothing atypical, according to published material, for that form. As the first-winter plumage of *michahellis* is very distinctive from that of the nominate taxon, we were able to eliminate the latter readily. The bird at Back Bay did not resemble a hybrid between four-year gull species. This record represents a first for the Christmas Bird Count in North America.

ACKNOWLEDGMENTS

Many thanks to Paul E. Lehman, P. A. Buckley, Marshall J. Iliff, and Bruce Mactavish, who assisted in assembling accurately the roster of extralimital records of this species in North America. Mactavish was also instrumental in providing VARCOM with comparative photographs of first-winter *michahellis* from France.

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FEA'S PETREL (PTERODROMA FEAE) OFF THE VIRGINIA COAST

J. BRIAN PATTESON P. O. Box 772 Hatteras, NC 27943

GRAYSON B. PEARCE 338 Faire Chase Chesapeake, VA 23320

Edward S. BRINKLEY 9 Randolph Avenue Cape Charles, VA 23310

On 9 September 1995, the writers, along with Audrey J. Whitlock, Thomas M. Gwynn, III, and others, observed a Fea's Petrel (*Pterodroma feae*) along a strong seawater thermocline (front) at 36° 44′ N, 74° 37′ W, or about 88.5 km east of the northern extreme of Back Bay, Virginia Beach. The seas were relatively calm and winds about five knots from the east over the course of the day, although large swells of up to five m were regularly encountered in deep water, owing to the passage in previous two days of Hurricane *Luis*. However, the periods between the swells were up to 25-30 m, allowing the small fishing vessel *High Hopes* a comfortable ride and relatively favorable scanning and birding conditions for the entire day.

The bird was first observed by Brinkley at 1023 EDT from the tuna tower of the boat and radioed to the cockpit and bridge as an odd-looking gadfly petrel, "possibly a Black-capped Petrel." The bird disappeared to the stern behind a swell some 250 m distant. Patteson brought the boat about 180° and quickly relocated the bird at 1035, and we observed the bird along with the rest of the boat's party and Captain David Wright until about 1050.

When first relocated, the bird was attempting to evade two jaegers (*Stercorarius* spp.) about 15 m above the ocean's surface, one of which was a juvenile Long-tailed Jaeger (*S. longicaudus*), the other not positively identified but apparently a nonadult Pomarine Jaeger (*S. pomarinus*). During the observation, the bird was as close as 60-80 m for about five minutes, and at greater distances of 80-300 m for the remaining 10 minutes. The seawater temperature at the surface was measured at 25.6°C when the petrel was first located, and we found that the bird stayed in the vicinity of a seawater frontal boundary with a steep gradient (measured at 23.3°C versus 27.2°C) for most of the observation. The incursion of warm water was apparently a filament of Gulf Stream water that had sheared off to the west-northwest of the main current and moved into Virginia waters. Such anomalies occur irregularly and unpredictably at this latitude. Field notes on the bird taken by Brinkley are as follows:

"Very small gadfly petrel, grayish-brown above, with carpal-ulnar "M" pattern darker [than remainder of dorsal surface], visible at closest range in good light. Jizz very different from Blackcapped Petrel: wings much narrower, with slightly more spatulate primary region (hand) in most flight attitudes. The lends the bird a "boomerang" shape characteristic of Cape Verde Petrels [former common English name] seen off North Carolina 1981-1995 by myself and others. Underwing entirely and (in indirect 90-degree-angle light) uniformly sooty gray, with inner edge of leading edge of wing noticeably paler [white]. Tail noticeably paler than back (eliminating Soft-plumaged Petrel [P. mollis]) and briefly-seen outer rectrices paler still (nearly white) than remainder of inner caudal area (covered by pearly gray uppertail coverts). Head and bill stocky for size. Half-hooded appearance. No noticeably darker eyepatch (but that would be tough to see at 60 m). No neck collar [i.e., breast band]. Some gray-brown feathering at the sides of the breast occasionally showed up at certain angles but underside (throat, vent, breast, sides) otherwise immaculately white. Good light."

The senior authors and other observers concurred with these observations as they were recorded.

DISCUSSION

The small gadfly petrels of the North Atlantic have only recently come under close scrutiny by amateur and professional ornithologists. Currently, there is widespread scientific consensus that Bermuda Petrel (P. cahow) is indeed a distinct species (see Wingate et al. 1998), but scientists are divided as to how other small gadfly petrels are to be classified. Though there have been no thorough scientific studies to demonstrate their specific status and interspecific relationships, at least two forms of the northeastern North Atlantic have been recognized by some authorities as full species, these being the critically endangered Zino's Petrel (P. madeira) and Fea's Petrel (P. feae), formerly known as Gon-gon, Cape Verde Petrel, Cape Verde Islands Petrel, or Fea's Soft-plumaged Petrel (Bourne 1983, Zino and Zino 1986). The latter is typically divided into two subspecies, P. f. deserta, nesting at Bugio, Desertas Islands, and the nominate form, nesting in the Cape Verde Islands. G. B. Nunn (in litt.) and Nunn and Zino (in ms.) recognize these subspecies as full species, Desertas Petrel (P. deserta) and Fea's Petrel (P. feae sensu strictu), based on morphology, ecology, and extensive genetic analysis. Conversely, one authority recommends combining Zino's and Fea's Petrel forms into one species consisting of three subspecies, this proposal being based on similarity of call-types (Bretagnolle 1995). All of the eastern North Atlantic forms, it is generally agreed, are closely related.

It is accurate to say that a great majority of seabird researchers and field ornithologists familiar with seabirds who have evaluated photographs from North American pelagic waters find them to refer to P. feae rather than P. madeira, which is a smaller bird with a noticeably smaller bill; other features believed to be distinctive in the field are still debated (cf. Tove 1997). The relative size of the two taxa in question, as well as the disparate dimensions of their bills, should provide adequate characters for at-sea identification, particularly when these characters are documented photographically. A very small minority nonetheless remains skeptical of the field identifiability of these and other closely related groups of gadfly petrels (cf. Enticott and Tipling 1997), which has led to the ABA Checklist Committee accepting the North Carolina records only as "Pterodroma feae/madeira" for the time being (Dunn et al. 1999). The seventh edition of the American Ornithologists' Union's Check-list of North American Birds (1998) lists Fea's Petrel in Appendix B. Fea's Petrel is accepted without qualification by the North Carolina Bird Records Committee (1995, 1997) and by the VARCOM (Kain 1998, Cross 1999) as having been documented satisfactorily in North Carolina and Virginia, respectively.

Photographs of the Virginia bird taken by Patteson show a small gadfly petrel with a pale, pearly gray caudal area above. Because of difficulties in field separation from Zino's Petrel, the VARCOM assigned this record to Category 2 (lacking sufficient physical evidence), as the photograph does not show the proportions of body and bill that would indicate Fea's over Zino's Petrel (Kain 1998). The very heavy bill, however, was noted in the field by the authors, and the proportions of the bird were too great for the diminutive Zino's, leading us to refer the record with confidence to Fea's Petrel. The lack of dark barring in the side and flank feathers and the very pale caudal area would appear to indicate a bird whose origin was in the northern taxon, meaning that this Virginia record may indicate Desertas Petrel, should that proposed taxonomic "split" gain currency (Brinkley, unpubl. photographs of *P. [feae] feae*; see Tove 1997, Nunn and Zino, in prep).

The authors have a long familiarity with this petrel at sea. Over the 1990s, all three have observed and Patteson has photographed some 30 Fea's Petrels off the North Carolina coast (ca. 80 per cent of documented North American records), in the process contributing substantially to the international dialogue on the field identification of this form (Brinkley and Patteson 1998). In the early 1980s, Pearce spotted the first North American record of what was then called the "Soft-plumaged Petrel" off Hatteras Inlet 24 May 1981 (Tove 1997). Many of Patteson's photographs have been published and disseminated by Internet (see Tove 1997, Brinkley and Patteson 1998, Dunn et al. 1999; see also http://www.patteson.com) and are acknowledged to be of Fea's Petrel by authorities on the complex.

In Virginia, in addition to the pelagic record, a single Fea's Petrel has been noted onshore, 6 September 1996 at Kerr Reservoir, Mecklenberg County, a waif of Hurricane *Fran* (Brinkley et al. 1998, Cross 1999). This species should be looked for off the Virginia coast in deep water, as it has been found annually in North Carolina's pelagic zone since 1992, always between 24 May and 16 September (Patteson, unpubl.). A Fea's Petrel or related species was noted on the later date of 9 Novem-

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ber 1984 off Georgia (Haney et al. 1993). Most Fea's Petrels off North Carolina have been found in the warm water of the Gulf Stream (typically 23.9°C or warmer), with many of the these records coming from waters only 100-160 km from the offshore Virginia record. Nevertheless, it may be that even the cooler Labrador Current waters off Virginia hold small numbers of the species, as there is one pelagic record from Canadian waters, from a deepwater canyon known as the "Gully," off Nova Scotia, from 7 July 1997 (Hooker and Baird 1997). Apart from this record, Patteson's photographs, and another a half-dozen others taken off North Carolina (Tove 1997), the only other record of the species in the western North Atlantic comes from Cape May, New Jersey, where a Fea's/Desertas Petrel passed the seawatch at Cape May Point State Park 6 September 1999 during the passage of Hurricane *Dennis* through the mid-Atlantic Coastal Plain (Larson et al. 2000; P. Symens, *in litt.*) The species has also been seen from seawatches on the coast of Ireland and elsewhere in Great Britain and the Netherlands (A. McGeehan, pers. comm.).

ACKNOWLEDGMENTS

The authors wish to thank Gary B. Nunn, of Perkin-Elmer Biosystems, Inc., and Francis Zino, M. D., for their help in navigating the turbulent waters of gadflypetrel systematics. Thanks are also due Captain David Wright, who helped us in documenting the Fea's Petrel off Virginia.

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A WHITE-TAILED KITE RECORD FOR THE EASTERN SHORE

BILL WILLIAMS 154 Lakewood Drive Williamsburg, Virginia 23185

At approximately 1100 EST 26 April 1998 a White-tailed Kite (*Elanus leucurus*) was observed from the Hardees parking lot in Cheriton, Northampton County, Virginia. Its long, narrow-winged shape, relative size, and very distinctive behavior made it immediately recognizable. Present in the vicinity were numerous Laughing Gulls (*Larus atricilla*). The bird was observed for approximately 5-7 minutes in hovering posture, extended flight, and perched, before it disappeared to the southwest being harassed by Laughing Gulls. Its flight and hovering were noticeably light and buoyant. At all times it appeared distinctively silver. All observations were made with 8 X 42 binoculars under excellent light conditions. There was a brisk westerly breeze.

The bird's relatively small, round head was silvery white across the crown and nape. Despite all the observation time the face was not seen well enough to note if the lores and supraloral area were black. The mantle and dorsal surface of the wings to the primary tips were silvery gray. The notably pointed and angular wings were substantially paler and proportionately longer and narrower than those of the ubiquitous Laughing Gulls. Each wing had a very distinct black epaulet covering the lesser and median coverts. Only the distal portion of the underwing was seen. It was grayish white with black at the tips of the primaries. The tail was proportionately long and appeared to be slightly notched. Its dorsal and ventral surfaces were completely white as were the breast, belly, and flanks. The legs were not seen, even when the bird perched for a few seconds about 400 meters away. No vocalizations were heard.

The kite was initially seen hovering 8-10 meters above a fallow field at a distance of approximately 80 meters. Its silvery, pointed wings were held high over its body. Their beat was shallow, mostly from the distal end giving the wings a very angular appearance, as the primaries seemed to be pointed posteriorly. The black "shoulder patch" was quite evident in this flight position. The tail was tucked somewhat under the body though not quite perpendicular to the ground and the head was pointed down. Flight in this position seemed light. The bird would hover for a few seconds, then cease movement, causing it to drop a meter or so before elevating itself to its original position to resume hovering.

As Laughing Gulls began to harass the kite, it left the field and flew southwest over U. S. Route 13. It crossed a cultivated field and briefly landed in a tree in a hedge row. It remained there less than 30 seconds then disappeared to the southwest. Even without binoculars the bird was easy to distinguish from the Laughing Gulls by it silvery white appearance, long narrow, angular wings and light, buoyant flight behavior. It seemed to be tossed about as it angled into the wind.

When this hovering bird was first observed it was readily apparent it was a kite by its body size, proportions, color, and behavior. I had seen a Swallowtailed Kite near this location in early April several years previous and approximately six weeks earlier had seen numerous Swallow-tailed and several Whitetailed Kites in Costa Rica. Mississippi Kites (*Ictinia misisippiensis*) have become almost regular on the Eastern Shore in the spring, though typically somewhat later. It was easy to eliminate Swallow-tail Kite from consideration since the observed bird did not have a black, forked tail, or black over the dorsal wing surface, and ventral trailing edge of the wing. Behaviorally, Swallow-tail Kites do not hover, preferring to soar when hunting. This species is also noticeably larger than the White-tailed Kite. Mississippi Kite was also ruled out when it was apparent the bird's tail was completely white above and below and its basic body color lacked any semblance of being completely gray. Mississippi Kites also prefer to hunt on the wing, seldom hovering. Finally, and conclusively, the black "shoulders" on this bird were clearly observed.

A hovering, silvery white bird on the Eastern Shore of Virginia in the spring immediately brings to mind several other species for consideration including adult male Northern Harrier (Circus cyaneus), Osprey (Pandion haeliatus) and several gull and tern species. Of these the Northern Harrier would be most similar in size, body proportions, color, and behavior. However, this species lacks the black wing coverts, and has more rounded, somewhat wider, and less angular wings than the White-tailed Kite. Its proportionately long tail is gray with a diagnostic white rump and a black subterminal band, neither of which were observed. Ospreys also hover extensively, though they would be unlikely to hover over fallow fields, at least to the extent of the observed bird. They are white ventrally but very recognizably dark brown over their entire dorsal surface. Their wings are broader and more round at the tip than the observed bird and their tails are proportionately shorter and clearly fan-shaped. Terns on the other hand, especially Gull-billed Terns (Sterna nilotica), would certainly be expected over Eastern Shore fields in the spring. Though they have shorter tails and clearly show a black cap, their pointed wings, and white coloration would be similar to the bird seen in this instance. However, their feeding behavior over fallow fields consists of progressive swooping and darting after insects, not hovering. Even Royal (S. maxima) and Caspian (S. caspia) terns, which might hover over a field, and are the only species the size of the bird seen, would easily be recognized by bill size and color, and shorter tails. They too would have a black cap or crest as they would most likely be in alternate plumage. The only gulls that might be considered by virtue of their approximate size would be Herring (Larus argentatus) and Ring-billed (L. delawarensis), the latter more so because of the location near a fast food establishment than the former. In either case, neither would have the proportionately long tail, black shoulder epaulets, narrow, pointed wings, or a small rounded head as did the bird described. Each of these species may hover as described, but not extensively over a fallow field. Nor would

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they appear light and buoyant in flight, and would unlikely be harassed by Laughing Gulls unless they were carrying potential food.

This sighting is the second Virginia record for this species and the first for the Eastern Shore. The state's first White-tailed Kite record occurred 3 June 1988 in Charles City County (Williams 1988). North of Virginia there is a 1910 record from Massachusetts (Fay 1910) and a 1983 record from New York state (Boyle et al. 1983). In 1998, an adult White-tail Kite was seen at Cape May, New Jersey for that state's first and only record (Paxton et al. 1998). Maryland has had one report though it was rejected by the state's records committee (M. Iliff pers. comm.). To the south, North Carolina had its second sighting, and only confirmed record, at Fort Fisher 8 April 1989 (Legrand 1989). The species is a resident in Florida (American Ornithologists' Union, 1998). As recently as May 1999 a nest near Osceola, Florida fledged 5 young for the first successful breeding in the central part of that state (Pranty, 1999).

ACKNOWLEDGMENTS

The is author very grateful to Marshall Iliff for his assistance.

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SHORT-TAILED SHEARWATER (PUFFINUS TENUIROSTRIS) AT NORFOLK CANYON

Edward S. Brinkley 9 Randolph Avenue Cape Charles, VA 23310

J. BRIAN PATTESON P. O. Box 772 Hatteras, NC 27943

CRAIG TUMER 1437 #1 R Street, NW Washington, DC 20009

On 18 January 1998, the writers and other participants aboard the headboat *Nancy Anne* observed a dark *Puffinus* shearwater that we identified in the field as a Short-tailed Shearwater, a bird of the Pacific Ocean basin. The bird was observed at the head of the Norfolk Canyon, some 100 km east of Cape Henry, for a total of about five minutes. It associated loosely with other seabirds at the rear of the boat, at distances of five to 500 meters. The observation was under heavily overcast skies, with a wind-sea state of about Force Four on the Beaufort Scale; the seawater surface temperature was not recorded, and the air temperature was approximately 3° C.

On three occasions, the bird passed through the "chum slick" (ground beef fat) attended by Herring Gull (Larus argentatus), Great Black-backed Gull (Larus marinus), Northern Gannet (Sula bassana), and Northern Fulmar (Fulmarus glacialis). Initially, the bird approached the feeding flock rapidly from well off the starboard stern, investigated the aggregation of gulls and a few fulmars over the chum, and departed away from the boat. Brinkley was the first to note it and called it to the attention of guides and participants. At this point, the bird was felt to be a dark shearwater, though at first (in calling it to the attention of the boat), Brinkley had called out a possible dark fulmar. Its second pass was behind the feeding gulls and gannets in the wake; the bird flew in a direct line behind the group and was lost behind a swell. It then reappeared about 20 minutes later amidships port, at a distance of about five meters and flew very rapidly toward the feeding flock, which it again did not join. It was at this point that the head and bill could be observed to best advantage. It passed out of sight to the starboard side of the wake and the feeding flock and was not seen again, despite our pass back in the direction of our chum line. The flight was rapid, direct, and arcing, perhaps a bit snappier than Sooty Shearwater and perhaps with a little less "wrist," but Sooty has a large suite of flight behaviors in various wind and sea states, so it would be unwise to make generalizations based on five minutes' observation of an individual bird.

Being in the port stern of the boat, Brinkley was physically closest to the bird and so able to observe the bird in greatest detail, noting particularly well the color and structure of the bill and head and the color of the eye. Other observers were able to study the overall proportions and pigmentation of the bird, including the underwing pattern. On the bird's third and closest pass by the stern, all experienced observers felt that the bird was neither a dark gadfly petrel (*Pterodroma* sp.), nor a dark-morph Northern Fulmar, nor a Sooty Shearwater (*Puffinus griseus*). Several intermediate ("light-dark") fulmars followed the boat for much of the afternoon, offering indirect comparison to the shearwater. Patteson and several other observers on board (George Wheaton among them) have experience with Short-tailed Shearwater from the eastern Pacific Ocean, and although Brinkley and Tumer have no experience with the species, both were certain that the bird represented a species new to them. The characters noted in the field by the writers and participants are as follows.

FIELD OBSERVATIONS

Size and proportions. - When seen at considerable distance, the shearwater was noted in the vicinity of a light-morph fulmar (one of 30 or more seen over the course of the day). Brinkley assumed it must be a dark-morph fulmar and watched it as it approached the feeding flock of gulls and gannets in the chum line. Its wingstrokes differed from the those of the nearby fulmar, being less lumbering, more sprightly, snappy, and direct, in other words, resembling those of mediumsized Puffinus shearwaters. In wingspan, in direct comparison with an arcing fulmar, the bird had appeared to be about 10-15 per cent smaller in span, though in body length the bird did not seem that much smaller at all. As the bird moved away from the feeding assemblage, both Patteson and Brinkley noted a dully paler central underwing, dark brown dorsal surface, and general proportions that were clearly wrong for any morph of fulmar. In subsequent studies of the bird, as close as five meters, Brinkley and other birders on the stern noted that the bird appeared more stubby-bodied than Sooty Shearwater, to have a steep forehead, a rounded crown, more spherical head overall, and a rather shorter bill than Sooty Shearwater. Our impression, too, was that the wings appeared a bit more compact, perhaps encompassing less area overall than those of Sooty Shearwater. On one occasion, the bird seemed to have a little bit of a "pot belly" to Brinkley, but such subjective characterizations can be misleading. Those familiar with the species felt then that the individual must be a Short-tailed Shearwater.

Head and bill. – Seen at closest range, these characters were consistent and striking and confirmed the impression of a species other than Sooty Shearwater. The overall cephalic projection appeared to be proportionately less than that of the Sooties we see so commonly from shore (especially at Cape Point, Buxton, North Carolina, where they sometimes pass just a few meters off the beach by the thousands) and on the spring pelagic trips off Maryland, Virginia, and North Carolina, as well as off California. Probably in part because of this smaller cephalic projec-

tion, the head seemed smaller, but this impression may have been strengthened by the combined appearance of a steep forehead and an apparently shorter, smaller bill. A pertinent analogy was drawn to the differences in the head and bill of Bermuda and Black-capped petrels (*Pterodroma cahow* and *P. hasitata*; cf. Wingate et al. 1997). The smaller bill of Bermuda Petrel lends the bird a more "dove-like" appearance, less formidable and raptor-like than that of the larger-billed Black-capped Petrel. When Bermuda Petrel was first observed off Cape Hatteras in 1993, this was one of the first cues that we were looking at an unfamiliar species. Likewise, with this shearwater, the impression was of a sort of "pygmy" Sooty Shearwater head, different in shape and proportion. In short, the overall impression was of a "gentler"-looking bird than Sooty Shearwater.

The bill itself appeared completely dark and proportionately probably shorter than that of Sooty Shearwater, which we perceive as having a relatively long and rather shallow bill among the common East Coast shearwaters. Both naricorn and maxillary unguis blended unobtrusively into the culmen of this small, dark bill, which immediately ruled out any species of gadfly petrel, whose bills are deeper and whose maxillary unguises are more strikingly arched. The bird's bill also handily ruled out a dark fulmar, which has a thick, stubby bill held well below the horizontal in flight.

Body plumage. – The bird appeared uniformly dark brown above. The mantle and rump sometimes appeared faintly paler, sometimes concolorous with the head. This variable impression was also the case ventrally: sometimes the bird appeared to be uniformly dark gray-brown below, and on two occasions, the bird appeared a bit darker-headed, with a slight but noticeable "dark-hooded" look (including the entire cephalic area, with throat and uppermost breast). When the bird was closest and in most favorable lighting conditions, several observers had the impression of a paler belly or ventral area below the uppermost breast. This impression of paler underparts contrasting with darker cephalic area was perhaps strengthened by the axillaries, which were clearly dark brown (see below). It was not possible to detect any molt of body plumage (difficult to detect on tubenoses at sea in any case), though molt might have also contributed to or caused the impression of a paler central belly. It is not known whether these abdominal feathers might wear or bleach differently than those of the head, but it is certainly possible.

Underwing and upperwing surfaces. – We did recall while on board that most of the literature on Short-tailed Shearwater cautions that underwing patterns in Sooty and Short-tailed Shearwaters are highly variable and not in themselves reliable for field identification of these species. In any event, all observers on board saw the same underwing pattern: a dark leading edge (lesser underwing coverts) and trailing edge (remiges' distal ends) to the wing and a dully paler but not highly contrasting center underwing (median and greater underwing coverts). At no point did these coverts "light up" (there was no direct sunlight to illuminate them). They appeared consistently paler from the carpal to the axillaries, without any incursions of darker streaks or any intrusive patterning. The bird seemed in crisp plumage, with no trace of molt in the wings anywhere, neither with feathers being replaced nor with different ages of remige when view dorsally. The upperwing surface appeared uniformly dark brown (with some very small grayish component, perhaps, at some angles), the remiges perhaps a bit darker. No one perceived a dark carpal-ulnar "M" pattern such as one sees on many medium-sized tubenoses.

Feet, eye, and tail. – The tail was entirely blackish brown and tapered to a point. It was spread several times, briefly, during course changes, but nothing in particular was noted about the rectrices other than that they did not appear to be in molt. The caudal projection seemed noticeably longer than the cephalic projection. The feet and legs appeared to be all dark when Brinkley saw them, briefly, flush against the undertail coverts and central rectrices. The tips of the toes projected a bit beyond these rectrices. The eye appeared to be dark at closest range.

DISCUSSION

None of the impressions gathered at sea could be confirmed with measurements. It occurred to us that a Sooty Shearwater seen in the winter might well fly differently than those we see in the warmer months, and that it might hold itself (its head in particular) differently in very cold weather. We have encountered Sooty Shearwater in the winter on two occasions (two birds on 9 February 1997 off Cape Hatteras; Davis 1997; and one bird on 21 February 1998 off Virginia Beach; Iliff 1998); these records represent two of only seven winter records for the western North Atlantic Ocean. On these occasions, we did not find that these birds differed in any respects from the Sooties seen in warmer months.

At the time of observation, we did not have or make reference to literature on the identification of all-dark Puffinus shearwaters. We did not consider Puffinus species other than Manx-complex (P. puffinus and related forms) and Sooty Shearwaters in the field, as none show proportions similar to the bird we studied. Thus we excluded very different Puffinus such as Flesh-footed (P. carneipes), Christmas (P. nativitatis), and Wedge-tailed (P. pacificus) from consideration. The proportions of bill exclude gadfly petrels such as Great-winged (Pterodroma macroptera), a possible vagrant to the North Atlantic. In the complex of Manx-like shearwaters, "Balearic Shearwater" (P. [yelkouan] mauretanicus) is a distinct possibility for western North Atlantic vagrancy (Brinkley 2000), as they disperse away from the Balearic Islands and northward into the northeastern North Atlantic at this time of year (Paterson 1997). In the complex of Manx-like shearwaters, this form most closely resembles Short-tailed Shearwater. Nevertheless, in all published photographs and illustrations we have located, Balearic Shearwater has a shape much like that of Manx Shearwater, with a sloping forehead, a longish, thin bill, and a stub-tailed appearance (caudal projection less than cephalic), with feet projecting well beyond the tips of the central rectrices (cf. Bourne et al. 1988, Yésou 1990). We observed one Manx Shearwater later that day, and we felt strongly, based on that encounter, that we could safely rule out the Manx-complex in the earlier sighting, including melanomorphs.

