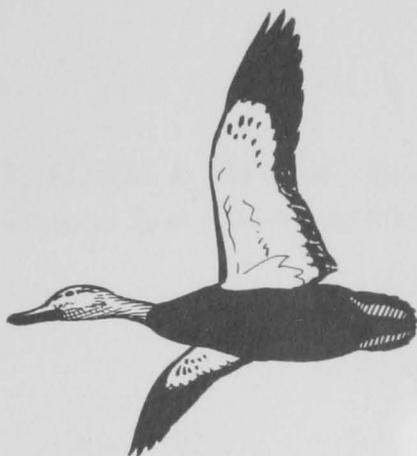


*Mary Fiske Ames*

# DISTRIBUTION OF THE BLACK DUCK



CIRCULAR 51

FISH AND WILDLIFE SERVICE  
UNITED STATES DEPARTMENT OF THE INTERIOR



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# DISTRIBUTION OF THE BLACK DUCK

Efforts to manage migratory game-bird species in North America have brought into focus the need for more exact information on the distribution of certain population segments of known size on both breeding and wintering areas. This information, when related to current banding programs and to annual breeding- and wintering-ground surveys, permits more accurate quantitative predictions of fall flights available to hunters. It also reveals those populations that need to be protected and managed through proper land-use practices or through special hunting restrictions.

The maps of breeding and winter ranges of the black duck (*Anas platyrhynchos*) and the related discussion in this report are based primarily on records taken from the literature and on data obtained from surveys of the breeding grounds and wintering areas. In describing the breeding and winter ranges, we have shown their relationship to natural ecologic regions. Each of these regions is characterized by a specific type of climax vegetation that is an indicator of general ecological conditions prevailing within the region. Information concerning the migration routes of the

black duck, based on the analysis of banding recoveries, was included in a previous paper by Addy (1953).

The material on the breeding populations of the black duck was obtained in Canada by the U. S. Fish and Wildlife Service, using aerial-survey methods based on a stratified sampling plan developed by the Branch of Game Management. The Canadian Wildlife Service supplied a plane and fuel and several aerial observers in the Maritime Provinces and obtained the necessary flight clearances and border entry permits for the survey parties.

The winter inventories are based mainly on aerial surveys conducted over the continental waterfowl wintering habitat. These were a cooperative enterprise of the U. S. Fish and Wildlife Service, the Canadian Wildlife Service, and the game commissions of the various States.

Special acknowledgment is made to Don P. Fankhauser, who assisted in the preparation of the range maps. I am also indebted to C. E. Addy, E. L. Atwood, C. D. Evans, S. H. Low, and G. B. Saunders for their helpful advice.

# BREEDING RANGE OF THE BLACK DUCK

Breeding black ducks are distributed (fig. 1) throughout the boreal coniferous forest formation of eastern Canada, extending westward to Lake of the Woods in western Ontario and to the southeast corner of the mainland of the District of Keewatin, Northwest Territories. They are found throughout the hemlock-white pine-northern hardwoods region of the Great Lakes-St. Lawrence and northern Appalachian areas, and extend into the northern part of the deciduous forest formation proper, including the maple-basswood region and the northern portions of the beech-maple, mixed mesophytic, and oak-chestnut forest regions (for descriptions of these regions, see Braun, 1950, pp. 35-37). Along the Atlantic coast, black ducks also occur regularly in the tidewater areas extending southward to North Carolina (Carteret County). At the northern margin of their breeding range, particularly along the west shore of Hudson Bay, they are found short distances into the arctic tundra along brush-bordered streams.

Populations of breeding black ducks are characteristically somewhat scattered throughout the range. General changes in abundance that do occur over wide areas are usually very gradual. Because of this, it is impractical to attempt to map in detail the areas within the range that show differential population densities.

Population densities of breeding black ducks in Quebec and Labra-

dor during 1955 and 1956, in terms of number of breeding birds per square mile, were computed from aerial transect data by C. D. Evans. These densities are shown for each of three major ecologic regions (table 1): (1) The hemlock-white pine-northern hardwood forest region; (2) the main boreal forest; and (3) the combined open boreal woodland and forest-tundra ecotone. The main boreal forest, open boreal woodland, and forest-tundra ecotone are subdivisions of the boreal coniferous forest formation as described by F. Kenneth Hare (1950, pp. 623-627).

