WOODCOCK STATUS REPORT

1973

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF SPORT FISHERIES AND WILDLIFE
Special Scientific Report—Wildlife No. 178

UNITED STATES DEPARTMENT OF THE INTERIOR
Bureau of Sport Fisheries and Wildlife

WOODCOCK STATUS REPORT, 1973

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Laurel, Maryland

Bureau of Sport Fisheries and Wildlife
Special Scientific Report--Wildlife No. 178
Washington, D.C. . 1974

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ABSTRACT

Evidence exists that the harvest of the American woodcock (Philohela minor) by waterfowl hunters has increased by about 10% each year since 1964. The continental harvest in 1972 was estimated to exceed 1.5 million woodcock. The 1973 singing-ground survey showed breeding population index declines of 6.3% in the Atlantic Region, 2.8% in the Central Region, and 4.3% rangewide. These indices are based on 804 comparable routes--5% fewer than the record 848 routes in 1971.

Wing-collection survey data for the 1972-73 season showed an increase in the productivity index of 7.6%. This change follows extreme fluctuations of +25% in 1970-71 and -27% in 1971-72 which represented the highest and lowest points respectively in the history of the index. Trends in hunter success have continued downward, declining 4.1% in 1972-73 from the previous year. Harvest chronology data suggest that some States could benefit from earlier or later seasons than those selected in recent years.

Woodcock banding has increased steadily. Limited band recoveries to date suggest little interchange between breeding populations of the Atlantic and Central Regions.

INTRODUCTION

During the past decade, the American woodcock has become a popular game bird with increasing numbers of hunters over a wider portion of its range. The species still rates well below waterfowl in terms of harvest, but the ratio of woodcock to waterfowl harvested has narrowed to 1:3, or less, in several northern States. Thus, the species has advanced from a "specialty" game bird highly regarded by a few hunters to a broader based recreational resource actively pursued by many sportsmen

Since there is no suitable sampling frame with which to conduct a randomized woodcock harvest survey in the United States, the magnitude of the harvest has been estimated from data derived from State surveys and from the Bureau's waterfowl hunter questionnaire survey (Clark 1972). The resulting estimate of 1.4 million woodcock harvested during the 1971-72 season (the latest full year of mail survey data) represents an increase of approximately 60% in a 6-year period. This is a crude estimate at best; however, it provides some insight into the utilization of the resource.

Although over one-half of the harvest occurs in the northern zone (comprising the North-Central and North Atlantic reference areas, Fig. 1), mid- and southern-zone harvests are increasing rapidly (Table 1).

In Canada, all migratory game bird hunters are required to obtain Federal permits. Thus, in recent years woodcock harvests there have been measured more precisely than those in the United States. The Canadian surveys (Benson 1968, 1969, 1970, 1971; Cooch et al. 1972, 1973) show the following harvests:

1967 - 90,000	1970 - 98,000[a]
1968 - 100,000	1971 - 108,000
1969 - 116,000	1972 - 122,000

[a]Season curtailed because of high levels of DDT metabolites in a preseason sample of woodcock.

Sampling procedures in Canada were changed in 1972. Harvest figures were lower by the new method but they were believed to be more accurate than the earlier procedures.

A combination of U.S. and Canadian harvest figures suggests that the continental woodcock harvest in 1972 exceeded 1.5 million birds and is increasing. Relatively little woodcock research has been accomplished, and much needs to be learned of the species' potential for meeting further recreational demands.

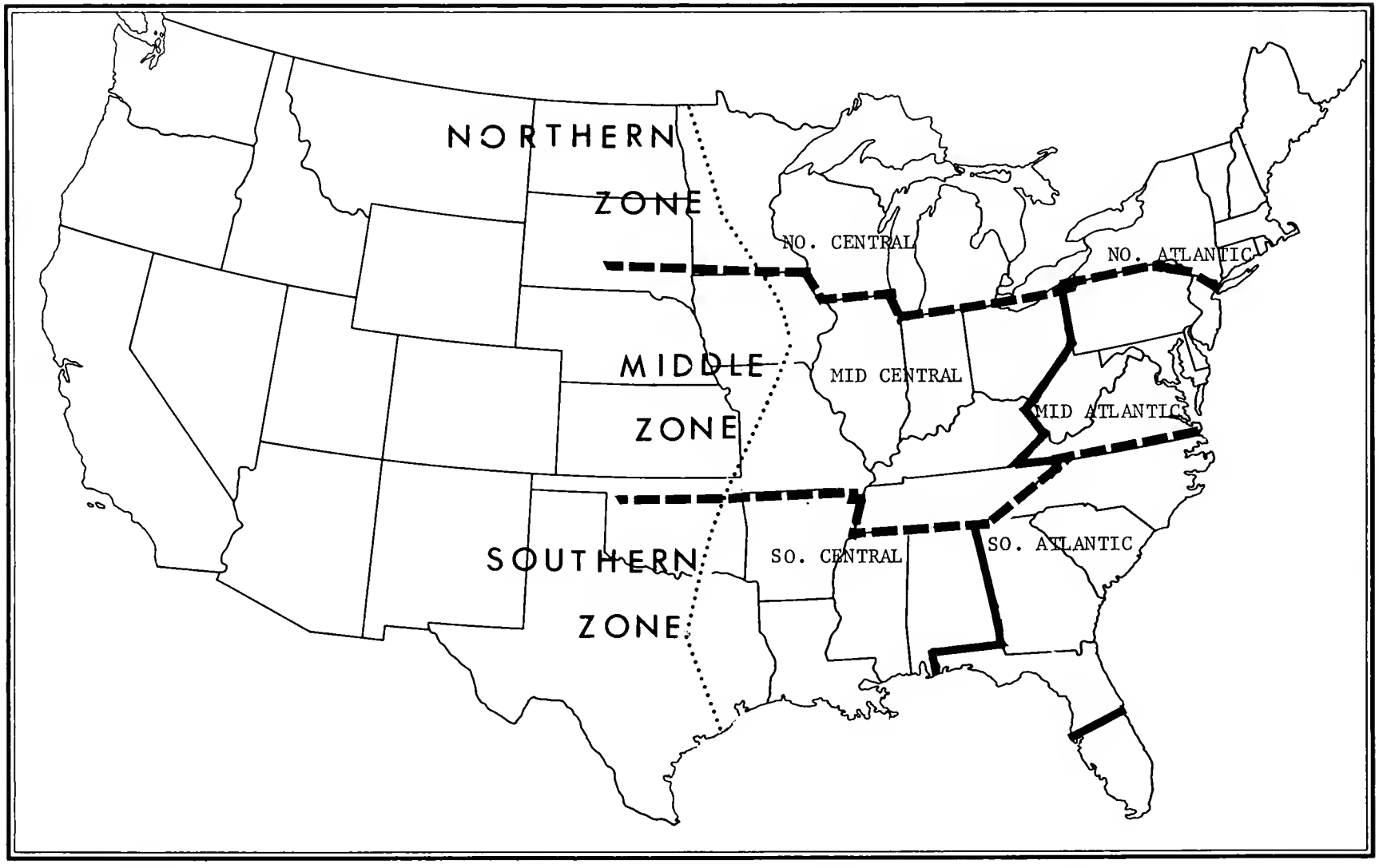

Fig. 1.--Reference areas of U.S. woodcock surveys. Area to the right of the dotted line is principal woodcock range.

Two annual surveys presently provide the basis for establishing woodcock hunting regulations in the United States: (1) A singing-ground survey, which provides an index of the postmigration breeding population, and (2) a wing-collection survey, which provides data on relative reproductive success of the species during the previous breeding season, and changes in size and distribution of the harvest by participating hunters.

Collection and analysis of data have steadily improved in both surveys. Although imperfect, these two basic surveys produce the best information currently available for managing woodcock. This report presents data from the 1973 singing-ground survey, the 1972-73 wing-collection survey, and additional information accumulated since publication of the Woodcock Status Report, 1972 (Clark 1973).

SINGING-GROUND SURVEY

Procedures

The singing-ground survey, which involves counts of singing males heard along predetermined routes (Table 2) is interpreted as an index to the size of the breeding population. Between 1964 and 1970, the survey has gradually changed from routes selectively located in woodcock habitat of average or better quality (management routes) to randomly located routes covering all levels of habitat quality (Clark 1970). Since 1970, the breeding population index has been based entirely upon these random routes, which provide better statistical reliability.

The 1973 index was based upon data derived from 804 routes comparable with those run the previous year. This number of routes is 5% less than the high of 848 in 1971. In computing the index, data from each State were weighted according to the State's proportion of the total land area (inland water area excluded) in the region or in the range of the species (Table 3).

Routes on which no singing males were heard at any of the 10 stops for 2 consecutive years under comparable circumstances are placed in the "Constant 0" group. They are included in the number of comparable routes but are not field-checked annually. At 5-year intervals they are rechecked to determine if woodcock are present.

Because the group of routes paired with comparable routes the preceding year to determine percentage change is not necessarily the same group paired with comparable routes the subsequent year, it is illogical to graphically depict numbers of singing birds heard per route. Conversion to random routes, which usually averaged fewer birds than management routes, precludes portraying the annual average number of birds per route. Number of woodcock heard per comparable route was calculated (Clark 1973) and plotted (Fig. 2).

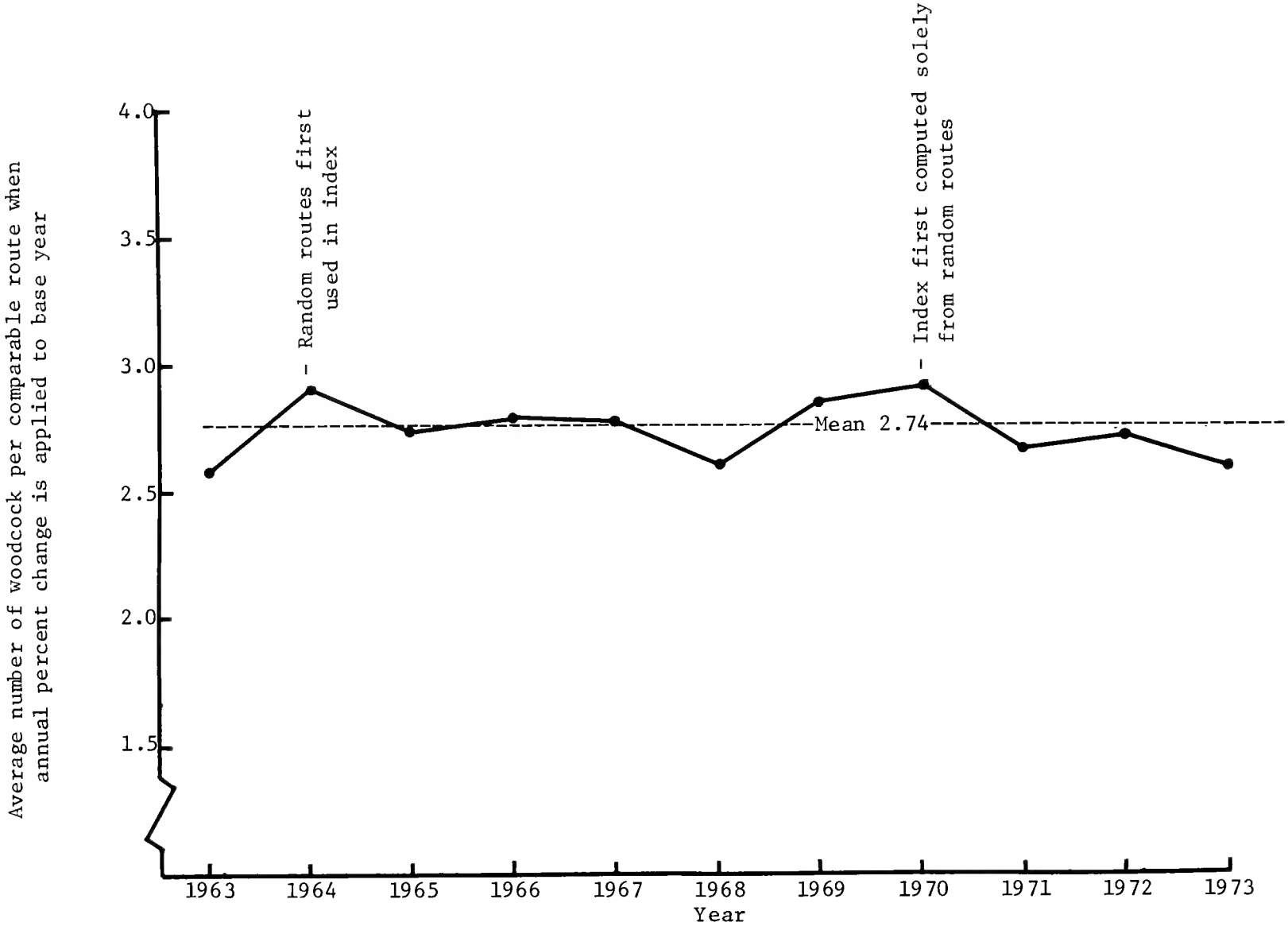

Fig. 2.--Trends in singing male woodcock as determined from annual singing-ground surveys. (Base Year - 1970)

Results

Number of woodcock heard per comparable route declined in 1973 by 6.32% in the Atlantic Region, 2.79% in the Central Region, and 4.32% rangewide. The following is a summary of the annual changes during the past 9 years, based on data weighted regionally and rangewide:

	Percentage change from previous year		
Year	Atlantic Region	Central Region	Rangewide
1965	-0.4	-11.1	-6.5
1966	+2.4	-0.5	+1.7
1967	+1.5	-3.5	0
1968	-8.4	-4.5	-6.9
1969	+4.2	+12.1	+8.8
1970	0	+3.1	+2.1
1971	-9.8	-7.3	-8.4
1972	+1.6	+3.7	+2.7
1973	-6.3	-2.8	-4.3

Since 1963, annual changes among regions generally have been compensatory (Fig. 2).