Review comments from researchers and ornithologists familiar with both Sooty and Short-tailed Shearwater (David A. Sibley, Richard A. Rowlett, Russell Fraker, Randall P. Moore, and Angus Wilson) have been uniformly supportive of this record as referring to *Puffinus tenuirostris*, as was the Virginia Avian Records Committee, which placed the record in Category 2 (Cross 2000). All reviewers of this record noted that, although some plumage characters tend to be seen more often in Short-tailed Shearwater than in Sooty Shearwater, no single character of plumage is diagnostic for either species. Rather, the shorter bill, steeper forehead, small, more rounded and "dove-like" head (and short cephalic projection when compared to caudal projection) comprise the best set of characters for at-sea identification of the species.

Consultation of the standard references for seabird identification has confirmed our study of plumage and particularly structure as referring to Short-tailed Shearwater. In our estimation, the photographic record more accurately depicts structural differences between the two species than do most illustrations. Photographs in all sources we examined (Harrison 1987/1997, Enticott and Tipling 1997, Farrand 1988, Lindsey 1986) depict consistent and noticeable differences in overall proportions, whereas some illustrations (particularly those in Harrison 1983/1987) do not record these distinctions as faithfully. Illustrations in Marchant and Higgins (1990), Dunn et al. (1999), Sibley (2000), and Shirihai (2002), however, do capture the subtle differences well, and the descriptions in those texts support the identification of the Virginia bird as Short-tailed Shearwater.

This record represents the first for the western North Atlantic and indeed the Atlantic basin, though it is by no means a singular instance of a displaced Pacific seabird in this ocean. New Jersey's recent record of Buller's Shearwater, as well as California's three recent records of Greater Shearwater, attest to the frequency with which such transequatorial migrant procellariids may end up in the "wrong" ocean. Bourne (1967) notes scores of older instances of even greater displacement. Given the enormous populations of Short-tailed Shearwater in the southern hemisphere (at some 23 million breeding birds, thus a population of over 35 million, one of the most abundant seabird species in the world; Marchant and Higgins 1990) and its epic annual migration into the northern Bering Sea, it is scarcely surprising that the species has turned up off our shores.

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SIXTY YEARS AGO IN THE RAVEN

From RED CROSSBILLS AT LEXINGTON, VIRGINIA. The Raven 12(4&5): 28-29 (1941).

It has long been known that the Red Crossbill (*Loxia curvirostra*) is a bird of erratic occurrence. So much is this true that several years ago the Crossbill from Sitka, Alaska appeared in Washington, D.C.

I have spent several years in the central part of New York State and during these years, only two records of an invasion of these birds were called to my attention. I had never seen the birds until this year when a small invasion of this species visited the area near Cornell University.

During my spring vacation, April 1, Miss Sally Foresman and I visited my family in Lexington. While there but three days, we spent most of our time in the field photographing and studying the birds. Our greatest surprise was when on April 3, we found a flock of twenty-seven Red Crossbills in a small pine tree not more than fifteen feet from a road about three miles northwest of Lexington. While watching these birds feeding on the seeds in the pine cones, a small flock of both sexes drifted down to a mud puddle ten feet from where we were standing. Here, they slowly and deliberately drunk for several minutes , allowing us ample time to make very close and interesting observations. These few soon flew up to another small pine and were joined by the rest of the flock. They continued to mill around in the top of this tree for about ten minutes before they flew off to a clump of pines on a nearby hill, calling as they went. J. Southgate Y. Hoyt, Laboratory of Ornithology, Cornell University, Ithaca, N.Y.

[*Editor's note*: Miss Foresman and Mr. Hoyt were married the following year, in 1942. In 1948, both received Ph.D.'s in ornithology from Cornell University. She worked in the Laboratory of Ornithology in various capacities until 1969, working with Arthur Allen among others. Southgate Hoyt died in 1951, and Sally Foresman died in October of 2002.]

From THE SEASON (1940) AT BLACKSBURG, MONTGOMERY COUNTY, VIR-GINIA, Charles Handley, Jr. The Raven 12(1): 2 (1941)

On May 27, the Black Rails arrived and were seen in increasing numbers up until about the 5th of June. About this time they became increasingly hard to flush, indicating nesting. The last birds were flushed on June 14, and by this time the marsh plants had grown so thick that it required the service of a dog to flush the rails. During the period of observation, there were four or more pairs of Black Rails in two of the larger marshes near Blacksburg. During this same period the nests of 4 Virginia Rails were located in three different marshes, and from June 12-14 an American Bittern was heard "pumping" in a marsh south of Blacksburg... From THE CHRISTMAS CENSUS. The Raven 12(1): 9 (1941)

Mountain Lake, Giles County, Virginia (Little Stony Creek Valley, from Bob Fields on Big Mountain (elevation 4100 feet) to beaver pond on Hoge farm (elevation 3100 feet). Dec. 27; 8:00 A.M. to 2:30 P.M. Heavy fog from 8:00 to 12:00 noon, with visibility less than 100 feet; intermittent rain remainder of period; strong southeast wind; temp. 46° at start 54° at finish. Two observers working together. Total hours afield, 6 $\frac{1}{2}$; total miles 16 (6 afoot, 10 by car). Ruffed Grouse, 3; Redtailed Hawk, 1; Northern Raven, 2; White-throated Sparrow, 1 (wintering at a small buckwheat field on Big Mountain at about 4000 feet elevation; also observed a the same point on Dec. 21); Carolina Junco, 73; White-Breasted Nuthatch, 2. Total 5 species, 82 individuals. – C. O. Handley, Jr. and C. O. Handley.

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, Paul R. Cabe, Biology Department, Washington & Lee University, Lexington, VA 24450 (cabep@wlu.edu).

Most manuscripts published in *The Raven* concern the distribution, abundance, and migration of birds in Virginia. Manuscripts on other ornithological topics, including Virginia-based historical reviews, bibliographical reviews, life history, 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 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.

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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:

 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 ast 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 issue.

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

In additions, 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 Paul R. Cabe, Biology Department, Washington & Lee University, Lexington, VA 24450.

OFFICERS OF THE VSO

President: Larry Lynch, 9430 Tuxford Road, Richmond, Virginia 23236 Vice President: Teta Kain, 7085 Caffee Creek Lane, Gloucester, Virginia 23061 Secretary: Lauren Scott, 11838 Chase Wellesley Drive #425, Richmond, Virginia 23233

Treasurer: Barbara Thrasher, 120 Woodbine Drive, Lynchburg, Virginia 24502

Raven Editor: Paul R. Cabe, Biology Dept., Washington & Lee University, Lexington, Virginia 24450.

Newsletter Editor: Linda Fields and Alan Schreck, 1573 21st Ct. N., Arlington, Virginia 22209

The Raven

JOURNAL OF THE VIRGINIA SOCIETY OF ORNITHOLOGY

Editor Paul R. Cabe



Volume 72, No. 2

Published by THE VIRGINIA SOCIETY OF ORNITHOLOGY

Fall 2001

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ISSN 0034-0146

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SEABIRD RECORDS ASSOCIATED WITH HURRICANE ACTIVITY IN VIRGINIA IN THE LATE 1990S

EDWARD S. BRINKLEY 9 Randolph Avenue Cape Charles, VA 23310-3123

> C. MICHAEL STINSON Route 2, Box 7280 Dillwyn, VA 23936

BRIAN TABER Coastal Virginia Wildlife Observatory P. O. Box 912 Eastville, VA 23347

> BILL WILLIAMS 154 Lakewood Drive Williamsburg, VA 23185

INTRODUCTION

Considered individually, the years 1995, 1996, 1998, and 1999 were each among the most active years on record for Atlantic tropical cyclones, with 19, 13, 14, and 12 storms, respectively. Analyzed as a whole, the period 1995-1999 was the most active five-year period yet recorded in the Atlantic, with 65 tropical storms, 41 hurricanes, and 20 major hurricanes. Between 1995 and 1999, the 20 "major" (Category Three to Five on the Saffir-Simpson scale of tropical storm intensity) hurricanes in the Atlantic also nearly constituted a record: 20 is a higher count than in any comparable period of time in the twentieth century and is four times the average since 1896. On 25 September 1998, in a striking example of the intensity of this recent phase of activity, Hurricanes *Georges, Ivan, Jeanne*, and *Karl* persisted simultaneously as hurricanes. Not since 22 August 1893, during a period rather similar to the late 1990s, had four full hurricanes co-existed in the Atlantic basin (Neumann et al. 1999).

The number of unusual bird records associated with this active period has been likewise unprecedented. Although the storms of 1995 did not track into the North American interior, those of 1996 did in the cases of *Bertha* and *Fran*. Students of birdlife from the Carolinas to Ontario found waterbirds, including pelagic seabirds, displaced by the many hundreds (Brinkley et al. 1997). The tropical storms of 1998 and 1999 remained east of the Virginia coast for the most part but nevertheless generated a significant number of storm-associated bird records, especially *Bonnie* of 1998 and *Dennis* of 1999. Historically, the number and diversity of seabirds observed on and from land in the context of tropical storms increases with the strength of the storm and its track: storms that pass east of the coastline tend to produce few records of pelagic birds from land (Brinkley, in ms.).

This article digests the reviewed records that have accumulated from the late 1990s' tropical cyclones (Table 1). Preliminary sight records have been widely disseminated via the Internet and published in journals such as *Field Notes/North American Birds* (e.g., Iliff 1997, 1999, 2000, Brinkley 1997, Brinkley et al. 1997), but the large number of sight records involved with these storms has meant, inevitably, that errors in dates, numbers and species of birds, and erroneous or unsupported reports made their way into print. No supporting documentation has been published previously on any of the Virginia records; the following account may be considered definitive.

 Table 1. Tropical cyclones 1996-1999 that produced noteworthy bird records in Virginia.

| Storm name | Max. Storm strength (Saffir- Simpson) | Dates of passage through Virginia | Storm Track | Observation dates | Number of pelagic species recorded |
|---------------|--|---|-----------------------------|-----------------------|---|
| Bertha | 3 | 13 July 1996 | through Chespeake Bay | 12-19 July 1996 | 12 |
| Fran | 3 | 6 September 1996 | through Piedmont | 6-7 September 1996 | 16 |
| Josephine | [extratropical] | 8 October 1996 | East of Capes | 8 October 1996 | 1 |
| Bonnie | 3 | 27 August 1998 | East of Virginia Beach | 27 August 1998 | 5 |
| Dennis | 2 | 30 August to 6 September 1999 (stalled offshore) | Off Virginia Beach | 2-7 September 1999 | 10-11 |
| Floyd | 4 | 15-16 September 1999 | Off Virginia Beach | 16 September 1999 | 1 |

Following the turbulent storm period of the 1930s through the 1950s, the 1960s through early 1990s marked a relatively quiet period for landfalling Atlantic tropical storms; over the 20-year interval 1960-1979, both the number and intensity of landfalling U. S. hurricanes decreased quite sharply. In September 1979, with *David*, the mid-Atlantic birding community became generally more aware of the displacement of seabirds by tropical storms and hurricanes (Scott 1980); in addition to displacing several tropical terns into Virginia (Bazuin 1983), *David* - which had been a relatively weak Category 1 hurricane at landfall in North Carolina - brought

a Black-capped Petrel to Covington, Alleghany County on 6 September 1979 (per J. Via), a dramatic instance of the capacity of even decaying systems to transport pelagic seabirds far into the interior. Even before *David*, ornithologists such as P. A. Buckley and Anthony J. Lauro in New York, and John O. Fussell, III, Derb Carter, and Harry LeGrand, Jr., in North Carolina had made significant contributions to the art of discovering storm-driven birds and interpreting birds' patterns of displacement during tropical cyclones in the 1960s and 1970s (Buckley 1960, Fussell and Allen-Grimes 1980). This conversation continued through the 1980s, chiefly in the Carolinas (LeGrand 1983, 1985, 1986a, 1986b, 1990a, 1990b, 1990c).

Prior to this period, Virginia had only a few records of hurricane-displaced seabirds, and so speculation about the phenomenon could be based only on a few data points, as had been true in the early twentieth century as well (Murphy [1936] has the most complete consideration of the phenomenon). Records such as the White-tailed Tropicbird found at Staunton after the Category Five Hurricane Hazel on 15 October 1954 (Larner 1979; one of four of the species so displaced to the interior, the other three being to New York and Pennsylvania), as well as older records of three Black-capped Petrel near Blacksburg and Winchester on 30 August 1893 following the "Sea Islands hurricane" (Smyth 1893, Clapp and Mehner 1992), had been considered extraordinary, even singular occurrences. Less unusual but also noteworthy were past observations of multiple Leach's Storm-Petrels in the state from the middles of the nineteenth and twentieth centuries: after Connie on 15 August 1955, which brought 12 to Norfolk; after the "Chesapeake-Potomac Hurricane," which transported 15-20 as far inland as Norfolk on 26 August 1933 (Murray 1952); and after the "Great Storm" of August 1842, which moved "several" to Petersburg (Rives 1890). Finally, five frigatebirds (of some 14 Virginia reports of Fregata) are likely associated with tropical storms: one at Kingsmill on the James River 6 September 1979 after David (Armour 1980), one at Alexandria 3 October 1988 after the landfall of Gilbert (Armistead 1989, Dalmas 1990), a Magnificent near Rural Retreat, Wythe County 13 October 1988 well after Gilbert (Stanley 1991), a Magnificent at Chincoteague NWR 20-28 September 1998, and one at Claytor Lake State Park, Pulaski County 6 October 1998, the latter two probably, but not clearly, related to the activity of Georges (Iliff 1999). The paucity of records of such birds away from the ocean has almost certainly been an artifact of the small number of observers until very recent times and also of the general lack of awareness of hurricanes' effects on seabirds.

In the years since *David*, the ranks of amateur ornithologists and birders have swelled significantly, but the strategies for seeking out birds during and after hurricane passage (e.g. see Fussell and Allen-Grimes 1980) remained relatively unknown, largely because there had been so little opportunity to test them in Virginia. Hurrican *Hugo* of 1989 was so destructive that birding in its aftermath was impractical or impossible. Nonetheless, a Black-capped Petrel was recovered at Verona, Augusta County 23 September 1989, following *Hugo* (Ake 1991). The subsequent six years, 1990-1995, offered no similar opportunities to observe tropical systems' effects on seabirds, although Hurricane *Bob* brought one Sooty Tern to the Chesapeake Bay mouth in August 1991 (Virginia Avian Records Committee [VARCOM] archive), and Tropical Storm *Beryl* produced a Band-rumped Storm-Petrel near Tryon, Polk County, North Carolina, in 1994 (Davis 1995). The late 1990s, however, provided exceptional opportunities to study the displacement of seabirds by landfalling Atlantic hurricanes and have greatly advanced our understanding of this phenomenon. Indeed, speculations following *Bertha* and *Fran* of 1996 (Brinkley et al. 1997) could be tested and retested during *Bonnie* of 1998 and *Dennis* and *Floyd* of 1999 (Brinkley 1999). Although the tropical storms of 1996, 1998, and 1999 did not produce a record of a tropicbird, they did entrain representatives of all other pelagic species recorded in Virginia as a result of tropical systems in the previous 153 years, as well as six species new to that list, and yielded an assemblage of records that surpasses anything observed in the Commonwealth in the past.

This article presents results of informal field work by the authors, Robert L. Anderson, David L. Hughes, George Harris, Joyce Livermore, Thomas M. Gwynn, H. Fenton Day, William Portlock (Hurricane Bertha of 1996); Day, Brinkley, Stinson, Anderson, Gwynn, Grayson B. Pearce, Brian L. Sullivan, and J. Brian Patteson (Hurricane Fran of 1996); the authors, Patteson, George C. Wheaton, and Donald J. Schwab (Hurricane Bonnie of 1998); Brinkley, Patteson, Randall P. Moore, Jamie P. Cameron, Steven W. Hairfield (Hurricane Dennis of 1999); and H. T. Armistead, Patteson, Pearce, Cameron, Brinkley, Hairfield, and Anderson (Hurricane Floyd of 1999). Coobservers of various birds included Rebecca White, Richard Cech, Thuy Tran, Nan LaRue, Dorothy Silsby, David Clark, George Wheaton, Beverly Leeuwenburg, Thomas C. Armour, and Joy Cooley. We also include here, for completeness, a few unreviewed reports from several other observers, including Lamar Gore, Barry Truitt [BTr], Bart Paxton, Irv Ailes, Aaron Haynes, Leslie E. Willis, Samuel H. Dyke, and J. and C. Gibson. Observers are noted with initials in Tables 2-8 below. Reports of review-list species for which no written documentation is on file with VARCOM are flagged with an asterisk in the tables.

Other observations from these storms have been published elsewhere (Brinkley et al. 1997; Brinkley 1999), and in the time since those articles, documentation related to these records has been reviewed and accepted by the VARCOM; the records reported here may be cross-referenced with the Committee's reports published in the *Raven* (Cross 1999, 2000). Other reports related to hurricanes have not been submitted to the Committee or have not been accepted.

Typically, descriptions of uncommon or rare species entail a single record of a single individual or group of birds seen on one or more days. The nature of hurricane displacement of seabirds, shorebirds, and other birds presents a different challenge. Vast numbers of pelagic birds are sometimes displaced far into the interior of continental North America. Also during such storms, overland migrants may be grounded while on migration or may seek shelter from harsh conditions. In the second half of the 1990s, hurricane-related bird records were legion, and of necessity, the reports made to VARCOM have been different from typical submissions. Records of some species were treated in greater detail than others; typically,

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very common species received short shrift, whereas little-known pelagic species merited more consideration in the field and the field notes of observers. Conditions in the field following tropical cyclones are usually not favorable for leisurely note-taking, much less for photography, though the viewing conditions during the storms *Bertha* and *Fran* in 1996, *Bonnie* in 1998, and *Dennis* and (to a lesser extent) *Floyd* in 1999 were favorable for prolonged observations and in-field discussions among multiple observers.

This article records the substance of identifications made in the field with the various species under observation, recorded in some cases after the birds were out of sight but as rapidly as the situations permitted. The observers have confirmed that the descriptions offered in this article were consensual in the field for multiple-observer records. Consensus in the field often took the form of calling out the relevant characters; for this reason, some descriptions are provided as lists of relevant marks observed in the field. In some cases, elaboration of terms such as "wingstripe" or "carpal bar" was provided for clarity to the VARCOM, though no such explanation was rehearsed in the field, whereas in one or two cases, it was necessary to check a reference book so as to see which tiers of covert feathers made up what we commonly call an "ulnar bar" in the field, etc. Such cases are clearly noted in the text. This is not the best method of taking data for posterity, but is preferable to allowing all of these records to go undocumented. Descriptions presented are abbreviated versions of the reports submitted to the VARCOM.

One difficulty confronted in compiling this material was to reckon with the association of pelagic waters with the Coastal Plain in the VARCOM review system: records such as Bridled Tern, for example, which are well documented in the offshore waters, were technically not required to be reviewed in the mouth of the Bay. Such records were submitted to the Committee despite their current absence on the Review List for the Coastal Plain. Other species, such as Wilson's Storm-Petrels, also not required to be reviewed on the Coastal Plain, were sufficiently numerous that they are not tabulated in the species accounts below. Their numbers are accurately digested elsewhere (Brinkley et al. 1997).

The phenomenon of storm-displacement, of course, encompasses much more than just extraordinary regional records and affects more than seabirds. Many common and uncommon bird species are seen in locally unusual areas or habitats, and various species are seen exhibiting atypical behaviors during and following such storms. For instance, during Hurricane *Bonnie* of 1998, Bill Williams and Brian Taber witnessed a rare diurnal mass movement between 0800 and 1200 EDT on 27 August 1998 at the Chesapeake Bay Bridge-Tunnel, involving many hundreds of warblers high in flight to the southwest on northerly winds. Among the masses were dozens of Common Yellowthroats, Black-and-white, Black-throated Blue, Blackburnian, and Cape May Warblers, and American Redstarts, along with Eastern Kingbirds. Typically, these species would be seen in reverse migration, moving *north* in the early morning along the Chesapeake Bay shores of lower Northampton County at this time of year. During Hurricane *Dennis*, Taber, Williams, and Armour found a host of uncommon or rare shorebirds, wading birds, and terns in flooded fields during the prolonged period of that storms passage off the Carolina and Virginia coasts. Among 1625 birds recorded in the Williamsburg area, the most noteworthy were birds recorded on 5 September 1999: a Glossy Ibis, 13 American Golden-Plovers, one American Avocet, one Hudsonian Godwit, two Sanderlings, one Buff-breasted Sandpiper, two Red-necked Phalaropes, and 12 Black Terns. During Hurricane Floyd, most beaches and other ocean vantages were closed to birders, who turned to farm fields and landings to seek out birds. On the Eastern Shore, birders found grounded migrant shorebirds and terms seeking refuge in open fields full of water, with counts from 16 September 1999 such as 15 American Golden-Plover, 200 Black-bellied Plover, 32 Semipalmated Plover, one Whimbrel, smaller numbers of Lesser and Greater Yellowlegs, Pectoral, Least, White-rumped, and Semipalmated Sandpipers, Caspian, Forster's, and Common Terns, and Snowy Egret. Also noted were large numbers of Tricolored Heron and smaller numbers of Little Blue Egret passing high overhead, borne northward in the gales. Stinson found a Tricolored Heron and a Stilt Sandpiper (both county firsts), along with numbers of Laughing Gulls and terns, in Prince Edward County on 6-7 September following Fran. The reader is encouraged to peruse similar records from past hurricanes to obtain a more comprehensive sense of the enormity of this phenomenon.

THE RECORDS

Data for Tables 2-8 are arranged according to several conventions common to point-counts at seawatches and pelagic surveys along transects. In cases in which time of observation was recorded in the field (for 13 July 1996 and the morning of 6 September 1996, for instance), the time is provided, either as a period-range (on the basis of one-hour periods, as at seabird point-counts) or an actual range for rarer species, or inclusive sets of periods (e.g., 0908-1830), for commoner species. In cases in which the precise time of particular observations was not recorded, approximate time is provided. All times noted are Eastern Daylight Time (EDT). Along with the time, the approximate distance between bird and observers is provided by letter codes (a through e) following the time. These codes are based, in the case of both the Chesapeake Bay Bridge-Tunnel and Kerr Reservoir, on known distances between islands, between islands and channel markers, or between points on the lake and small peninsulas and islands. Distances are coded as follows: a = 100 m or less; b = 100-250 m; c = 250-500 m; d = 500-750 m; e =greater than 750 m. The shortest distances between bird and observer(s) are typically given. Abbreviations used in the accounts and tables include: CNWR (Chincoteague National Wildlife Refuge, Accomack County), ESVNWR (Eastern Shore of Virginia National Wildlife Refuge, Northampton County), HRBT (Hampton Roads Bridge-Tunnel), CBBT (Chesapeake Bay Bridge-Tunnel; islands numbered south to north, 1 to 4), Little Island (Little Island City Park, Virginia Beach), Hunting Creek (in Alexandria and Fairfax County), Townsend (eastern terminus of Magotha Road, Northampton County), and Kerr Reservoir (John H. Kerr Reservoir and Dam, Mecklenburg County).