TABLE 1.—Population densities of breeding black ducks in Quebec and Labrador, by regions, 1955-56

Year	Number of breeding birds per square mile in—		
	Hemlock-white pine-northern hardwood	Main boreal forest	Open boreal woodland and forest-tundra
1955-----	0.44	0.26	0.28
1956-----	.49	.33	.27

It will be noted that the population densities of breeding black ducks in the main boreal forest and in the combined open boreal woodland-forest tundra ecotone are nearly identical. Therefore, for our purposes it is feasible to combine these two regions, and to consider the all-inclusive boreal coniferous forest as a single geographical unit, insofar as the distribution

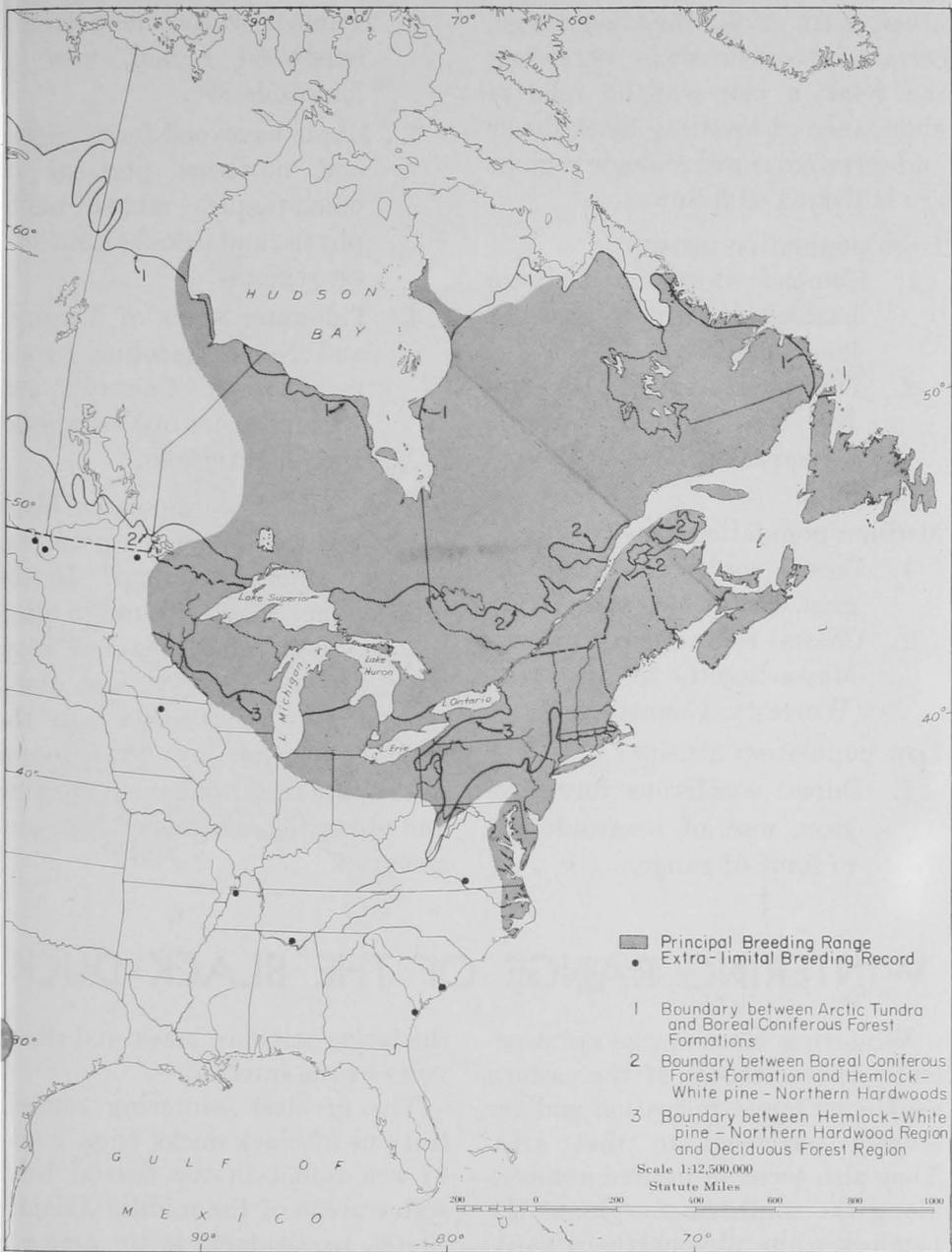


FIGURE 1.—Breeding range of the black duck (*Anas rubripes*).

of breeding black duck populations in Quebec and Labrador is concerned. The differences in population densities between the boreal coniferous forest region and the hemlock-white pine-northern hardwood forest region, however, are

believed to be sufficient to warrant their treatment as separate geographical units.

On the basis of the differences in population density shown in table 1, as well as numerous other observations and published records for

other parts of the breeding range, certain generalizations regarding the relation between the relative abundance of breeding black ducks and certain natural ecologic regions are indicated as follows:

High population density:

1. Hemlock-white pine-northern hardwood region, east of longitude 85°.
2. Tidewater areas of Delaware Bay and eastern shore of Chesapeake Bay in Maryland.

Medium population density:

1. Boreal coniferous forest region, east of longitude 85°.
2. Coastal tidewater areas from Massachusetts to Maryland (Worcester County).

Low population density:

1. Boreal coniferous forest region, west of longitude 85° to limit of range.

2. Hemlock-white pine-northern hardwood region, west of longitude 85°.
3. Maple-basswood forest region and northern portions of beech-maple, mixed mesophytic, and oak-chestnut forest regions.
4. Tidewater areas of Virginia and North Carolina (south to Carteret County) and western shore of Chesapeake Bay in Maryland.

During the breeding season, black ducks occur in or near a great variety of aquatic habitats. In the interior they may be found in alkaline marshes, acid bogs and muskegs, lakes and ponds, and along the margins of streams. In the coastal tidewater areas, they occur in salt, brackish, and fresh marshes and along the margins of bays and estuaries.

## WINTERING RANGE OF THE BLACK DUCK

Wintering black ducks are especially characteristic of the eastern deciduous forest formation and are largely restricted to that area. They also occur in limited numbers along the southern margin of the hemlock-white pine-northern hardwood forest region, in the coastal tidewater area between Massachusetts and Newfoundland, and along the northern margin of the Floridian subtropical evergreen forest formation. They may be found in a great variety of aquatic habitats, but tend to concentrate in the coastal tidewater areas and along

the larger streams, lakes, and reservoirs of the interior.

The greatest wintering concentrations of black ducks (figs. 2 and 3) are found in the coastal tidewater areas of the middle Atlantic States, particularly in the area extending from Massachusetts to North Carolina. Other large concentrations occur in the interior on the larger lakes, rivers, and reservoirs of the East Central States (Tennessee, Kentucky, Ohio, Indiana, and Illinois). Fair numbers also occur in the Southeastern States, in northern New England,