WING-COLLECTION SURVEY

The primary objective of the woodcock wing-collection survey is to determine reproductive success as reflected by the age and sex composition of the harvest. The survey also produces information on changes in geographic and chronologic distribution, size of the harvest, and daily and seasonal hunter success.

Response to the wing-collection survey has been generally good since its inception in 1959. Annual wing submissions have ranged from 8,786 the first year to 19,165 for the 1971-72 season, and have averaged nearly 15,000 annually.

Procedures

Procedures for collecting, processing, and analyzing survey data were the same as for the 1968-69 season (Clark 1970). Other pertinent information may be found in Clark (1973).

Distribution of hunter contacts by States is shown in Table 4. To improve the distribution of the wing sample, more hunters in midlatitude and southern States have been contacted in recent years (Table 5). Adequate samples are now available from most northern States.

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Hunters who cooperated in previous years submitted the most wings and were the sole source of comparable data. Lists of hunters' names and addresses obtained from State harvest surveys probably produce the least biased samples within each State; however, procedural variations between States introduce additional biases. More importantly, many States either have no harvest survey or do not inquire about woodcock harvests in their questionnaires. Names added annually at the request of survey participants or their friends are few. The list of woodcock hunters from the Bureau's waterfowl mail survey is the largest source of names, but the number of wings submitted per contact is very low. A significant bias in this source is the large State-to-State variation in the ratio of waterfowl hunters to total hunters. For example, both Louisiana and Pennsylvania are important woodcock harvest States. However, only 1 Pennsylvania hunter in 20 purchases a duck stamp; in Louisiana, one-third of all hunters purchase duck stamps. Obviously, precise analysis of a survey sample originating from such varied sources is impossible. Nonetheless, major changes in woodcock productivity and harvest rates probably can be detected from these various survey sources.

Results

A total of 8,265 hunters was contacted in the 1972-73 woodcock survey, 4% fewer than the high of 8,593 in 1971-72. Number of wings received declined slightly from 19,165 in 1971-72 to 18,978 in 1972-73. Wing totals vary between different tables in this report because incomplete information necessitated the exclusion of a few wings from some tabulations.

A listing by States of the number of cooperators, envelopes returned, and wings received for the past two hunting seasons is shown in Table 6. Numbers of envelopes are shown because each represents 1 day's hunt by one hunter and consequently is the daily bag.

Comparison of Sample Source

Response rate and wings contributed per hunter in the three principal categories are shown in Table 7. Response rate and number of wings submitted were generally higher for hunteres who had been in the survey for more than 1 year.

Weighting Factors

Because the number of wings received from each State may not be proportional to the woodcock harvest in that State, it was necessary to weight data used in computing overall productivity and harvest index trends.

Because we lack a uniform sampling frame for woodcock hunters, no completely satisfactory weighting method has been devised. Current procedures are based upon a combination of data from the Bureau's waterfowl mail survey, duck stamp sales, and State license sales (Clark 1970). Derivation of weighting factors for computing productivity and harvest indices for the 1972-73 season is shown in Table 8.

Productivity Index

In this report, reproductive success is used as a measure of annual productivity. Woodcock can be aged and sexed by wing plumage characters (Martin 1964). The ratio of immatures per adult female in the harvest, as determined from the wing-collection survey, provides a measure of reproductive success during the preceding breeding season (Table 9). Considerable variation occurs in immature-adult female ratios between different harvest areas (States or Provinces) and between different years for the same harvest areas. These variations are probably caused by differences in hunting season dates, weather conditions, hunting season restrictions imposed by emergency situations (such as fire hazard), and possibly differential migration coupled with differential vulnerability to hunting between sex and/or age groups. However, before the 1970-71 season, annual change in age ratios was small when rangewide data were weighted and combined (Fig. 3). Greatest fluctuations to date consisted of a 25% increase in 1970-71 (Clark 1973) followed by a 26.9% decline in 1971-72 (Table 10). The index showed an increase of 7.6% in 1972-73.

Cause of these unusual fluctuations in age ratio has not been determined. Adverse weather shortly after hatching may be a factor. Examination of climatological data for May (when most woodcock hatch) in States having the greatest density of breeding woodcock shows that average temperatures were above normal in 1970 and below normal in 1971 (U.S. Dept. of Commerce 1970 and 1971).

A review of 1972 data suggests that although climatological conditions may influence woodcock productivity, the correlation probably would be much clearer if it were more localized in both time and location. Temperatures in May 1972 were above normal in all climatological regions of the woodcock's principal breeding range except in northern Maine and southern coastal New England (Table 11), yet woodcock productivity increased only moderately (8.2%). Closer examination of the data (U.S. Dept. of Commerce 1972) revealed that temperatures were somewhat below normal the first 3 weeks of May in the North Atlantic Region and the first half of May in the North Central Region. Record high temperatures later in the month more than compensated for earlier low temperatures. This raises the possibility that productivity in early broods may have been low, but greater success in later broods resulted in an overall increase in productivity from the low of the previous year.

Although data from only 3 years do not establish positive correlation between spring temperatures and woodcock productivity, they suggest that temperatures and other weather factors merit closer study.

Variation in the productivity index due to differences in hunters sampled has been eliminated by using only data from hunters participating in the survey both years in computing the change in the weighted index.

Hunter Success Index

Trends in the daily and seasonal woodcock harvest have been appraised by determining annual percentage change in the number of wings submitted by hunters who participated in the survey for 2 consecutive years (Table 12). Average daily harvests have changed little from year to year.

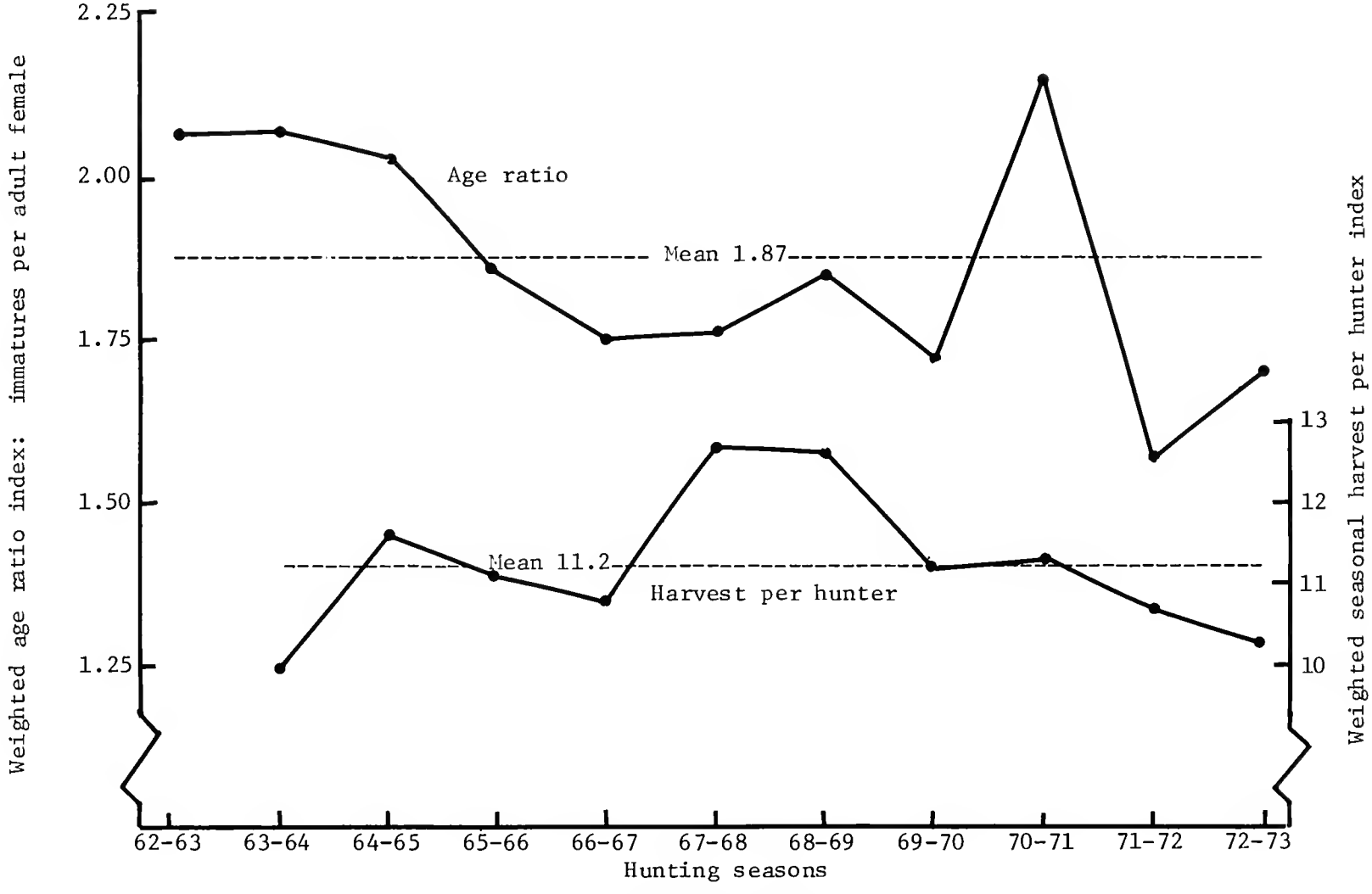

Fig. 3.--Weighted age ratio and seasonal harvest per hunter indices, as determined from annual woodcock wing-collection survey data from comparable hunters (Base Year - 1969-70).

Seasonal harvest has shown slightly greater annual percentage changes than daily harvest. Apparent upward trends through 1970-71 (Fig. 3) are misleading because the substantial increases in 1964-65 and 1967-68 probably resulted from greater hunting opportunity. Hunting was curtailed by hazardous fire conditions over much of the Northeast in 1963. Return to normal in 1964 resulted in a much higher seasonal harvest per hunter. Increased harvest in 1967-68 may be attributed to an increase in season length from 50 to 65 days. When sharp increases in 1964-65 and 1967-68 are discounted, the trend in hunter success is almost steadily downward. The cause of the decline cannot readily be explained. Hunter success index declined 4.1% in 1972-73.

Daily hunter success was examined for the past five seasons; however, little variation between seasons was evident. Greater variations were evident in regional summaries of the data (Table 13). However, annual variations were small when samples totaled over 1,000 hunts.

Hunter success, along with other factors, needs further study before hunting pressure can be equated with woodcock population trends. A correlation may be revealed by information obtained through a uniform sampling frame such as the proposed Federal migratory upland game bird hunting permit and from accumulating banding data.

Regional Analysis of Wing-Collection Data

Sex and Age Ratios

An investigation of factors affecting productivity and hunter success was initiated in 1970. Since differential migration by sex and age groups in conjunction with the timing of hunting seasons would materially influence the productivity index, the first step was an analysis of regional sex and age ratios by time periods.

A study of recent band recovery data suggests that less intermingling of woodcock between the Central and Atlantic Regions occurred than was formerly supposed; therefore, data from the two regions were analyzed separately. Within each region, three subunits were established (Fig. 1). Criteria used in selecting subunits were as follows:

1. Northern subunit--States having relatively high-density woodcock breeding populations and harvests consisting of a high proportion of locally reared birds.

2. Middle subunit--States having moderate- to low-density breeding populations and harvests consisting primarily of migrant woodcock.

3. Southern subunit--States having very low breeding population densities and harvests consisting almost entirely of wintering and migrant woodcock.

Naturally, there is overlapping of characteristics between these subunits, because State boundaries, though useful, do not accurately delineate the criteria described.

Woodcock harvest, as represented by the wing collection, was divided into 10-day segments for regional comparisons. These segments were then grouped into three major periods so that approximately 50% of the wings were in the middle period and 25% each in the first and third periods. If seasonal trends in sex or age ratios occur, this broad separation between early and late season should make them more apparent. Weather influences the timing of migration and subsequently the availability of woodcock for harvest. In view of the great year-to-year variation in weather, results are not yet conclusive. However, we believe that accumulated data may eventually reveal enlightening trends. Data for the 1968-69 through 1972-73 seasons are summarized for the Central Region in Table 14 and for the Atlantic Region in Table 15. Extension of the season framework through February (15 February in 1971) shifted the median harvest period to a later time period in southern subunits in 1971, 1972, and 1973.

Chronology of Harvest

Distribution of the harvest as shown by 10-day wing-collection periods provides some insight into timing of the fall migration. Inasmuch as substantial numbers of woodcock are produced in Canada, harvest in the northern States probably includes some migrants. It is possible, however, to encompass the period of greatest abundance of woodcock for a particular State within a season length of 65 days. In a few States, the hunting season is set primarily with native game species in mind; therefore, the period of greatest abundance for migratory species such as the woodcock may be missed in many, if not most, years. A north-to-south distribution of the 1972-73 and the latest 5-year average harvests is shown for the Central (Table 16) and Atlantic (Table 17) Regions. Larger samples are needed for some States, but the data indicate the chronology of fall migration.

The data only approximate the migration chronology, since no adjustment was made in either table for periods encompassing less than 10 days of hunting. Such periods may occur at the beginning or end of the hunting season. Heavier hunting pressure on the opening day or first weekend may partially compensate for a shortened period. However, the typical concentration of hunting effort and harvest in the beginning of the season probably is not as great for woodcock as for some other game birds.