Black-capped Petrel Pterodroma hasitata

Forty Black-capped Petrels were observed in the Coastal Plain in 1996 and 1998, and five or six were observed in Piedmont locations in 1996 (Table 2). This total of 45-46 individuals is triple the number of prior state records. The birds were all seen well by multiple observers very familiar with the species from pelagic excursions off the North Carolina coast.

| Table 2. | Records | of | gadfly | petrels | in | Virginia | following | tropical | cyclones | 1996- |
|----------|---------|----|--------|---------|----|----------|-----------|----------|----------|-------|
| 1999. | | | | | | | | | | |

| Species | Storm | Location | Date | Time | Distance | # | Observers |
|------------------------|--------|------------------------------------|----------|-----------|----------|-----|---------------------------------------|
| Black-capped Petrel | Bertha | CBBT 1 | 13/07/96 | 0740-0900 | a - e | 4 | RLA, ESB |
| | Bertha | CBBT 1 | 13/07/96 | 1300-1400 | d | 1 | CMS, ESB, RLA |
| | Bertha | CBBT 1 | 13/07/96 | 1500-1600 | c—d | 2 | TMG, DLH, JL, GH, ESB, RLA, CMS |
| | Bertha | CBBT 1 | 13/07/96 | 1600-1700 | cd | 2 | TMG, DLH, JL, GH, ESB, RLA, CMS |
| | Bertha | Fort Story | 13/07/96 | 1900 | е | 1* | GBP |
| | Bertha | CBBT 1 | 14/07/96 | 0645-1320 | b—e | 26 | BT, BW, HFD, ESB |
| | Bertha | Chesapeake Bay off Cape Charles | 14/07/96 | unknown | unknown | 1* | BTr |
| | Fran | CBBT 1 | 09/07/96 | 0700-1200 | е | 2 | BT, JBP, GBP, ESB, BLS, RW, JC, DC |
| | Fran | Kerr Reservoir | 06/09/96 | 1123-1830 | d—e | 5-6 | ESB, JBP, HFD, BLS |
| | Bonnie | CBBT 1 | 27/08/98 | | е | 1 | ESB, JBP, DJS, CMS |
| Trinidade Petrel | Bertha | CBBT 1 | 13/07/96 | 1120-1123 | d | 1 | RLA, ESB |
| | Bertha | CBBT 1 | 13/07/96 | 1215-1220 | C | 1 | RLA, ESB |
| | Fran | Kerr Reservoir | 06/09/96 | 1300-1830 | a—e | 1 | JBP, HFD, ESB, CMS, BLS |
| Fea's Petrel | Fran | Kerr Reservoir | 06/09/96 | 0736-0739 | c—d | 1 | ESB |

Black-capped Petrel appears to be a rare visitor to Virginia, at least within 185 km (100 nautical miles) from shore. There are seven records of 11 birds noted in deepwater habitat off Virginia 1971-1992. In addition, there are four records of five birds recorded after hurricanes in the Mountains and Valleys 1893-1989, for a total of 11 state records (of 16 individual birds). There are no previous records from the Coastal Plain or the Piedmont. In wider context, there are 29 records of 32 Black-

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capped Petrels noted in association with storms and tropical storms in North America (1846-1995), plus at least another 51 noted in 1996-1999, not including Virginia's 45-46. North of Virginia's territorial pelagic waters, there are only seven records of the species within the United States' Exclusive Economic Zone (200nautical-mile limit), three more off the Virginia Capes beyond the Zone, and three records from the northeastern North Atlantic. South of Virginia, the species is common to very common in appropriate habitat (fairly deep water seaward of the western wall of the Gulf Stream), with many counts between 200 and 593 in recent years (Brinkley and Patteson 1998).

All Black-capped Petrels noted in Virginia in 1996 and 1998 were studied with spotting scopes (KOWA TSN-2s, with 20x-wide and 30x-wide eyepieces; at Kerr Reservoir with a Questar [Patteson]); in the case of one Black-capped at the CBBT, the bird flew within a few meters of the fishing pier and was studied through a binocular (Zeiss 10x40). Identification was straightforward based on the following features: dark gray dorsal surface (upperwing, mantle, scapulars, rump); uppertail coverts (often called "rump") show as a wide white band; blackish tips of rectrices; entirely white ventral surface; underwing white with black borders and incursive black "ulnar" bar (lesser coverts); dark gray "caps" (including the eye) of varying configuration, set off by a white collar of variable width at the nape/side of neck. This latter feature, combined with the wide white rectrix bases, rules out the somewhat similar Bermuda Petrel (Wingate et al. 1998). In one case, the deep, black bill of the bird passing the CBBT fishing pier could be studied carefully as well. Other than the dark bills, soft part color could not be studied on these birds, though the dark eyes were observable on one bird that exited the Thimble Channel during Bertha.

The pattern of flight of all birds observed conformed to typical dynamic flight of Black-capped Petrel. Black-capped Petrels at Kerr Reservoir were observed making very rapid "dummy" passes (sallying forward into the wind, then dropping back into original position) at a point north of Palmers Point (cf. flight descriptions in Brinkley 1999). Though Patteson and Brinkley have observed approximately 17,000 Black-capped Petrels between 1977 and 2003, neither had seen this sort of flight behavior offshore; it was observed again in Black-capped Petrels and other tubenoses in the Croatan and Roanoke Sounds of North Carolina during Hurricane *Bonnie* (27 August 1998) and again during the aftermath of Tropical Storm *Earl* (4 September 1998), which concentrated shearwaters moved inland by *Bonnie* along lee shores (Brinkley 1999).

Trinidade [Herald] Petrel Pterodroma [arminjoniana] arminjoniana

In 1996, two Trinidade Petrels were observed in the Coastal Plain, and one was observed in the Piedmont (Table 2). Again, the birds were all seen well by observers familiar with the species from pelagic excursions off the North Carolina coast.

There are no confirmed previous records of this species in Virginia or its offshore waters (but see Armistead 1992). The species is of regular occurrence in

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the Gulf Stream, generally but not strictly over deep water, off the coast of central North Carolina, where no more than three birds have been recorded in a day (over 120 records exist for the North Atlantic; Brinkley and Patteson 1998). As a hurricane waif, Trinidade Petrel has been documented in New York (Allen 1934) and possibly Pennsylvania (Hess 1997). In view of the near absence of Sooty Shearwater in the annals of storm displacement of seabirds in eastern North America (the species is chiefly a spring migrant at our latitudes), the report of two unidentified dark procellariids exhibiting "puzzling flight characteristics" at Lake Anna following Hurricane *David* (Bazuin 1983) may refer to this species.

The dark-morph bird observed at the CBBT during Bertha was described by Anderson and Brinkley: a long-winged gadfly petrel with an entirely silkendark-chocolate plumage. Identification as a gadfly petrel was straightforward: it lacked the long, thin bill of the similar Sooty Shearwater, showing instead, at relatively close range of 300 meters, a stout, short bill. Dark-morph Parasitic Jaeger was ruled out on the basis of structure, flight style, and the presence of naricorns. On the dorsal surface, there was a very subtle but distinct "M" pattern of darker, blackish plumage comprised of the outer primaries, greater coverts, and rump, typical of many tubenoses and especially gadfly petrels. The only pale area of the plumage detectable was in the base of the undersecondary coverts, but this was diffuse, not nearly so pronounced as in most published photographs of the dark morph, but within the range of Trinidade Petrel underwings preserved as flat skins at the National Museum of Natural History (Brinkley, unpubl. photos). The degree of this variability is not noted in the literature but is important for accurate field identification. The shafts of the primaries were visible when the bird began kiting, low over the water, into the southwest wind, but the shafts were not truly pale (as has been photographed on one Trinidade Petrel off the coast of North Carolina), and this may indicate an adult bird. The bird was under observation for about five minutes with a KOWA TSN-2 (30x-wide eyepiece) and a Balscope Senior scope.

The light-morph bird observed at the CBBT during *Bertha* was described by the same observers. It was a bit more distant than the dark-morph Trinidade Petrel, but the flight style and structure of the light-morph bird are identical. The flight of this bird was described as a series of very narrow, steep arcs, a dynamic flight more striking than that of Black-capped Petrel by virtue of the rapidity of the ascent and descent. Plumage a medium brown above with a hint of a dark carpalulnar "M" dorsally, and pale below, with a pale underwing and a dark ulnar bar nearly flush with the leading edge of the underwing [cf. photographs in Patteson and Brinkley 1994, Brinkley and Patteson 1998, Bradshaw 2002]. Brinkley also noted a very short bill (difficult to perceive any bill after the bird began to angle northward), which would not be present on any species of shearwater. The bird was studied well only for about 2 minutes, after which it moved northward up the west side of North Thimble Island and out of view; the same optical equipment was used as in the first account.

There was also at least one light-morph Trinidade Petrel present on Kerr

Reservoir, and it was studied at length and at leisure, for much of the afternoon, by all five observers present there during and after the passage of the hurricane. It could not have been a more cooperative bird for study. For an additional account of the bird's activities, see Sullivan (1997). The bird ranged from just west of the Keats Peninsula, north to the opposite shore (west of the campground), and eastward about as far the several hundred meters east of the Keats Peninsula. It was observed most closely from the Keats Peninsula, when the bird was apparently called in (using an imitation of the call) to a point nearly overhead.

Description by Patteson, Sullivan, Day, and Brinkley is as follows. The bird was a medium, cold brown above, appearing darker in low light and at greater distances and sandier in more intense illumination and closer range. The darker carpal-ulnar "M" pattern was easily discerned, even at great distances. The cephalic projection of the bird, when seen at a distance, was about half the caudal, lending the bird a somewhat long-ended look at times. The wings, even when drawn in to the body, tended to look long, longer at least than those of Black-capped Petrel, possibly because Trinidade Petrel has narrower wings overall. Below, the bird was pale, lacking the dark mottling on breast/lower throat that an intermediate morph would have and with very little flank mottling. The sides of the head were neutral gray-brown, which graded into the white of the underparts. The bill was dark, and every feature of its structure could be observed: a short, thickset bill (unique to gadfly petrels) but overall less imposing than a Black-capped Petrel, owing to its shallower, shorter structure but also its less imposing maxillary unguis (unguicorn). When the bird was nearly overhead, just under treetop height, even its feet and legs were visible briefly; its legs were bicolored, with orangish tarsi and bases of the feet and blackish distal webbing. The bird's style of flight varied tremendously over the afternoon, but for the most part, it engaged in high, point-topoint sailing on horizontal wings, interspersed with longer bouts of high dynamic arcs. The bird showed no apparent signs of exhaustion (as the Cory's Shearwaters, for example, did) or difficulty with the winds; it seemed uniquely in its element among other species' clear aerodynamic instability. The bird was observed on and off for more than two hours, at least, in the course of the afternoon; optical equipment as for Black-capped Petrels, with the addition of Zeiss 10x40 (ESB, HFD) and Zeiss 7x42 (BLS, JBP) binoculars, when the bird was very close, and a Celestron C-90 telescope (CMS).

It was formerly thought that the light morph of Trinidade Petrel was much rarer than the dark (e. g., Lee 2000), but in the last several years, numbers of records of light morphs have increased from the pelagic zone off North Carolina. It seems likely that in the past, Trinidade Petrels seen at a distance were assumed to be jaegers or Cory's Shearwaters (Brinkley and Patteson 1998). Of the roughly 110 records of Herald Petrels from that state, about 20 are of light morphs and about 10 of intermediate morphs. Indeed, on an excursion into the Gulf Stream from Hatteras Village 16 September 2002, for instance, Brinkley, Patteson, and others saw at least three and possibly several more light-morph Herald Petrels and no dark morphs (Davis 2003).

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Fea's Petrel Pterodroma feae

One Fea's Petrel was observed in the Piedmont in 1996 by a single observer familiar with Fea's Petrel and Soft-plumaged Petrel in the field and with their field identification (Table 2). There is only a single previous accepted record of this species from the state, a bird photographed off the coast on 9 September 1995 (Kain 1998, Patteson et al. 2001). Fea's Petrel has been variously called Gon-gon, Cape Verde Petrel, Cape Verde Islands Petrel, Fea's Soft-plumaged Petrel, and Soft-plumaged Petrel (in the case of the latter, *feae* was considered a subspecies of *P. mollis*).

Description of the bird was recorded as follows. At 0736, Brinkley, stationed at the Route 4 parking pull-off on the causeway/dam structure at Kerr Reservoir, noted a small gadfly petrel in southward flight between the lot and the nearest peninsula of the campground to the west. Its flight appeared labored-not the springy dynamic arcs observed in this species offshore, but rather short, stiff, erratic, shallow beats into the southwest wind. It continued on this course southsouthwestward past the tip of the Keats Peninsula. The following features were observed and recorded: pale grayish tail mostly covered by creamy-white uppertail coverts (only rectrix tips clearly visible as grayish); upperwing/back with overall bluish-gray cast; strong dark brownish carpal-ulnar "M" unbroken across rump; gravish sides to neck but no breast band; crown darker than nape, connected to wide blackish eyepatch; noticeably heavy bill, much like that of Black-capped Petrel (observed four hours later and through the afternoon hours here); underwing slaty-gray, with pale patches only at the bend in the wing. First thought to be evidence of molt, these are caused by pale bases to otherwise slaty or medium-gray greater underwing coverts here; the extent of these pale bases varies considerably among individuals.

The highly endangered Zino's Petrel (*P. madeira*), sometimes considered a subspecies of Fea's Petrel (Bretagnolle 1995), was eliminated by a concert of features that together suggest Fea's Petrel: the bird's relatively heavy build and long wings, its relatively heavy bill, and its lack of contrastingly dark secondaries (and thus a "secondary bar," that is, isolated pale uppersecondary coverts) do not suggest Zino's, which averages smaller and smaller-billed than Fea's and about 50 per cent lighter in weight. Brinkley has seen at least 12 firm Fea's Petrels at sea, and inasmuch as the Kerr Reservoir bird differed not at all in structure and plumage, identified this bird as a Fea's Petrel. Caveats on taxonomic arrangement of eastern Atlantic gadfly petrels, and on their field identification, can be found elsewhere (Dunn et al. 1997, Brinkley and Patteson 1998, Dunn 2000, Patteson et al. 2001).

Fea's Petrel is a very uncommon visitor to Gulf Stream waters off North Carolina between May and mid-September (Brinkley and Patteson 1998), where there are some 35 records 1981-2002. There are few other records of the species for North America (Patteson et al. 2001). It is worth noting that observers at Cape May Point State Park, including seabird authorities Dirk and Peter Symens of Belgium, identified a Fea's Petrel with certainty on 6 September 1999, during southeasterly gales associated with the passage of Hurricane *Dennis* (Larson et al. 2000). There are no other from-shore records in North America, but the species has been seen on

seawatches off the coast of Ireland and possibly elsewhere in Great Britain (A. McGeehan, pers. comm.).

Cory's Shearwater Calonectris diomedea

Thirteen Cory's Shearwaters (plus an unknown number of beached corpses) were recorded during three tropical storms in the Coastal Plain in 1996, 1998, and 1999, while four Cory's were recorded for the Piedmont in 1996 (Table 3). All observers were familiar with the species.

There are rather few records of this large shearwater from the state's inshore waters, though Cory's is often very numerous seaward of the 100-fathom contour in Virginia waters in late summer and early fall. No precise figures of nearshore records are known. The species has been reported twice from Back Bay NWR beaches and once each from the CBBT, Chincoteague NWR, and First Landing (formerly Seashore) State Park, to our knowledge, but these reports have not been formally reviewed. It is thus still appropriate to consider it a very rare visitor to the mouth of the Chesapeake Bay and to monitor records of the species here. No records exist for Virginia's interior, and in fact there are only five records from the entire continental interior through 2003 (Vermont, Massachusetts, North Carolina, Connecticut, Pennsylvania), excluding records from the North Carolina sounds, and all of these records are associated with the passage of tropical cyclones.

All individuals observed were large shearwaters, pale brown above with dark tails (some with variable white tips to uppertail coverts), dusky pale brown heads, large yellow bills with dusky tips, pale whitish underwings with dark borders, and white undersides. No other shearwater has such a combination of features. In the case of two of the Kerr Reservoir individuals, Stinson noted and it was confirmed by others that a difference in size was observable when the birds were near one another; this is attributable to the marked sexual dimorphism in the species, with males averaging larger than females.

Greater Shearwater Puffinus gravis

Eleven Greater Shearwaters (plus an unknown number of beached corpses) were recorded during two tropical storms in the Coastal Plain in 1996 and 1999 (Table 3). All observers were familiar with the species. Some of these records were made at the mouth of the Chesapeake Bay, where the species has been recorded in past years between 22 April (very early) and early November (e. g., Linehan 1972). Two 1996 records, however, hail from west of the mouth of the Bay, at Suffolk (Willis, pers. comm.) and one from the middle of the Chesapeake Bay 11 km south of the border with Maryland waters (Kain 1998), where the species has not previously been documented in the state. In the state's pelagic zones, the species is an irregular but often common transient in late spring and varies from numerous to very scarce through the summer and fall.

All Greater Shearwaters observed possessed the following features: fairly large shearwater, dark brown above, darkest in primary region (blackish brown); clearly defined black cap, encompassing eye; long black bill; tail very dark with

| Species | Storm | Location | Date | Time | Distance | # | Observers |
|-----------------------------|--------|------------|----------|-----------|----------|----|---|
| Band-Rumped Storm-Petrel | Bertha | Cape Henry | 12/07/96 | 0650 | b | 1 | ESB |
| | Bertha | CBBT 1 | 13/07/96 | 0740-0900 | b—d | 4 | ESB, RLA |
| | Bertha | CBBT 1 | 13/07/96 | 0900-1000 | с | 1 | ESB, RLA |
| | Bertha | CBBT 1 | 13/07/96 | 1400-1500 | d | 1 | CMS, RLA, ESB |
| | Bertha | CBBT 1 | 13/07/96 | 1500-1600 | b—d | 1 | TMG, DLH, JL, GH, ESB, RLA, CMS, RLA, CM |
| | Bonnie | CBBT 1 | 27/08/98 | morning | d | 1 | ESB, JBP, DJS, CMS |
| Leach's Storm-Petrel | Bertha | CBBT 1 | 13/07/96 | all day | a—e | 12 | TMG, DLH, JL, GH, ESB, RLA, CMS |
| | Bertha | CBBT 1 | 14/07/96 | morning | b—e | 14 | ESB, BT, BW, HFD, RLA, CM |

 Table 3. Records of storm-petrels in Virginia following tropical cyclones 1996-1999.

short white uppertail coverts; pale below with extreme dark tips in otherwise pale underwing coverts. A grayish-brown belly patch was observed on the second CBBT bird from 13 July. At the CBBT in July 1996, the flight of Greaters was noted to differ from that of Black-capped Petrels in being more labored, with flapping from the carpal joint; typically also flew eastward, rather than north or south, as the Black-cappeds did. During *Bertha*, one of the Greaters was seen in direct comparison with a Cory's.

Audubon's Shearwater Puffinus Iherminieri

Four Audubon's Shearwaters (and a large number, undetermined, of beached corpses) were recorded at the coast in association with tropical storms in 1996 and 1999 (Table 3). The species has been recorded at least once from the CBBT 21 August 1974 (Scott and Cutler 1975) and once from Chincoteague NWR 29 July 1979 (Scott 1979), neither record in the context of tropical storms, but it is otherwise unknown from shore in Virginia, though it is often fairly common offshore in summer and early autumn, its numbers apparently dependent upon surface seawater temperature and the presence of *Sargassum* spp. and the pelagic drift community.

Notes on the CBBT birds are as follows: small black-and-white shearwater with rather short, paddle-like wings, a rather long tail (appearance of a long tail probably enhanced by relatively short-winged look), dusky undertail coverts, and shortish bill (though a slender bill, not stout as in Black-capped Petrels). Underwing coverts and undersides white; dark brown above and on sides of face and borders of underwing (remiges and marginal coverts). Manx would look longerwinged and -billed (more like a tiny Greater in jizz), with bright white undertail coverts.

Leach's Storm-Petrel Oceanodroma leucorhoa

A total of 26 Leach's Storm-Petrels was noted during Hurricane *Bertha* in 1996 (Table 4). The species has been observed during hurricanes in the past and, on one occasion, during a northeaster (one at Lynnhaven Inlet 19 May 1972, per W. McDowell). On the Atlantic seaboard, Leach's is in fact the most numerous of the seabird species displaced by tropical cyclones, apparently outnumbering even records of Laughing Gull and Sooty Tern. Its status in Virginia's offshore waters is not clear, but it appears to be an uncommon transient, chiefly in the spring, and an irregular summer visitor, with a maximum count of 189 off Chincoteague NWR 15 August 1992 (per K. H. Bass).

All Leach's Storm-Petrels that were positively identified were obviously larger than the nearby Wilson's; all showed the warm brown dorsal surface and long, buffy carpal bars typical of the species; the shape of white uppertail coverts varied but was usually an oblong patch, divided in the center, that did not extend evenly to the ventral side; the wing at the carpal angle was usually sharp, with clean, sharp lines, reminiscent of a nighthawk (*Chordeiles*). The manner of flight was sometimes erratic and bounding, but during the high winds of *Bertha*, for instance, many Leach's showed flight behaviors more dynamic, closer to Bandrumped. For this reason, observers were compelled to leave some *Oceanodroma* unidentified, if we were not able to study plumage details carefully.

Band-rumped Storm-Petrel Oceanodroma castro

During *Bertha* in 1996, records of eight Band-rumped Storm-Petrels were obtained for the Coastal Plain (Table 4). Between 1988 and 2002, there are four firm records of one, seven, 12, and one Band-rumped Storm-Petrels, all made in appropriate habitat in the deepwater areas seaward of the Continental Shelf (Abbott and Czaplak 1993, Blom et al. 1994, Patteson and Brinkley 1997, Iliff 2003); in addition, one or two Virginia sight records of single birds in the same habitat probably refer to this somewhat cryptic and little-known species (Dalmas 1989). The state had no records through 1995 from the nearshore or any inland area.

All but one of the 1996 and 1998 records from Cape Henry beach and CBBT 1 are multiple-observer records. The observers associated with these reports have various levels of experience with Band-rumped Storm-Petrel: Brinkley and Patteson seen hundreds or thousands off North Carolina and Louisiana, and Hughes and Anderson have seen the species off North Carolina as well, whereas the other observers were less familiar with the species in the field. The opportunity to compare Wilson's, Band-rumped, and Leach's Storm-Petrels with spotting scopes on terra firma was extraordinary and, to our knowledge, unprecedented prior to the landfall of *Bertha*.

Before 1996, there were four North American records of this species away from pelagic habitats, all of corpses recovered from the interior of the continent after the passage of tropical storms (from the District of Columbia, Indiana, Ontario, and North Carolina); in addition, there are four coastal records (three in Florida, one in North Carolina). More recently, in February 1998, a long-dead Band-rumped was discovered near Erie, Pennsylvania (J. McWilliams, in litt.). In 1996, small num-

| Species | Storm | Location | Date | Time | Distance | ŧ | Observers |
|-------------------------|--------|--|-----------|-----------|----------|-----|--|
| Cory's Shearwater | Bertha | CBBT 1 | 13/07/96 | 0900-1000 | С | 1 | ESB, RLA |
| | Bertha | CBBT 1 | 13/07/96 | 1000-1100 | С | 1 | ESB, RLA |
| | Bertha | CBBT 1 | 13/07/96 | 1800-1854 | d | 1 | CMS, ESB, RLA |
| | Bertha | CBBT 1 | 14/07/96 | ~1100 | d | 1 | BT, BW, HFD, ESB |
| | Bertha | CBBT 1 | 14/07/96 | 1200+ | d | 1 | BT, BW, RLA, CM |
| | Fran | Hunting Creek, Alexandria | 06/09/96 | ? | ? | 2 | PP |
| | Fran | Kerr Reservoir | 06/09/96 | 0908-1830 | с—е | 4 | CMS, JBP, ESB, HFD, BLS |
| | Fran | Kerr Reservoir | 06/09/96 | 0900+ | е | 2 | RLA, GBP |
| Bonnie Dennis | Bonnie | CBBT 1 | 27/08/98 | afternoon | C | 1 | ESB, JBP, CMS, DJS |
| | Dennis | CNWR (tideline corpses) | 05/09/99+ | | | 20+ | AH, AI, BP |
| | Dennis | CBBT 4 | 05/09/99 | ? | d | 5 | JBP, RPM, JC, SH, ESB |
| Greater Shearwater | Bertha | CBBT 1 | 13/07/96 | 0745 | b | 1 | ESB |
| | Bertha | CBBT 1 | 13/07/96 | 1100-1200 | b | 1 | ESB, RLA |
| | Bertha | CBBT 1 | 13/07/96 | 1400-1500 | d | 1 | ESB, RLA, DLH, TMG, JL, GH, CMS |
| | Bertha | CBBT 1 | 13/07/96 | 1700-1800 | C | 1 | ESB, RLA, CMS |
| | Bertha | CBBT 1 | 13/07/96 | 1845 | С | 1 | ESB, RLA, CM |
| | Bertha | Mills E. Godwin Bridge, Suffolk | 13/07/96 | 0630 | | 1 | LEW (specimen) |
| | Bertha | CBBT 1 | 14/07/96 | 1100 | d | 1 | BT, BW, HFD, ESB |
| | Bertha | Chesapeake Bay, 11 km south of Maryland waters | 16/07/96 | | b | 1 | WP |
| | Fran | James R., Suffolk | 06/09/96 | | | 1 | LEW |
| | Dennis | CNWR (tideline corpses) | 05/09/99+ | | | 20+ | AI, BP, AH |
| | Dennis | CBBT 4 | 05/09/99 | ? | d | 2 | JBP, RPM, JC, SH, ESB |
| Audubon's Shearwater | Bertha | CBBT 1 | 14/07/96 | 1200 | е | 1 | BT, BW, ESB |
| | Dennis | CBBT 4 | 05/09/99 | morning | е | 1+ | JBP, RPM, JC, SH, ESB |
| | Dennis | Fort Story | 05/09/99 | | | 1 | GBP; bird killed by Great Black-backed Gull |
| Dennis | CNWR | 05/09/99+ (tideline corpses) | | | | 80+ | AH, IA, BP |

| Table 4. | Records of shearwaters in | Virginia follo | wing tropical | cyclones | 1996-1999. |
|----------|---------------------------|----------------|---------------|----------|------------|
| | | 0 | | | |

bers of Band-rumped Storm-Petrels were observed at Cape May, New Jersey, during the passage of *Bertha* there 13 July (Brinkley et al. 1997). During *Bonnie*, at least two were observed in the Croatan Sound west of Roanoke Island, North Carolina one the day before a single Band-rumped was noted from the CBBT (Brinkley 1999).

Reviewed details of the birds are as follows. Features observed on the positively identified birds included (these were rehearsed orally on nearly every bird, so that less experienced observers could gain more experience with field identification of the species): shape of white uppertail coverts a band of even width above, about 50% the width of the brown tail itself—and not divided or bulging in the center; size noticeably larger than nearby Wilson's Storm-Petrels; overall ground color of plumage more blackish than Leach's' warm brown; a grayish, indistinct carpal bar (upperwing coverts, greater and median), unlike Leach's' neat, bright buffy or buffy-white carpal bar; carpal angle consistently greater than in Leach's observed (wings held farther away from body); occasional gliding on bowed wings; width of wing at base usually noticeably greater than Leach's' overall wing area always obviously greater than surrounding Wilson's'; fairly heavy bill for storm-petrel; feet never seen to project beyond rectrix tips.

