

Section 6

Waterfowl Populations of the Assateague Island Area.

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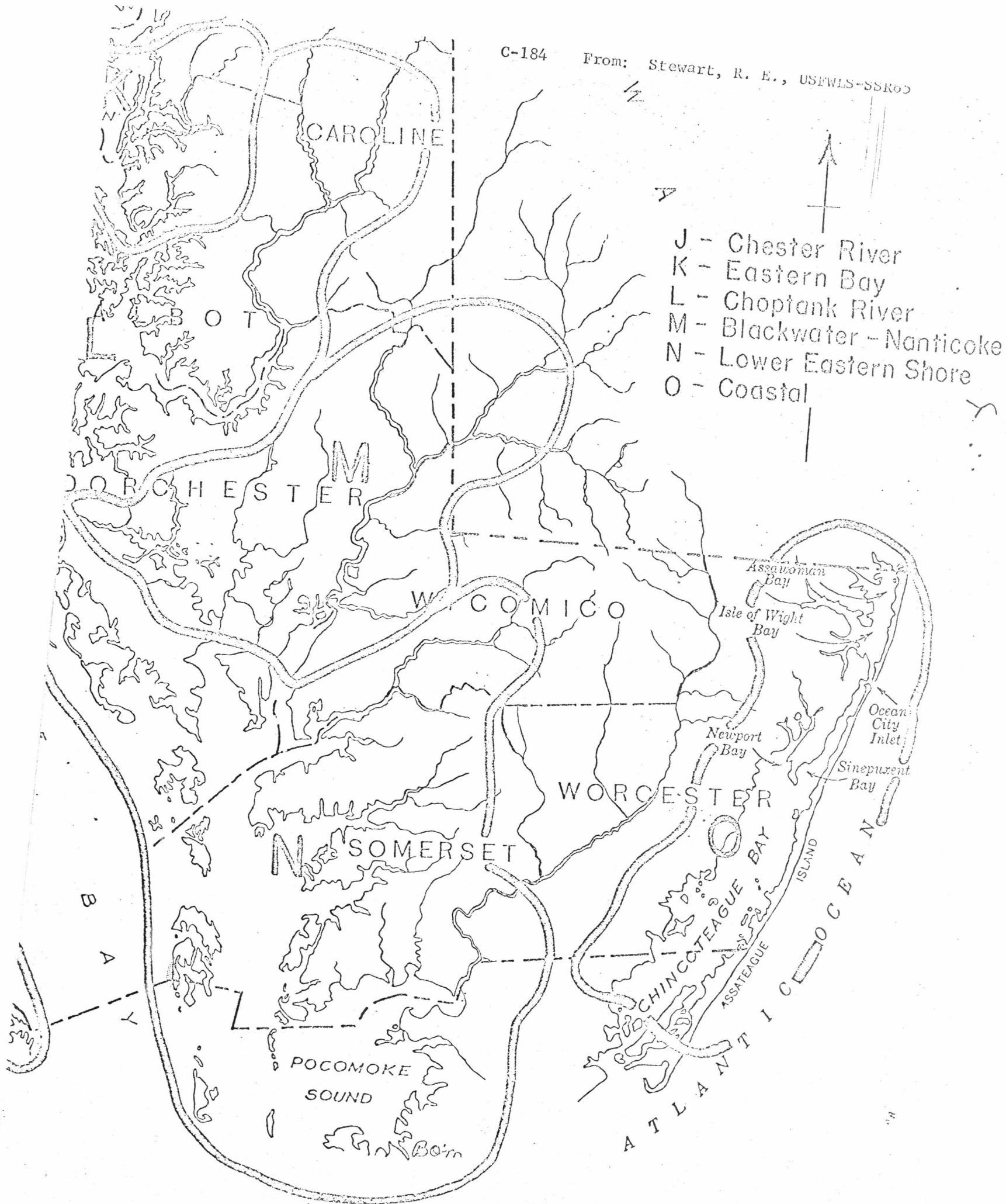
Stewart, R. E., 1962

Waterfowl Populations in the Upper Chesapeake Region.