Wing-collection survey data were summarized by 7-day periods as well as by 10-day periods. Distribution of the harvest by 7-day periods beginning with the opening date in each State provides better information on the chronology of harvests in individual States (Tables 18 and 19). The shorter period makes regional pooling of data more difficult because it magnifies problems of State-to-State variation in opening dates. In contrast, it eliminates the variation in hunting opportunity associated with 10-day periods, where the first period may contain from 1 to 10 days and some may include two weekends. Effect of weekend hunting varies materially if Sunday hunting is permitted.

The woodcock hunting season in some northern States may be curtailed by weather or conflicts with the deer hunting season when use of bird dogs may not be permitted. However, hunters in most of those States still enjoy good woodcock hunting.

The data in Tables 18 and 19 suggest that some States could benefit from earlier or later seasons than those selected in recent years. Although results may be biased by inadequate sample sizes in some States, unduly high percentages of the total season's harvest in the first 2 weeks suggest that an earlier season might be desirable. In contrast, the concentration of the harvest towards the end of the season suggests the need for a later season. States having small samples in the survey may profit by examining data from other States in their same general latitude.

SUMMARY OF RESEARCH ACTIVITIES

Federally funded woodcock projects in progress during the fiscal year ending 30 June 1973 are listed in Table 20. Banding is a particularly pressing need, especially on breeding grounds. Much greater banding effort at the northern edges of main breeding areas in Ontario, Quebec, and the Maritime Provinces is essential for adequate understanding of the origins of wintering and migrant populations as well as the timing of migrations. Population origin and migration data are needed to evaluate the influence of weather on reproduction and other factors of vital importance to woodcock management. Expansion of banding effort in the 12-year period, 1961-72, is reflected in Table 21. The increase, particularly evident in preseason banding, is graphically shown in Fig. 4.

Comparisons of recovery locations of woodcock banded in the Atlantic Region with those banded in the Central Region (Table 22 and Figs. 5 and 6) add to existing evidence that principal woodcock migration routes have north-south orientation. Interspersion on the wintering grounds of birds reared in the Atlantic and Central Regions is suggested by recoveries of winter-banded birds in the northern parts of both regions. However, 85% of the recoveries from winter-banded woodcock were reported from the region in which they were banded. Most interregional recoveries were from birds banded near regional borders, illustrating the minor problem caused by use of State and Province boundaries to delineate regions. The lack of substantial interchange between breeding grounds suggests strong fidelity to natal areas and fairly distinct Atlantic and Central breeding populations.

ACKNOWLEDGMENTS

Most data in this report would not be available without the cooperation of the Canadian Wildlife Service; Provincial and State conservation departments; Bureau personnel of Regions 3, 4, and 5; and the many individuals who assisted in the surveys.

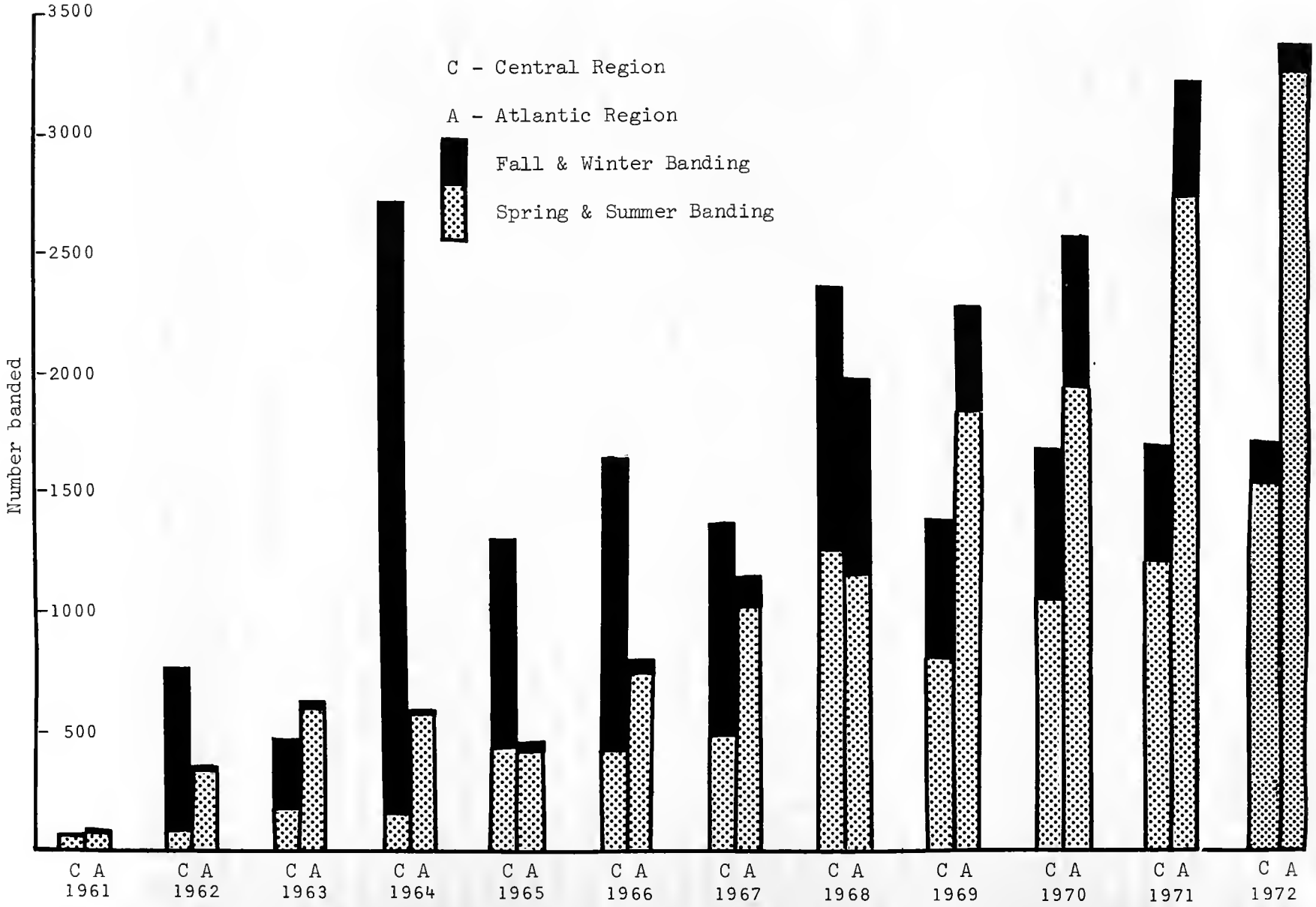

Fig. 4.--Woodcock banding by regions, 1961-72 (excluding experimental birds).

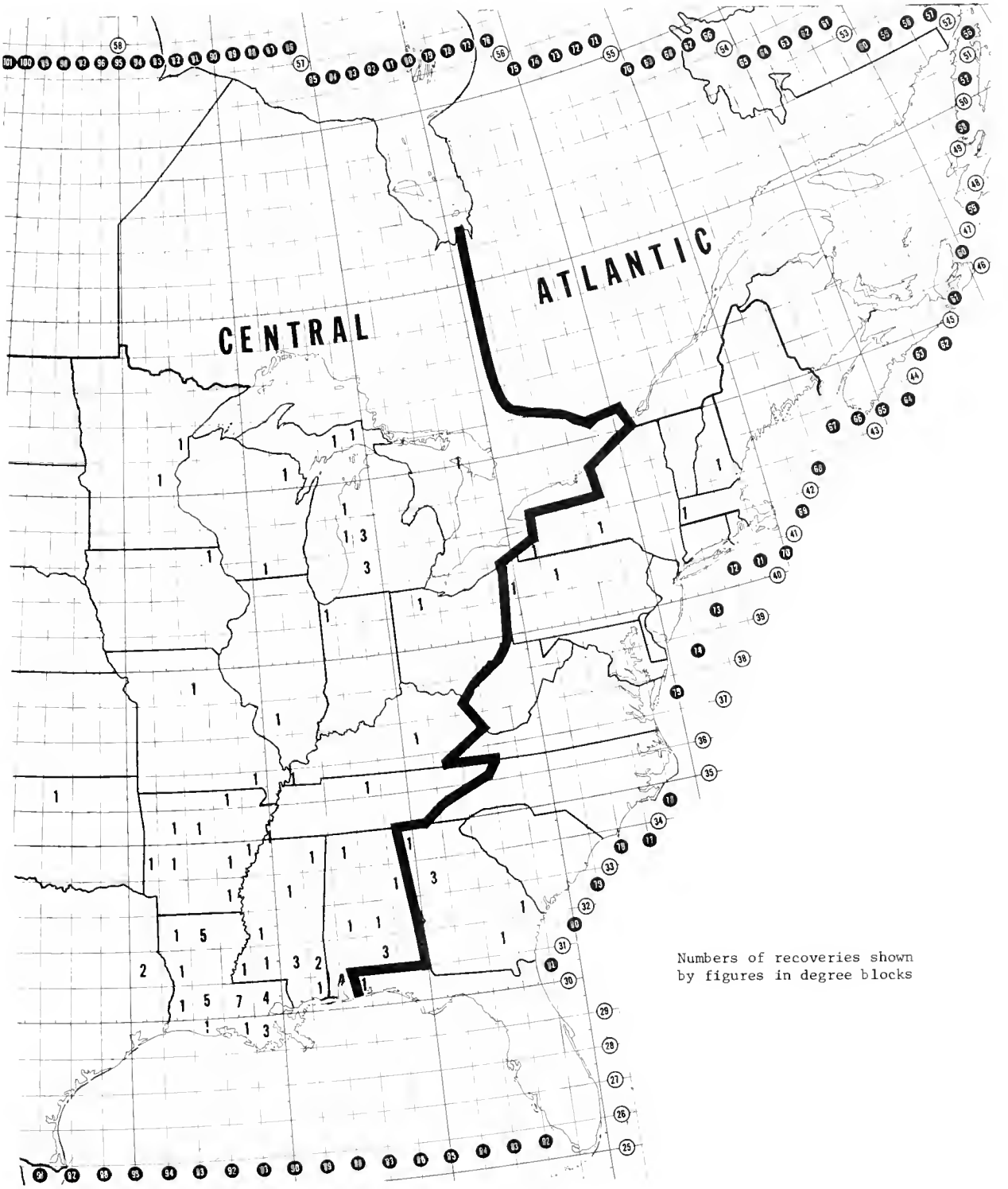

Fig. 5.--Recoveries of woodcock banded on Central Region breeding grounds north of 40th parallel (excluding birds recovered in degree block of banding or in contiguous degree block but including all years and all "How Obtained" codes).

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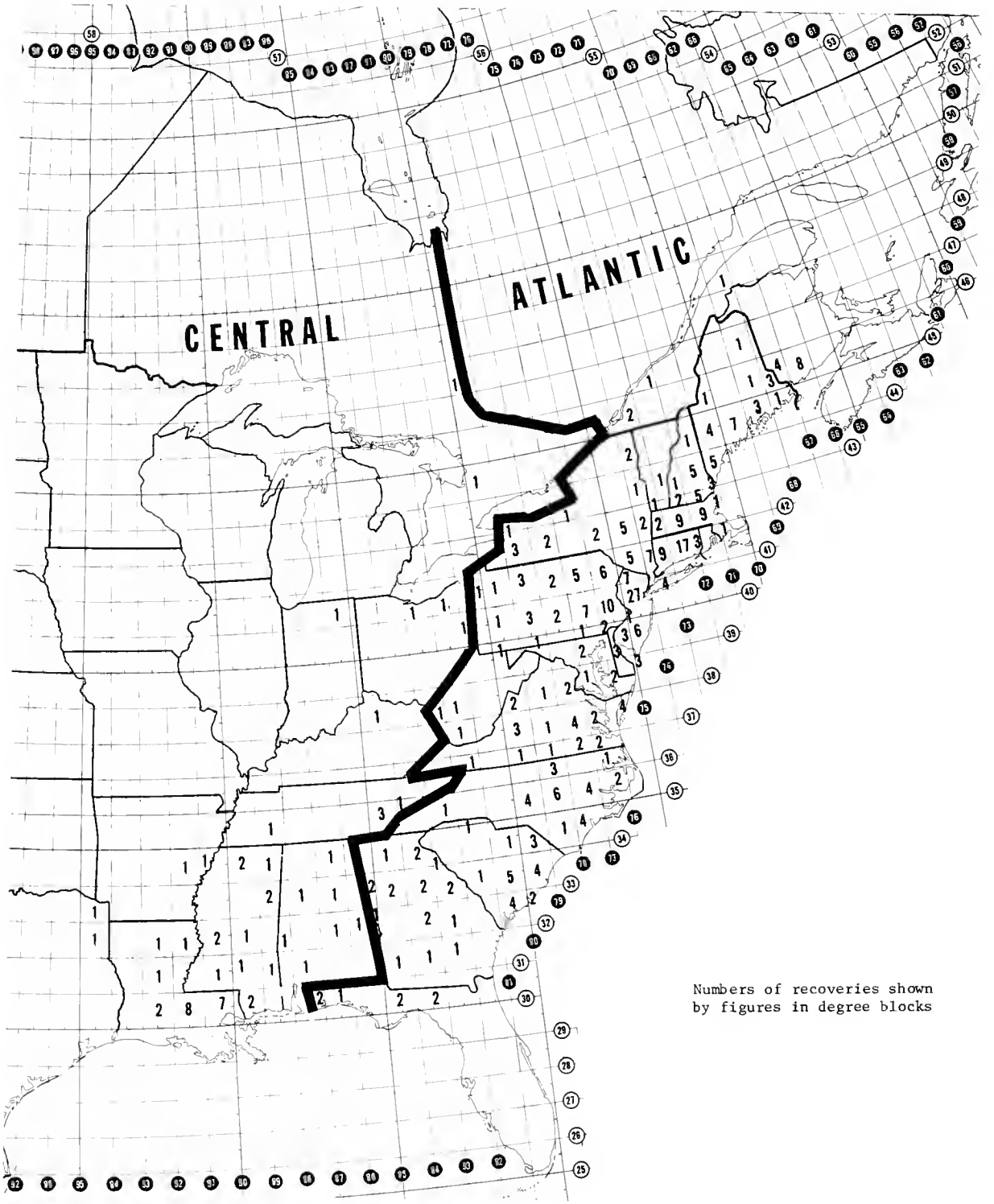

Fig. 6.--Recoveries of woodcock banded on Atlantic Region breeding grounds north of 40th parallel and in West Virginia (excluding birds recovered in degree block of banding or in contiguous degree block but including all years and all "How Obtained" codes).