White-faced Storm-Petrel Pelagodroma marina

One individual was noted from Kingsmill on the James, Williamsburg, on 6 September 1996 by Bill Williams (Cross 2000); the observation was at 1250 following the passage of *Fran* and lasted about three minutes. Another individual of this species was found the same day at Jordan Lake in North Carolina (Brinkley et al. 1997). These are the first interior North American records of this rare bird; only two previous hurricane-associated records are known from North America: two birds seen from the Bonner Bridge over Oregon Inlet 2 October 1971, after Hurricane *Ginger* (R. L. Ake, R. White, pers. comm.; Teulings 1972) and a single bird in Connecticut 10 August 1976, after Hurricane *Belle* (Finch 1977).

Notes by Williams are as follows. The storm-petrel was seen from the marina, where it appeared above the James River from the west, initially about 200 m distant but passing as close as 75 m, observed through a Swarovski scope with a zoom eyepiece used at 20-30x. Lighting conditions were excellent. The bird was white below from the throat to the belly. The face was pale gravish white, with a discernable black post-ocular line. The top of the head was gray-black. The mantle was a pale gray, as was most of the upperwing surface. Form the neck to the bend in the wing, the leading edge was a contrasting whitish to pale gray. The tail was dark gray, except for a very noticeable whitish-gray, somewhat U-shaped band across the coverts. The underwing coverts were noticeably whitish. The wings were pointed and held back as it flew. I could make out the legs trailing beyond the tip of the tail. The bird's head was proportionately small and slightly rounded over the forehead to a stout though narrow bill. The head, including the bill, reminded me of a Wilson's Storm-Petrel in proportion, size, and shape. The bird did not alter its flight behavior over the course of the observation, flying unerringly into the strong head wind just 10-20 cm over the river's surface.

Parasitic Jaeger Stercorarius parasiticus

In addition to records totaling 10 birds from the Coastal Plain, where regular, one Parasitic Jaeger was noted in the Piedmont in 1996. Parasitic Jaeger is irregularly observed in small numbers from the CBBT, particularly on migration and during easterly winds; the species forages primarily in the littoral zone. Nevertheless, the late 1990s' storms were likely responsible for several records of the species. Tropical Storm Josephine passed through Virginia 8 October 1996, with heavy rains and high winds from the east, northeast, and later northwest. On that date, Taber observed eight adult Parasitic Jaegers, two of them dark morphs, from CBBT 1. The only other storm-related record of Parasitic Jaeger is from Dennis, two (one dark morph adult, one intermediate-morph juvenile) noted from CBBT 4 on 5 September 1999 by Patteson, Moore, Cameron, Hairfield, and Brinkley. Despite the species' presence as a common migrant on the Great Lakes in the autumn, it is rarely recorded as an overland migrant elsewhere in the East, and there is only one confirmed record of this species from the interior of Virginia, at Alexandria 7 September to 26 October 1985 (Abbott 1986) and none for the Piedmont (Kain 1987), although an unidentified small jaeger at Kerr Reservoir after Hugo 22 September 1989 (Armistead 1990) could have been this species.

One subadult Parasitic Jaeger was observed for five minutes beginning at 1330 at Kerr Reservoir, at distances of 250-500 m, by Patteson, Day, Sullivan, and Brinkley. This jaeger was first noticed in pursuit of and harassing a Black Tern east of Palmers Point. Its jizz was clearly different from that of the heavy-bellied, widewinged Pomarine Jaeger observed earlier in the day, but its wing shape bore no affinity to the neat, angular lines of the Black Tern (as Long-tailed Jaeger's would), being more rounded through the remiges and at the carpal angles. In plumage, the bird closely resembled a basic-plumaged light-morph adult, with warm brown upperparts (no strong contrast between remiges and coverts above), pale underparts, with a fairly well-developed brown chest band (neither as wide nor as mottled as is typical of Pomarine), very limited mottling in sides/flanks near the wing base, and wavy "zebra" stripes on uppertail and undertail coverts. The bird's black bill was sturdy, though not as heavy as that of the morning's Pomarine. Cap shape was consistent with Parasitic, encompassing the plumage below the eye and the area well behind the eye (very unlike the neat, small black "poll" of the Longtailed) but not nearly as extensive or angular as the "hangman's hood" of the Pomarine. The cap was not altogether black, with clean edges, as in an adult, however; rather it was dusky, with somewhat diffuse edges, and the head overall appeared rather washed-out looking, especially toward the nape, a bit reminiscent of a juvenile Long-tailed Jaeger. At the base of the primaries in the underwing was a well-developed crescent of white (not the double crescent characteristic of Pomarine). The bird's brown-and-white, narrow "zebra striping" in the underwing coverts, combined with the clean belly, made this bird probably a second-fall subadult rather than a third-fall bird, which would have mostly dark underwing coverts.

Long-tailed Jaeger Stercorarius longicaudus

Two individuals were recorded in the Coastal Plain during tropical storms in 1996 and 1999. This species is typically a highly pelagic migrant, with 14 records (involving some 26-28 birds) 1973-2002 from the pelagic zone but only three previous onshore records in Virginia: a specimen from Ship Shoal Island 26 June 1975 (Williams 1976), one at Chincoteague NWR 22 May 1978 (Larner and Scott 1978), at least one on the beach at Back Bay NWR 22 September 1989 in the wake of Hurricane *Hugo* (P. McQuarry, unpubl. data), and one at the CBBT 14 May 1995 at (T. M. Gwynn, A. J. Whitlock, pers. comm.). There is only one record of the species from the state's interior, a juvenile intermediate morph in the Mountains and Valleys at Smith Mountain Lake, Franklin County 5-6 September 1993 (Cross 1999).

During Tropical Storm *Josephine*, Taber observed an adult Long-tailed from CBBT 1 in the context of a passage of eight Parasitic Jaegers. From CBBT 4, Patteson, Moore, and Cameron studied a juvenile dark-morph Long-tailed Jaeger during the passage of *Dennis* on 5 September 1999.

Pomarine Jaeger Stercorarius pomarinus

In association with tropical storms, one Pomarine Jaeger was recorded in the Coastal Plain, another in the Piedmont, both in 1996. At CBBT 1, a light-morph adult was observed by Anderson and Brinkley between 1100 and 1200 at distances of 500± m during *Bertha*; this is a typical location for the species, which is seen irregularly at the mouth of the Bay on migration and into early January. There are, however, only two confirmed records of the species from the interior prior to 1996, at Claytor Lake, Pulaski County, and Beaverdam Reservoir, Loudoun County (Akers et al. 1976, Kain 1995) and only one record subsequent to 1999 at Kerr Reservoir (Iliff 2002), which makes the record of the dark-morph juvenile at Kerr Reservoir noteworthy.

This individual was first seen at 0800 by Brinkley and subsequently by Day, Sullivan, and Patteson 1030-1400 at relatively close range. The bird was noted in pursuit of a Cory's Shearwater by the group, next to which it appeared menacingly large and heavy-bodied, especially heavy-bellied, and the wings were very broad, much more so than those of the Parasitic Jaeger observed later in the day. The plumage was very dark chocolate brown overall, with paler whitish-gold tips in all coverts of remiges and rectrices. Greater underprimary coverts, however, were whitish with dark tips, as were the primaries themselves, creating two large white crescents in the "hand," diagnostic marks for Pomarine Jaeger. The bill was deep, heavy, with a paler base and dark tip. There was relatively little white in the primaries dorsally: the outer two or three shafts were white, and the bases of 2-3 others were white as well.

Sabine's Gull Larus sabini

One adult Sabine's Gull was recorded in the Piedmont in 1996, at Kerr Reservoir 6 September 1996 between 1010 and 1015 by Sullivan, Patteson, Day, and Brinkley. Though there are few previous records of this species in association with

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tropical cyclones, there were 11 records of Sabine's Gull taken during the passage of *Fran* in eastern North America; Virginia's was the southernmost. There is no previous Piedmont record of the species in the state (Kain 1987), but there are eight records of single birds from the Coastal Plain 1967-2002.

The Kerr Lake Sabine's Gull was observed in flight past the parking bluff in a group of Sooty Terns at distances of about 300-500 m. It was described as follows. An adult in alternate plumage with no appreciable wear noted. White below. Head gray with darker black collar encircling the head. Bill relatively short and black, with the tip of bill yellow. Tail white. Underside of primaries dusky medium gray, underwing otherwise white. Dorsal pattern in flight: black outer primaries with (reduced) white apical marks on a few primaries; white secondaries and outersecondary/innerprimary coverts; and deep gray upperwing coverts otherwise, producing the distinctive "three-triangle" pattern of black, white, and gray that is diagnostic of adult Sabine's Gull.

Great Black-backed Gull Larus marinus

Two Great Black-backed Gulls were recorded on the Piedmont in 1996. There are very few records of this gull from the interior of the Piedmont south of the Richmond area; the Kerr Reservoir record from 30 November 1976 is an exception (Kain 1987). Where the Piedmont is narrow and very near the Potomac River in the north, there is a natural corridor for the species, and records have increased here markedly in the second half of the twentieth century. Single birds were observed at Kerr Reservoir 6 September 1996 by Patteson and Stinson, an adult and an immature, in the afternoon at about 1400, both at long range.

Sandwich Tern Sterna sandvicensis

Sandwich Tern, a regular littoral-zone forager and occasional nester in the state, was recorded for the first time in the Virginia Piedmont (Kain 1987) following Hurricane *Fran* of 1996, with records of four birds from three sites (Table 5); another at Kingsmill provided a second local record (cf. Sheehan 1998). Sandwich Terns were recorded in abundance after Hurricane *Bertha*, with a count of 226 from the CBBT 13 July 1996 establishing a new state high count (Brinkley et al. 1997). This species is known to be driven northward by hurricanes but is rarely driven into the interior of the continent, from which there are only 10 records of 34 birds of this species prior to 1996 (between Georgia and Ontario).

All four adult Sandwich Terns seen in flight at Lake Anna, Briery Creek Lake, and Kerr Reservoir were large but slender *Sterna*, noticeably very pale birds overall, faintly gray in the dorsal surface in flight, with a faint bar of darker gray in the outer (but not the outermost) primaries. The long, slender wings accentuated the impression of a long, slender bird, as did the very long, slender black bill (in all cases, the yellow tip to the bill could be seen well). Otherwise the birds were white, with white forehead and blackish nuchal collar, the remnant of the black cap from alternate plumage. Wingstrokes were noted to be clean, deep, and powerful.

| Species | Storm | Location | Date | Time | Distance | # | Observers |
|---------------|--------|----------------------------|-------------|------------|----------|--------------|--|
| Sandwich Tern | Fran | Kerr Reservoir | 06/09/96 | 1020 | С | 1 ad. | ESB, BLS, JBP, HFD, RLA, CM |
| | Fran | Kerr Reservoir | 06/09/96 | ~1600 | c—d | 1 ad. | ESB, BLS, JBP, HFD, RLA, CM |
| | Fran | Briery Creek Reservoir | 06/09/96 | morning | | 1 ad. | CMS, RLA, CM |
| | Fran | Kingsmill, Williamsburg | 06/09/96 | morning | | 1 | BW, TCA, RLA, CM |
| | Fran | Lake Anna | 07/09/96 | 1020 | | 1 ad. | LL, HFD, RLA, CM |
| Arctic Tern | Fran | Kerr Reservoir | 06/09/96 | ~1750 | b—c | 1 first-fall | ESB, BLS, RLA, CM |
| | Dennis | CBBT 4 | 02-05/09/99 | ~1600 | a—c | 1 ad. | JBP, RPM, JC, SH, ESB, RLA, TT, RC, RLA, CM |
| Roseate Tern | Bertha | Little Island Park | 12/07/96 | 1440 | С | 2 ad. | BL, ESB. RLA, CM |
| | Bertha | CBBT 1 | 14/07/96 | ~1130 | a | 1 ad. | HFD, BT, BW, ESB, RLA, CM |
| | Fran | Kerr Reservoir | 06/09/96 | 0727-0728 | b | 1 ad. | ESB |
| | Bonnie | CNWR | 28/08/98 | | | 1 ad. | SHD |
| | Bonnie | CBBT 4 | 27/08/98 | afternoon | С | 1 ad. | JBP, ESB |
| | Floyd | Townsend | 16/09/99 | morning | a | 1 ad. | JC, ESB, JBP |
| Least Tern | Fran | Kerr Reservoir | 06/09/96 | ~1400 | C | 1 ad. | JBP, BLS, HFD, ESB, RLA, CM |
| | Fran | Kerr Reservoir | 06/09/96 | ~1600 | d | 1 imm. | JBP, BLS, HFD, ESB, RLA, CM |
| Royal Tern | Fran | Kerr Reservoir | 06/09/96 | 0730-1830a | C | 40 | CMS, ESB, HFD, BLS, JBP, RLA, CM |
| | Fran | Lake Anna | 06/09/96 | | | 3* | J. and C. Gibson |

| AND AD DY ALCOUNT OF THE AND ALL THE MALL THE PARTY OF TH | Table 5. | Records of | terns in | Virginia | following | tropical | cyclones | 1996-1999 |). |
|--|----------|------------|----------|----------|-----------|----------|----------|-----------|----|
|--|----------|------------|----------|----------|-----------|----------|----------|-----------|----|

Arctic Tern Sterna paradisaea

Two Arctic Terns were recorded in the context of tropical storms, one in 1996 in the Piedmont, the other in 1999 in the Coastal Plain (Table 5). There are some 10 pelagic records (involving 15 birds) of this species for Virginia and three records of single May adults from the immediate coast 1978-1992. There are no previous records for the Piedmont (Kain 1987). This is an especially poorly documented species in Virginia, with only perhaps five or six documented reports and few photographs (none archived); few of the offshore records have supporting details. The species migrates at considerable distances from shore and would probably be encountered more regularly in the spring if pelagic tours were held at that season. Richard Rowlett, offshore of Virginia and North Carolina during the passage of David in September 1979, sorted through many hundreds of massed white terns and found a ratio of 20: 3.5: 1 among Common: Arctic: Roseate Terns (Fussell and Allen-Grimes 1980), and it is thus not surprising that a hurricane would be responsible for an interior record. Interior records from the Southeast are nonexistent, and there are very few from the Northeast, almost all from fall migration, though Maryland and Pennsylvania both have spring records.

Details on the Kerr Reservoir bird were recorded as follows. In a large (ca.

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20-25) flock of juvenal- and basic-plumaged adult Common Terns, all flying south along the lakeshore at the Route 4-pull-off, a single juvenal-plumaged tern stood out strongly by virtue of its bright white upperparts and natty head pattern, in particular by the very ghostly pale secondaries, paler than the upperwing coverts. Brinkley first noted the bird, and Sullivan was quick to single it out subsequently. The lesser coverts showed an almost imperceptible, diffuse gravish color, paler than any like-aged Common Tern would be, and the marginal coverts were pale grayish-white, unlike in the Commons. The rump, rectrices, and underparts were bright white, as was the forehead. The structure of the black "half-hood" also looked different from surrounding Common Terns: it was very distinctly separated from areas of the white head feathering (no diffuse borders or grayish tones), especially the white forehead, encompassed the dark eye within the leading edge, and extended uniformly and crisply back over the nuchal area as a "hood." This clean black hood combined with the very short "pin-prick" black bill to lend the entire cephalic area a very different appearance from that of the Common Terns. The underwing was not well studied. Primary tips showed only the faintest of gray and then only at the extreme tip of the feather, and the entire primary region appeared pale, unlike in the Commons. The mantle was very clean, uniformly pale gray, lacking the brown/gray patterning of the young Commons. Flight style differences from the Common Terns were not noted. The grey in the outer rectrices was not noted but may not have been observable. The shape of the bird seemed more graceful in flight than the Commons, probably because Arctic juveniles have slightly shorter wings than Commons and give the impression of having a narrower primary area than Commons (juveniles lack the adult's long tail).

Roseate Tern Sterna dougallii

Six Roseate Terns were recorded in the Coastal Plain in 1996, 1998, and 1999, and one was recorded on the Piedmont in 1996 (Table 5). Roseate Tern is an irregular spring migrant and late summer/early fall migrant in very small numbers along the coast, with approximately 37 records of 60 birds 1952-1992. It has not been recorded inland in Virginia, and we know of no other interior records from the eastern states of North America other than a report from Frederick County, Maryland 16 May 1992 (Hall 1992) and a group of 15 following Hurricane *Carol* 31 August 1954 at Andover, Massachusetts (Veit and Peterson 1993). During Hurricane *Fran*, Roseates were recorded at several Upper Bay locations from Maryland, where they have never been recorded in the past (Brinkley et al. 1997).

The single adult Roseate Tern at Kerr Reservoir was seen 0727-0729 by Brinkley as it passed by the bluff at the Route 4 parking pull-off. There was a light drizzle being swept along by winds of 20-30 knots, but a TSN-2 KOWA scope with 30x-wide eyepiece was trained on the bird, and it was not difficult to get a good study of it at distances of about 200 m. In the small flock of Common Terns, the bird stood out immediately by virtue of its very long tail, its chalky white plumage above (much like that of Gull-billed Tern), its long, apparently all-dark bill, and its long wings. Scope study revealed a longish-looking head/cap (accentuated by the
long, dark bill perhaps) and a dark outer web to the outermost primary, which contrasted strongly with the very white upperparts. The gray tones to the upperwing surface and mantle were not discernable on this bird, though they were obvious on all the Commons, which made the bird appear, by its strong white tones and long tail, most like a tiny tropicbird in amongst the Commons. This appearance is limited to Roseate Tern.

Least Tern Sterna antillarum

Two Least Terns were recorded in the Piedmont in 1996 following Hurricane *Fran* (Table 5). There are only three previous Piedmont records of this species, which is an Endangered nester in the interior of the continent. Least Terns are recorded relatively often following the passage of tropical storms through the continent's interior, but usually in very small numbers.

Both Least Terns were observed well in the context of large numbers of larger *Sterna* and several Black Terns. Both were very tiny birds with extremely slender bodies and narrow wings, with jerky, rapid wingbeats. The adult bird showed black in the outermost primary, a black "bridle" (black cap, eyeline, and white forehead), a long, slender, deep yellow bill, and pale gray dorsal surface in flight; otherwise white. The juvenile showed a more diffuse head pattern, resembling a winter Common Tern somewhat, a dusky bill, and a dusky carpal-ulnar "M," created by dusky outer primaries and lesser coverts.

Royal Tern Sterna maxima

At minimum, 43 Royal Terns were noted in the Piedmont following the passage of Hurricane *Fran* in 1996 (Table 5). There are two previous Piedmont records of Royal Tern in Virginia, an abundant coastal nester and postnesting wanderer. The species is routinely recorded well to the north of nesting areas following the passage of tropical cyclones.

Only about 40 Royal Terns could be observed on Kerr Reservoir at any given time, but the actual number present was undoubtedly much higher (most of the lake is invisible from any single vantage point). At dusk, observers could see some Royals and Laughing Gulls ascending, as if to depart the lake at night; few were observed by Anderson and Pearce the following day. All Royal Terns observed were robust terns, if a bit slenderer than Caspian Terns observed, essentially white birds but for blackish nuchal collars, medium gray outer primaries (only a few adults), more extensive gray in the primaries in the majority of the birds (thus apparently first-fall birds), pale gray in the dorsal surface otherwise. The long, bright orange bills could be seen at great distances (particularly in the Questar), but many Royals were seen at very close range.

Bridled Tern Sterna anaethetus

Sixteen Bridled Terns were observed on the Coastal Plain in 1996, 1998, and 1999 in association with tropical cyclones (Table 6). All birds were observed on the immediate outer coast. The species has been detected annually in Virginia's

| Species | Storm | Location | Date | Time | Distance | # | Observers |
|--------------|--------|--|-------------|-----------|----------|------------------|---------------------------------------|
| Bridled Tern | Bertha | CBBT 1 | 13/07/96 | 1100-1200 | С | 1 | ESB, RLA |
| | Bertha | CBBT 1 | 13/07/96 | 1700-1800 | C | 1 ad. | RLA, ESB, TMG, JL, GH, DLH, CMS |
| | Fran | Kingsmill | 06/09/96 | | | 1 | BW, TCA |
| | Fran | CBBT 1 | 07/09/96 | 0700-1200 | b—d | 5 | ESB, GBP, JBP, BT, BLS, JC, DC, RW |
| | Bonnie | CBBT 1 | 29/08/98 | | | 4 | BT, GW |
| | Dennis | CBBT 4 | 05/09/99 | ? | d | 1 | JBP, RPM, JC, SH, ESB |
| | Floyd | CBBT 4 | 16/09/99 | | | 1 | ESB, SWH, JBP, JC, RPM |
| | Floyd | Virginia Beach Oceanfront, 57 th Street | 16/09/99 | ? | ? | 2 | GBP |
| Sooty Tern | Bertha | CBBT 1 | 13/07/96 | 1900 | b | l ad. n | ESB |
| | Bertha | Kingsmill | 13/07/96 | | | 3 | TCA |
| | Bertha | HRBT | 15-19/07/96 | | | 1 ad. | JBP, ESB (specimen) |
| | Fran | CBBT 1 | 06/09/96 | | | 9 | TMG, D.JS |
| | Fran | Kingsmill | 06/09/96 | | | 8 | TCA, BT, BW |
| | Fran | Hunting Creek | 06/09/96 | | | 1 | PP |
| | Fran | CBBT 1 | 06/09/96 | | | 2 | RLA |
| | Fran | Kerr Reservoir | 06/09/96 | 0825 | С | 1 ad. | ESB |
| | Fran | Kerr Reservoir | 06/09/96 | 0835 | a | 3 ad. | BLS, JBP |
| | Fran | Kerr Reservoir | 06/09/96 | 0835 | b | 1 juv. | ESB |
| | Fran | Kerr Reservoir | 06/09/96 | 0929 | d | 1 ad. | HFD, JBP, BLS, ESB |
| | Fran | Kerr Reservoir | 06/09/96 | ??0825 | c—d | 5 | HFD, JBP, BLS, ESB |
| | Fran | Kerr Reservoir | 06/09/96 | 1001-1015 | C | 2 ad., 2 juv. | HFD, JBP, BLS, ESB |
| | Fran | Kerr Reservoir | 06/09/96 | 1123 | d | 1 juv. | HFD, JBP, BLS, ESB |

Table 6. Records of tropical terns in Virginia following tropical cyclones 1996-1999.

pelagic waters since the first state record was established in 1977 (Rowlett 1979). Prior to 1996, interior records of Bridled Tern in North America, surprisingly scarce, come from South Carolina (one), North Carolina (three records of six birds), Ontario (one), and Virginia, which has one record of two birds from Lake Anna following Hurricane *David* in 1979 (Bazuin 1983). Virginia also has coastal records of Bridled Tern associated with the passage of *David* in 1979 at Chincoteague (Scott 1980) and following *Hugo* in 1989 from Back Bay NWR (P. McQuarry, unpubl. data). In the tropical cyclones of the late 1990s, however, no Bridled Terns were recorded in the Piedmont north of North Carolina, which held six birds in three locations after *Fran* in 1996 (Brinkley et al. 1997), and only one in the interior Coastal Plain, that being one from Bolling Air Force Base 7 September (Brinkley et al. 1997). It is of

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interest that this species—which is often numerous off the mid-Atlantic coasts in early autumn—is comparatively scarce, especially inland, following tropical storms, whereas Sooty Tern is, in this history of hurricanes past, very numerous after storms' passage but is recorded in much smaller numbers than Bridled in neritic waters in the region. Curiously, Bridled Tern was the *only* truly pelagic species to be observed in the context of five different tropical systems in Virginia in the late 1990s.

All birds studied at the CBBT were noted to have a general structure and build similar to Common Tern, thus lacking the "mini-frigatebird" appearance of Sooty Tern (which has more wing area overall, as well as greater wingloading and aspect ratio). All birds were brown above, pale below. In all cases, some trace of the "bridle" was evident, but none showed a stark black bridle, as an adult in definitive plumage would. In most cases, the underwing was clearly seen (only on a few CBBT birds was it not studied well after *Fran*): pale in the coverts and faint brown on the outer remiges, creating the impression of a weak brown trailing edge, less starkly contrasting and less extensive than the black remiges of the many Sooty Terns observed.

Observers were uncertain as to the precise age of most Bridled Terns seen in the context of these storms. Though our West Indian subspecies S. a. melanoptera is somewhat variable in juvenal plumage, in the examples we have studied in the east from Florida to Maryland, there is generally some pale edging visible on some upperwing coverts and/or scapulars. None of the Bridled Terns observed in 1996 in the inshore areas showed any trace of this pattern and thus were believe not to be juveniles; rather, all were uniformly medium-brown above (in the case of the one positively identified adult, a gravish-brown). Thus, most birds were aged as "nonjuveniles." "Nonjuvenal" plumage could refer either to a second-summer/ second-fall plumage or to the adult plumage in a state of molt of the body feathers. Because no field guide or technical reference illustrates the plumage of the secondcalendar-year Bridled Tern, and because we have not yet had opportunity to review specimens of known age, we are uncertain how to distinguish second-calendar-year birds in summer from molting adults (22+ months old) in the field. Olsen and Larsson (1995) note that the second-calendar-year bird should have 1) outer rectrices shorter than the adult; 2) outer rectrices lacking white of the adult; and 3) head markings more diffuse than in adult in clear definitive plumage. In the case of one adult observed on the second CBBT bird in 1996, the tail pattern was seen clearly as the bird banked to alight on a piece of flotsam in the Thimble Channel. As the tail fanned, it was clear that (at the least) most of the two outer rectrices were white, making the bird an adult of the West Indian subspecies, rather than any plumage of the nominate or of S. anaethetus antarctica. Because nesting occurs through much of the year in the tropics, it is probably not possible to say whether more distant birds with "fuzzy" head patterns were adults in molt or second-calendar-year birds. Because most birds showed some molt in the primaries, however, it is likely that many were adult birds.