U. S. F. W. L. S. - SSR, Wildlife No. 65.

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COASTAL SECTION

Habitats

The principal habitats of the Coastal section are the oceanic littoral zone, the coastal bays, and the coastal embayed salt marshes. Other less important habitats are estuarine river marshes and brackish estuarine bay marshes. These are restricted to narrow stretches along some of the tidal streams that extend into the interior. Large agricultural fields adjoin the coastal bays.

Waterfowl

This section is an important area for waterfowl migrating along the Atlantic coast. January inventory data, during the years 1955-58 show that the wintering population ranged from 21,400 in 1958 to 62,600 in 1957, averaged 44,000. The yearly variation in numbers of wintering waterfowl is not so great as in other sections of the Upper Chesapeake region. The population peak is in the late fall.

Proportions of the various species at different seasons are shown in table 32. Canada Geese, Brant, Black Ducks, Canvasbacks, and scaup are predominant during winter. These plus Mallards, Pintails, Green-winged Teal, Blue-winged Teal, and American Widgeons are numerous during migration.

Sea ducks, particularly the three species of scoters, are the more characteristic waterfowl on the ocean; they are largely restricted to the littoral zone within 1 mile of the beach. Brant, Red-breasted Mergansers, and various diving ducks (including Greater Scaup, Common Goldeneyes, Buffleheads, and Oldsquaws) are the more numerous waterfowl of the coastal bays. Black Ducks are the only common and widely distributed waterfowl in the coastal embayed salt marshes. Black Ducks and Canada Geese frequently travel back and forth between the coastal embayed marshes, shoal-water areas of the coastal bays, and nearby agricultural fields of the mainland. Pintails, American Widgeons, and other dabbling ducks are common in areas where artificial impoundments have been made by constructing dams, gut plugs, and dikes. Several thousand Canvasbacks often roost on Heines Pond, near the western shore of Newport Bay.

COASTAL BAYS

The coastal bays are shallow lagoons separated from the ocean by narrow, sandy strips of barrier beach. They include Chincoteague, Newport, Sinepuxent, Isle of Wight, and Assawoman Bays, and the St. Martins River, about 85,000 acres in all. With the exception of dredged channels, nearly the entire area is less than 6 feet deep at mean low tide.

The bay waters are in contact with the ocean only through the narrow Ocean City inlet and through various creeks and narrows at the lower end of Chincoteague Bay. These connections cause a slight tidal fluctuation of the bays, usually amounting to less than 1-foot. Extensive shoals, often less than 1 foot deep, border the barrier beaches; water is noticeably deeper along the mainland side of the bays. Because of evaporation, salinity in the coastal bays sometimes is greater than in the ocean.

Vegetation

Plants of this habitat are kinds that are able to withstand high salinities. Sea-lettuce and another green alga, *Enteromorpha*, are abundant in the shallower portions, and various species of red and brown algae are common. Submerged vascular plants are local and scarce at present, although extensive beds of eelgrass grew over most of the coastal bay areas before 1931 (Cottam and Munro, 1954).

Fishes and Invertebrates

Various fish, mollusks, and crustaceans are common throughout the coastal bay areas. Small razor clams, *Tagelus divisus*, the bivalve Baltic macoma (*Macoma balthica*), amphipod crustaceans (Gammaridae), and isopod crustaceans (*Chiridotea coeca*) were found in the gullets or gizzards of waterfowl collected for food-habits study.