Special appreciation is extended to the University of Massachusetts Press for permission to reproduce the late Mr. A. Lassell Ripley's etching "Early Woodcock" which again appears on this report's cover.

Also, special thanks are extended to the biologists who worked at the Patuxent Wildlife Research Center, Laurel, Md., processing nearly 19,000 woodcock wings and coding the data for computer analysis. These cooperators and their affiliations were as follows:

John V. Dobell	Canadian Wildlife Service
Gary Donovan	Maine Department of Inland Fisheries and Game
Allan C. Glasscock	West Virginia Department of Natural Resources
Larry Gregg	Wisconsin Department of Natural Resources
William B. Krohn	Bureau of Sport Fisheries and Wildlife, Orono, Maine, Field Station
Tim Linkkila	Connecticut Department of Environmental Protection
Fant W. Martin	Bureau of Sport Fisheries and Wildlife, Migratory Bird and Habitat Research Laboratory
Bob McKee	Maryland Fish and Wildlife Administration
Josh Sandt	" " " " "
Bert Schuber	" " " " "
Joseph C. Shugars	" " " " "
W. Hassel Taylor	Virginia Commission of Game and Inland Fisheries
Stephen J. Toth, Jr.	New Jersey Division of Fish, Game, and Shellfisheries
Joseph Ware, Jr.	Bureau of Sport Fisheries and Wildlife, Moosehorn National Wildlife Refuge

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A P P E N D I X

Table 1.--Woodcock harvest data from Waterfowl Hunter Mail Survey.

REFERENCE AREA	Waterfowl hunters in woodcock hunting States		Waterfowl hunters who hunted woodcock		Woodcock harvest by waterfowl hunters	
	Number[a]	% Increase[b]	Number[a]	% Increase[b]	Number[a]	% Increase[b]
North Central	451,261	47.6	65,684	58.2	198,291	41.0
Mid-Central	256,574	60.8	16,668	84.9	42,184	50.6
South Central	402,868	63.6	24,524	90.7	113,264	61.2
REGION TOTAL	1,110,703	56.1	106,877	68.6	353,738	48.1
North Atlantic	194,074	85.6	58,439	91.3	192,861	60.4
Mid-Atlantic	193,640	69.3	40,204	148.1	114,176	148.5
South Atlantic	104,790	49.0	9,440	112.1	29,997	64.9
REGION TOTAL	492,504	70.3	108,084	111.1	337,034	82.8
Northern Zone	645,335	57.3	124,124	72.2	391,152	49.9
Mid-Zone	450,214	64.4	56,873	125.5	156,359	111.4
Southern Zone	507,658	60.3	33,964	96.2	143,261	62.0
U.S. TOTAL IN WOODCOCK RANGE	1,603,207	60.2	214,961	87.6	690,772	63.2

[a] Average of two latest seasons for which data are available (1970-71 and 1971-72).

[b] Increase from average of 1964-65 and 1965-66 seasons (6-year period).

Table 2.--Woodcock breeding population indices as indicated by singing-ground surveys in 1972 and 1973 (random routes only).

State or Province	Number of routes conducted		Comparable routes[a]	Woodcock heard per comparable route	
	1972	1973		1972	1973
ATLANTIC REGION					
Connecticut	9	9	11	2.45	2.18
Delaware	2	1	3	0.33	0.67
Maine	53	50	47	4.38	4.47
Maryland	11	15	14	1.14	0.93
Massachusetts	17	16	18	1.94	2.72
New Brunswick	56	58	43	6.02	5.56
New Hampshire	15	14	13	4.92	3.77
New Jersey	13	12	18	1.94	2.61
New York	71	57	64	2.55	2.41
Nova Scotia	43	41	34	1.91	2.09
Pennsylvania	43	40	59	1.15	0.76
Prince Edward Island	9	9	9	2.56	2.56
Quebec	20	26	12	3.58	3.00
Rhode Island	2	2	4	1.25	1.25
Vermont	21	20	20	2.95	2.35
Virginia	41	31	67	0.61	0.37
West Virginia	21	20	47	0.98	0.79
REGIONAL TOTAL & WEIGHTED AVERAGE[b]	447	421	483	2.69	2.52
REGIONAL INDEX CHANGE					-6.32%
CENTRAL REGION					
Illinois	20	17	24	0.17	0.17
Indiana	25	22	55	0.56	0.49
Michigan	117	119	100	3.50	3.99
Minnesota	47	43	54	1.48	1.72
Ohio	57	45	69	1.39	1.07
Ontario	65	49	39	7.72	6.67
Wisconsin	68	68	86	1.67	1.76
REGIONAL TOTAL & WEIGHTED AVERAGE[b]	399	363	427	2.87	2.79
REGIONAL INDEX CHANGE					-2.79%
RANGEWIDE TOTAL & WEIGHTED AVERAGE[b]	846	784	910	2.78	2.66
RANGEWIDE INDEX CHANGE					-4.32%

[a] Includes routes carried as constant zero routes.

[b] Weighted averages are sums of products of woodcock heard per comparable route and the corresponding State or Province percentage of the total land area sampled. States or Provinces excluded where one comparable route represents more than 2,000 square miles or where the 2-year average is less than 0.5 birds per route.

Table 3.--Computation of woodcock singing-ground survey weighting factors.

Survey Area[a]	Land Area[b] (Sq. Mi.)	Comparable Routes	Sq.Mi. per Comp. Rt.	Weighting Factor Regional	Weighting Factor Rangewide
ATLANTIC REGION					
Connecticut	4,870	11	443	.0195	.0091
Delaware	1,982	3	661	.0079	.0037
Maine	30,933	47	658	.1238	.0579
Maryland	9,891	14	706	.0396	.0185
Massachusetts	7,833	18	435	.0313	.0147
New Brunswick	27,835	43	647	.1114	.0521
New Hampshire	9,033	13	695	.0362	.0169
New Jersey	7,532	18	418	.0302	.0141
New York	47,869	64	748	.1916	.0896
Nova Scotia	20,402	34	600	.0817	.0382
Pennsylvania	45,025	59	763	.1802	.0843
Prince Edward Island	2,184	9	243	.0087	.0041
Rhode Island	1,049	4	262	.0042	.0020
Vermont	9,274	20	464	.0371	.0174
West Virginia	24,084	47	512	.0964	.0451
REGIONAL TOTAL	249,796	404	618	.9999	
CENTRAL REGION					
Indiana	36,189	55	658	.1273	.0678
Michigan	56,818	100	568	.1999	.1064
Minnesota[c]	46,503	54	861	.1636	.0871
Ohio	41,018	69	594	.1443	.0768
Ontario[c]	49,220	36	1,367	.1732	.0922
Wisconsin	54,464	86	633	.1916	.1020
REGIONAL TOTAL	284,212	400	711	1.0000	
RANGEWIDE TOTAL	534,008	804	664		.9999

[a] Excluding States and Provinces where each comparable route represents more than 2,000 square miles or where fewer than 0.5 birds are heard per route.

[b] Land area only (inland water excluded) as listed in 1970 Commercial Atlas and Marketing Guide - Rand-McNally & Co.

[c] Excluding sections of Minnesota and Ontario outside of survey area.

Table 4.--Distribution of contacts and wings received per contact in 1972-73 woodcock wing-collection survey.

State of residence	Packets mailed by contact code[a]						Packets returned	Total hunters contacted	Total wings received[b]	Wings per contact
	1	2	4	7	8	9				
Ala.	14	71	1	--	--	42	2	126	59	.47
Ark.	4	32	1	--	--	--	--	37	20	.54
Conn.	98	400	13	2	--	21	2	532	731	1.37
Del.	12	76	2	--	--	333	6	417	20	.05
D.C.	--	3	4	--	--	--	--	7	0	.00
Fla.	8	67	--	--	1-	26	1	101	49	.49
Ga.	28	80	4	1	10	115	3	235	147	.63
Ill.	18	130	12	--	1	1	--	162	150	.93
Ind.	24	96	10	--	--	--	2	128	176	1.38
Iowa	3	11	--	--	--	--	--	14	3	.21
Kans.	--	22	--	--	--	--	--	22	0	.00
Ky.	--	22	2	--	--	--	--	24	11	.46
La.	35	175	8	--	--	259	4	473	714	1.51
Maine	159	66	22	8	73	384	5	707	3,177	4.49
Md.	31	157	5	--	17	--	2	208	214	1.03
Mass.	129	354	17	2	--	124	13	613	1,697	2.77
Mich.	170	55	24	--	53	--	1	301	1,790	5.95
Minn.	42	120	6	--	30	5	2	201	657	3.27
Miss.	9	87	6	--	3	93	4	194	176	.91
Mo.	10	38	8	--	--	--	1	55	45	.82
N.H.	53	157	7	--	1	--	1	217	409	1.88
N.J.	174	235	26	6	--	135	3	573	1,280	2.23
N.Y.	124	254	45	4	32	87	4	542	1,790	3.30
N.C.	25	94	5	--	4	17	3	142	197	1.39
Ohio	80	234	15	--	--	--	4	325	560	1.72
Okla.	3	28	--	--	1	--	--	32	4	.12
Pa.	152	311	15	--	--	--	--	478	1,035	2.17
R.I.	18	60	--	7	14	127	5	221	336	1.52
S.C.	14	89	7	--	9	21	1	138	141	1.02
Tenn.	31	33	1	--	--	--	--	65	17	.26
Tex.	8	49	2	--	5	13	--	77	34	.44
Vt.	40	93	3	--	15	--	1	150	626	4.17
Va.	25	85	2	--	6	--	1	117	104	.89
W. Va.	18	29	17	--	8	--	--	72	187	2.60
Wis.	160	135	33	2	2	233	6	559	2,199	3.93
TOTAL	1,719	3,948	323	32	285	2,035	77	8,265	18,755	2.27

[a] Code 1 - Previous year's Code 1, 2, 4, 7, and 8 hunters who submitted wings.
Code 2 - Waterfowl mail survey hunters who reported hunting woodcock.
Code 4 - Requested participation or proposed by fellow hunter.
Code 7 - Appeared on both Code 1 and Code 9 lists.
Code 8 - Previous year's Code 9 hunters who submitted wings.
Code 9 - From list provided by State, primarily from State kill survey.

[b] Excluding wings from Special Study areas.

Table 5.--Changes in regional distribution of hunter contacts, 1968-69 to 1972-73.

REFERENCE AREA	1968-69	1969-70	1970-71	1971-72	1972-73	5-Year Percent Change
North Central	1,894	1,850	1,757	1,661	1,061	-44
Mid-Central	542	791	721	793	795	+47
South Central	286	254	454	899	939	+228
REGION TOTAL	2,722	2,895	2,932	3,353	2,795	+3
North Atlantic	2,836	3,105	2,304	2,888	2,982	+5
Mid-Atlantic	1,424	1,470	1,764	1,741	1,872	+31
South Atlantic	264	330	447	611	616	+133
REGION TOTAL	4,524	4,905	4,515	5,240	5,470	+21
Northern Zone	4,730	4,955	4,061	4,549	4,043	-15
Mid-Zone	1,966	2,261	2,485	2,534	2,667	+36
Southern Zone	550	584	901	1,510	1,555	+183
U.S. TOTAL	7,246	7,800	7,447	8,593	8,265	+14

Table 6.--Data from woodcock wing-collection surveys: 1971-72 and 1972-73 hunting seasons. Mean values for 1970-71 included for comparison.