Sooty Tern Sterna fuscata

Seventy-eight Sooty Terns-53 birds on the Coastal Plain and 25 on the Piedmont-were observed in storms of 1996, 1998, and 1999 (Table 6). In contrast to past storms, only one instance of mortality was documented among these 78 birds. The species is well known as a hurricane-bird throughout its range, including in Virginia, which has numerous prior records of the species 1960-1991. Specifically, the Piedmont had five prior records of the species (involving some 10-11 birds), four of those records associated with David of 1979 (Larner and Scott 1981) but one with Hugo in 1989 (Armistead 1990). The Coastal Plain had 15 prior records of the species involving at least 28 birds: one following Donna in 1960 (the first state record of the species; Smith 1961); one record of 2 birds after Doria in 1971 (Grant 1971); 12 as a result of David (involving 24 birds, 12 of which were carcasses [Scott 1980, Larner and Scott 1981, Kain 1987]); and one after Bob in 1991 (VARCOM archive). In addition to these storm-related records, there are four records of single adults from the Virginia barrier islands 1971-1991 apparently unrelated to hurricanes. Offshore, the species appears to be quite rare, with only four Virginia records (of some six birds) 1978-2000. Richard Rowlett and G. Burrell recorded 110 Sooty Terns in the pelagic zone off Virginia about 248 km east of Cape Charles 11 September 1979 (Larner and Scott 1981), but these were believed to have been transported northward and westward by David. When the onshore records are considered independently, however, the storms of 1996, 1998, and 1999 produced about twice the number of Sooty Terns from all other tropical disturbances in Virginia combined.

Observers of Sooty Terns noted a suite of characters that eliminated Bridled and other dark terns. Adults were jet black above, stark white below, with long black bills. The shape is like no other tern species: very wide in the base of the wing, powerful, sharp angles at the carpal joint and trailing edge bend of the wing, with a razor-sharp point at the wing's tip and a long tail, dark above, that appears to fold to a sharp point when viewed side-on, features somewhat reminiscent of a frigatebird. The adults' underwings were black in the remiges, starkly contrasting with white underwing coverts, darker and more extensive than in Bridled Tern. In numerous but not all cases, the small white forehead, thick black eyeline, and black cap could be well-studied; in all such cases, the white forehead did not become superciliary. Juveniles appeared largely dark overall; only in the closest birds could faint pale upperwing covert edges be discerned. Variably whitish lower belly and vent and variably pale underwings were observed on all juveniles. All had heavy, dark bills. No other tern has similar plumage.

Black Skimmer Rhynchops niger

One adult Black Skimmer was observed and photographed by Stinson along Route 4 south of the dam at Kerr Reservoir at 1500 on 6 September 1996. There are two previous Piedmont records, from Louisa County (11-22 August 1976) and Albemarle County (20 May 1981) (Kain 1987). Black Skimmers have been recorded rather rarely following the passage of tropical storms, although *Fran* was responsible for records of 11 other skimmers between North Carolina and Pennsylvania (Brinkley et al. 1997).

Willet Catoptrophus semipalmatus (apparently subspecies inornatus)

Two Willets were observed in the Piedmont following Hurricane *Fran* in 1996 (Table 7). There are five previous records from the Virginia Piedmont (Kain 1987), but one of these (by Patteson and others at Riverville) has not yet been reviewed by VARCOM.

Both Willets observed were very large shorebirds, pale brown above, very pale whitish below, with no mottling below. Tail grayish with white base, feet projecting well beyond the tail. Head grayish brown, bill much longer than head, fairly stout. Wide, striking white wingstripe, produced by white bases to remiges and white inner secondaries, blackish tips to primaries, and very dark underwing coverts, axillaries, and upperprimary coverts. Overall plainness and paleness suggested western subspecies.

| Species | Storm | Location | Date | Time | Distance | # | Observers |
|-------------------------|--------|---------------------|----------|-----------|----------|--------|----------------------------|
| Willet | Fran | Kerr Reservoir | 06/09/96 | 1030 | С | 2 | BLS, JBP, ESB, HFD |
| Ruddy Turnstone | Fran | Kerr Reservoir | 06/09/96 | 0736 | b | 1 ad. | ESB |
| | Fran | Kerr Reservoir | 06/09/96 | 0950 | C | 2 | BLS, JBP, ESB, HFD |
| | Fran | Kerr Reservoir | 06/09/96 | 1400+ | a—c | 3+ | CMS, BLS, JBP, ESB, HFD |
| Red-necked Phalarope | Bertha | Cape Henry beach | 12/07/96 | 0700 | b | 1 | ESB |
| | Fran | Kerr Reservoir | 06/09/96 | 1025 | d | 20 | HFD, JBP, BLS, ESB |
| | Fran | Kerr Reservoir | 06/09/96 | 1112 | C | 3 | HFD, JBP, BLS, ESB |
| | Fran | Kerr Reservoir | 06/09/96 | 1001-1015 | b | ~20 | HFD, JBP, BLS, ESB |
| | Fran | Kerr Reservoir | 06/09/96 | 1123 | a—b | 1 juv. | HFD, JBP, BLS, ESB |
| | Fran | Craney Island | 07/09/96 | 1500+ | a | 8 | ESB, TMG, m. ob. |
| | Fran | CBBT 1 | 07/09/96 | 1100 | е | 1 | ESB |
| | Fran | Craney Island | 07/09/96 | 1500+ | a | 3 ad. | ESB |
| Red Phalarope | Fran | Kerr Reservoir | 06/09/96 | 1112 | a—b | 1 ad. | BLS, JBP, ESB, HFD |
| | Fran | Craney Island | 07/09/96 | 1500+ | a | 2 ad. | ESB |

| Table 7. | Records of a | nonpelagic | shorebirds | in | interior | Virginia | following | tropical |
|----------|--------------|------------|------------|----|----------|----------|-----------|----------|
| cyclones | 1996-1999. | | | | | | | |

Ruddy Turnstone Arenaria interpres

Minimally, six Ruddy Turnstones were observed in the Piedmont after Hurricane *Fran* in 1996 (Table 7). There are two previous Piedmont records of this species in Virginia (Kain 1987), though it is probably more regular here in late May and early June than available records indicate (particularly after or during the passage of strong low pressure cells).

All turnstones observed were very chunky, medium-small waders, with short, dark bills, seen in flight and on the shoreline. Though the turnstones observed were in changing or basic plumage, the harlequin pattern of the upperparts was striking: white rectrices with a black subterminal band, dark rump and white lower back, and dark or reddish in the upperwing, with pale bases to the remiges and white lesser coverts. (In this case, it should be stated unequivocally that no such dissection of plumage was necessary in the field—all observers simply noted the unique dorsal pattern and chorused: "Turnstones!") The "3+" record indicates that single birds were noted on the edge of the reservoir shore and in flight, but that (of the six or seven sightings) no more than three birds could be determined to have been present. As with the more numerous gulls and terns, these represent the most conservative estimate possible.

Red Phalarope Phalaropus fulicarius

In Virginia, the only Red Phalarope noted inland in the tropical storms of the late 1990s was at Kerr Reservoir 6 September 1996, following *Fran*; a group of two adults at Craney Island the next day was unusual for the number, but single birds have been recorded here previously (Table 7). This species is rare and irregular on land in Virginia, but it is occasionally common to abundant in the offshore waters during migration, sometimes well into winter. There are two previous Piedmont records, the first a specimen collected at University of Virginia, Charlottesville 18 September 1938 (Dickinson and Calhoun 1939; also *Raven* 9: 109), the other a bird near South Boston, in Halifax County 23 December 1990 (VARCOM archive).

Among the second large flock of Red-necked Phalaropes seen 6 September 1996, Patteson, Brinkley, Sullivan, and Day saw a phalarope of stockier build, much paler overall, with ghostly gray mantle and scapulars lacking any streaking. The bird bore a sliver of slightly darker feathering on the lower back that contrasted more strongly with the rest of the upperparts than in the Red-neckeds, had a chunkier, thicker bill (also a bit shorter), and a less extensive black eyepatch. All concurred as this bird passed in front of us (and nearly overhead) that this was an adult Red Phalarope in basic plumage. The bird was under observation for about one minute, but conditions for study were favorable.

Red-necked Phalarope Phalaropus lobatus

Several flocks of Red-necked Phalaropes were seen at Kerr Reservoir in 1996, following *Fran*, and others were scattered along the coast after *Fran* and *Bertha* in the same year, probably but not certainly storm-related (Table 7). The species is a regular transient in very small numbers on the coast, becoming much more numerous offshore zones. There are four previous Virginia Piedmont records of single birds and one Mountains-Valleys record from Roanoke of multiple birds that is likely related to the passage of *David*.

All three groups of Red-necked Phalaropes at Kerr Reservoir 6 September 1996 were seen flying in tight formation in the storm, all from the parking pull-off Vol. 72(2) THE RAVEN

on Route 4. In all cases, the birds appeared light below and very dark above, with pale and buff streaking above in scapulars, coverts, and mantle, dusky gray tails with white uppertail coverts, dark rumps and dark dividing lines down the rectrix coverts. All had relatively long, very thin black bills, heavy black eye patches, white foreheads and mostly dark crowns, which connected narrowly to the dark mantle. On all birds, an extensive wingstripe (pale bases to remiges) was visible. Shape was squat, with fairly small-appearing head for the body. Feet did not project beyond the tail.

Unidentified individuals

The unidentified birds seen during the storms merit brief mention. There were 2 *Pterodroma* and 7 *Oceanodroma* at the CBBT 13 July 1996, and 2 *Pterodroma* there 7 September 1996. An unidentified storm-petrel was at Kingsmill Marina 6 September 1996 (BW). At Kerr Reservoir 6 September 1996, observers found one small tubenose (a small gadfly petrel or an Audubon's Shearwater; BLS), a large shearwater (probably Greater; ESB), and a small dark jaeger (not Pomarine; ESB, HFD, JBP). Two unidentified dark-backed *Sterna* (either Bridled or Sooty Terns) and two unidentified storm-petrels were at the CBBT 28 August 1998 during *Bonnie* (CMS, ESB, JBP, DJS). An unidentified *Pterodroma* was observed during landfall of *Dennis* 5 September 1999 (JBP, ESB, JC, RPM). One unidentified *Sterna* (either Bridled or Sooty Tern) was noted 16 September 1999 at 57th Street, Virginia Beach, during *Floyd* (GBP), and another was at the CBBT the same date (JC, ESB, JBP, SH). An unidentified white *Sterna* was at Briery Creek Lake 6 September 1996 after *Fran* (CMS).

ACKNOWLEDGMENTS

We thank Roger Clapp, Sue Heath, Brian Patteson, Charlotte Friend, and Jeff Blalock for assistance in gathering information on older records considered herein. Thanks are also due to all observers listed above who provided details on seabirds noted during these storms.

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1998 EASTERN SHORE SEASIDE BARRIER ISLAND/ LAGOON COLONIAL WATERBIRD SURVEY

BARRY R. TRUITT The Nature Conservancy Virginia Coast Reserve Nassawadox, VA 23413

DONALD J. SCHWAB Virginia Department of Game & Inland Fisheries Williamsburg, VA 23188

INTRODUCTION

Because of their importance as top level predators in coastal estuaries, populations of colonial waterbirds are used as potential indicators of ecological changes in coastal systems. In 1993, the population status and distribution for all colonial waterbird species breeding on the Coastal Plain of Virginia were generated by a fairly comprehensive survey (Watts and Byrd 1998). This survey subdivided the Coastal Plain of Virginia into five geographic regions, including the Eastern Shore seaside-barrier island/lagoon system along the seaward margin of the Delmarva Peninsula north to the Maryland/Virginia boundary line. This coastal system was determined to be the most important region for the majority of breeding colonial waterbirds in Virginia, hosting over 70% of all breeding pairs and 23 of the 24 colonial species found in Virginia in 1993.

In 1996, the Virginia Barrier Island Avian Partnership, an informal team of regional avian experts and representatives from the different management agencies, recommended the continuation of current long-term monitoring programs in order to collect data on trends for birds breeding in the barrier island/lagoon system (The Nature Conservancy, unpublished). The current monitoring programs for colonial waterbirds include the annual colonial and beach-nesting waterbird surveys that are restricted mainly to the barrier islands of the Virginia Coast Reserve along with Assawoman, Wreck, and Fishermans Islands (see Williams et al.1990). These island surveys are augmented about every five years (since 1977) by surveys of colonial waterbirds nesting in the whole seaside barrier island/lagoon system, including all lagoonal marshes and the northern islands of Assateague, Chincoteague, and Wallops (Figure 1).

The purpose of this study was to generate population estimates for all colonial waterbird species currently breeding in the Eastern Shore seaside barrier island/lagoon system in 1998 and to compare them with the 1993 results. Population trends for the system will also be compared with those determined for the barrier islands in 1997 (Williams et al.1998).



METHODS

Methods utilized in conducting the 1998 seaside barrier island/lagoon system colonial waterbird survey closely followed those used by Watts et al. (1993). An extensive aerial survey of this coastal system using fixed-wing aircraft was conducted for 11 hours over three days beginning June 8th. Attempts were made to inspect all potential nesting areas in this system. Follow-up boat and ground surveys of all barrier island and marsh colonies were conducted over 8 days for all colonial species, with the exception of the gulls. Estimates of nesting numbers of Laughing, Great Black-back, and Herring Gulls were generated from aerial surveys, as the gulls were still very synchronous at the time of the survey in June, not having experienced any abnormal high tides and wash-outs. All estimates of aerial surveys were performed by the same observer. Many different observers were utilized for the boat and ground surveys, but most observers had also participated in the 1993 survey.

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 for all species, in spite of the lack of ground verification of this relationship (see Erwin 1979). [this is not clear to me - one adult equals one pair?]

RESULTS

A total of 223 different colonies were mapped and surveyed in the Eastern Shore seaside barrier island/lagoon system during the 1998 survey. Colonies contained an estimated 64,608 breeding pairs of 24 species of colonial waterbirds. One new nesting species, Double-crested Comorant, was found during the 1998 survey. Current results are compared with the 1993 results in order to begin assessment of long-term trends in breeding colonial waterbird populations in this important coastal system (Table 1).

Because waterbird populations fluctuate annually by 5-15% (Williams et al.1990), we used a 20% change in the population to indicate a significant increase or decline. A total of five species (White Ibis, Great Blue Heron, Sandwich Tern, Double-crested Cormorant, and Brown Pelican) exhibited significant increases in population over the five-year period. A total of eleven species (Snowy Egret, Tricolored Heron, Little Blue Heron, Cattle Egret, Green-backed Heron, Yellow-crowned Night Heron, Herring Gull, Gull-billed Tern, Caspian Tern, Common Tern, and Black Skimmer) exhibited significant declines over the five-year period. Eight species exhibited no significant change in population during the five-year period. The overall population of colonial waterbirds breeding in this system declined by 8% and the total number of colonies declined by 5%. Species exhibiting significant declines bear further monitoring in the future in order to establish long term trends.

The total number of colonies of colonial waterbirds breeding in this sys-

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| Species | | 1993 N | Max. Pairs | 1998 N M | Max. Pairs | % Change |
|--------------------|------------------------|-----------|------------|-------------|------------|----------|
| Waders | | | | | | |
| White Ihis | Fudocimus albus | 1 | 3 | 1 | 18 | 500% |
| Glossy Ibis | Plegadis falcinellus | 9 | 779 | 7 | 822 | 6% |
| Great Blue Heron | Ardea herodias | 1 | 8 | 1 | 10 | 25% |
| Great Egret | Casmerodius albus | 10 | 885 | 11 | 976 | 10% |
| Snowy Earet | Earetta thula | 12 | 1862 | 10 | 1212 | -35% |
| Tri-colored Heron | Egretta tricolor | 9 | 713 | 7 | 530 | -26% |
| Little Blue Heron | Egretta caerulea | 8 | 330 | 6 | 195 | -41% |
| Cattle Egret | Bubulcus ibis | 6 | 854 | 5 | 540 | -37% |
| Green Heron | Butorides striatus | 7 | 47 | 2 | 3 | -94% |
| Black-crowned | Nycticorax nycticorax | 9 | 442 | 8 | 359 | -19% |
| Night Heron | | | | | | |
| Yellow-crowned | Nyctanassa violacea | 3 | 63 | 3 | 36 | -43% |
| Night Heron | | | | | | |
| Gulls | | | | | | |
| Great Black-backed | Larus marinus | 20 | 362 | 15 | 369 | 2% |
| Gull | | | | | | |
| Herring Gull | Larus argentatus | 27 | 6106 | 42 | 4653 | -24% |
| Laughing Gull | Larus atricilla | 109 | 44387 | 122 | 43784 | -1% |
| Terns | | | | | | |
| Gull-billed Tern | Sterna nilotica | 29 | 604 | 16 | 478 | -21% |
| Caspian Tern | Sterna caspia | 4 | 7 | 2 | 4 | -43% |
| Royal Tern | Sterna maxima | 2 | 3250 | 3 | 3451 | 6% |
| Sandwich Tern | Sterna sandvicensis | 2 | 30 | 1 | 54 | 80% |
| Forster's Tern | Sterna forsteri | 69 | 2169 | 69 | 2426 | 12% |
| Common Tern | Sterna hirundo | 38 | 3247 | 28 | 1727 | -47% |
| Least Tern | Sterna antillarum | 24 | 747 | 16 | 709 | -5% |
| Others | | | | | | |
| Black Skimmer | Rynchops niger | 23 | 2549 | 19 | 1766 | -31% |
| Double-crested | Phalacrocorax auritus | | | 1 | 6 | 600% |
| Cormorant | | | | | | |
| Brown Pelican | Pelecanus occidentalis | 1 | 324 | 1 | 470 | 45% |
| Total | | 235 | 69968 | 223 | 64608 | -8% |

 Table 1. Estimated number of colonies (N) and breeding pairs in 1993 and 1998.

 The category "Colonies" refers to the number of colonies that included each species.

tem declined by 5% during the five-year period, though several species, especially Gull-billed Tern, Common Tern, and Least Tern, exhibited significant declines in their total number of colonies. Since all three of these species nest on barrier island beaches in this system (the Least Tern exclusively), the declines in their numbers of colonies might be related to an increase in mammalian predators on the islands (Erwin et al. 2001).

The population trends presented here for the system in 1998 compare favorably with population trends determined for the barrier islands for most species (Williams et al.1998). Two exceptions to the island population trends include Herring Gulls, whose population is stable on the islands but decreasing significantly in the system, and Glossy Ibis, whose population has decreased significantly on the islands but is stable in the system.

Unusual discoveries made during the survey included 10 pairs of Black-neck Stilts observed near the heronry along the causeway marshes near Chincoteague, Virginia on May 26, 1998 by Mike Erwin and Brian Eyler. In spite of strong territorial behavior (e.g. distraction displays), nesting could not be confirmed, but their discovery during the breeding season bodes well for this species to nest in this system in the future.

On June 13, 1998, Barry Truitt and Brian Eyler discovered Gull-billed Terns nesting on wrack in two locations in the Gap Marshes southeast of Quinby, Virginia (Accomack county). At both colony sites, the Gull-billed Terns nested with Laughing Gulls on the wrack, and one site also supported nesting Forster's Terns. Though Gull-billed Terns were once known as the "marsh tern" (Parnell et al.1995) and have been found recently nesting on shell piles in the salt marsh in coastal Virginia (Erwin et al.1998), we believe that this is the first record of this tern nesting on wrack in a salt marsh in Virginia (see Terwilliger1991).

Data from the 1998 survey are being entered [have been entered?] into a Geographical Information System (GIS) at the University of Virginia's Virginia Coast Reserve/Long Term Ecological Research (LTER) program for use in an ecosystem-level analysis of the relationship between landscape elements and avian diversity in this coastal system.

ACKNOWLEDGMENTS

We thank the many individuals who participated in the 1998 survey. Aerial surveys were conducted by Don Schwab, Barry Truitt, and Ruth Beck. The pilot was Carter Crabbe of Chesapeake Aviation. Ground and boat surveys were conducted by Bill Williams, Ruth Beck, Michael Beck, Bill Akers, Jerry Via, Don Schwab, Barry Truitt, Brian Eyler, Mike Erwin, Amanda Knoff, Irv Ailes, and Karen Pacheo. Funding for the 1998 survey was provided by the U.S. Fish & Wildlife Service, the Virginia Department of Game & Inland Fisheries, and the Virginia Coast Reserve of The Nature Conservancy.

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THE 2000 BEACH-NESTING AND COLONIAL 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 101 Charles Street, Apt #1 Annapolis, Maryland 21401

RUTH BECK P.O. Box 270 Barhamsville, Virginia 23011

JERRY VIA 3265 Laurel Drive Blacksburg, Virginia 24060

INTRODUCTION

The twenty-sixth consecutive annual survey of the beach-nesting and colonial waterbirds of the Virginia barrier islands was completed 18-21 June 2000. With the exception of Parramore Island, all of the Virginia barrier islands from Assawoman Island on the north through Fisherman's Island on the south were surveyed. Field strategies and techniques were consistent with those previously described (Williams et al. 1990). Table 1 presents an island-by-island summary of the survey results.

Early spring storms 21-23 March and 28-30 March brought significant wind and water erosion to the barrier islands. Most notably affected was Cedar Island where an existing inlet near the center of the island was further widened. Due to the seasonal timing of these events, there was no disruption of breeding efforts for colonial and/or beach-nesting waterbirds.

RESULTS AND OBSERVATIONS

The number of nesting Brown Pelicans (*Pelecanus occidentalis*) declined for the first time since 1989 (Williams 1989). The total of 1475 on Fisherman's Island, the only colony for this species on Virginia's Atlantic barrier islands, was a 19%

| Pre. | 101 | | | | | | | _ | _ | _ | | | | | | | | | | | | | | | | | | |
|---------|---------|---------|----------------|---------|---------|----------|---------|---------|---------|----------------|---------|----------|------------------|--------|----------|----------|--------|----------|----------|----------|---------|----------|----------|----------|----------|----------|----------|-----------------|
| Total | 1475 | 29 | 32 | 215 | 159 | 107 | 231 | 104 | 4 | 302 | 5 | 80 | 95 | 2 | 52 | 119 | 539 | 3938 | 3106 | 487 | 48 | 0 | 2387 | 4 | 344 | 60 | 318 | 1344 |
| Fisher | 1475 | | 32 | | 58 | 59 | 47 | 88 | | 79 | | 99 | | | | | 61 | 3676 | 654 | 86 | | | 2387 | 4 | | 60 | | |
| Smith | | | | | | | | | | | | | | | | | 29 | | | | | | | | | | | |
| Myrtle | | | | | | | | | | | | | | | | 2 | 22 | | | | 2 | | | | 6 | | 39 | |
| Mink | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Gdwn | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Shp Shl | | | | | | | | | | | | | | | | | 19 | | | | | | | | 38 | | | 352 |
| Wreck | | | | 24 | 27 | 21 | 137 | 12 | 2 | 162 | 2 | | 21 | | | | 56 | 220 | 1089 | 211 | | | | | 9 | | 42 | 14 |
| L. Cobb | | | | | | | | | | | | | | | | | 12 | 42 | 331 | 27 | | | | | 26 | | | 97 |
| Cobb | | | | 120 | 16 | 27 | 34 | 2 | 2 | 61 | 3 | 14 | 63 | 2 | | + | 28 | | 210 | 28 | | | | | | | 24 | |
| Rogue | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hog | | | | | | | | | | | | | | | | | 34 | | | | | | | | 14 | | 18 | 104 |
| Chm Pol | | 29 | | 70 | 58 | | 13 | 2 | | | | | 11 | | | | 14 | | 337 | 83 | | | | | | | | |
| Sandy | | | | | | | | | | | | | | | | | 22 | | 485 | 52 | | | | | 98 | | | 25 |
| Рагга | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Das Shl | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cedar | | | | | | | | | | | | | | | 22 | 28 | 103 | | | | 46 | | | | 153 | | 126 | 752 |
| Metorn | | | | | | | | | | | | | | | 13 | 64 | 121 | | | | | | | | | | 47 | |
| Assa | | | | | | | | | | | | | | | 17 | 24 | 18 | | | | | | | | | | 22 | |
| | Brn Pel | DC Corm | GBI Her | Grt Egt | Sny Egt | LtBI Her | Tri Her | Cat Egt | Grn Her | BCN Her | YCN Her | Wht Ibis | Glsy Ibis | No Har | Wil Plvr | Pip Plvr | Am Oys | Lgh Gull | Her Gull | GBb Gull | Gb Tern | Cas Tern | Ryl Tern | Snd Terr | Com Tern | For Tern | Lst Tern | BIk Skim |

 Table 1. Compiled counts by island. Species and island abbreviations follow previous conventions.

decrease from the 1922 breeding birds found in 1999, yet significantly higher than the survey's longitudinal mean of 823 (Williams et al. 2001).