Waterfowl

Transient and wintering waterfowl are fairly common, and sometimes locally abundant on the coastal bays. Brant are especially numerous. They usually concentrate in shoal-water areas along the barrier beach side. Fair-sized flocks of Canada Geese and Black Ducks also are often present on the shoals, ranging back and forth from there to adjacent coastal embayed marshes and nearby agricultural fields. Diving ducks, sea ducks, and mergansers usually are most numerous in the deeper portions of the bays, near the mainland shores. The predominant waterfowl in deep water are Greater Scaup, Common Goldeneyes, Buffleheads, Oldsquaws, White-winged Scoters, Surf Scoters, and Red-breasted Mergansers. Others that occasionally are fairly numerous include American Widgeons, Canvasbacks, Lesser Scaup, and Common Scoters.

Results of sample counts on coastal bays are shown in table 9.

The gullet and gizzard food contents of 22 waterfowl collected on the coastal bays were examined. Sea-lettuce, eelgrass, corn, and several invertebrate species were the principal foods in this small series.

OCEANIC LITTORAL ZONE

The portion of the littoral zone occupied by waterfowl extends outward from the beach for about 1 mile. In the Upper Chesapeake region this area covers approximately 26,000 acres, including about 1,000 acres of shoal water. Macroscopic plant life is comparatively scarce, but many kinds of fish and numerous species of mollusks, crustaceans, and other invertebrates are plentiful.

Many thousands of sea ducks occasionally flock in the littoral zone during the fall, winter, and spring. Predominant sea ducks (in the order of abundance) are Surf Scoters, White-winged Scoters, and Common Scoters. Oldsquaws and Red-breasted Mergansers sometimes are fairly numerous.

Unusually large concentrations of sea ducks were present in the oceanic littoral area between Ocean City and the Maryland-Delaware line on April 6, 1946, and on March 1, 1955. Counts were made from 10 observation points on March 1, 1955, with these totals: Surf Scoters, 19,014; White-winged Scoters, 4,700; Common Scoters, 1,893; Red-breasted Mergansers, 31; scaup, 3; and Ruddy Duck, 1. Counts from four observation points on April 6, 1946, were: Surf Scoters, 8,400; White-winged Scoters, 8,004; Common Scoters, 6,300; and Red-breasted Mergansers, 21.

COASTAL EMBAYED SALT MARSHES

The shallow bays just back of the barrier beaches along the coast are fringed with coastal embayed salt marshes (fig. 3). These marshes, which include approximately 21,000 acres in the Upper Chesapeake region, extend southward from Cape Henlopen, Delaware, about 55 miles to the lower end of Chincoteague Bay, where they adjoin the coastal sea-island salt marshes of Virginia.

Vegetation

Saltmarsh cordgrass is the predominant plant. It grows in nearly pure stands throughout most of the coastal embayed salt marshes, but the plants are much shorter than those of the same species in the extensive stands of the coastal sea-island salt marshes to the south. Emergent marsh plants that grow in scattered patches include saltmeadow cordgrass, saltgrass, needlerush, blackrush, and

glasswort. Hightide-bush grows in narrow bands on the more elevated natural levees of the tidal creeks or guts and on the spoil banks of drainage ditches; it grows in fairly broad zones along the upland margins of the marshes, often associated with groundselbush, waxmyrtle, bayberry, and other shrubs. Sea-lettuce is common at the mouths of tidal creeks. Some widgeongrass usually is present in marsh ponds with poor drainage, and is fairly abundant in certain artificial ponds impounded by gut plugs or dams. Small pockets of brackish or fresh estuarine marsh occur along the mainland side of the coastal embayed marshes near the upper limits of tide water, where small streams drain into the marsh. The more important plant species in these restricted areas include Olney three-square, common three-square, big cordgrass, and rosemallow.