State of residence	Number of cooperators		Number of envelopes		Number of wings		Avg. no. of wings per envelope			Avg. no. of wings per cooperator		
	71-72	72-73	71-72	72-73	71-72	72-73	70-71	71-72	72-73	70-71	71-72	72-73
Ala.	14	16	37	42	46	59	1.8	1.2	1.4	4	3	4
Ark.	4	7	11	15	19	20	1.7	1.7	1.3	9	5	3
Conn.	101	135	321	395	660	731	2.1	2.1	1.9	7	7	5
Del.	12	16	29	18	62	20	1.4	2.1	1.1	4	5	1
Fla.	8	11	19	26	20	49	2.0	1.1	1.9	9	3	4
Ga.	46	39	83	82	147	147	1.6	1.8	1.8	3	3	4
Ill.	18	23	51	72	113	150	1.8	2.2	2.1	4	6	7
Ind.	23	27	75	79	148	176	1.8	2.0	2.2	5	6	7
Iowa	1	1	9	3	18	3	---	2.0	1.0	--	18	3
Ky.	---	4	---	10	---	11	1.2	---	1.1	1	--	3
La.	36	59	136	270	299	714	2.4	2.2	2.6	9	8	12
Maine	236	216	1,200	1,189	3,194	3,177	2.7	2.7	2.7	13	14	15
Md.	47	27	126	83	278	214	2.0	2.2	2.6	5	6	8
Mass.	129	190	579	748	1,462	1,696	2.4	2.5	2.3	11	11	9
Mich.	222	152	932	740	2,184	1,790	2.5	2.3	2.4	10	10	12
Minn.	71	63	288	264	712	642	2.7	2.5	2.4	9	10	10
Miss.	11	30	20	101	25	176	1.7	1.3	1.7	4	2	6
Mo.	9	9	16	18	33	45	2.2	2.1	2.5	5	4	5
N.H.	55	58	190	200	424	409	2.3	2.2	2.0	11	8	7
N.J.	180	195	856	630	2,223	1,296	2.3	2.6	2.1	9	12	7
N.Y.	160	194	696	816	1,668	1,790	2.4	2.4	2.2	11	10	9
N.C.	28	35	103	93	179	197	2.3	1.7	2.1	7	6	6
Ohio	79	78	257	238	592	560	2.6	2.3	2.4	9	7	7
Okla.	4	2	6	2	7	4	1.0	1.2	2.0	2	2	2
Pa.	151	121	476	459	1,093	1,035	2.3	2.3	2.3	7	7	8
R.I.	39	40	131	139	320	336	2.5	2.4	2.4	9	8	8
S.C.	23	32	73	86	129	141	1.8	1.8	1.6	5	6	4
Tenn.	8	10	17	14	28	17	1.2	1.6	1.2	2	4	2
Tex.	13	10	25	22	60	34	1.1	2.4	1.5	2	5	3
Vt.	56	47	330	270	870	626	2.5	2.6	2.3	13	16	13
Va.	31	20	61	55	99	104	2.0	1.6	1.9	6	3	5
W. Va.	25	19	100	80	254	187	2.2	2.5	2.3	7	10	10
Wis.	160	250	651	950	1,505	2,198	2.3	2.3	2.3	8	9	9
Other	---	---	---	---	294	224	---	---	---	--	--	--
TOTAL	2,000	2,136	7,904	8,209	19,165	18,978	2.4[a]	2.4[a]	2.3[a]	9.2[a]	9.4[a]	8.8[a]

[a]Unweighted mean (includes data from all States, but excludes information from the special study areas and unknown contact codes).

Table 7.--Comparison of response and rate of wings received for principal contact codes[a], 1972-73 season (nonresident hunting excluded).

State of Residence	No. of Contacts			% Responding			Wings/Contributor		
	Contact Code			Contact Code			Contact Code		
	1[b]	2	9[b]	1[b]	2	9[b]	1[b]	2	9[b]
Ala.	13	70	42	31	11	10	2	4	5
Ark.	4	32	--	50	9	--	2	1	--
Conn.	99	399	23	52	18	43	8	2	9
Del.	12	75	328	25	5	2	1	1	1
D.C.	--	3	--	--	0	--	--	--	--
Fla.	8	67	25	38	12	12	5	1	9
Ga.	29	79	114	31	15	12	5	3	4
Ill.	18	130	1	17	5	--	3	2	--
Ind.	22	96	--	41	10	--	4	5	--
Iowa	3	11	--	0	0	--	--	--	--
Kans.	--	22	--	--	0	--	--	---	--
Ky.	--	22	--	--	9	--	--	4	--
La.	34	175	255	62	10	6	20	8	5
Maine	167	65	389	72	15	16	17	9	7
Md.	31	156	--	35	8	--	7	2	--
Mass.	130	348	120	55	21	13	7	3	2
Mich.	169	55	--	64	24	--	14	3	--
Minn.	42	118	5	52	12	20	10	2	2
Miss.	9	86	89	56	10	11	6	4	4
Mo.	10	37	--	30	3	--	5	3	--
N.H.	52	157	--	63	17	--	8	3	--
N.J.	180	235	138	63	12	33	6	2	4
N.Y.	126	254	90	78	15	32	11	3	9
N.C.	24	94	16	67	9	19	8	3	4
Ohio	80	230	--	51	19	--	8	2	--
Okla.	3	28	--	33	7	--	1	2	--
Pa.	152	311	--	54	14	--	9	3	--
R.I.	25	60	129	36	10	9	6	2	3
S.C.	14	88	20	43	15	35	7	2	5
Tenn.	31	33	--	23	6	--	1	2	--
Tex.	8	49	13	50	6	23	3	1	1
Vt.	39	93	--	62	13	--	16	2	--
Va.	25	84	--	40	5	--	5	3	--
W. Va.	18	29	--	61	14	--	10	6	--
Wis.	162	131	233	61	10	59	9	2	9

[a] See Table 4 for identification of codes.

[b] Code 1 and 9 data overlap slightly because both include Code 7 data.

Table 8.--Derivation of weighting factors for the 1972-73 woodcock wing-collection survey in 13 States.

STATE	A	B	C	D	E	F	G[a]	H[b]	J[c]	K[d]	L[e]	M[f]
	Hunting License Holders		Duck Stamp Sales		Woodcock Kill by Duck Stamp Purchasers		License Holders to Stamp Sales Ratio			Percent of Mean	State Kill Index	State Weight Factor
	1970-71	1971-72	1970-71	1971-72	1970-71	1971-72	1970-71	1971-72	Mean			
Conn.	85,452	83,723	15,779	16,875	24,312	18,754	5.4156	4.9614	5.1885	65.949	14,201	.0283
La.	348,635	337,609	129,046	119,980	99,385	76,481	2.7016	2.8139	2.7578	35.053	30,824	.0613
Maine	219,373	195,622	18,182	18,121	34,420	35,198	12.0654	10.7953	11.4304	145.288	50,573	.1006
Mass.	123,589	120,944	29,993	25,404	33,410	26,316	4.1206	4.7608	4.4407	56.444	16,856	.0335
Mich.	941,426	785,752	131,404	110,768	80,595	110,390	7.1644	7.0937	7.1290	90.614	86,530	.1722
Minn.	377,384	326,776	173,877	178,564	21,501	21,520	2.1704	1.8300	2.0002	25.424	5,469	.0109
N.H.	97,360	87,443	9,880	9,910	9,876	13,029	9.8543	8.8237	9.3390	118.705	13,595	.0270
N.J.	196,533	208,843	35,002	42,572	29,086	41,156	5.6149	4.9056	5.2603	66.862	23,483	.0467
N.Y.	756,060	662,558	108,582	114,044	77,693	83,132	6.9630	5.8097	6.3864	81.175	65,275	.1299
Ohio	565,896	597,793	43,508	43,971	13,631	18,509	13.0067	13.5952	13.3009	169.063	27,168	.0541
Pa.	1,166,634	1,122,399	81,074	87,903	56,816	60,613	14.3897	12.7686	13.5792	172.600	101,342	.2016
Vt.	148,282	128,843	7,435	8,703	11,885	10,774	19.9438	14.8044	17.3741	220.836	25,020	.0498
Wis.	634,992	632,944	151,524	158,670	94,187	68,389	4.1907	3.9891	4.0899	51,985	42,258	.0841

[a] $G = \frac{A}{C}$ [b] $H = \frac{B}{D}$ [c] $J = \frac{G+H}{2}$ [d] $K = \frac{J}{\frac{\Sigma J}{13}}$ [e] $L = K\,\frac{E+F}{2}$ [f] $M = \frac{L}{\Sigma L}$

TABLE 9.--WOODCOCK PRODUCTIVITY BY HARVEST AREA AS INDICATED BY THE 1972-73 WING-COLLECTION SURVEY.

STATE OR PROVINCE OF HARVEST	AGE AND SEX CATEGORIES							TOTAL WINGS RECEIVED[a]	IMMATURES PER ADULT FEMALE[b]
	ADULT			IMMATURE			UNKNOWN AGE		
	MALE	FEMALE	UNKNOWN	MALE	FEMALE	UNKNOWN			
ALA.	10	16	--	14	19	--	1	60	--
ARK.	7	7	--	9	5	--	--	28	--
CONN.	94	163	3	194	160	7	5	626	2.21
DEL.	--	3	--	4	4	--	2	13	--
FLA.	6	6	--	17	18	1	1	49	--
GA.	34	37	--	44	39	2	3	159	2.30
ILL.	6	10	--	9	12	--	--	37	--
IND.	17	27	--	28	30	--	1	103	2.15
IOWA	--	1	--	1	--	--	--	2	--
KY.	1	4	--	1	4	--	--	10	--
LA.	95	133	--	243	271	--	2	744	3.86
MAINE	807	1,098	38	934	828	34	67	3,806	1.64
MD.	23	27	--	46	19	--	2	117	2.41
MASS.	181	310	6	211	189	9	15	921	1.32
MICH.	386	630	19	500	449	12	29	2,025	1.53
MINN.	95	169	7	135	146	1	2	555	1.67
MISS.	41	52	1	60	46	--	1	201	2.04
MO.	6	10	--	3	6	--	--	25	--
N.B.	33	55	--	45	39	2	--	174	1.56
N.H.	196	339	8	177	160	5	12	897	1.01
N.J.	129	205	3	282	272	7	10	908	2.74
N.Y.	383	677	13	478	445	9	11	2,016	1.38
N.C.	43	54	1	52	34	3	3	190	1.65
OHIO	92	143	1	99	88	2	5	430	1.32
OKLA.	1	1	--	2	--	--	--	4	--
PA.	198	337	5	251	266	9	24	1,090	1.56
R.I.	27	19	--	32	34	--	2	114	3.47
S.C.	26	50	--	55	24	--	--	155	1.58
TENN.	4	3	--	6	4	--	--	17	--
TEXAS	7	7	--	6	1	--	--	21	--
VT.	165	234	7	156	121	4	14	701	1.20
VA.	12	15	1	26	35	--	1	90	--
W. VA.	50	45	1	57	47	2	8	210	2.36
WIS.	442	752	10	603	585	7	4	2,403	1.59
TOTAL	3,617	5,639	124	4,780	4,400	116	225	18,901	1.65

[a]EXCLUDING WINGS FROM SPECIAL STUDY AREAS.
[b]UNWEIGHTED DATA FROM HARVEST AREAS REPRESENTED BY AT LEAST 100 WINGS.

TABLE 10.--INDICES OF WOODCOCK PRODUCTIVITY AS INDICATED BY AGE RATIOS DETERMINED FROM WINGS RECEIVED FROM COOPERATORS WHO PARTICIPATED IN BOTH 1971-72 AND 1972-73 SURVEYS.

STATE OF HARVEST	PROPORTION OF TOTAL KILL (WEIGHTING FACTOR)	NUMBER OF WINGS RECEIVED		ADULT FEMALES		IMMATURES		IMMATURES PER ADULT FEMALE[a]	
		1971-72	1972-73	1971-72	1972-73	1971-72	1972-73	1971-72	1972-73
ALA.		13	10	--	--	6	5	--	--
ARK.		11	14	--	--	5	9	--	--
CONN.[b]	.0283	466	399	82	100	305	231	3.72	2.31
DEL.		11	4	--	--	7	3	--	--
FLA.		10	14	--	--	5	9	--	--
GA.		56	56	--	--	22	28	--	--
ILL.		24	8	--	--	13	4	--	--
IND.		38	37	--	--	21	27	--	--
LA.[b]	.0613	209	449	62	81	106	304	1.71	3.75
MAINE[b]	.1006	3,180	3,050	940	893	1,563	1,440	1.66	1.61
MD.		119	84	23	23	70	40	3.04	1.74
MASS.[b]	.0335	551	547	142	177	282	247	1.99	1.40
MICH.[b]	.1722	1,922	1,804	685	565	862	856	1.26	1.52
MINN.[b]	.0109	568	488	183	149	259	244	1.42	1.64
MISS.		20	57	--	--	14	34	--	--
MO.		3	15	--	--	--	5	--	--
N.B.		148	144	29	46	81	75	2.79	1.63
N.H.[b]	.0270	706	669	242	242	312	255	1.29	1.05
N.J.[b]	.0467	1,225	631	291	137	763	384	2.62	2.80
N.Y.[b]	.1299	1,651	1,430	588	480	710	657	1.21	1.37
N.C.		122	116	47	30	40	58	.85	1.93
OHIO[b]	.0541	327	342	82	108	168	155	2.05	1.44
OKLA.		3	1	--	--	1	1	--	--
PA.[b]	.2016	891	860	292	264	398	418	1.36	1.58
R.I.		52	73	--	--	31	43	--	--
S.C.		93	60	34	14	30	30	.88	2.14
TENN.		12	10	--	--	4	7	--	--
TEXAS		44	12	--	--	16	2	--	--
VT.[b]	.0498	776	649	237	218	368	263	1.55	1.21
VA.		47	62	--	--	29	42	--	--
W. VA.		197	141	47	28	100	73	2.13	2.61
WIS.[b]	.0841	1,376	1,080	450	352	691	531	1.54	1.51
TOTAL AND WEIGHTED AGE RATIO[b]		14,871	13,316	4,538	3,986	7,282	6,480	1.58	1.70
CHANGE IN WEIGHTED AGE RATIO									7.59

[a]COMPUTED ONLY FOR HARVEST AREAS (STATES) REPRESENTED BY AT LEAST 150 WINGS IN THE 2 YEARS.
[b]WEIGHTED AGE RATIOS FOR THE SUM OF THE PRODUCTS OF STATE AGE RATIOS X THEIR WEIGHTING FACTORS.

Table 11.--Temperature variations in principal woodcock breeding areas of the United States, 1970-72 (temperatures in °F).