First recorded as barrier islands breeders on Chimney Pole Marsh in 1998 (Williams et al. 2000), Double-crested Cormorant (*Phalacrocorax auritus*) numbers at that site increased from 16 in 1999 (Williams et al. 2001) to 29 this year. There were 12 active nests.

Among the long-legged wading bird species there were several notable positive and negative trends. Great Blue Herons (Ardea herodius) increased by 2 pairs over 1999 (Williams et al. 2001) at their only barrier islands nesting site on Fisherman's Island. The 215 Great Egrets (Ardea alba) was the second lowest total for this species for the longitudinal survey, significantly below the survey mean of 397 (Williams et al. 2001). An all-time low of 195 was recorded in 1990 (Williams et al. 1991). Snowy Egret (Egretta thula) numbers declined slightly from the 1999 total of 191, and were significantly lower than the survey mean of 531 (Williams et al. 2001). For the second consecutive year, Little Blue Heron (E. caerulea), Tricolored Heron (E. tricolor), and Cattle Egret (Bubulcus ibis) numbers increased (Williams et al. 2001). Nevertheless, all three species were below their historical survey averages of 127, 443, and 175 respectively. Green Herons (Butorides striatus) were once again hard to find during the survey. Prior to 1995 the annual count averaged approximately 30 birds. In the last 6 surveys we have found as few as 0 in 1995 (Williams et al. 1996) and no more than 8 in 1997 (Williams et al. 1998). Blackcrowned Night-Heron (Nycticorax nycticorax) numbers increased for a third consecutive year, yet remained well below the survey mean of 775 (Williams et al. 2001).

The most noteworthy tally of the survey was the total of 80 White Ibis (*Eudocimus albus*) from two colonies. The Fisherman's Island heronry had 66 adults. Another 14 were observed on Cobb Island. In both locations large feathered young were observed. Since 1994 this species has increased ten-fold. Glossy Ibis (*Plegadis falcinellus*), on the other hand, continued a four year decline posting an all-time low count of 95, significantly less than their 25-year mean of 499 (Williams et al. 2001).

Counts of all three solitary beach-nesting species, Wilson's (*Charadrius wilsonia*) and Piping (*C. melodus*) plovers and American Oystercatchers (*Haematopus palleatus*) remained consistent with recent years. The plover species were at their respective survey averages of 50 and 113. All of the Wilson's Plovers and 116 of the 119 Piping Plovers were found on the three northern-most islands in our survey, Assawoman, Metompkin, and Cedar. The American Oystercatcher continues to be of concern. Its numbers remain significantly below the longitudinal survey mean of 837 (Williams et al. 2001). Recent Atlantic coast studies indicate that "from Virginia south, breeding numbers show a decline in recent years" (p. 198, Davis et al. 2001).

Laughing Gull (*Larus atricilla*) numbers equaled their second all-time lowest count, significantly below their historical mean of 10,646. Herring Gull (*L. argentatus*) counts were relatively unchanged and consistent with their longitudinal survey mean of 3164. Great Black-backed Gulls (*L. marinus*) posted their second all-time

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highest totals, more than twice their historical mean of 206 (Williams et al 2001).

Counts among the tern species registered mixed results compared to previous surveys. Royal Tern (*Sterna maxima*) totals were the second lowest in the history of the survey. The previous low was 1330 in 1976 (Williams et al. 1990). Common Tern *S. hirundo* numbers decreased by 54% over 1999 (Williams et al. 2001), amounting to the survey's all-time lowest count; this year's total of 344 is 89% below the historical mean. The Least Tern (*S. antillarum*) total of 318 was a significant increase over the second all-time low count of 122 in 1999 (Williams et al. 2001). However, it was 57% below the survey mean of 725 (Williams et al. 2001).

We were pleased to find that the Black Skimmer (*Rhynchops niger*) population posted a modest gain over the all-time low of 1221 adults in 1999 (Williams et al. 2001). Barry Truitt (pers. comm.) reported late in the nesting season "over 300 fledglings" from a colony on the north end of Cedar Island and "over 200 chicks and fledging birds" on Wreck Island. These anecdotes are an encouraging sign for this species that has a historical survey mean of 4400 (Williams et al. 2001).

Barrier island field work never fails to produce the best in unexpected bird sightings. Among the more interesting ones for this survey were 2 basic plumaged Common Loons *Gavia immer* off Hog Island 20 June, a dead Sooty Shearwater (*Puffinus griseus*) on Metompkin Island 21 June, and 2 Wilson's Storm Petrels (*Oceanites oceanicus*) off Smith Island 19 June. A single Pied-billed Grebe (*Podilymbus podiceps*) was observed on Hog Island 21 June. Six Red-breasted Mergansers (*Mergus serrator*) were observed during the survey, three on Fishermans Island 18 June, 1 on Cedar Island 20 June, and 2 on Sandy Island 21 June. Most unusual was a female Northern Pintail (*Anas acuta*) on Metompkin Island 20 June. Up to 20 Marbled Godwits (*Limosa fedoa*) made the sandy beach behind the Machipongo Station on Hog Island their morning staging place throughout the survey period. On 20 June Cedar Island hosted a Whimbrel (*Numenius phaeopus*) and a single Western Sandpiper (*Calidris mauri*).

ACKNOWLEDGMENTS

We are grateful for the support of Susan Rice, Manager of the Eastern Shore National Wildlife Refuge, for access to and vehicular transport on Fishermans Island. We could not complete our surveys without Barry Truitt, who makes getting to and from the barrier islands as easy as possible. Rick Kellam and Richard Ayers were exceptional hosts at the Machipongo Station on Hog Island. We were assisted in the field by Calvin Brennan, Justin Crump, Oskars Keiss, and Philip Smith.

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RANGE EXPANSION OR REINVASION OF OLD RANGE? A DISCUSSION OF THE STATUS OF SPECIES WITH NORTHERN AFFINITIES IN WISE COUNTY BASED ON OVER THIRTY YEARS OF OBSERVATION

RICHARD H. PEAKE P. 0. Box 28 Wise, Virginia 24293

There is little doubt that the avifauna of Southwest Virginia has undergone noticeable changes during the last half of the twentieth century. One of the more interesting categories of change has been the appearance or, as I would argue, the reappearance of species for whom the recognized center of their ranges is to the north of Southwest Virginia. Bird observations in far Southwest Virginia, especially Wise County, support the thesis that many species that are now appearing in this region are reestablishing themselves in old range rather than expanding into new range. The recent avifaunal changes in Southwest Virginia seem, therefore, to result more from man's manipulation of the environment than from changes in climate.

At a time when many species whose center of abundance is to the south of Virginia are expanding their breeding ranges northward (e. g., Scissor-tailed Flycatcher, Carolina Wren, Northern Mockingbird, Northern Cardinal), extreme Southwest Virginia has witnessed a steady increase in its breeding avifauna of species whose center of abundance is to the north (e. g., Black-capped Chickadee, Least Flycatcher, Winter Wren, Swainson's Thrush, Magnolia Warbler). It appears to me that, on the basis of my observations and those of my contemporaries together with what can be gleaned from the literature, we are witnessing a return of species to areas that they probably occupied in former times as these areas return to forest and that forest ages sufficiently to sustain these species.

From the personal records of F. M. Jones, we know that the abundance of many species in the avifauna in Wise County today is considerably different from what it was in the 1930's when Jones studied birds along the route of the highway being built down the valley between Norton and Pound. Many of the species he noted are no longer abundant in this area but are more commonly found at higher elevations; exceptions include fairly mature cove hardwoods with hemlock and rhododendron along the streams draining the cove (e.g. Phillips Creek, which now harbors a sizable population of Black-throated Green Warblers and Black-throated Blue Warblers at altitudes ranging below 510 m). In addition, I have found Darkeyed Juncos at low elevations during the breeding season in several places in Wise County, and the Lee County foray (Dalmas 1997) located a singing bird on a northfacing bluff over North Fork of the Clinch River (510 m). These species could have been present in this area at low elevations all during this century and the last, but since almost all of the land was under cultivation earlier in the century, this seems

unlikely. However, there are a number of places in neighboring Dickenson County (including Breaks Interstate Park) where Black-throated Blue Warblers occur at low elevations, in some cases in close proximity to human habitation and cultivation. I am unaware how long these warblers have been in the Phillips Creek drainage in recent times, but the breeding season of 2000 witnessed the first Canada Warblers recorded in the Phillips Creek drainage (3 singing males on June 12, 2000 at elevations just over 600 m; Lois Boggs and R. H. Peake).

There are other suggestions that some of the species with northern affinities were present in past years during the breeding season in Wise County. For Winter Wrens, Murray (p. 78,1952) cites a bird found near High Knob "by Addy, June 22, 1929," and Clapp (1997) lists a nest found at low elevation near Big Stone Gap in mid-May 1933 by Joshua F. B. Camblos. Recent records by the author and Philip Shelton suggest that there is an increasing population of this species. Shelton (pers. comm.) found singing birds in the drainage below High Knob Lake during the late 80's and in recent years there have been singing males in June in the area above the lake itself (2 singing mates in 1998, RHP and 1 in 1999 DEP and RHP); lower elevation records include the Roaring Branch drainage below Appalachia. During the breeding season of 2000, Shelton (personal communication) found singing birds down the Little Stony Creek drainage. Taken together, these records indicate that this species probably is expanding its population. It may simply be coincidence that this expansion is occurring at a time when the forest is beginning to attain something like mature growth, but I am inclined to believe there is a connection between these occurrences.

A few Least Flycatchers could be found from time to time in Wise and neighboring Dickenson County at fairly low elevations in the 1970's. They were generally associated with apple orchards, a habitat in which the species is found further south in the Appalachians in North Carolina and Georgia. As these orchards have disappeared since 1968, so have the low-elevation Least Flycatchers, the last recorded by me a singing male found on a Breeding Bird Survey at Dewey Chapel in Wise County in the early 1990's. They were also found in open lowland situations during the Lee County foray in 1992 (Dalmas 1993). However, during the 1990's this species established itself in open dry deciduous woodland on High Knob, first at High Knob Lake and then spreading out from there along the ridge of Powell Mountain, where it can now be reliably found at a number of places during June and early July.

Arthur H. Howell (1908) found a Canada Warbler at low elevation on his July 22-29,1908 trip to Big Stone Gap, and Mengel (1964) found nests of the species and collected specimens on Black Mountain in Kentucky in 1952. When I first began field work in Wise County in 1968, it was possible to find a few Canada Warblers during the breeding season at High Knob Lake in the *Rhododendron* that grows along much of the edge of the lake. This population slowly increased. and in the 1990's, this population underwent what may be termed explosive growth. It expanded over the entire ridge of Powell Mountain and then spread to lower elevations on the mountain and finally appeared at much lower elevations at Roaring Branch (540 m, one singing bird) below Appalachia, and at Phillips Creek near Pound (660 m, three singing birds in 2000). In addition, a pair was found near the Breaks Interstate Park on Pine Mountain at 780 m in 1984.

These apparent expansions suggest the possibility that small populations of these species may have survived during the years in the late nineteenth and early twentieth centuries when almost all of the land in Wise County was timbered and turned to subsistence agriculture. Once the forest returned and achieved some maturity, these species have been able to expand their populations.

Another species to be considered is the Magnolia Warbler, a species that probably was not present during the breeding season in Wise County before the 1990's, when it was first discovered on High Knob and later confirmed to be breeding. This species had appeared at Mt. Rogers and at Laurel Bed Lake in the 1970's, and has been expanding its range to lower elevations on Mt. Rogers and to neighboring Whitetop. The population at Laurel Bed Lake, though noted in subsequent years, has not noticeably increased. It has been surprising to note the rapidity with which the Magnolia Warbler has increased its population on High Knob. It has expanded its population along the ridge of Powell Mountain and is now much more easily found than the Blackburnian Warbler, which it apparently has displaced from the hemlock-rhododendron areas around High Knob Lake. The example of the Magnolia Warbler may therefore represent a range expansion southward that is not merely a reestablishment of old range after restoration of habitat. There is, of course, the possibility (though it seems unlikely to me) that there was a small, undiscovered population of breeding Magnolia Warblers in the southern Appalachians. I am not aware of evidence that the appearance of Magnolia Warblers on Mt. Rogers, at Laurel Bed Lake, and at High Knob Lake did not represent a true southward range expansion. This southward extension now seems to be repeating itself with a range expansion by the Yellow-rumped Warbler at Mt. Rogers (Philip Shelton, personal communication).

Brown Creepers have been appearing with greater regularity in Wise County in recent years during the breeding season, especially in the Roaring Branch and Phillips Creek drainages, where they have been noted on a number of point counts in June in the 1990's below 540 m. This species may be responding to the maturing forest.

For many species with northern affinities, High Knob Lake seems to provide a needed foothold. During the 2000 breeding season, Shelton (pers. comm.) found a singing Swainson's Thrush at High Knob Lake. He had found this species at Mt. Rogers many years earlier. It has maintained a population there since the 1970's, although it has not spread from the summit to lower elevations as has the Hermit Thrush. However, both the Hermit Thrush and the Swainson's Thrush were found on the summit of Tazewell Beartown during the 1986 VSO Tazewell Foray (Peake 1987). This species may establish itself at High Knob Lake which seems to be a magnet that attracts northern species. Red-breasted Nuthatches have also appeared at High Knob Lake during the breeding season but have as yet given no evidence of establishing a breeding population.

On the basis of range expansion that has occurred elsewhere in Southwest Virginia, especially at Mt. Rogers, Whitetop, Tazewell Beartown, and Laurel Bed Lake/Russell Beartown, it seems worthwhile to look for Red-breasted Nuthatches and for Black-capped Chickadees and Saw-whet Owls as breeding birds at High Knob and elsewhere on Powell Mountain. The Black-capped Chickadee has established (or re-established) itself on Mt. Rogers during the last third of the twentieth century. In the late sixties, the only place on Mt. Rogers that an observer could find a Black-capped Chickadee was on the mountain's summit. Today the majority of the chickadees above 1050 m in the Mt. Rogers area can properly be called Black-capped Chickadees, although there is much evidnce of hybridization below this elevation. A similar trend is occurring at Tazewell Beartown and Laurel Bed Lake (Clapp 1997).

It seems plausible that both these species, which utilize northern hardwood forest as well as spruce, could appear at High Knob during the breeding season. Perhaps other species with northern affinities might also make an appearance. There is now a sufficient amount of breeding bird information from Powell Mountaina that it should be easier in the future to ascertain whether or not observers are witnessng a true range expansion or simply the reappearance of speceis diminished by the destruction of habitat.

At a time when global warming is of great concern, it is interesting to note the movement of species with northern affinities southward in the Southern Appalachians. Although some of these species may be true pioneers, others seem to be merely reestablishing their presence in areas where they historically occurred before the cutting of the forest that originally covered the region. Perhaps man's manipulation of the environment directly by eliminating forest or by permitting it to regrow has more to do with recent avifaunal changes in Southwest Virginia than do climatic changes.

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AVIAN WINDOW STRIKE MORTALITY AT A SUBURBAN OFFICE PARK

TIMOTHY J. O'CONNELL 802 Boulder Springs Dr. Richmond, VA, 23225 current address Penn State Cooperative Wetlands Center 301 Forest Resources Laboratory University Park, PA 16802 tjo111@psu.edu

ABSTRACT

From May 1993 to May 1994, I recorded incidences of window strike mortality at four glass-surfaced buildings in a corporate office park in suburban Richmond, Virginia. Each building was checked for dead birds by walking the perimeter of the building approximately weekly. Individual victims were counted and identified to species, depending on the state of preservation. I documented 116 individuals of 40 species killed at the four buildings, with a mean annual mortality rate of 29 individuals killed per building. This rate is nearly three times the carefully derived and independently verified estimated rate of ten birds/building/ year, suggesting that structures with high rates of bird strikes can indeed compensate for structures with low incidences of bird strikes in continental scale estimates of window-strike mortality. Unlike previously published reports on bird-window collisions, mortality in this study was significantly higher in the spring and fall than in winter. I also documented a disproportionately low incidence of mortality among birds attracted to feeders and a high incidence of mortality in long distance migrants. Window-strike mortality at office parks may mimic more closely the type of mortality documented at certain well-known skyscrapers than it does the mortality observed at private residences with feeding stations.

INTRODUCTION

Reports of dramatic bird kills at communications towers have recently garnered media attention as the construction of thousands of new towers is contemplated following passage of the Telecommunications Act of 1996 (Ornithological Council 1999). Lighted towers can confuse migrating birds that are drawn to the light, particularly during periods of light rain or fog. As birds repeatedly circle around the lighted area, they may be injured or die from collisions with the tower itself, guy wires, or other birds (Cochran and Graber 1958, Avery et al. 1976). Isolated instances of massive kills (e.g., thousands of birds in a single night) have been reported from individual towers. At least one on-line compilation estimates that approximately 5 million birds are killed annually in North America from collisions with towers (www.towerkill.com). The 1998 report from the resolutions committee of the North American Ornithological Conference (David Blockstein, Chair) urged the telecommunications industry, the United States Fish and Wildlife Service, the Federal Aviation Administration, and the Federal Communications Commission to work together to study the phenomenon and ultimately devise means to reduce bird mortality from tower collisions.

Similar to tower mortality, large numbers of birds also die annually from collisions with skyscrapers and other tall buildings. Buildings close to waterfront areas on important migration pathways (e.g., Chicago, Toronto, New York City) can be especially problematic to nocturnal migrant birds. For example, volunteers collected approximately 2900 dead and injured birds in downtown Toronto, Ontario in 2000. As with towers, lights shining on and from within buildings disorient migrant birds and lead to collisions (Fatal Light Awareness Program, www.flap.org).

Despite startling reports of bird mortality from specific buildings or towers, bird mortality from striking windows is a more insidious, and perhaps more serious, problem for bird conservation. Window-killed birds are typically claimed (at any time of day) by simply not recognizing reflective glass as a barrier. Window kills often occur in residential neighborhoods where landscaping is reflected in windows creating the illusion of continuous vegetation, or where the glass reflects the sky and creates the illusion of a clear flight line (Klem 1989).

Klem (1990a) produced an estimate of the numbers of birds killed annually by striking windows in the United States, and provides a convincing argument to regard the assessment as conservative. His estimate of 1-10 fatalities/building/ year places the total number of fatalities somewhere between roughly 97 million and 975 million birds per year. Dunn (1993) provided an independent assessment of mortality rate (0.65 –7.70 fatalities/home/year) from the Cornell Laboratory of Ornithology's Project FeederWatch data that matches closely with Klem's estimate. These estimates are based largely on data from mortality at private residences, and do not include data from kills at towers or skyscrapers.

Klem and Dunn's independent estimates of mortality from window collisions, while disturbing, have been slow to attract the widespread attention of conservationists, either due to ignorance (Klem 1991) or perhaps because of the wide range in the predicted number of fatalities casts doubt on the overall impact. It may not be possible, however, to improve the precision of such estimates because so many factors operate in determining the likelihood that a bird will strike a window on any given building. We do know that certain buildings, due to their location near high densities of birds attracted to feeding stations, their location along routes heavily used by migrants, or merely due to the particularly confusing reflections that their windows produce, kill far more than a single bird annually (Klem 1989, 1990a, 1991, Dunn 1993). Elevated mortality rates at these buildings may compensate for buildings at which no mortality occurs to maintain the continental mortality rate at 1-10 fatalities/building/year, but there is little quantitative data to support this contention (Klem 1990a). My objective in this paper is to describe a situation in which several buildings exhibited high rates of window strike mortality, and suggest that the conditions that made these buildings particularly deadly for birds may be rather common.

STUDY AREA AND METHODS

From May 1993 to May 1994, I counted window-killed birds around the perimeters of four office buildings in suburban Richmond, Chesterfield County, Virginia (approximately 37° 31' N, 77° 32' W). This rapidly urbanizing region of Chesterfield County lies within the Piedmont Physiographic Province, several kilometers west from the fall line of the James River marking the edge of the Coastal Plain (Woodward and Hoffman 1991). All four buildings were located in a corporate office park setting adjacent to high intensity residential development and a busy commercial thoroughfare. Two of the buildings were situated close enough to afford views of a small (approximately 1 ha), artificial lake and naturalistic walking trail on an unnamed tributary to Powhite Creek. The remaining two buildings were situated across a four-lane, divided avenue, and within roughly 100 m of a four-lane highway. Strips and small patches of mature second growth forest were preserved as open space in the development. Forested areas were characterized by an overstory of Virginia pine (*Pinus virginiana*), red oak (*Quercus rubra*), white oak (*Q. alba*), tuliptree (*Liriodendron tulipifera*) and sweetgum (*Liquidambar styraciflua*).

All four buildings were irregular in shape (i.e., more than 4-sided) and contained large expanses of tinted, mirrored glass in various configurations from ground level to the roof. All buildings were four to six stories in height, and surrounded by ornamental shrubs, lawns, and paved parking areas. The entire office park was maintained by a professional landscaping crew and grassy areas were heavily watered and lush. The office park contained several additional buildings, some of which also included mirrored glass exteriors and claimed birds, but these were not included in my observations. I selected the four buildings; I then developed a walking route that would allow me to efficiently sample the buildings.

The perimeters of all four buildings in this study were adjacent to sidewalk, paved parking area, mowed lawn, pine bark mulch, or evergreen shubs. With the exception of approximately 15 m along one side of one building that was densely vegetated, I was able to access the entire perimeter of each building with a clear view from the building's base out to approximately 3 m. Thus I am confident that I was able to detect close to 100% of the carcasses in this zone. Neither Klem (1990a) nor Dunn (1993) provide detailed information on visual detection probabilities, most likely because they are assumed to approach 100%.

I searched the perimeter of each building for dead birds approximately weekly (50 total surveys). If a thunderstorm or strong front moved through the area, I conducted my search as soon as possible after its passage, rather than wait a full week until my next search. I assumed that any dead birds found at the base of the buildings were healthy individuals that died from colliding with glass surfaces on the buildings' exteriors. All casualties were counted and identified to species, sexed, and aged if possible. I delivered particularly fresh specimens to the vertebrate collections of Virginia Commonwealth University, Richmond, Virginia, under the curation of Dr. Charles Blem.

I compiled data on a year of window strike mortality for each building individually and a total list for all four buildings. For comparison with other datasets of window-killed birds, I described the total list in terms of life history guild composition (Ehrlich et al. 1988). I compared the proportion of residents, temperate migrants, tropical migrants, and birds that frequent feeding stations in the 15 most commonly recorded fatalities between my sample and those reported in Klem (1990a). To identify seasonal peaks in mortality, I applied one-way ANOVA with Tukey's multiple comparisons procedure, coding calendar dates as factor levels in the ANOVA model (Neter et al. 1990). I examined seasonality by testing for differences in "calendar" seasons delimited by the equinoxes and solstices, and also by seasons defined by bird migratory behavior. The "bird-defined" seasons were: 1 April – 31 May (spring), 1 June – 31 July (summer), 1 August – 15 November (autumn), and 16 November – 31 March (winter). I used a square root transformation on the response variable in the ANOVA models to provide homogeneity of variance among factor levels.

Both Klem (1990a) and Dunn (1993) mention that predators and scavengers likely take many window-killed bird carcasses before the mortality can be recorded. My study area supported raccoons (Procyon lotor), opossums (Didelphis virginiana), gray squirrels (Sciurus carolinensis), American Crows (Corvus brachyrhynchos), and feral cats (Felis catus) in abundance, and some carcasses were doubtless removed before I tallied them. In addition, maintenance crews routinely ran lawnmowers over bird carcasses to remove them from where they could be seen by building patrons. This bias may have influenced my sample to a greater degree than previous studies because I only checked buildings approximately weekly as opposed to daily (e.g., Klem 1989). Also, the buildings' residents in my study were not specifically involved in an effort to document bird mortality at their windows as were the Project FeederWatch participants (Dunn 1993). Despite the seeming increased risk of my sample being subject to a larger proportional removal bias, many of the carcasses I encountered at all four buildings were badly decayed, and had apparently been lying on the ground for several days. This suggests that removal bias may have had limited impact on my results.

RESULTS

I documented 116 birds of 40 species killed by striking the four buildings in my sample (Table 1). The four buildings yielded 38 individuals of 18 species, 21 individuals of 18 species, 27 individuals of 19 species, and 30 individuals of 20 species, respectively. The mean number of individuals killed per building throughout the year-long sampling period was 29 \pm 7.07. I recorded a mean number of fatalities per week of 2.32 \pm 2.32 for all four buildings, combined.