Fishes and Invertebrates

Numerous small fish of various species inhabit the coastal embayed salt marshes. Good-sized schools of broad killifish (*Cyprinodon variegatus*), striped killifish (*Fundulus majalis*), and common killifish (*Fundulus heteroclitus*) abound in the creeks or ponds. Among the invertebrates, saltmarsh snails (*Helicostoma bidentatus*) and periwinkle snails (*Littorina irrorata*) are common and widespread. Clusters of ribbed mussels (*Velutella demissa*) are frequent along the margins of tidal creeks and guts. Swarms of fiddler crabs (*Uca pugnax*) and fair numbers of marsh crabs (*Sesarma reticulatum*) are present on the tidal mud flats, along with numerous amphipod, copepod, and shrimp-type decapod crustaceans.

Waterfowl

The characteristic species of transient and wintering waterfowl are:

Primary Species

Canada Goose	Black Duck
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Secondary Species

Snow Goose	Shoveler
Mallard	American Widgeon
Pintail	Hooded Merganser
Green-winged Teal	American Coot
Blue-winged Teal (transient)	

Black Ducks are the only common and widely distributed waterfowl. Canada Geese are numerous only in a few local areas.

Black Ducks, Mallards, and Green-winged Teal generally are most numerous along the tidal creeks and guts. Canada Geese and Snow Geese are most numerous on the more extensive saltmarsh cordgrass areas or on tidal mud flats. Pintails, Shovelers, Blue-winged Teal, and American Widgeons prefer the open marsh ponds with poor drainage, or ponds with stable water level that have been created artificially.

Scattered pairs of Black Ducks breed on the coastal embayed salt marshes, and occasionally a pair or two of Mallards or Blue-winged Teal. Isolated islands of marsh in the coastal bays apparently are more attractive for nesting than the marshes along the shore. All nests found were in the drier, more elevated portions of the marsh.

Sample boat counts of waterfowl made on March 2, 1955, and on December 27, 1955, covered approximately 2,875 acres. A total of 1,919 waterfowl was recorded, a density of about 430 birds per square mile. Canada Geese made up more than one-third of the total, and Black Ducks made up another third.

The gullet and gizzard food contents of nine waterfowl collected in the coastal embayed salt marshes were examined. Commonest plant foods were seeds of Olney three-square, common three-square, and widgeongrass. The saltmarsh snail (*Melampus bidentatus*) was the predominant food item taken by the six Black Ducks examined.

Canada Geese and Snow Geese were observed to feed to a considerable extent on the leaves and rootstalks of saltmarsh cordgrass as well as on corn and grain sprouts in fields nearby.

BRANT

Branta bernicla (Linnaeus)

Brant are common spring and fall transients and winter residents on the coastal bays during most years. Fairly large numbers occasionally occur along the eastern shore of Chesapeake Bay in the area from Pocomoke Sound to the Hoga River. A few flocks sometimes are present farther up between the Hoga River and the lower portion of Eastern Bay.

Numbers vary greatly from year to year. January inventories for 1953-58 show that the wintering population ranged from 100 in 1955 to 32,200 in 1954, averaged 9,300. This average figure represents about 5% of the continental wintering population, which is restricted almost entirely to the Atlantic coastal area from Massachusetts to North Carolina. Approximately 99% of the average wintering population of the Upper Chesapeake region during 1955-58 was in the Coastal section; less than one-half of one percent was in the Lower Eastern Shore section and the Choptank River section. The fall migration ordinarily takes place during the period of October 10-20 to December 10-20, with the peak between October 25 and December 10. The normal spring migration extends from February 10-20 to April 20-30, with the peak between February 20 and April 10.

Habitats

Brant are especially characteristic of the shallow expanses of salt water of the coastal bays. They ordinarily are most numerous along the barrier-beach side of the bays, and tend to concentrate wherever sea-lettuce is abundant. Along the eastern shore of Chesapeake Bay, the greatest numbers occur in the shallow salt waters of Tangier Sound and adjoining estuaries, particularly in areas where eelgrass and widgeongrass are common. Brant occasionally occur in shallow areas of brackish waters near the mouth of the Choptank River and lower part of Eastern Bay.