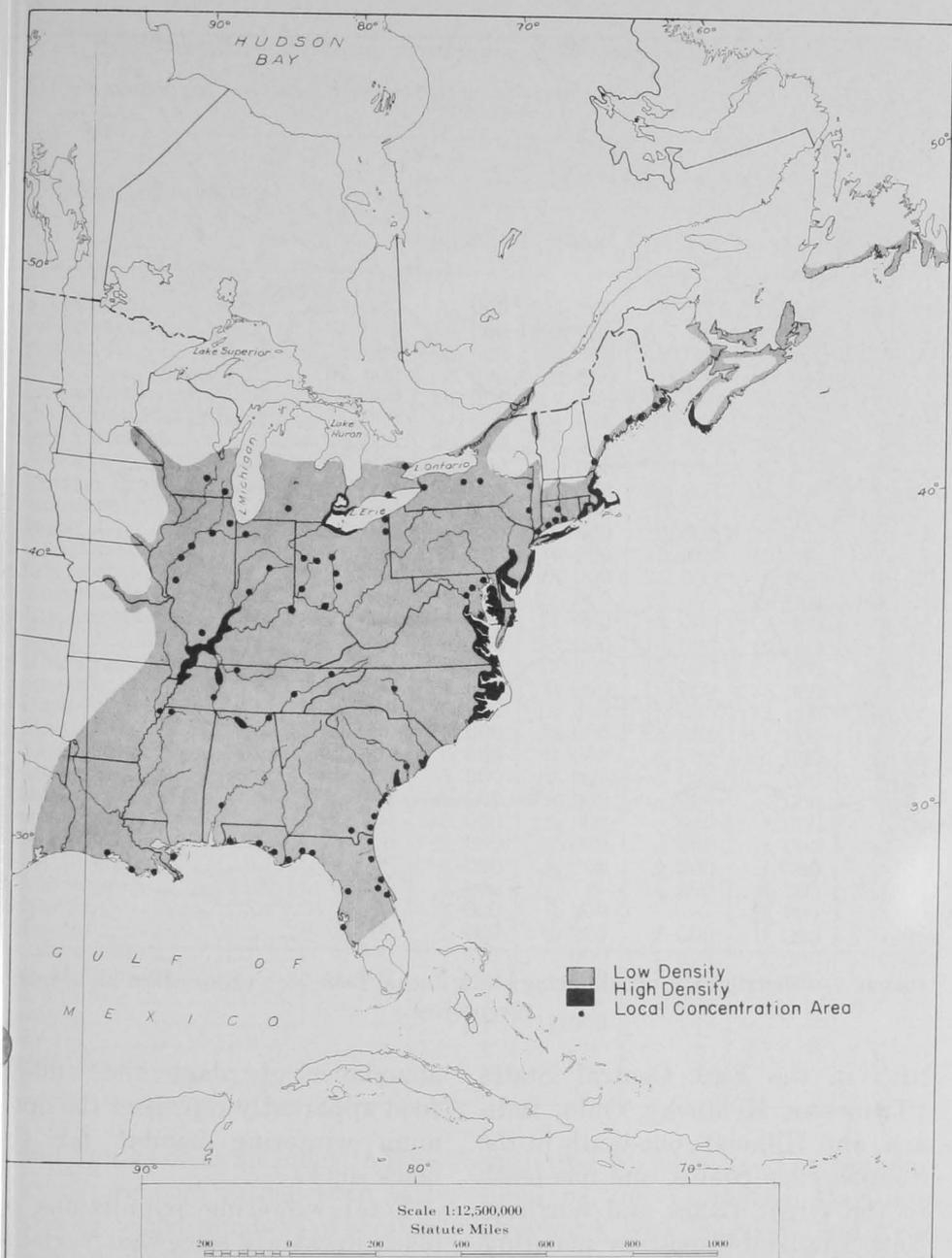


FIGURE 2.—Principal wintering range of the black duck (*Anas rubripes*).

in the Canadian Maritime Provinces, and in the Great Lakes area. In figure 3, areas of similar densities are grouped together into six regions of approximately equal size.

Data from the January inventories (table 2) indicate that the win-

tering black duck populations during the 5-year period, 1952-56, totaled approximately 678,000. Roughly three-fifths of these wintering ducks were in the Atlantic coastal areas extending from Massachusetts to North Carolina, one-



FIGURE 3.—Distribution of wintering black ducks, 1952-56. (Map based on January inventories.)

fifth in the East Central States (Tennessee, Kentucky, Ohio, Indiana, and Illinois), one-tenth in the Southeastern States, and one-tenth in the Great Lakes and northern New England-Canadian maritime areas (fig. 3). The highest population densities were found in tide-water areas of New Jersey, Delaware, Maryland, and Virginia, which together furnished more than two-fifths of the total wintering populations. In these four States, the extensive tidal marshes and adjacent agricultural areas with their

abundance of plant and animal food apparently represent the optimum wintering habitat for the black duck.