Of the 40 species documented as fatalities in my sample, 19 were long-distance migrants, 12 were short-distance migrants, and 9 species were annual residents in the study area. Six species in my sample (Dark-eyed Junco, Downy Fall 2001

Table 1. Total avian window strike fatalities recorded at the four buildings in the study area, May 1993 – May 1994. Taxonomy follows the American Ornithologists' Union 7th edition check-list (1998).

| Common Name | Scientific Name | Total |
|-----------------------------|------------------------|-------|
| American Robin | Turdus migratorius | 9 |
| Yellow-bellied Sapsucker | Sphyrapicus varius | 7 |
| Black-throated Blue Warbler | Dendroica caerulescens | 7 |
| Black-and-white Warbler | Mniotilta varia | 7 |
| Dark-eyed Junco | Junco hyemalis | 7 |
| Ruby-crowned Kinglet | Regulus calendula | 5 |
| Golden-crowned Kinglet | Regulus satrapa | 5 |
| Wood Thrush | Hylocichla mustelina | 5 |
| Yellow-rumped Warbler | Dendroica coronata | 5 |
| Veery | Catharus fuscescens | 4 |
| Ovenbird | Seiurus aurocapillus | 4 |
| Mourning Dove | Zenaida macroura | 3 |
| Yellow-billed Cuckoo | Coccyzus americanus | 3 |
| Brown Creeper | Certhia americana | 3 |
| Indigo Bunting | Passerina cyanea | 3 |
| Northern Flicker | Colaptes auratus | 2 |
| Chimney Swift | Chaetura pelagica | 2 |
| Great Crested Flycatcher | Myiarchus crinitus | 2 |
| Swainson's Thrush | Catharus ustulatus | 2 |
| Gray Catbird | Dumetella carolinensis | 2 |
| Northern Mockingbird | Mimus polyglottos | 2 |
| Swamp Sparrow | Melospiza georgiana | 2 |
| Common Grackle | Quiscalus quiscula | 2 |
| House Finch | Carpodacus mexicanus | 2 |
| Sharp-shinned Hawk | Accipiter striatus | 1 |
| Belted Kingfisher | Cerle alcyon | 1 |
| Downy Woodpecker | Picoides pubescens | 1 |
| Red-eyed Vireo | Vireo olivaceus | 1 |
| House Wren | Troglodytes aedon | 1 |
| Gray-cheeked Thrush | Catharus minimus | 1 |
| Hermit Thrush | Catharus guttatus | 1 |
| Brown Thrasher | Toxostoma rufum | 1 |
| Nashville Warbler | Vermivora ruficapilla | 1 |
| Northern Parula | Parula americana | 1 |
| Blackpoll Warbler | Dendroica striata | 1 |
| American Redstart | Setophaga ruticilla | 1 |
| Northern Waterthrush | Seiurus noveboracensis | 1 |
| Eastern Towhee | Pipilo erythophthalmus | 1 |
| White-throated Sparrow | Zonotrichia albicollis | 1 |
| House Sparrow | Passer domesticus | 1 |
| unknown thrush | Catharus sp. | 1 |
| unknown waterthrush | Seiurus sp. | 1 |
| unknown warblers | Parulidae | 3 |

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Woodpecker, House Finch, House Sparrow, Mourning Dove, and White-throated Sparrow) could be considered "feeder birds" due to their propensity to occur around feeding stations. Figure 1 illustrates the number of birds in various life history guilds among the 15 most-reported fatalities in my sample and in the data compiled by Klem (1990a).

Window-strike mortality peaked in my sample during periods of bird migration. Maximum casualties per week were recorded for samples taken on 12 May 1993 and 27 April 1994 (9 individuals each) and on 6 October 1993 (8 individuals). Mean casualties per week were highest during autumn (3.33 ± 2.35) and spring (2.73 ± 3.01), followed by summer (1.46 ± 0.97) and winter (0.86 ± 0.90). Seasonal differences, however, were not statistically significant when I used seasons defined by equinoxes and solstices (F3,49 = 2.60, P = 0.063). When I defined seasons by avian migratory behavior, seasonal differences in mortality were significant and higher in autumn and spring than in summer and winter (F3,49 = 4.47, P = 0.008, 95% confidence intervals for Tukey's multiple comparisons did not include zero).

DISCUSSION

The annual mortality rate at the buildings in my sample (21-38, mean = 29) was consistent with that reported for other structures known to claim an unusually high number of victims. Klem (1990a) reports that annual window collisions at a home in Carbondale, Illinois claimed 33 victims; 26 individuals were killed in one year from striking windows at a home in Purchase, New York. Of the 507 participants in Project FeederWatch who reported window strike mortality during the winter of 1989-1990, six tallied ten or more fatalities in a four-month observation period, i.e., at least 30 annual fatalities given a consistent rate (Dunn 1993).

Because the buildings in my sample were not homes that attracted birds to a supplemental food source, the composition of the most commonly killed birds in my sample differs from that reported by Klem (1990a). Considering only the 15 most often recorded casualties (Fig. 1), my sample is characterized by a dearth of "feeder" birds and residents, and more long-distance than short-distance migrants. Klem's (1990a) sample includes a large proportion of feeder birds and more short-distance than long-distance migrants.

Notably absent from my sample were abundant local residents such as Carolina Chickadee (*Poecile carolinensis*), Tufted Titmouse (*Baeolophus bicolor*), Carolina Wren (*Thryothorus ludovicianus*), and Red-bellied Woodpecker (*Melanerpes carolinus*). Blem and Willis (1998), in a survey of the Virginia Commonwealth University Ornithological Collection, list House Sparrow, Brown-headed Cowbird (*Molothrus ater*), and Common Yellowthroat (*Geothlypis trichas*) as the most abundant victims of "human-caused mortality" in the greater Richmond, Virginia area. These three species are represented in my sample by a single House Sparrow.

The paucity of abundant breeding and "feeder" species in my sample and the presence of many migrants that did not breed in the study area suggests that most of the mortality I observed affected migrants in passage. This observation is



Figure 1. Life history guild composition of the 15 most frequently recorded avian window strike fatalities in this study compared to the data presented in Klem (1990a). Resident birds (e.g., Mourning Dove) occur in an area in all seasons; temperate migrants (e.g., Brown Creeper) winter south of their breeding range, but generally within the continental United States; tropical migrants (e.g., Black-and-white Warbler) typically winter south of 30∞ latitude. Feeder birds (e.g., House Sparrow) are those that frequent feeding stations. Note that the numbers for each study do not sum to 15 because "feeder birds" are not mutually exclusive with migratory behavior.

supported by the significantly greater mortality observed during spring and fall migration than during the winter months when mortality of feeder birds is presumably the greatest. Thus, the mortality I observed at a suburban office park may be more similar to that observed in large cities on major migration pathways, e.g., downtown Toronto, Ontario, Canada (FLAP, www.flap.org), than it is to mortality observed at homes with feeding stations.

Because my study area was not located along a particularly well-defined migration route, I can only speculate on the cause for so much mortality in the office park I sampled. Perhaps the mere combination of mirrored glass exteriors and a forested corridor was enough to place many birds moving through the area at risk of collision. Although most of the forested patches and strips in the development were small, the buildings tended to reflect those patches and create the illusion of more extensive forest. The presence of permanent water may have also attracted migrants in need of a stopover site while traversing a large metropolitan area. I compared my data with other samples of window strike mortality (e.g., Klem 1990a, Dunn 1993). This assumes that all observers in all studies have an equal probability of detecting bird carcasses along the perimeters of buildings. Klem's estimate is derived from data collected personally, data submitted by homeowners participating in the study, and museum records from a multitude of sources (Klem 1990a). Dunn's estimate is derived from observations submitted by 1165 participants in Project FeederWatch (Dunn 1993). There has been no concerted effort to standardize methods for quantifying window kills, and all sources are likely subject to biases. For example, it is possible that some birds are killed at windows, but the carcass is hidden or inaccessible in vegetation. Predators and scavengers may remove injured and dead birds around the base of buildings before the birds can be tallied by human observers. Finally, many birds hit windows and fly away seemingly unharmed but ultimately succumb to injuries sustained in the collision (Klem 1990b).

Biases in detection probabilities for window-killed birds share one thing in common – they all lead to underestimates of the full biological effect of window-strike mortality for wild birds. Until methods for standardizing the collection of such data can be adopted, we can only speculate that these biases affect all studies equally. Klem (1990a) and Dunn (1993), using very different protocols, arrived at similar estimates on the rate of continental scale window-strike mortality. My methods (perimeter search around buildings) were similar to those employed in previous studies.

Whatever the specific causes for the mortality I observed, it is clear from a local conservation standpoint that the number of birds killed in this one office park is non-trivial. My overall estimate of annual mortality is roughly three times Klem's (1990a) upper estimate for window strike mortality in general, and provides support that certain buildings may easily compensate in the overall estimate for those at which mortality does not occur. Also, while not explicitly stated, Klem's (1990a) assertion that high-mortality buildings will compensate for low-mortality buildings in his overall estimate probably assumes that high mortality occurs at two types of buildings: private homes with feeding stations and large buildings along migration corridors. My observations document mortality like that witnessed at large buildings along migratory corridors, but in a largely residential suburban landscape. Furthermore, I did not observe high mortality at a single, unusually deadly building, but rather at four separate, well-spaced buildings in the development. This fact leads me to conclude that any similar combination of reflective glass, naturalistic landscaping, and a permanent water source could create a "migrant trap" in a most unfortunate sense of the term.

Future research in window-strike mortality would benefit greatly from standardization of detection methods and quantification of detection biases. To date, researchers have only been able to identify the biases and explain how they lead to conservative estimates of mortality. Efforts to better quantify and account for detection biases, as well as sampling from randomly selected houses and neighborhoods, could potentially refine estimates of continental scale mortality from window collisions. These advancements may be necessary before the larger conservation community can confidently stand behind efforts to help solve the problem.

ACKNOWLEDGMENTS

I wish to thank Charles Blem for curating many of the birds that struck windows in the study area. Bill Evans provided insightful comments on the manuscript. I am grateful to Tracy O'Connell for allowing me to convert our freezer into a temporary avian morgue.

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CAN RED-TAILED HAWKS SMELL PREY?

George Reiger 29419 Burton Shore Road Locustville, VA, 23404

As a budding naturalist and big-game angler in the 1950s, I was impressed by how quickly a "chum slick" of ground Menhaden would attract petrels and shearwaters – often faster than it would our target species of Bluefin Tuna. When fishing for sharks in the lower Delaware Bay in the 1960s, spraying the surface of the water with menhaden oil from an atomizer frequently drew gulls to the vicinity of our boat more rapidly than it did the Sand-tiger Sharks we subsequently caught, tagged and released.

When I went on pelagic birding trips out of Ocean City, Maryland, in the 1970s, I first purchased a gallon of Menhaden oil from a local tackle shop and periodically poured a shot glass's worth over the side rather than dump big bags of popcorn or bread crusts, as most of my companions did. My fish-oil technique was not only a little less like littering, it seemed to attract more birds of more different species more quickly than popcorn or bread crusts.

However, since most of my companions believed that birds – with the possible exception of the Turkey Vulture – lacked any sense of smell, they insisted the curious petrels and shearwaters had come to investigate the floating bits of bread and popcorn – and possibly the sight of the slicks I'd created – rather that the smell of the fish oil that caused the slicks. Since I had no published studies to support me, I could only suggest that the low-flying birds had probably smelled the slicks a lot further off than they could have seen the unfamiliar bits of human food.

However, by the end of the 1970s, the widely held assumption that most bird species are unable to detect odors was being challenged by an increasing number of researchers. In Frank B. Gill's ornithology text (1995, p. 200), he cites a study which concluded that "the sexual prowess of male Mallards, depends on smelling a female's breeding odors. Experimental cutting on the olfactory nerves inhibits courtship and sexual behavior (Balthazart and Schoffeniels 1979). Female odors apparently come from oil gland secretions, which change in composition during the breeding season."

Still, old assumptions die hard, and unless a given species is proven to have a sense of smell, it is still generally regarded to be deficient in this matter. For example, although G. Ronald Austing (1964, p. 12) conceded in <u>The World of the Red-tailed Hawk</u>, that "it is probable that the majority of birds have a moderately developed olfactory sense," he nonetheless concludes: "The red-tailed hawk is one of those species in which the sense of smell appears poorly developed, at least in helping to locate its prev."

I'll now recount a personal experience involving a Red-tailed Hawk: On

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the night of December 10-11, 1999, the compost pile behind the west side of my boat garage was raided by an animal or animals capable of carrying off two, 20inch (filleted) Striped Bass carcasses. Since the unknown creature(s) scattered kitchen scraps all around the compost area, and since scavengers tend to return once they've made a successful raid, I decided to trap and remove the animal(s) before it/they caused more extensive damage.

I set a Havahart box trap designed for an animal the size of a Virginia Opossum or small Raccoon. The trap's doors and roof are made of galvanized sheet metal, and its openings (at either end) are 11 inches wide by 9 inches high. For bait, I used the head and attached skin of an Eastern Cottontail Rabbit I had shot for dinner on December 11. The bait was folded in a lump so it would balance atop the trap pan and not interfere with its release. The trap was then set beneath the overhanging limb of a large Red Cedar behind the boat garage. The tree is obscured to the south by a large White Oak and a pile of bricks and blocks; to the west, by a 3-rail fence, a screen of 25-year-old Loblolly Pines, and a hedge of Autumn Olive shrubs; to the north, by a dense planting of 20-year-old Loblolly Pines and Red Cedars; and to the east, by the garage itself. The trap was set back beneath the screening tree so that a shy animal would feel safe about venturing inside.

The next morning (December 12), I was astonished to discover an immature Red-tailed Hawk in the trap. I was so intent on releasing the bird quickly and unharmed that I never thought (until later, of course) to photograph the hawk in the trap. When I shook the bird out, it "mantled" briefly and then – taking the only way out of the narrow cul de sac – flew low and so close, it brushed me with its wings.

The bait could not have been seen from the air. When I climbed atop the brick-and-block pile to get an elevated view, the trap was even more imperceptible. And even had the hawk been able to see through the intervening vegetation, it could not have seen the bait through the solid top and raised doors of the trap. For me, the most remarkable aspect of what happened was not that a hawk had smelled the rabbit remains, but that it had been able to distinguish the scent and trace it to its source amid the many distracting odors from the proximate compost heap.

The hawk I caught was not, of course, the compost raider. Two nights later, I caught a large Opossum, and the raids stopped. But just as a cracked egg is familiar food and a bait the Opossum couldn't resist, the fresh-dead smell of the Red-tailed Hawk's most common prey (Cottontail Rabbit) was something the bird apparently couldn't resist. Hunger compelled it to land in a narrow (less than 12 feet wide) area surrounded by a building and vegetation more than 30 feet high, then squeeze into a 9- x 11-inch tunnel. Indeed, the bird was so hungry that, despite its stressful confinement in the trap, it had devoured the entire rabbit head by the time I arrived.

Red-tailed Hawks, along with Turkey Vultures (commonly) and Bald Eagles (rarely), are birds that benefit from the dead animals (road-kills and drowned nuisances) I leave on the field behind the house during the fall and winter when such raptors – particularly immature birds – are having trouble making ends meet.
A refined sense of smell would be a vital asset for any hawk trying to survive harsh winters and other periods of food shortage. Yet because no controlled research has been done on the ability of hawks to smell, most people remain skeptical. After wildlife rehabilitator Wendy Looker treated and released a Redtailed Hawk caught in a leg-hold trap, she concluded by e-mail: "The trap was likely set to attract a fox or other furbearer. [Although] it is required that the bait (meat, etc.) be buried in the dirt (not 'open' to view from above) . . . [it must not have been, because] "raptors have no sense of smell and therefore, unless they see bait from the sky, are extremely unlikely to get caught in a trap."

In the absence of evidence, why is it more logical to assume that hawks can't smell than that they can? A trapper's meat-baits are cut in random shapes. If a bait is left exposed, a Red-tailed Hawk circling overhead would see nothing familiar in the sliced meat. However, if it <u>smelled</u> something good to eat, that's a different matter.

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BREEDING STATUS OF THE NORTHERN HARRIER IN COASTAL VIRGINIA

BRYAN D. WATTS Center for Conservation Biology College of William and Mary Williamsburg, VA 23187-8795

STEPHEN C. ROTTENBORN Wetland Studies and Solutions, Inc. 14088-M Sully Field Circle Chantilly, VA 20151

INTRODUCTION

The Northern Harrier (*Circus cyaneus*) is a widespread species, breeding throughout the northern latitudes of North America, Europe, and Asia (Brown and Amadon 1989). Along the Atlantic coast of North America, this species reaches the southern limit of its normal breeding range in coastal Virginia, being a rare and erratic breeder further south (MacWhirter and Bildstein 1996). Within coastal Virginia, breeding is often in remote areas where pairs are not frequently detected.

The status of the Northern Harrier breeding population in Virginia has never been well known. Bailey (1913) describes breeding as uncommon to rare and primarily along the barrier islands. This status had apparently not changed by 1952 (Murray 1952). The most recent edition of the Virginia checklist lists breeding as rare and very local with breeding documented along the barrier islands, in Mathews County, and in the city of Hampton (Kain 1987). In 1989, the Northern Harrier was recommended for the status of endangered in the state of Virginia due to its small breeding population (Bazuin 1991). Based on available information, the annual breeding population was estimated to fall between 5 and 10 pairs. It was noted, however, that this species may have been breeding in other unknown locations.

The purpose of this paper is to present a summary of more recent observations of breeding or summering Northern Harriers that 1) give some insight into the current status and distribution of the breeding population, and 2) point to areas where breeding is likely but currently undocumented.

METHODS

Two sources of information were used in the summary of recent observations of Northern Harriers during the summer months. The first of these consisted of observations of breeding and summering harriers made by the authors between 1991 and 1996. Most of these observations were made during the summers of 1991 and 1992 while the authors were independently conducting research on other bird species. Watts looked for harriers on the western shore of the Chesapeake Bay, surveying the shoreline from Bethel Beach south through Hampton. Rottenborn looked for harriers primarily on the Eastern Shore. Several barrier islands (Wreck, Cobb, and Hog Islands) were surveyed intensively, while surveys in marshes on the bayside (from Saxis south to Onancock) and seaside (between the mainland and the barrier islands) of the Eastern Shore were less thorough. Rottenborn also observed harriers in the vicinity of Grandview Beach and Plumtree Island in the Hampton-Poquoson area.

Observations were also made in subsequent years in other regions of the coastal plain. No attempt was made to systematically survey the entire coastal plain specifically for breeding harriers. In addition, no attempt was made to solicit information from the birding community or from other researchers, who likely have observed harriers in areas unknown to the authors. However, some information was obtained incidentally from other observers.

The second source of information summarized here was the ornithological literature. All observations of potentially breeding Northern Harriers that were recorded in the literature between 1970 and 1996 and that contained specific locational information were included. Although the literature did provide some confirmation of prior breeding for locations where the authors observed harriers, no recorded observations were found that included "new" locations. For the purposes of this summary, locations were considered to be potential nesting areas if a pair of Northern Harriers was observed during the months of June or July. A location was considered to be a confirmed nesting area if a nest containing either eggs or young was located.

RESULTS

Western Shore. - Along the western shore of the Chesapeake Bay, breeding activity of the Northern Harrier has been observed within four general locations from Mathews County to the city of Portsmouth. These areas included: 1) Bethel Beach, 2) Guinea, 3) the Back River vicinity, and 4) Craney Island.

A single pair of harriers has been observed over the extensive marshes in the Bethel Beach/Winter Harbor area (Mathews County) during several breeding seasons. A nest was located and monitored during the summer of 1990 by Bazuin (Armistead 1990). During the summer of 1992, Watts (1992) observed four pairs of harriers in the Guinea Marshes (Gloucester County). Pairs were distributed along the expansive marshes between the Severn River and the York River. Watts located active nests of three of these pairs. Also during the summer of 1992, five pairs of harriers were observed by Watts in expansive marshes surrounding the Back River (Cities of Poquoson and Hampton). Observations included one pair on Plumtree Island, one pair in the marshes at Langley Air Force Base, and one pair in the marsh behind Grandview Beach. Two "pairs" in Messick Marsh consisted of a single bigamous male attending an adult and a subadult female. A single nest was found in Messick Marsh by Watts in 1992. No attempt was made during that year to locate nests for other pairs in this area. However, Rottenborn located a nest on Plumtree Island in 1989 and observed a male repeatedly carrying prey (Least Tern chicks) from Grandview Beach across the New River to Plumtree Island in June 1990. Harrier activity has been observed on Craney Island (City of Portsmouth) during numerous breeding seasons, although no nests have been found at this location.

Seaside Eastern Shore. - On the seaside of the Eastern Shore, harriers nest primarily on the barrier islands and in the marshes between these islands and the mainland. In the northern seaside region, harriers frequently oversummer at Wallops Island, and two nests were found there in 1982 (Vaughn 1993). Most of Rottenborn's observations on the seaside of the Eastern Shore were made south of Parramore Island. After 1990 surveys located two pairs on Hog Island and a nest on Cobb Island, a total of at least eight "pairs" (including females mated with bigamous males) were observed in the summer of 1991 by Rottenborn. That year, single pairs were observed on Wallops, Wreck, and Fisherman Islands; two pairs were on Hog Island; one nest was on Ship Shoal Island; and two nests were found on Cobb Island. In 1992, Rottenborn found single nests on Wreck and Cobb Islands. Previously, a nest was found on Cobb Island in 1979 (Scott 1979) and another was found on Fisherman Island in 1987 (Armistead 1987). In addition to the nests found on the barrier islands, Watts located a nest in a large fallow field on the Eastern Shore of Virginia National Wildlife Refuge during the summer of 1995. This pair was also resident during the summer of 1996.

Bayside Eastern Shore. - During casual roadside surveys of the marshes from Saxis south to Onancock in the summer of 1991, Rottenborn confirmed breeding by two pairs of harriers in the vicinity of the Saxis Wildlife Management Area. One nest was found at Marsh Market, while the second pair had recently fledged young near Hammock Landing. Harrier activity has been observed over Freeschool Marsh within the Saxis area for a number of years, and nest-building was observed there in 1989 (Armistead 1989). During the summer of 1995, Watts observed a pair of harriers over the Michaels Marsh section of the Saxis Wildlife Management Area. Also during that year, Watts observed a pair of harriers around the marshes surrounding the mouth of Hunting Creek. No attempt was made to determine the breeding status of these pairs.

Inland Areas. - Oversummering harriers appear to be much less abundant in Virginia in inland areas than on the immediate coast and the shores of Chesapeake Bay. However, during the summer of 1996, Watts observed harriers in two inland locations within coastal Virginia. The first was a pair hunting over a large soybean field on Curles Neck Farm in Henrico County. The second was a pair hunting over a large wheat field along route 625 just north of route 616 in Sussex County. Although no attempt was made to monitor these birds to determine breeding status, time of year and behavior suggested breeding.

DISCUSSION

The results presented here are consistent with earlier suggestions (e.g. Murray 1952, Bazuin 1991) that coastal Virginia supports a relatively small breeding population of Northern Harriers. Because observations were spread over a number of years, calculation of an exact number of breeding pairs is not possible. However, a conservative population estimate based on the collective number of pairs in different locations would be approximately 25 breeding pairs. Historically, breeding of the Northern Harrier is poorly documented in Virginia but based on the current agreement between breeding pairs and available habitat there is no reason to suspect any long-term decline in the population.

Northern Harriers were documented during the breeding season within 6 counties and 3 independent cities. The largest portion of the population appears to occur within the barrier island/lagoon system along the seaside of the Delmarva Peninsula. The northern portion of this system including Wallops Island north through Chincoteague Bay may also support harriers but was not covered during this survey. Pairs were also documented on the upper bayside of the Delmarva. Many of the extensive marshes in this region are very remote and were not covered effectively. These marshes become progressively smaller toward the south such that it is unlikely that harriers would be supported on the lower bayside. The last large concentration of birds was along the lower western shore of the Chesapeake Bay. Breeding activity here seems to be focused below Bethel Beach. No harriers were detected in marshes north of this location despite shoreline surveys conducted in this area during 1995. The extensive habitats along the North Landing River and within Back Bay may also support breeding harriers. Numerous accounts of harriers within these areas have been made outside of the breeding season. Surveys should be conducted during the breeding period to determine breeding status within this location.

Coastal breeding areas appear to be focused around extensive salt marshes situated along the outer coastal plain. Repeated surveys throughout the 1990's of extensive brackish and tidal-fresh marshes that occur further inland along the Rappahanock, Mattaponi, Pamunkey, and James Rivers have not resulted in the detection of harriers during the breeding season (Watts, pers. obs.). Although these marshes have much taller plant species (e.g. *Spartina cynosuroides, Zizania aquatica, Typha latifolia*) when compared to salt marshes, harriers are known to utilize such habitat elsewhere in their breeding range (MacWhirter and Bildstein 1996).

As with many ground-nesting species, harriers are likely influenced by the distribution of mammalian predators. This may be one reason why a large portion of the population occurs along the barrier islands. Historically, ground predators have been absent from many of these islands. Large marshes with lowgrowing vegetation may also offer some protection by providing nearly limitless positions for nest placement and a large visual field for detecting approaching predators. Large populations of predators within mainland areas may serve to limit breeding opportunities. The single nest located on the Eastern Shore of Virginia National Wildlife Refuge was positioned in the center of a dense patch of brambles (*Rubus spp.*) making both detection and access difficult.

Additional surveys, particularly within areas not previously covered, would help to refine population estimates for this species in Virginia. Nest-building behavior is particularly easy to observe in the second half of May. Bigamy has been reported frequently throughout this species range (Simmons et al. 1986) and was detected in the limited survey presented here. For this reason, breeding females rather than males provide a more accurate assessment of population size.

ACKNOWLEDGMENTS

While conducting studies of marsh-nesting birds during the summer of 1992, B.D. Watts was supported by a grant from the U.S. Environmental Protection Agency. Rottenborn's work on the Eastern Shore in 1991 was supported in part by The Nature Conservancy, the College of William and Mary, Ruth A. Beck, and the Augusta and Monticello Bird Clubs.