Biogeographic Sections

Seasonal changes in the Upper Chesapeake populations during 1958-59 are shown in table 42. The Coastal section was the only important area for this species after the majority of the birds arrived. Within the Coastal section, most of the birds usually concentrated in the Sinepuxent Bay area.

Food Habits

The gullet and gizzard food contents of 13 Brant were examined (table 43). Brant apparently feed almost entirely on sea-lettuce along the coast; eelgrass and widgeongrass probably are more important in Chesapeake Bay. Before 1931, when eelgrass also was abundant along the Atlantic coast, the coastal birds fed on it almost exclusively (Cottam, Lynch, and Nelson, 1944).

Local Distribution of Hunting Kill

Information concerning local distribution of hunting kill of Brant within the Upper Chesapeake region was obtained through an analysis of the distribution of 42 weighted recoveries of birds banded outside of Maryland and Virginia. Ten of the recoveries were reported in 1956 and 32 in 1957. Forty-two percent were from the Coastal section, 41% from the Lower Eastern Shore section, 12% from the Choptank River section, and 5% from the Eastern Bay section. The comparatively high proportion of the kill along the eastern shore of Chesapeake Bay suggests that the Brant populations may have been appreciably larger in this area during 1956 or 1957 than they were during 1958-59. The greatest local kill (23% of the total) was in the lower end of Chincoteague

Bay (Virginia portion). Kill data arranged by months showed that 42% of the kill was in November, 35% in December, and 23% in January.

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Table

SAMPLE COUNTS OF WATERFOWL ON COASTAL BAYS¹

	December	January- February	March
Whistling Swan	1		
Canada Goose	158	100	155
Brant	3,700	6,300	8,260
Snow Goose		4	
Mallard			1
Black Duck	1,618	258	53
American Widgeon	1		
Canvasback	600	100	
Scaup	13,040	200	403
Common Goldeneye	109	90	35
Bufflehead	587	34	8
Oldsquaw	1,180	25	25
White-winged Scoter	548	4	10
Surf Scoter	1,100	2	51
Common Scoter			3
Ruddy Duck		1	
Red-breasted Merganser	8	113	156
Total	22,650	7,231	9,160

¹ These data were recorded during general coverages of the coastal bays rather than on systematic censuses of measured areas.

Table

BIOGEOGRAPHICAL DISTRIBUTION OF WINTERING POPULATIONS OF
WATERFOWL IN THE UPPER CHESAPEAKE REGION: AVERAGES FOR 1955-58

Upper Potomac Section	1%
Central Potomac Section	5%
Lower Potomac Section	3%
Patuxent River Section	3%
Lower Western Shore Section	4%
Central Western Shore Section	4%
Upper Western Shore Section	3%
Susquehanna Flats Section	3%
Upper Eastern Shore Section	6%
Chester River Section	21%
Eastern Bay Section	14%
Choptank River Section	12%
Blackwater-Nanticoke Section	13%
Lower Eastern Shore Section	7%
Coastal Section	5%
Total [Percent]	100%
Total [Population]	966,550

Table

SPECIES COMPOSITION OF WATERFOWL POPULATIONS IN THE COASTAL SECTION

	January Populations: Average Percentages, 1955-58	Seasonal Population Changes in 1958-59 (Percentages)				
		Oct.2-10	Nov.3-12	Dec.1-12	Jan.7-13	Mar.3-16
Whistling Swan	+			+		+
Canada Goose	11		21	10	5	10
Brant	12			4	6	21
Snow Goose	5			+	+	+
Mallard	6	14	2	1	4	2
Black Duck	22	26	20	41	31	23
Gadwall				3	+	€
Pintail	1	6	12	9	1	1
Green-winged Teal	+	4	8	2		4
Blue-winged Teal		13	1	+		2
Shoveler				3		2
American Widgeon	+	36	33	10	1	13
Redhead	4					
Ring-necked Duck	+			+	+	+
Canvasback	15			9	26	18
Scaup	11			1	23	+
Common Goldeneye and Bufflehead	4		+	2	3	4
Oldsquaw				+		+
Scoters	6		+	+	+	+
Mergansers	+					
American Coot	+		3	2		
Unidentified Ducks	1	+				
Total Percent	100	100	100	100	100	100
Total Populations	44,000	5,200	33,900	41,200	33,700	16,400