	1970 (25.0% increase in age ratio)	1971 (26.9% decrease in age ratio)	1972 (8.2% increase in age ratio)
ATLANTIC REGION (25 climatological divisions)			
Average departure from normal	+1.12°	-1.58°	+.56°
Temperature range	-1.4° to +3.1°	-3.9° to +1.4°	-1.7° to +2.9°
Number divisions above normal	22	2[a]	19
Number divisions normal	1	1	2
Number divisions below normal	2[b]	22	4
CENTRAL REGION (25 climatological divisions)			
Average departure from normal	+0.62°	-2.38°	+3.16°
Temperature range	-3.4° to +3.2°	-4.4° to -0.2°	+1.4° to +5.4°
Number divisions above normal	17	0	25
Number divisions normal	0	0	0
Number divisions below normal	8[c]	25	0

[a] Coastal Maine and New York's St. Lawrence valley.

[b] Northern Maine and northwestern Vermont.

[c] Northern Minnesota, northern Wisconsin, and Michigan's Upper Peninsula.

TABLE 12.--INDICES OF WOODCOCK HUNTING SUCCESS AS INDICATED BY NUMBER OF WINGS RECEIVED FROM COOPERATORS WHO PARTICIPATED IN BOTH 1971-72 AND 1972-73 WING-COLLECTION SURVEYS.

STATE OF RESIDENCE	WEIGHT FACTOR	NUMBER WHO COOPERATED BOTH YEARS	NUMBER OF ENVELOPES		NUMBER OF WINGS		AVG. NO. WINGS PER ENVELOPE		AVG. NO. WINGS PER COOPERATOR[a]	
			1971-72	1972-73	1971-72	1972-73	1971-72	1972-73	1971-72	1972-73
ALA.		4	9	7	13	1	1.4	1.4	--	--
ARK.		2	5	5	9		1.8	1.0	--	--
CONN.[b]	.0283	49	204	185	449	39	2.2	2.1	9.2	8.0
DEL.		3	6	4	11		1.8	1.0	--	--
FLA.		2	9	9	10	1	1.1	1.6	--	--
GA.		11	35	29	54	5	1.5	1.9	4.9	5.1
ILL.		3	13	7	24		1.8	1.1	--	--
IND.		9	26	19	38	3	1.5	1.9	--	--
LA	.0613	21	92	150	199	41	2.2	2.8	9.5	20.0
MAINE[b]	.1006	150	990	945	2711	258	2.7	2.7	18.1	17.3
MD.		11	42	38	113	8	2.7	2.2	10.3	7.6
MASS.[b]	.0335	65	244	253	504	49	2.1	2.0	7.8	7.6
MICH.[b]	.1722	123	677	653	1702	162	2.5	2.5	13.8	13.2
MINN.[b]	.0109	42	216	203	537	46	2.5	2.3	12.8	11.1
MISS.		6	14	26	19	3	1.4	1.3	--	--
MO.		3	3	6	3	1	1.0	2.5	--	--
N.H.[b]	.0270	33	129	129	273	27	2.1	2.1	8.3	8.3
N.J.[b]	.0467	105	478	321	1187	61	2.5	1.9	11.3	5.8
N.Y.[b]	.1299	109	548	534	1335	115	2.4	2.2	12.2	10.6
N.C.		17	74	53	119	11	1.6	2.2	7.0	6.8
OHIO[b]	.0541	40	142	134	325	33	2.3	2.5	8.1	8.4
OKLA.		1	3	1	3		1.0	1.0	--	--
PA.[b]	.2016	78	300	327	777	76	2.6	2.3	10.0	9.8
R.I.		12	25	42	52	7	2.1	1.7	4.3	6.1
S.C.		11	47	39	90	5	1.9	1.5	8.2	5.3
TENN.		1	2	3	2		1.0	1.0	--	--
TEXAS		4	14	5	44	1	3.1	2.4	--	--
VT.[b]	.0498	34	263	236	692	56	2.6	2.4	20.4	16.7
VA.		11	32	31	46	6	1.4	2.0	4.2	5.5
W. VA.		10	63	47	172	10	2.7	2.3	17.2	10.7
WIS.[b]	.0841	97	499	415	1225	92	2.5	2.2	12.6	9.5
TOTAL AND WEIGHTED AVERAGE[b]		1,067	5,204	4,856	12,738	11,30	2.5	2.4	12.3	11.8

[a]COMPUTED ONLY FOR STATES REPRESENTED BY AT LEAST 10 HUNTERS WHO COOPERATED BOTH YEARS.
[b]WEIGHTED AVERAGE IS THE SUM OF THE PRODUCTS OF STATE AVERAGES MULTIPLIED BY THEIR WEIGHTING FACTORS USING ONLY STATES REPRESENTED BY AT LEAST 15 HUNTERS WHO COOPERATED BOTH YEARS.

TABLE 13.--DISTRIBUTION OF DAILY BAG SIZES IN WOODCOCK WING COLLECTION BY HARVEST AREAS 1972-73 AND 1968-69 THRU 1972-73 SEASONS.

HARVEST AREA	YEAR	BAG SIZE 1 NO.	1 %	2 NO.	2 %	3 NO.	3 %	4 NO.	4 %	5 NO.	5 %	TOTAL SUCCESSFUL HUNTS
NO. CENTRAL	1972-73	853	41.4	416	20.2	285	13.8	166	8.1	341	16.5	2,061
	1968-73	682	42.5	345	21.5	248	15.5	131	8.2	198	12.1	1,604
MID-CENTRAL	1972-73	131	45.6	66	23.0	42	14.6	22	7.7	26	9.1	287
	1968-73	137	48.1	67	23.2	39	13.5	19	6.7	24	8.3	286
SO. CENTRAL	1972-73	211	45.3	90	19.3	70	15.0	29	6.2	66	14.2	466
	1968-73	132	44.6	60	20.1	42	13.8	23	7.3	45	14.0	302
CENTRAL TOTAL	1972-73	1,195	42.5	572	20.3	397	14.1	217	7.7	433	15.4	2,814
	1968-73	951	43.4	472	21.6	329	15.0	173	7.9	268	12.0	2,193
NO. ATLANTIC	1972-73	1,535	40.2	877	23.0	552	14.5	310	8.1	545	14.3	3,819
	1968-73	1,370	39.0	836	23.9	566	16.2	335	8.9	445	11.8	3,552
MID-ATLANTIC	1972-73	555	48.1	268	23.2	133	11.5	92	8.0	107	9.3	1,155
	1968-73	627	45.7	321	23.3	189	13.6	105	7.0	154	10.2	1,396
SO. ATLANTIC	1972-73	159	54.3	66	22.5	35	11.9	14	4.8	19	6.5	293
	1968-73	124	59.4	44	20.9	21	9.7	10	5.1	10	4.8	209
ATLANTIC TOTAL	1972-73	2,249	42.7	1,211	23.0	720	13.7	416	7.9	671	12.7	5,267
	1968-73	2,121	41.6	1,201	23.6	777	15.2	450	8.2	610	11.2	5,159
U.S. TOTAL	1972-73	3,444	42.6	1,783	22.1	1,117	13.8	633	7.8	1,104	13.7	8,081
	1968-73	3,072	42.1	1,673	23.0	1,106	15.2	623	8.1	877	11.4	7,351

TABLE 14.--SUMMARY OF SEX AND AGE RATIOS IN WOODCOCK WING COLLECTION BY PERIODS - CENTRAL REGION.

REGION	PERIOD	HUNTING SEASON	SAMPLE SIZE[a]	PERCENT OF SEASON SAMPLE	ADULT FEMALES 100 MALES	IMMATURE FEMALES 100 MALES	IMMATURES 100 ADULT FEMALES	IMM FEM PER 100 ADU FEM
NORTH CENTRAL	I (TO 9/30)	1972-73	1,248	25.9	160	104	176	90
		1968-73	948	24.4	157	92	180	87
	II (10/1-20)	1971-73	2,417	50.1	183	94	156	75
		1968-73	2,305	49.8	193	108	153	79
	III (AFTER 10/20)	1971-73	1,156	24.0	150	85	138	63
		1968-73	1,022	25.9	161	98	136	67
MID-CENTRAL	I (TO 10/10)	1972-73	169	28.3	213	121	117	64
		1968-73	175	30.6	153	108	176	90
	II (10/11 - 11/10)	1971-73	336	56.2	145	93	157	76
		1968-73	354	62.9	148	90	173	82
	III (AFTER 11/10)	1971-73	93	15.6	138	95	148	72
		1968-73	93	16.5	134	71	0	82
SOUTH CENTRAL	I (TO 12/10)	1972-73	66	6.3	92	105	394	206
		1968-73	84	12.7	121	103	300	159
	II (12/11 - 1/10)	1971-73	595	57.2	139	91	350	167
		1968-73	467	53.5	145	102	87	144
	III (AFTER 1/10)	1971-73	379	36.4	230	123	259	143
		1968-73	294	28.7	148	112	9	109

[a] EXCLUDING ADULT UNKNOWNS AND UNKNOWN SEX AND AGE.

TABLE 15.--SUMMARY OF SEX AND AGE RATIOS IN WOODCOCK WING COLLECTION BY PERIODS - ATLANTIC REGION.

REGION	PERIOD	HUNTING SEASON	SAMPLE SIZE[a]	PERCENT OF SEASON SAMPLE	ADULT FEMALES 100 MALES	IMMATURE FEMALES 100 MALES	IMMATURES 100 ADULT FEMALES	IMM FEM PER 100 ADU FEM
NORTH ATLANTIC	I (TO 10/10)	1972-73	2,190	25.3	160	110	131	68
		1968-73	2,131	24.4	159	104	156	79
	II (10/11-31)	1971-73	5,253	60.7	169	82	144	65
		1968-73	6,422	61.4	141	96	172	84
	III (AFTER 10/31)	1971-73	1,204	13.9	119	86	189	87
		1968-73	1,234	14.2	117	85	51	116
MID-ATLANTIC	I (TO 10/20)	1972-73	556	24.[illegible]	165	122	172	95
		1968-73	706	22.1	166	113	167	88
	II (10/21 - 11/20)	1971-73	1,449	62.5	149	87	184	86
		1969-73	2,492	65.0	137	101	199	1[illegible]9
	III (AFTER 11/20)	1971-73	313	13.5	169	101	552	277
		1968-73	419	12.9	104	86	42	95
SOUTH ATLANTIC	I (TO 12/10)	1972-73	103	19.3	95	146	337	[illegible]0
		1968-73	68	20.1	122	96	43	116
	II (12/11 - 1/10)	1971-73	246	46.2	105	54	195	68
		1968-73	229	49.8	107	72	14	89
	III (AFTER 1/10)	1971-73	184	34.5	221	57	15[illegible]	55
		1968-73	119	30.1	141	81	60	118

[a]EXCLUDING ADULT UNKNOWNS AND UNKNOWN SEX AND AGE.

Table 16.--Distribution of the 1972-73 woodcock harvest by 10-day periods in Central Region. (T = less than 1.)

STATE & YEAR	SEASON OPENED	SAMPLE SIZE	PERIOD[a] 1 (9/1-10)	2	3	4 (10/1-10)	5	6	7 (11/1-10)	8	9	10 (12/1-10)	11	12	13 (1/1-10)	14	15	16 (2/1-10)	17	18	MEDIAN PERIOD OF HARVEST
			Percentage of sample collected during period (dashes indicate season open but no wings collected)																		
MINN.																					
1972-73	9/2	542	11	12	9	19	32	17	1												10/1-20
1971-72	9/4	707	6	13	7	19	24	26	4												10/1-20
4-Yr. Avg.		362	6	9	13	18	29	21	3												10/1-20
WIS.																					
1972-73	9/16	2,330		6	13	22	30	21	7	1											10/11-20
1971-72	9/11	1,680		7	6	24	25	34	3	2											10/11-20
4-Yr. Avg.		1,333		7	13	22	30	23	4	1											10/11-20
MICH.																					
1972-73	9/15	1,996		16	16	23	25	13	5	2											10/1-20
1971-72	9/15	2,388		14	13	23	20	24	6	T											10/1-20
4-Yr. Avg.		2,073		12	15	25	23	20	5	T											10/1-20
ILL.																					
1972-73	10/15	37					27	24	19	27	3	--	--								10/21-11/10
1971-72	10/15	28					4	7	11	57	21	--	--								11/11-20
4-Yr. Avg.		15				6	7	2	16	60	9	--	--								11/1-20
IND.																					
1972-73	9/23	98			9	13	1	13	40	23	--										10/21-11/10
1971-72	9/25	52			--	10	21	23	11	29	6										10/21-11/10
4-Yr. Avg.		87		6	12	11	21	23	14	11	2	--									10/11-31
OHIO																					
1972-73	9/15	413		8	11	16	23	20	18	4											10/11-20
1971-72	9/17	419		10	9	10	19	24	20	9											10/11-31
4-Yr. Avg.		434		10	12	15	19	21	16	T	T										10/11-20
MO.																					
1972-73	10/1	24				8	12	--	29	46	4	--									11/1-20
1971-72	10/1	12				8	--	--	25	50	17	--									11/1-20
4-Yr. Avg.		17				5	13	6	26	32	16	2									11/1-20
KY.																					
1972-73	11/16	10								60	30	10	--	--	--	--					11/11-20
1971-72	11/18	0								--	--	--	--	--	--	--	--				---
4-Yr. Avg.		3								10	69	21	--	--	--	--	--				11/21-30

Table 16.--Distribution of the 1972-73 woodcock harvest by 10-day periods in Central Region--continued. (T = less than 1.)