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WINTER RECORD FOR OVENBIRD IN NORTHERN VIRGINIA

RICHARD A. FISCHER U.S. Army Engineer R&D Center Environmental Laboratory 3909 Halls Ferry Rd. Vicksburg, MS 39180

CHRIS EBERLY Department of Defense Partners in Flight P.O. Box 54 The Plains, VA 20198

On 8 February 2001 at approximately 1000 hours, we observed an Ovenbird (Seiurus aurocapillus) while conducting winter bird surveys on the U.S. Army Garrison, Fort Belvoir, Fairfax County, VA. During the observation period, skies were slightly overcast with clear on-the-ground visibility. The individual was first detected and identified when it flew up from the ground and perched on a 2 cm diameter branch approximately 2 m from the ground in a small mixed pine-hardwood stand surrounded by bottomland hardwood forest. Both observers were within approximately 15 m of the bird when it was first detected. We were able to slowly approach the bird to within approximately 6m, and we continued to observe the bird at close range using Swarovski 10x42 and 8x30 binoculars for another 6-7 minutes before it flew off. All normal Ovenbird field marks were clearly discernable: white eye-ring, streaked breast, lack of wing bars, brown-orange crown stripe bordered by black stripes, olive-brown back, white below. Our overall impression of the bird indicated it was not lacking for food, as it showed typical plumpness. We did not detect any vocalizations during the observation period. Although the ovenbird is a common breeding species on Fort Belvoir, there are no other known winter records.

The record was submitted to the Virginia Avian Records Committee (VARCOM) and accepted in Category 2 (sight record without any physical evidence, but for which there is written documentation accepted by VARCOM), extending the Virginia date for Ovenbird to 8 February.

SPOTTED TOWHEE (PIPILO MACULATUS) AT BARLOW POND, YORK AND JAMES CITY COUNTIES

EDWARD S. BRINKLEY 9 Randolph Avenue Cape Charles, VA 23310

On 11 February 1995, while searching the edges of Barlow Pond for a reported Eurasian Wigeon (*Anas penelope*), Adam M. Byrne and I noted a male towhee similar to the several male Eastern Towhees present but differing in the following respects: the primaries lacked white bases (this appears as a white crescent on the folded wing, as was seen on several Eastern Towhees present nearby), and the scapulars and wing coverts were all white-tipped, making the back look zebra-striped (black and white) and producing two white wingbars. In addition to this, both the male Eastern Towhees and the Spotted Towhee showed limited amounts of white in the primaries and tertials. No other distinctions in plumage were noted.

This bird's "zebra-striped" pattern was equally striking in flight, as it flushed away from the observers. The observation lasted only 3-4 minutes, as the group of towhees (some 7-9 in all) flushed rapidly and lit back in the greenbriar (*Smilax*) tangles as we walked along the side of the lake and the side of a wet area to the south of the lake on the other side of SR 646 (Newman Road). The observation was at distances of 4-10 meters in excellent light of midmorning (about 1045 EST). I used Zeiss 10x40 binocular, Byrne a Zeiss 7x42. Both are familiar with several subspecies of Spotted from western birding excursions.

Donald J. Schwab succeeded in locating this bird on 15 February, and I relocated the bird on 19 February and studied the bird for several minutes on the south side of SR 646, at distances of about 8-12 m, in somewhat less optimal light than during the first sighting. At this point, I scrutinized the birds for signs of hybridity (as hybridization is well known between races of Eastern and Spotted where ranges overlap) and found none. On this occasion, the bird also twice gave an upward-slurring "tweee" call-note unlike that of Eastern Towhee and characteristic of some races of Spotted.

DISCUSSION

Since the 1950s, Eastern and Spotted Towhees were considered forms of "Rufous-sided Towhee." In 1995, the American Ornithologists' Union (1995) restored Spotted Towhee to its pre-1957 status as a full species. As many as 12 subspecies have been described in *Pipilo maculatus* (Rising and Beadle 1996), many of them rather localized, but only one, the Arctic Towhee (*P. m. arcticus*) has been identified in the eastern United States and Canada as a vagrant (Buckley 1959, Hauser 1960, Levine 1998, Post and Greenlaw 2001, Greenlaw and Engstrom, in press). This widespread form breeds from the Canadian prairies south into central Nebraska (Rising and Beadle 1996) and as such is the closest form to the eastern seaboard.

The largest recorded eastward influx of Spotted Towhees appears to have occurred during the winter of 1994-1995. The late autumn of 1994 had already brought unprecedentedly large numbers to Iowa, where it is considered very uncommon in winter (S. Dinsmore, pers. comm.). Maryland recorded its first Spotted Towhee on 17 December 1994 (subsequently accepted by the Maryland Bird Records Committee, per M. J. Iliff), and other singles were found in New Brunswick (McLaren 1995), New Jersey (Boyle et al. 1995), and Massachusetts (Nikula 1995). This irruption may be associated with above-average numbers of other western species in the East in winter 1994-1995: Green-tailed Towhee (*P. chlorurus*), Mountain Bluebird (*Sialia currucoides*), Black-headed Grosbeak (*Pheuticus melanocephalus*), and Townsend's Solitaire (*Myadestes townsendi*) in particular (M. J. Iliff, pers. comm.).

In recent years, there have been ten records of this species from Quebec (Bannon et al. 1999), two from the Canadian Maritime Provinces (Mactavish 1999), seven from New York (Levine 1998), three from Massachusetts (Veit and Peterson 1993), and one each from North Carolina (Hauser 1960), South Carolina (Post and Greenlaw 2001), Florida (Bowman 2000, Greenlaw and Engstrom, in press), Penn-sylvania (per N. J. Pulcinella), and Georgia (Davis 2000). Most birds winter west of the Mississippi River, but the species can be found in small numbers in Missouri, Louisiana, Illinois, Iowa, Minnesota, and elsewhere to the east of typical wintering range (Rising and Beadle 1996).

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SPRING RECORD OF SWAINSON'S HAWK IN VIRGINIA

BRIAN TABER Coastal Virginia Wildlife Observatory P.O. Box 912 Eastville, Virginia 23347

There are more than 30 reports of Swainson's Hawks (*Buteo swainsoni*) in Virginia from late August to January (Sullivan and Taber, forthcoming). In this note, I detail the only Virginia spring record known to me. At 10:40 a.m. (EST), I watched as a dark morph immature moved north across the James River at the College Creek Hawkwatch, a program of Coastal Virginia Wildlife Observatory, in James City County, on April 22, 2001. The bird was following the usual track for raptors at the site (Taber 1997). The sky was clear, the temperature was 21EC. Strong west and southwest winds had persisted at the site for four days prior to the observation.

The bird was flying at less than 30 m and at a distance of about 250-300 m, when first observed, using a 22X scope. Visibility improved from the initial backlighting as the bird moved to within about 150 m, as it passed to the east. It then circled for several minutes, just over treetop level, to the north of the site, as many raptors do, before disappearing over the trees.

The manner of flight was rather "harrier-like" with an obvious dihedral and deep, slow wingbeats. Though no birds were accompanying it, I judged its size to be consistent with a Northern Harrier, which it initially resembled. It had long, tapered wings and all dark brownish underwings and underbody. The dark brownish upperside was slightly mottled with a lighter brown, indicating an immature, rather than adult bird. The fanned tail, seen as it circled, was lighter than the body and wings and was faintly crossed by several thin bands, with a somewhat more obvious terminal or sub-terminal band.

I eliminated other dark buteos by the wing shape and the lack of lightercolored flight feathers. Northern Harrier was eliminated by overall color and tail length. An adult Swainson's Hawk would show a more defined tail band pattern.

There is one accepted spring record for Swainson's Hawk in Maryland, an adult light morph, which also occurred in the third week of April (17 April 1984; M. Iliff, pers. comm.). It was recorded at the Fort Smallwood Hawkwatch, which is about 250 kilometers due north of the College Creek Hawkwatch.

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2000 REPORT OF THE VIRGINIA AVIAN RECORDS COMMITTEE (VARCOM)

Вов Cross VARCOM Chair 1523 Live Oak Drive Tallahassee, FL 32301

This is the thirteenth report of the Virginia Avian Records Committee (VARCOM). Previous reports have appeared in The Raven annually since 1988. The purpose of VARCOM is to evaluate all reports and documentation of rare, unusual, or difficult to identify bird species and identifiable subspecies originating from within Virginia's boundaries and adjacent ocean waters. Additionally, VARCOM evaluates unusual breeding records for Virginia birds and reports of species that are found outside of their normal seasonal or geographical limits within the state. Accepted records of species previously unverified in Virginia are used in the formation of the Virginia checklist (VSO Annotated Checklist).

VARCOM is composed of nine members, including seven voting members, a non-voting Secretary/Compiler, and Chairperson. Voting members normally serve four-year, non-consecutive, terms while the Secretary/Compiler and Chairperson serve one-year renewable terms. The following list includes all VARCOM members 2000 and term expiration dates for voting members: Bob Cross (Chair), Charlotte Friend (Secretary/Compiler), Dan Cristol (2000), Wallace Coffey (2000), George "Cricket" Barlow (2001), Brian Patteson (2001), Brian Taber (2001), George Armistead (2003), Don Schwab (2003).

In accordance with the VARCOM bylaws, a submission will be accepted if all members vote to accept on any round of voting or if a minimum of six members vote to accept on the third (final) round of voting. When a submission is not accepted, it does not necessarily mean that the identification was not correct, but only that the documentation was insufficient to rule out all other possibilities. Any report may be re-submitted to VARCOM in the event that additional information is included that might result in acceptance of the submission. All materials submitted to VARCOM including written descriptions, sketches, photographs, videotapes, and audio recordings are maintained by the Secretary/Compiler for permanent archiving.

This report provides the final disposition and details of 38 records (25 species) evaluated by VARCOM in 2000. A total of 30 records (19 species) was accepted by VARCOM yielding an acceptance rate of 79 percent. Eight records (8 species) were not accepted on the basis of insufficient documentation to establish identity. An additional 26 records (18 species) remained in circulation at the close of the year. Three records (10 %) were accepted as category three records due to questionable natural origin. Notably, four species, Clark's Grebe (*Aechmophorus*)

clarkii), Cinnamon Teal (*Anas cyanoptera*), Eurasian Collared-Dove (*Streptopelia decaocto*), and Cave Swallow (*Petrochchelidon fulva*) were accepted in 2000 as first Virginia records.

Records evaluated by VARCOM in 2000 originated from 13 Virginia cities or counties and the Chesapeake Bay Bridge Tunnel (CBBT) with the largest number (4/13%) coming from the CBBT. Most accepted observations (18/60%) were from locations within Virginia's Coastal Plain. A total of 41 observers contributed to the records examined by VARCOM in this report. We would like to thank those individuals who submitted details of their sightings for review in 2000. Your efforts represent an important contribution to the growing data base of Virginia ornithological records available to researchers, land managers, birders and others.

All records appearing in this report are listed by common name and scientific name according to the nomenclature and phylogenetic sequence of the 7th AOU Checklist (AOU 1998, 2000). The following is a summary of records evaluated by VARCOM from 1 January 2000 to 31 December 2000.

ACCEPTED RECORDS

Clark's Grebe (*Aechmophorus clarkii*), 1 individual, Chesapeake Bay Bridge-Tunnel island # 1, 11 February 2000. First accepted state and Coastal Plain record in category two [John Hammond, Charles W. Ziegenfus, Joey Kellner, Dick Schottler]. Formerly considered a paler morph of Western Grebe (*Aechmophorus occidentalis*). This sighting marks first accepted east coast record since the separation of the two species. Excellent documentation, ruling out intermediate forms or hybrids, was submitted from multiple observers familiar with both Aechmophorus grebes.

Anhinga (*Anhinga anhinga*), 2 individuals in a group of 7 birds, Orange County, 26 September 1999. Third accepted Piedmont record in category two [George Harris].

Anhinga (*Anhinga anhinga*), 1 individual, Banister River WMA, Halifax County, 2 July 2000. Fourth accepted Piedmont record in category two [Jeffrey C. Blalock].

White-faced Ibis (*Plegadis chihi*), 1 individual, photographed, Chincoteague NWR, 2 July 1999. Second accepted Coastal Plain record in category one [Christopher French]. Photograph clearly shows red facial skin, eye, and legs distinguishing this bird from Glossy Ibis (*Plegadis fulcinellus*).

Mute Swan (*Cygnus olor*), 1 individual, Greenville, Augusta County, 28 November 1998. This represents the third Mountains and Valleys record accepted in category three [YuLee Larner].

Eurasian Wigeon (*Anas penelope*), 1 individual, Airlie, Fauquier County, 24 October 1999. Third accepted Piedmont record in category two [Susan Heath].

Eurasian Wigeon (Anas penelope), 1 individual, photographed, Fauquier County, 18

November, 27 November, 29 November, 3 December, 9 December 1999. Fourth accepted Piedmont record in category one [Susan Heath].

Cinnamon Teal (*Anas cyanoptera*), 1 male bird, Accotink Wildlife Refuge, Fairfax County, 16 September – 12 December 1998. First accepted state and Coastal Plain record in category one [Gregory Fleming, Valerie Kitchens, Robert Hilton, Lisa Shannon].

Cinnamon Teal (*Anas cyanoptera*), 1 male bird, Mason Neck N.W.R., Fairfax County, 15 November 1998. Second accepted Coastal Plain record, accepted in category two [Sherman Suter].

White-cheeked Pintail (*Anas bahamensis*), 1 individual, Ridgeway Park, Hampton, 8 February 1998. Accepted in category three [Don Schwab, Ben Copeland]. Two previous Coastal Plain records, none recent. Resident in the Bahamas, Greater Antilles, Puerto Rico, and Lesser Antilles. Widespread resident in South America. Some records from Florida and Texas may be natural long distance vagrants. This species is fairly common in captivity. Although storm-related appearance raises the possibility of wildness, behaviors suggest the bird was an escapee. Photo shows adequate details to establish identification, but origin could not be established.

Surf Scoter (*Melanitta perspicillata*), 1 individual, Beaverdam, Loudoun County, 8 Nov 1997. Fourth Piedmont record, accepted in category two [David Abbott].

Hooded Merganser (*Lophodytes cucullatus*), 1 adult female, 5 young, Warren, Albemarle County, 6 May – 31 May 2000. First accepted breeding record in the Piedmont [Bruce Davenport].

Mississippi Kite (*Ictinia mississippiensis*), 1 individual, Rockfish Gap, Nelson County, 17 October 1998. Seventh accepted Mountains and Valleys record in category two [Brenda Tekin, Patrick Alther]. Mid-Atlantic reports increased dramatically in the 1990's. Increasing range as southeastern populations increase.

Swainson's Hawk (*Buteo swainsoni*), 1 light morph juvenile, Kiptopeke State Park, 11 September 1998.. Third accepted Coastal Plain record in category two [Marshall lliff]. Increasingly regular fall migrant on the Coastal Plain.

Swainson's Hawk (*Buteo swainsoni*), 1 dark morph juvenile, Kiptopeke State Park, 13 September 1998. Fourth accepted Coastal Plain record in category two [James Cameron, Sue Hopkins, Brian Johnson, Aaron Hanes].

Swainson's Hawk (*Buteo swainsoni*), 1 dark morph juvenile, Kiptopeke State Park, 22 October 1998. Fifth accepted Coastal Plain record in category two [James Cameron, Marshall Iliff, Bob Anderson, Harten, Andy Davis].

Swainson's Hawk (*Buteo swainsoni*), 1 dark morph juvenile, Kiptopeke State Park, 27 October 1998. Sixth accepted Coastal Plain record in category two [Marshall Iliff].

Swainson's Hawk (*Buteo swainsoni*), 1 light morph juvenile, trapped and photographed, Kiptopeke State Park, 27 October 1998. Seventh accepted Coastal Plain record in category one [Marshall Iliff, James Cameron, Aaron Hanes, Brian Johnson, Andy Davis].

Swainson's Hawk (*Buteo swainsoni*), 1 dark morph juvenile, photographed, Kiptopeke State Park, 6 November 1998. Eighth accepted Coastal Plain record in category one [Marshall Iliff].

Great Skua (*Stercorarius skua*), 1 individual, on the beach 5 kilometers south of Back Bay NWR headquarters, Back Bay CBC, 29 December 1999. Accepted in category two [Edward S. Brinkley]. Undoubtedly more regular in the western North Atlantic than the records indicate, but definitive separation at sea from juvenile and dark morph South Polar Skuas (*Stercorarius maccormicki*) has been notoriously problematic. This individual was well-observed and well-described by observer highly experienced with the complex. Formerly Catharacta skua. All Skuas were transferred into the same genus, *Stercorarius*, as the Jaegers in the AOU's Forty-second supplement (AOU 2000).

Black-tailed Gull (*Larus crassirostris*), 1 bird, Chesapeake Bay Bridge-Tunnel island #4, Chesapeake CBC, 26 December 1998. One of four accepted 1998 Coastal Plain records. Accepted in category two [Edward S. Brinkley]. Black-tailed Gull has been accepted each winter beginning with 1995.

Black-tailed Gull (*Larus crassirostris*), 1 bird, Fishermans Island, 27 December 1998. One of four accepted 1998 Coastal Plain records. Accepted in category two [Bill Williams]. Black-tailed Gull has been accepted each winter beginning with 1995.

Black-tailed Gull (*Larus crassirostris*), 2 birds, photographed, Chesapeake Bay Bridge-Tunnel island #4, 31 December 1998, mid-afternoon. One of four accepted 1998 Coastal Plain records. Accepted in category one [James C. Leupold]. Black-tailed Gull has been accepted each winter beginning with 1995.

Black-tailed Gull (*Larus crassirostris*), 1 birds, Chesapeake Bay Bridge-Tunnel island #2, Little Creek CBC, 31 December 1998, mid A.M. One of four accepted 1998 Coastal Plain records. Accepted in category two [Paul Sykes]. Black-tailed Gull has been accepted each winter beginning with 1995.

California Gull (*Larus californicus*), 1 adult, The Plains CBC, Fauquier County, 19 December 1999. First accepted Piedmont record in category two [Bob Abrams].

Eurasian Collared- Dove (*Streptopelia decaocto*), 1 individual, Sterling, Loudoun County, 4 June 2000. First accepted state and Piedmont record in category two [Bruce Hill]. The species was introduced into the Bahamas in 1974, and is believed to have dispersed naturally to south Florida by the mid 1980's. Since then, It has rapidly expanded it's range. Reported from Louisiana, Texas, Oklahoma, New Mexico, California, Iowa, Illinois, Georgia, Tennessee, North Carolina, Pennsylvania, New York, New Jersey, Massachusetts. Some records may be of recent escapees from captivity. Official acceptance has been slow due to debates of natural range expansion vs escaped individuals. Long expected in Virginia. Well-described but video and photos provided could not rule out similar Ringed Turtle-Dove (*Streptopelia risoria*).

Alder Flycatcher (*Empidonax alnorum*), Dulles Greenways Wetland, Loudoun County, 7 July 1998. Second accepted Piedmont record in category two [Danny Crookston, Matt O'Donnell, Valerie Kitchens].

Cave Swallow (*Petrochelidon fulva*), 3 juveniles, Grandview Beach, Hampton, 18 December 1999. First accepted state and Coastal Plain record in category two [Richard Goll, Cindy Carlson]. Formerly *Hirundo fulva*. East coast records for this species are accumulating rapidly from Nova Scotia to North Carolina following a strong incursion into northeast and mid-Atlantic regions in 1999. Observation date fits well with other east coast records. Identification requires careful separation from Cliff Swallow (*Petrochelidon pyrrhonota*) and possible hybrids involving Cliff Swallow or Barn Swallow (*Hirundo rustica*). May be expanding range. Disjunct North American populations result in two identifiable subspecies, *P.f. fulva* from south Florida and the Greater Antilles or *P.f. pallida* from Mexico and the southwestern United States.

Rock Wren (*Salpinctes obsoletus*), 1 individual, Orange County, 24 September and 28 September 1999. First accepted Piedmont record in category two [George Harris]. Two previous Coastal Plain records.

European Goldfinch (*Cardeulis cardeulis*), 1 adult male, College of William and Mary, Williamsburg, 30 August 1999. Accepted in category three [Daniel A. Cristol]. Native to western Europe. No currently established North American breeding populations are known, although reported as formerly breeding on Long Island, New York. Reported from Alabama and several counties in south Florida. One record from Maryland (St. Michaels, 1996), also of questionable origin. The species is known as a popular cage and aviary bird and has no recognized pattern of vagrancy. No evidence was presented in support of natural occurrence.

SUBMISSIONS NOT ACCEPTED

Western Grebe (*Aechmophorus occidentalis*), 1 individual, Orange Lake, Orange County, 9 January 1999.

Cinnamon Teal (*Anas cyanoptera*), 1 individual, Hog Island Wildlife Management Area, Surry County, 17 October 1998.

Ivory Gull (*Pagophila eburnea*), 1 individual, Chesapeake Bridge-Tunnel Islands, 12 September 1998.

Green Violet-Ear (*Colibri thalassinus*), 1 individual, New Canton, Buckingham County, 25-27 October 1998.

Cave Swallow (*Petrochelidon fulva*), 1 individual, Fishermans Island, 1 November 1998.

Siberian Blue Robin (*Luscinia cyane*), 1 individual, Chincoteague NWR, last week of June 1992.

Veery (Catharus fuscescens), 1 individual, Danville, 19 December 1998.

Kirtland's Warbler (*Dendroica kirtlandii*), 1 individual, Frederick County, 25 September 1999.

SUBMISSIONS CIRCULATING

Pacific Loon (*Gavia pacifica*), 1 individual, Fort Story, Little Creek CBC, 31 December 1999).

Greater White-fronted Goose (*Anser albifrons*), 1 individual, Rosedale, Russell County, 24-25 October 2000.

Surf Scoter (*Melanitta perspicillata*), 2 individuals, Sandy River Reservoir near Rice, Prince Edward County, 15 November 1999.

Swallow-tailed Kite (*Elanoides forficatus*), one individual, Shenandoah County, 14 August 2000.

Swainson's Hawk (*Buteo swainsoni*),1 individual, 29 September 2000, Snickers Gap, Loudoun/Clark Counties.

Sandhill Crane (Grus canadensis), 1 adult, 15-16 April 29, 2000 Madison County.

Black-tailed Gull (*Larus crassirostris*), one adult, Chesapeake Bay Bridge-Tunnel, Chesapeake CBC, 26 December 1999.

Black-tailed Gull (*Larus crassirostris*), one adult, Chesapeake Bay Bridge-Tunnel, 15 January 2000.

Mew Gull (*Larus canus*), 1 individual, Chesapeake Bay Bridge-Tunnel island **#1, 30** December 1999.

Rufous Hummingbird (Selasphorus rufus), 1 individual, Chesterfield County, 10 October 2000.

Alder Flycatcher (*Empidonax alnorum*), one bird, Orange County, 25 May, 28 May, 29 May, 2 June, 24 June 2000.

Scissor-tailed Flycatcher (*Tyrannus forficatus*), one bird, Stuarts Draft, Augusta County, 23 July 1992.

Scissor-tailed Flycatcher (*Tyrannus forficatus*), one bird, Appomattox County, 13 June 2000.

Scissor-tailed Flycatcher (*Tyrannus forficatus*), one bird, Prince Edward County, 24 June 2000.

Scissor-tailed Flycatcher (*Tyrannus forficatus*), pair and 4 young, Culpeper County, 15 June – 25 August 2000.

Cave Swallow (*Petrochelidon fulva*), 1 individual, Eastern Shore of Virginia NWR, 4 November 1999.

Cave Swallow (Petrochelidon fulva), 2 individuals, Cape Charles, 1 May 2000.

Bicknell's Thrush (Catharus bicknelli), 1 individual, Wise County, 3 September 1998.

Bicknell's Thrush (Catharus bicknelli), 1 individual, Wise County, 19 September 2000.

Townsend's Warbler (*Dendroica townsendi*), 1 individual, Kiptopeke State Park, 2 December 1999.

Townsend's Warbler (*Dendroica townsendi*), 1 individual, Devil's Ditch area north of Kiptopeke State Park, 30 December 1999 - 12 January 2000.

Kirtland's Warbler (Dendroica kirtlandii), 1 individual, Wise County, 10 May 1995.

Kirtland's Warbler (Dendroica kirtlandii), 1 individual, Wise County, 8 May 2000.

Lark Bunting (*Calamospiza melanocorys*), one male, Chesapeake Bay Bridge-Tunnel island #3, 7 June 2000.

Harris's Sparrow (*Zonotrichia querula*), 2 individuals, Bull Run Post Office Road, Fairfax County, 10 December 1999-23 January 2000.

Bullock's Oriole (Icterus bullockii), 1 individual, Dyke Marsh, Fairfax County, 27 August 2000.

LITERATURE CITED

AMERICAN ORNITHOLOGISTS' UNION. 1998. Check-list of North American Birds. Seventh ed. American Ornithologists' Union, Washington, D.C.

AMERICAN ORNITHOLOGISTS' UNION. 2000. Forty-second supplement to the American Ornithologists' Union Check-list of American Birds. Auk 117:847-858.

ERRATUM

In Brian Taber's (2001) paper *Spring migration of Turkey Vultures at College Creek* (Raven 72(1): 63-65) the flight speed of vultures was incorrectly reported as 2.4 to 13 km/hour. Actual flight speeds were estimated to be 13 to 65 km/hr.



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, Paul R. Cabe, Biology Department, Washington & Lee University, Lexington, VA 24450 (cabep@wlu.edu).

Most manuscripts published in *The Raven* concern the distribution, abundance, and migration of birds in Virginia. Manuscripts on other ornithological topics, including Virginia-based historical reviews, bibliographical reviews, life history, 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 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.

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