Table

BIOGEOGRAPHICAL DISTRIBUTION OF BRANT DURING THE 1958-59 SEASON

	Nov. 3-12, 1958	Dec. 1-12, 1958	Jan. 7-13, 1959	Mar. 3-16, 1959
Coastal Section	<u>0</u>	<u>95%</u>	<u>94%</u>	<u>100%</u>
Sinepuxent Bay	(0)	(83)	(63)	(32)
Chincoteague Bay	(0)	(12)	(0)	(50)
Assawoman Bay	(0)	(0)	(31)	(18)
Lower Eastern Shore Section	<u>100%</u>	<u>5%</u>	<u>6%</u>	<u>0</u>
Smith Island Area	(29)	(5)	(6)	(0)
Tar Bay Area	(71)	(0)	(0)	(0)
Other Sections	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Populations	70	1,900	2,100	3,400

Table 43

FOODS OF BRANT FROM THE UPPER CHESAPEAKE REGION¹

	Coastal Bays 5 Birds ²	Washington Market 8 Birds ³
Stems and Leaves (or Thalli) of Submerged Aquatic Plants	<u>100%</u> (47-100)	<u>100%</u> (63-100)
Sea-lettuce	100% (47-100)	
Eelgrass		100% (63-100)
Widgeongrass		100% (63-100)

¹ Percentage occurrence of foods that made up 5% or more of the volume in individual birds. Figures in parentheses show 95% confidence limits.

² Sinepuxent and Isle of Wight Bays, Worcester County, Maryland, March 7 and March 22, 1956.

³ Purchased in Washington, D. C. market, December, 1913, probably shot along eastern shore of Chesapeake Bay.

Table

BIOGEOGRAPHICAL DISTRIBUTION OF BLACK DUCKS DURING THE 1958-59 SEASON

	Oct. 2-10, 1958	Nov. 3-12, 1958	Dec. 1-12, 1958	Jan. 7-13, 1959	Mar. 3-16, 1959
Chester River Section	<u>20%</u>	<u>34%</u>	<u>41%</u>	<u>36%</u>	<u>27%</u>
Central Chester River	(12)	(21)	(36)	(31)	(12)
Lower Chester River	(8)	(13)	(5)	(3)	(5)
Upper Chester River	(1)	(+)	(+)	(2)	(9)
Coastal Section	<u>10%</u>	<u>13%</u>	<u>15%</u>	<u>10%</u>	<u>11%</u>
Outer Chincoteague Bay	(8)	(11)	(13)	(7)	(6)
Choptank River Section	<u>13%</u>	<u>9%</u>	<u>8%</u>	<u>17%</u>	<u>13%</u>
Central Choptank	(3)	(5)	(6)	(8)	(2)
Lower Choptank	(5)	(3)	(2)	(8)	(9)
Eastern Bay Section	<u>14%</u>	<u>9%</u>	<u>10%</u>	<u>15%</u>	<u>11%</u>
Upper Eastern Bay	(10)	(5)	(6)	(8)	(5)
Miles River	(1)	(1)	(2)	(5)	(2)
Lower Eastern Shore Section	<u>15%</u>	<u>8%</u>	<u>8%</u>	<u>10%</u>	<u>9%</u>
Hooper Island-Elliott Area	(7)	(4)	(5)	(5)	(4)
Wicomico-Pocomoke Area	(6)	(2)	(2)	(3)	(3)
Blackwater-Nanticoke Section	<u>15%</u>	<u>8%</u>	<u>6%</u>	<u>5%</u>	<u>7%</u>
Upper Blackwater	(6)	(3)	(3)	(2)	(1)
Lower Blackwater-Nanticoke	(5)	(2)	(3)	(2)	(3)
Upper Eastern Shore Section	<u>6%</u>	<u>8%</u>	<u>3%</u>	<u>1%</u>	<u>11%</u>
Bay Shore	(4)	(7)	(1)	(1)	(5)
Central Potomac Section	<u>1%</u>	<u>2%</u>	<u>3%</u>	<u>2%</u>	<u>3%</u>
Susquehanna Flats Section	<u>2%</u>	<u>3%</u>	<u>2%</u>	<u>1%</u>	<u>2%</u>
Patuxent River Section	<u>3%</u>	<u>2%</u>	<u>1%</u>	<u>1%</u>	<u>2%</u>
Upper Western Shore Section	<u>1%</u>	<u>2%</u>	<u>2%</u>	<u>4%</u>	<u>1%</u>
Lower Potomac Section	<u>0</u>	<u>4%</u>	<u>4%</u>	<u>1%</u>	<u>1%</u>
Upper Potomac Section	<u>4%</u>	<u>4%</u>	<u>4%</u>	<u>4%</u>	<u>2%</u>
Central Western Shore Section	<u>4%</u>	<u>4%</u>	<u>4%</u>	<u>4%</u>	<u>4%</u>
Lower Western Shore Section	<u>4%</u>	<u>4%</u>	<u>4%</u>	<u>4%</u>	<u>4%</u>
Total Populations	12,900	51,500	111,700	108,800	32,300