STATE & YEAR	SEASON OPENED	SAMPLE SIZE	PERIOD[a] 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	MEDIAN PERIOD OF HARVEST
			9/1-10			10/1-10			11/1-10			12/1-10			1/1-10			2/1-10			
			Percentage of sample collected during period (dashes indicate season open but no wings collected)																		
OKLA.																					
1972-73	11/20	4								--	100	--	--	--	--	--	--				11/21-30
1971-72	11/20	7								--	43	14	14	14	14	--					12/1-10
4-Yr. Avg.		3							--	--	64	13	13	5	5	--	--				---
ARK.																					
1972-73	12/1	28										--	4	21	4	21	46	4			---
1971-72	12/1	21										10	10	57	10	10	--	5			12/21-1/10
4-Yr. Avg.		32									--	14	14	36	12	14	9	2			12/21-1/10
TENN.																					
1972-73	11/18	14								29	36	14	7	14							11/21-30
1971-72	11/6	50							20	36	32	4	6	2	--						11/11-30
4-Yr. Avg.		33							5	32	44	6	6	2	--	4	1				11/21-30
TEX.																					
1972-73	11/18	18								--	6	17	11	44	22	--	--				12/11-31
1971-72	11/20	59								--	2	12	12	19	14	37	5				1/1-10
4-Yr. Avg.		53								--	6	13	16	9	13	20	24				1/11-20
LA.																					
1972-73	12/9	731										7	21	29	11	18	9	5	1		12/21-1/10
1971-72	11/25	307									6	11	17	26	17	11	13				12/21-30
4-Yr. Avg.		445									5	9	16	29	19	11	11	1			12/21-30
MISS.																					
1972-73	12/18	195											13	39	7	5	4	18	13		---
1971-72	12/18	37											43	11	8	3	14	8	14		---
4-Yr. Avg.		46									2	7	18	21	21	8	12	6	5		12/21-1/10
ALA.																					
1972-73	12/26	50												18	14	22	12	12	20	2	1/11-31
1971-72	12/24	43												14	19	16	7	12	12	21	1/11-2/10
4-Yr. Avg.		43									2	6	15	9	22	17	14	7	3	5	1/1-20

[a]Eleven days in last period of 31-day months; eight days in Period 18.

Table 17.--Distribution of the 1972-73 woodcock harvest by 10-day periods in Atlantic Region. (T = less than 1.)

STATE & YEAR	SEASON OPENED	SAMPLE SIZE	PERIOD[a] 1 (9/1-10)	2	3 (10/1-10)	4	5	6 (11/1-10)	7	8	9 (12/1-10)	10	11	12 (1/1-10)	13	14	15 (2/1-10)	16	17	18	MEDIAN PERIOD OF HARVEST
			Percentage of sample collected during period (dashes indicate season open but no wings collected)																		
MAINE																					
1972-73	9/25	3,717			1	25	45	24	4	T											10/11-20
1971-72	9/24	3,750			3	26	39	28	4	T											10/11-20
4-Yr. Avg.		3,532			7	25	32	32	3	T	T										10/11-20
N.Y.																					
1972-73	9/20	1,974		1	3	24	27	22	17	6	T										10/11-31
1971-72	9/20	1,939		1	4	17	20	31	25	3	T										10/11-31
4-Yr. Avg.		2,065		T	3	18	27	31	17	4	T										10/11-31
VT.																					
1972-73	9/30	676			5	30	35	23	6	T	--	--									10/11-20
1971-72	9/25	893			13	13	26	39	8	T											10/1-31
4-Yr. Avg.		641			11	24	32	26	6	T	T										10/11-20
N.H.																					
1972-73	10/1	879				39	33	22	6	--	--	--									10/11-20
1971-72	10/1	850				28	34	30	7	T	--	--									10/11-20
4-Yr. Avg.		1,128				29	32	27	12	T	T	--									10/11-20
MASS.																					
1972-73	10/10	898				13	46	26	12	2	T										10/11-31
1971-72	10/10	709				--	41	32	20	6	1										---
4-Yr. Avg.		805				6	36	37	15	5	1										10/20-31
CONN.																					
1972-73	10/21	609						46	35	15	4	T	--	--							---
1971-72	10/16	581					11	24	27	29	7	1	1								11/1-10
4-Yr. Avg.		728					12	41	26	15	5	1	T	T							10/21-11/10
R.I.																					
1972-73	10/21	113						54	27	12	2	2	3	--	--						---
1971-72	10/23	81						50	17	14	14	4	--	1							---
4-Yr. Avg.		79						40	38	9	11	2	--	1	--						---
PA.																					
1972-73	10/14	1,052					40	33	18	8	1	T	--								10/21-31
1971-72	10/16	1,140					23	29	32	15	1	--	--								10/21-11/10
4-Yr. Avg.		1,178					25	38	25	9	2	--	--								10/21-31
N.J.																					
1972-73	10/14	897					12	24	24	17	14	3	4	2							11/1-10
1971-72	10/2	1,799				7	9	11	35	25	11	3									11/1-10
4-Yr. Avg.		1,943				10	12	22	27	16	10	3									10/21-11/10

Table 17.--Distribution of the 1972-73 woodcock harvest by 10-day periods in Atlantic Region--continued. (T = less than 1.)

STATE & YEAR	SEASON OPENED	SAMPLE SIZE	PERIOD[a] 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	MEDIAN PERIOD OF HARVEST
			9/1-10			10/1-10			11/1-10			12/1-10			1/1-10			2/1-10			
			Percentage of sample collected during period (dashes indicate season open but no wings collected)																		
W. VA.																					
1972-73	10/14	208					10	29	46	16	--	--	--								10/21-11/10
1971-72	10/16	244					16	17	40	23	3	1									11/1-10
4-Yr. Avg.		139		T	1	2	16	26	31	19	5	T	--								10/21-11/10
MD.																					
1972-73	10/5	117				8	7	23	21	28	8	5									11/1-10
1971-72	10/5	210				1	4	8	14	35	31	8									11/11-20
4-Yr. Avg.		159				1	7	18	22	21	18	9	5								11/1-20
DEL.																					
1972-73	9/30	13			--	--	8	23	--		23	38	8	--							---
1971-72	11/19	56								21	29	7	7	13	14	9	--				---
4-Yr. Avg.		30								8	46	13	10	10	7	5	1				---
VA.																					
1972-73	11/13	89								22	18	4	3	13	21	17					12/1-31
1971-72	11/15	84								39	14	19	10	5	2	11					11/21-30
4-Yr. Avg.		101								20	29	16	12	6	3	14	--				11/21-12/20
N.C.																					
1972-73	12/9	184										11	18	28	11	8	14	9			12/21-1/10
1971-72	12/11	133											15	17	13	14	11	17	13		1/1-31
4-Yr. Avg.		116								2	7	9	17	20	16	8	10	6	4		12/21-1/10
S.C.																					
1972-73	12/26	136												12	23	16	10	5	21	13	1/11-31
1971-72	12/24	114												14	11	9	14	14	22	17	1/21-2/10
4-Yr. Avt.		95									4	4	16	15	17	11	17	4	9	4	1/1-20
GA.																					
1972-73	11/20	143								1	16	17	9	24	13	10	9				12/11-31
1971-72	11/20	137								2	10	34	12	16	16	7	4				12/11-20
4-Yr. Avg.		82								2	10	22	17	16	18	10	5				12/11-31
FLA.																					
1972-73	11/11	47								--	30	30	4	28	8	--					12/1-20
1971-72	11/20	18								--	6	11	22	28	11	17	6				12/21-31
4-Yr. Avg.		24							--	4	5	10	17	37	12	11	4				12/21-31

[a]Eleven days in last period of 31-day months; eight days in Period 18.

Table 18.--Distribution of 1969-70 through 1972-73 wing collections by 7-day periods[a] - Central Region.
(T = less than 1.)

State	Year	Opening Date	Sample Size	Percentage of harvest in single period										Percentage of harvest in combined periods		
				1	2	3	4	5	6	7	8	9	10	1&2	3-6	7-10
Ala.	1969-70	11-28	34	18	3	9	21	--	21	6	18	6	--	21	50	29
	1970-71	12-13	51	22	2	16	24	4	4	2	20	6	2	24	47	29
	1971-72	12-24	42	12	14	10	12	5	5	10	10	19	5	26	31	43
	1972-73	12-26	49	18	12	10	12	12	8	10	14	2	--	31	43	27
Ark.	1969-70	11-28	40	--	--	25	10	12	8	20	10	10	5	0	55	45
	1970-71	12-1	56	23	14	4	7	21	5	9	--	14	2	38	38	25
	1971-72	12-1	21	10	5	29	24	19	5	5	--	--	5	14	76	10
	1972-73	12-1	28	--	4	4	11	7	4	18	25	29	--	4	25	71
Ill.	1969-70	10-1	14	--	--	--	--	21	--	79	--	--	--	--	21	79
	1970-71	10-1	4	--	25	25	--	--	--	50	--	--	--	25	25	50
	1971-72	10-15	28	4	7	11	--	54	4	21	--	--	Closed	11	68	21
	1972-73	10-15	37	27	24	3	30	11	3	3	--	--	Closed	51	46	3
Ind.	1969-70	9-20	115	9	14	4	4	13	21	15	13	9	--	23	41	36
	1970-71	9-19	60	33	7	3	7	8	17	12	10	2	2	40	35	25
	1971-72	9-25	52	--	8	14	10	21	8	10	12	19	--	8	52	40
	1972-73	9-23	98	9	6	7	1	7	26	20	23	--	--	15	41	44
Ky.	1969-70	11-20	7	86	14	--	--	--	--	--	--	--	--	100	--	--
	1970-71	11-19	4	25	75	--	--	--	--	--	--	--	--	100	--	--
	1971-72	11-18	0	--	--	--	--	--	--	--	--	--	--	--	--	--
	1972-73	11-16	10	60	30	10	--	--	--	--	--	--	--	90	10	--
La.	1969-70	11-27	641	7	8	9	9	17	19	13	10	8	1	14	54	32
	1970-71	12-9	332	4[b]	8	18	22	18	9	5	11	2	3	11	68	21
	1971-72	11-25	307	6	8	13	11	19	6	15	8	12	2	14	48	38
	1972-73	12-9	730	15	16	21	10	6	13	9	5	2	3	31	50	19
Mich.	1969-70	9-15	1,684	15	11	19	17	19	14	4	2	1	Closed	25	69	6
	1970-71	9-15	2,165	14	12	17	19	13	14	7	3	T	Closed	26	64	10
	1971-72	9-15	2,385	15	10	12	17	14	16	11	4	1	Closed	25	59	16
	1972-73	9-15	1,994	17	9	17	17	18	10	7	4	2	Closed	26	61	13
Minn.	1969-70	9-6	252	8	9	6	14	11	26	14	12	1	--	17	57	26
	1970-71	9-5	246	5	5	4	15	13	26	18	8	5	--	11	58	31
	1971-72	9-4	707	6	4	12	5	12	17	18	19	6	T	10	46	44
	1972-73	9-2	542	8	8	8	5	10	21	23	13	4	1	16	44	40

Table 18.--Distribution of 1969-70 through 1972-73 wing collections by 7-day periods[a] - Central Region--continued. (T = less than 1.)

State	Year	Opening Date	Sample Size	Percentage of harvest in single period										Percentage of harvest in combined periods		
				1	2	3	4	5	6	7	8	9	10	1&2	3-6	7-10
Miss.	1969-70	11-28	32	--	9	3	38	22	12	3	12	--	--	9	75	16
	1970-71	12-12	33	--	6	18	12	12	6	24	6	12	3	6	48	46
	1971-72	12-18	37	46	8	5	3	3	11	3	8	5	8	54	22	24
	1972-73	12-18	195	34	19	6	4	3	3	7	14	7	4	53	15	32
Mo.	1969-70	10-1	11	9	--	--	--	9	--	27	36	9	9	9	9	82
	1970-71	10-1	32	3	--	9	16	34	19	12	6	--	--	3	78	19
	1971-72	10-1	12	8	--	--	--	8	50	17	--	17	--	8	58	33
	1972-73	10-1	24	8	--	12	--	29	--	29	21	--	--	8	42	50
Ohio	1969-70	9-19	394	19	8	6	16	17	10	7	12	5	--	27	49	24
	1970-71	9-18	435	18	12	10	9	13	14	13	7	4	1	29	46	25
	1971-72	9-17	419	13	5	5	14	14	12	18	10	7	2	18	45	36
	1972-73	9-15	413	8	8	10	14	18	11	12	14	5	T	15	53	32
Okla.	1969-70	11-2	1	--	--	100	--	--	--	--	--	--	--	--	100	--
	1970-71	11-21	4	25	50	--	--	25	--	--	--	Closed	Closed	75	25	--
	1971-72	11-20	7	14	28	14	--	14	14	14	--	Closed	Closed	43	43	14
	1972-73	11-20	4	75	25	--	--	--	--	--	--	--	--	100	--	--
Tenn.	1969-70	11-17	47	72	13	2	--	6	--	--	--	4	2	85	8	6
	1970-71	11-26	21	76	10	5	--	5	--	--	5	--	--	86	10	5
	1971-72	11-6	50	22	26	26	14	4	4	4	--	--	--	48	48	4
	1972-73	11-18	13	54	15	--	--	--	15	--	8	--	8	69	15	15
Tex.	1969-70	11-22	94	5	15	--	14	5	11	5	19	20	5	20	30	50
	1970-71	11-21	20	5	20	10	10	--	5	20	5	--	25	25	25	50
	1971-72	11-20	59	--	8	5	10	12	8	7	20	24	5	8	36	56
	1972-73	11-18	18	--	11	11	--	11	39	28	--	--	--	11	61	28
Wis.	1969-70	9-13	1,049	7	7	10	16	23	22	9	4	2	1	14	70	16
	1970-71	9-12	1,480	7	7	13	18	23	15	10	6	2	T	14	68	18
	1971-72	9-11	1,680	5	4	4	12	23	19	19	12	1	1	9	58	33
	1972-73	9-16	2,328	8	5	17	17	24	13	10	5	1	T	13	71	16

[a]First period begins on season opening date; 10th period 2 days or less.
[b]Four-day period Nov. 26-29 only.