Total wintering populations of black ducks are somewhat variable from year to year, as is shown by the following January inventories: 1952—518,000; 1953—753,000; 1954—653,000; 1955—804,000; and 1956—670,000. During this period the maximum count (in 1955) was 55 percent above the minimum count (in 1952). The results of these surveys should be considered

TABLE 2.—*Wintering populations of the black duck, 1952-56*

[Data from January inventories; figures rounded to the nearest 1,000; numbers of 500 or less indicated by plus (+)]

State or Province	Average 1952-56	Average number in—				
		1952	1953	1954	1955	1956
Maryland	129,000	54,000	134,000	85,000	224,000	149,000
New Jersey	85,000	78,000	102,000	85,000	97,000	65,000
Virginia	52,000	35,000	55,000	72,000	58,000	42,000
Ohio	37,000	8,000	34,000	29,000	48,000	64,000
Delaware	36,000	30,000	60,000	39,000	25,000	28,000
New York and Vermont	31,000	27,000	34,000	27,000	32,000	34,000
North Carolina	28,000	30,000	22,000	25,000	41,000	22,000
Indiana	27,000	8,000	42,000	21,000	33,000	29,000
Maritime Provinces	23,000	21,000	24,000	21,000	29,000	22,000
Tennessee	22,000	45,000	19,000	26,000	11,000	9,000
Illinois	22,000	9,000	15,000	26,000	27,000	32,000
Massachusetts	21,000	22,000	24,000	22,000	19,000	19,000
Kentucky	20,000	23,000	25,000	25,000	6,000	21,000
Pennsylvania	18,000	13,000	21,000	13,000	29,000	16,000
South Carolina	17,000	16,000	17,000	18,000	17,000	18,000
Florida	17,000	14,000	33,000	14,000	16,000	9,000
Michigan	17,000	3,000	10,000	13,000	23,000	35,000
Louisiana	14,000	23,000	8,000	16,000	15,000	7,000
Ontario	11,000	5,000	12,000	15,000	13,000	10,000
Maine	10,000	10,000	12,000	11,000	11,000	8,000
Rhode Island	7,000	8,000	9,000	6,000	6,000	5,000
Alabama	6,000	5,000	10,000	5,000	5,000	6,000
Connecticut	6,000	8,000	6,000	6,000	4,000	5,000
Georgia	5,000	10,000	5,000	6,000	1,000	1,000
Wisconsin	4,000	2,000	4,000	9,000	4,000	3,000
West Virginia	4,000	2,000	3,000	9,000	1,000	4,000
Mississippi	3,000	5,000	+	4,000	4,000	4,000
Missouri	2,000	2,000	6,000	+	2,000	1,000
Arkansas	2,000	1,000	4,000	2,000	1,000	1,000
Newfoundland	1,000	+	1,000	1,000	1,000	1,000
New Hampshire	1,000	1,000	1,000	1,000	1,000	+
Minnesota	+	+	+	1,000	+	+
Quebec	+	+	1,000	+	+	+
Iowa	+	+	+	+	0	+
South Dakota	+	+	+	+	+	0

trend figures or as an index to population numbers rather than estimates of actual numbers of wintering black ducks. Although counts are made over all important wintering areas, segments of the population are undoubtedly missed, particularly those occurring along small streams in the interior.

The relative amount of yearly fluctuation in numbers of black ducks is quite variable in different parts of the wintering range, as is

indicated in table 2. The populations of the Canadian Maritime Provinces, New England, and New York appear to be comparatively stable, while the populations of most of the Middle Atlantic and South Atlantic States tend to show a more definite amount of annual change. The most pronounced fluctuations occur in Maryland, Newfoundland, the Great Lakes area, the East Central States, the Gulf Coast States, and in the States

along the western fringe of the wintering range. The variation in numbers found in Michigan, Ohio, Indiana, and Illinois is especially interesting since a very noticeable

build-up during the 5-year period is indicated, while at the same time the populations of Tennessee underwent a definite decline.

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