Table

FOODS OF 13 BLACK DUCKS FROM SALT ESTUARINE BAY MARSHES OF LOWER EASTERN SHORE SECTION¹

Animal Food	77% (35-93)	Seeds	38% (13-69)
Fish (chiefly Poeciliidae)	54 (25-81)	Widgeongrass	31 (9-62)
<u>Melampus bidentatus</u> (Gastropoda)	15 (1-46)	Saltgrass	8 (+-37)
<u>Bittium varium</u> (Gastropoda)	15 (1-46)	Saltmarsh Bulrush	8 (+-37)
Amphipoda	15 (1-46)	Hightide-bush	8 (+-37)
Decapoda	8 (+-37)	Needlerush	8 (+-37)
Libelluloidea nymphs	8 (+-37)	Twigrush	8 (+-37)
Heteroptera nymphs	8 (+-37)	Leaves, Stems and Rootstalks of Submerged Aquatic Plants	23 (5-54)
Corixidae	8 (+-37)	Widgeongrass	23 (5-54)
Coleoptera	8 (+-37)		
Grain	15 (1-46)		
Corn	15 (1-46)		

¹ Collected during fall and winter. Percentage occurrence of foods that made up 5% or more of the volume in individual birds. Figures in parentheses show 95% confidence limits.

Table 61

FOODS OF 6 BLACK DUCKS FROM COASTAL SALT MARSHES¹

Animal Food	100% (54-100)	Seeds (con't)	
<u>Melampus bidentatus</u> (Gastropoda)	67 (22-96)	Twigrush	17% (+-65)
<u>Volisella demissa</u> (Pelecypoda)	33 (4-78)	Saltgrass	17 (+-65)
Fish	17 (+-65)	Bayberry	17 (+-65)
Amphipoda	17 (+-65)	Leaves, Stems and Rootstalks of Submerged Aquatic Plants	17 (+-65)
Coleoptera	17 (+-65)	Sea-lettuce	17 (+-65)
Seeds	33 (4-78)		
Widgeongrass	33 (4-78)		
Saltmarsh Cordgrass	17 (+-65)		

¹ Collected during late fall, winter and early spring. Percentage occurrence of foods that made up 5% or more of the volume in individual birds. Figures in parentheses show 95% confidence limits.