Table 19.--Distribution of 1969-70 through 1972-73 wing collections by 7-day period[a] - Atlantic Region.
(T = less than 1.)

State	Year	Opening Date	Sample Size	Percentage of harvest in single period										Percentage of harvest in combined periods		
				1	2	3	4	5	6	7	8	9	10	1&2	3-6	7-10
Conn.	1969-70	10-18	856	29	33	16	13	6	2	1	T	--	--	62	37	1
	1970-71	10-17	821	27	23	19	17	8	3	1	1	--	1	50	48	2
	1971-72	10-16	581	15	16	15	20	19	11	3	T	1	T	31	65	4
	1972-73	10-21	610	29	26	26	11	6	3	T	--	--	--	55	44	T
Del.	1969-70	11-21	11	54	27	18	--	--	--	--	--	--	--	82	18	--
	1970-71	11-20	32	19	12	6	--	22	16	9	6	9	--	31	44	25
	1971-72	11-19	56	27	25	5	7	2	2	12	11	9	--	52	16	32
	1972-73	9-30	13	--	--	8	23	--	15	15	31	8	--	--	46	54
Fla.	1969-70	11-15	29	3	10	3	7	10	3	21	28	14	--	14	24	62
	1970-71	11-21	31	--	10	3	10	16	29	10	13	3	6	10	58	32
	1971-72	11-20	18	--	11	6	6	28	17	11	--	17	6	11	56	33
	1972-73	11-11	47	--	11	26	23	--	6	23	9	2	--	11	55	34
Ga.	1969-70	11-20	40	12	15	20	12	--	12	8	10	10	--	28	45	28
	1970-71	11-20	106	8	5	4	11	13	20	14	7	8	10	12	48	40
	1971-72	11-20	135	12	2	32	10	13	4	13	3	7	2	14	60	26
	1972-73	11-20	143	13	10	11	4	7	22	11	5	12	4	23	45	32
Maine	1969-70	9-24	3,161	13	14	18	27	20	8	1	1	Closed	Closed	27	72	2
	1970-71	10-1	3,715	18	20	23	24	11	2	T	T	--	Closed	39	61	T
	1971-72	9-24	3,750	3	16	28	22	20	8	2	T	Closed	Closed	19	79	2
	1972-73	9-25	3,715	2	19	26	30	15	7	1	T	Closed	Closed	20	79	1
Md.	1969-70	10-10	122	3	8	18	16	12	12	8	14	8	1	12	57	31
	1970-71	10-9	176	2	7	14	18	16	9	14	8	8	4	8	56	35
	1971-72	10-5	210	2	1	4	9	7	19	30	20	7	1	3	39	58
	1972-73	10-5	115	9	2	18	8	20	12	19	7	3	3	10	58	31
Mass.	1969-70	10-10	1,032	30	24	23	11	7	5	1	T	Closed	Closed	53	46	1
	1970-71	10-10	753	32	24	24	10	8	1	1	T	Closed	Closed	56	43	1
	1971-72	10-10	709	32	21	21	14	8	4	1	--	Closed	Closed	52	47	1
	1972-73	10-10	898	42	28	13	11	5	1	T	--	Closed	Closed	70		
N.H.	1969-70	10-1	1,026	24	19	26	16	11	3	1	--	--	Closed	42	56	1
	1970-71	10-1	1,185	20	16	19	19	16	9	T	T	T	Closed	37	63	T
	1971-72	10-1	850	21	18	26	18	13	4	--	T	--	Closed	38	62	T
	1972-73	10-1	879	26	28	24	14	7	2	--	--	--	Closed	53	47	--
N.J.	1969-70	10-4	2,102	11	8	14	21	16	9	10	7	4	1	19	59	22
	1970-71	10-3	1,612	9	7	17	16	13	17	9	7	4	1	17	63	21
	1971-72	10-2	1,799	4	8	5	7	21	21	18	10	6	1	12	54	34
	1972-73	10-14	897	12	16	16	15	12	12	7	2	5	2	28	56	16

Table 19.--Distribution of 1969-70 through 1972-73 wing collections by 7-day periods[a] - Atlantic Region--continued. (T = less than 1.)

State	Year	Opening Date	Sample Size	Percentage of harvest in single period										Percentage of harvest in combined periods		
				1	2	3	4	5	6	7	8	9	10	1&2	3-6	7-10
N.Y.	1969-70	9-22	2,161	3	12	14	21	25	12	7	5	1	T	15	72	13
	1970-71	9-21	2,035	3	12	11	14	22	17	13	5	2	T	15	65	20
	1971-72	9-20	1,939	4	7	10	14	15	21	22	5	1	--	11	61	28
	1972-73	9-20	1,966	3	8	17	21	15	13	14	8	1	T	11	66	23
N.C.	1969-70	11-28	53	8	21	4	23	13	8	19	2	2	2	28	47	24
	1970-71	12-11	209	9	13	15	14	7	7	12	15	5	2	22	44	34
	1971-72	12-11	133	8	20	4	9	8	11	5	7	20	8	28	33	39
	1972-73	12-9	185	17	16	22	10	3	8	8	8	6	3	33	42	25
Pa.	1969-70	10-18	1,032	47	21	14	11	5	2	T	--	--	--	68	32	T
	1970-71	10-17	1,107	32	23	25	11	5	3	1	--	--	--	56	44	1
	1971-72	10-16	1,137	27	18	266	17	8	4	T	--	--	--	45	55	T
	1972-73	10-14	1,051	40	25	13	13	7	1	T	T	--	--	65	34	T
R.I.	1969-70	10-25	56	36	25	14	11	12	2	Closed	--	--	--	61	39	--
	1970-71	10-24	65	29	15	40	3	6	5	Closed	--	--	1	45	54	1
	1971-72	10-23	81	40	15	21	6	4	10	4	--	1	--	54	41	5
	1972-73	10-21	113	36	20	25	11	3	1	2	3	--	--	57	39	4
S.C.	1969-70	11-28	81	5	6	15	14	5	14	12	15	11	4	11	47	42
	1970-71	12-13	66	9	17	14	11	11	17	4	4	3	11	26	52	23
	1971-72	12-24	109	9	5	7	8	9	5	15	17	20	3	15	30	55
	1972-73	12-26	127	11	17	16	5	7	6	4	17	17	1	28	33	39
Vt.	1969-70	9-27	393	15	22	28	22	11	2	T	--	--	--	36	63	T
	1970-71	9-26	609	10	22	19	18	15	14	3	--	T	--	32	65	3
	1971-72	9-25	888	13	10	11	24	26	11	4	T	--	--	23	73	4
	1972-73	9-30	675	22	22	27	18	9	3	T	--	--	--	44	56	T
Va.	1969-70	11-17	113	20	20	13	14	15	1	4	--	10	4	40	43	17
	1970-71	11-16	168	8	18	6	16	7	15	2	7	14	8	26	44	30
	1971-72	11-15	84	39	8	23	11	1	2	2	2	6	5	48	37	16
	1972-73	11-13	89	20	17	3	4	1	2	13	18	16	5	37	11	52
W. Va.	1969-70	10-11[b]	80	10	20	20	18	30	2	--	--	--	Closed	30	70	--
	1970-71	10-10[b]	147	9	10	22	19	27	10	3	--	--	Closed	18	78	3
	1971-72	10-16	243	21	11	26	19	13	8	2	--	--	--	32	66	2
	1972-73	10-14	208	10	20	16	38	12	4	--	--	--	--	30	70	--

[a]First period begins on season opening date; 10th period 2 days or less.
[b]Excluding special 8-day season in September.

Table 20.--Bureau-funded woodcock research for FY 1973 in the United States.[a]

Organization	Activity	Annual allotment	Scheduled expiration (Fiscal year)
Bureau of Sport Fisheries and Wildlife			
Orono Field Station	Habitat, banding, and behavioral studies[b]	$25,000	Indefinite
Moosehorn NWR	Banding and habitat studies	5,000	Indefinite
Connecticut	Breeding ground banding[b]	2,400	1974
Massachusetts	Singing-ground survey route randomization and banding[b]	2,400	1973
Michigan	Population study[b]	1,800	1973
New York	Breeding ground banding[b]	2,400	1974
	Population studies[b]	4,850	1975
Pennsylvania	Breeding ground banding[b]	4,850	1973
West Virginia	Breeding ground banding[b]	6,100	1975
	Parasite studies[b]	6,000	1973
Wisconsin	Breeding ground banding and breeding biology[b]	15,500	1977

[a] In addition, several Provinces and States are supporting projects under one or more of the activities listed, from their own resources and/or (in the States) Federal Aid Funds.

[b] Funds made available through the Accelerated Research Program for Shore and Upland Migratory Game Birds.

Table 21.--Woodcock banding by States, 1962-72 (excluding experimental birds).

LOCATION	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	11-YR TOTAL
ATLANTIC REGION												
Conn.			1				1	2	22	23	22	71
Fla.	1							4			1	6
Ga.			1		1			4				6
Maine	263	515	457	301	471	549	732	828	866	1,244	1,593	7,819
Md. & D.C.	6	22	12	16	13	7	5	2	4	9	14	110
Mass.	5	1	5	1	8	121		4	31	166	208	550
N.B.			17	5				261	191	263	191	928
N.H.						4	5			1		10
N.J.	6	13	12	7	13	4	645	345	556	452	287	2,340
N.Y.	9	15	20	9	19	8	14	485	479	762	741	2,561
N.C.	1						3		1			5
N.S.			34				1		7	1		43
Pa.	45	51	9	6	9	5	36	38	69	54	53	375
P.E.I.					1							1
R.I.		2			6	2	7	9	6		4	36
S.C.		1		1	1	1		1		4	1	10
Vt.									1	3	1	5
Va.	1						3	7	2		1	14
W. Va.		8	16	103	301	434	516	249	291	207	180	2,305
REGIONAL TOTAL	337	628	584	449	843	1,135	1,968	2,239	2,526	3,189	3,297	17,195
CENTRAL REGION												
Ala.			2	2			2	2	1	1	9	19
Ill.		2		1	2	2	3	4		9	2	25
Ind.	1	1	5	8				76	69	17		177
Iowa	2	3	1	5	3	2			3		2	21
La.	748	292	2,549	815	1,230	900	1,076	472	521	329	169	9,101
Mich.	50	124	79	355	365	396	868	403	397	472	315	3,824
Minn.	1	13	4	3		17	79	111	58	63	86	435
Miss.	1							146	132	98		377
Ohio		6	8		6	6	1	3	12	16	9	67
Okla.		1										1
Ont.	12	10	20	41	14	22	19	26	9	19	18	210
Tenn.		1	1	1		1	3		1			8
Tex.								1				1
Wis.	9	19	31	20	27	22	281	185	473	599	1,037	2,703
REGIONAL TOTAL	824	472	2,700	1,251	1,647	1,368	2,332	1,429	1,676	1,623	1,647	16,969
COMB. TOTAL	1,161	1,100	3,284	1,700	2,490	2,503	4,300	3,668	4,202	4,812	4,944	34,164

Table 22.--Summary of woodcock band recovery file through September 8, 1973.

State or Province of Recovery	State or Province of Banding																									
	ATLANTIC REGION													Region Total	CENTRAL REGION										Region Total	Range Total
	Conn.	Maine	Md.	Mass.	N.B.	N.H.	N.J.	N.Y.	N.S.	Pa.	Que.	Vt.	W.Va.		Ala.	Ind.	La.	Mich.	Minn.	Miss.	Ohio	Okla.	Ont.	Wis.		
ATLANTIC REGION																										
Conn.	4	21		1	3		4			1		1		35			2								2	37
Del.		2			1		1							4												4
Fla.		5		1	1			2						9												9
Ga.		11	1	2		1		3					2	20			2	4					2		8	28
Maine		315		3	4		2			2			1	327			8								8	336
Md.		5	2											7												7
Mass.	1	20		47			2						1	71			6	1							7	78
N.B.		14	1		56		1							72			1								1	73
N.H.		11		3	1	1	1	1					1	19		1	8								9	28
N.J.		29		4	7		93	6						139			3								3	142
N.Y.		19	1	2	2		4	77		1			5	111			20			1	1		1		23	133
N.C.		15		2	1		8	3		2			3	34			1								1	35
N.S.									9					9	1		7								8	17
Pa.		25	1	3	4		9	10		50	1		4	107			28	1					1		30	137
Que.		1					1	2			1		1	6			2								2	8
S.C.		13	1	2			1	3		1			3	24			2								2	26
Vt.		1		1										2			3								3	5
Va.		15		4	1		5	3					3	31												31
W. Va.					1			1			1		424	427			3								3	430
Subtotal	5	522	7	75	82	2	132	111	9	57	3	1	448	1,454	1	1	96	6		1	1		4		110	1,564
CENTRAL REGION																										
Ala.		2					1	3					2	8			16	5		3			2	1	27	35
Ark.		1											1	2			19						1	7	27	29
Ill.																	6							1	7	7
Ind.		1												1		3	7	1							11	12
Iowa																	3							1	4	4
Ky.		1												1			9	1		1				1	12	13
La.		9		1	3			3					5	21		1	183	15	1	1			1	12	214	235
Mich.																1	122	353		2				4	482	482
Minn.																	12		13					1	26	26
Miss.		3		1			1	2		1			5	13		1	44	6	1	1				3	56	69
Mo.																	7	1	1						9	9
Ohio		1					1	1		1				4			12				3				15	19
Okla.																						1		1	2	2
Ont.							1	1					1	3			19	1		1			3		24	27
Tenn.		3						1					1	5			5	1						1	7	12
Tex.		2												2			2	1						1	4	6
Wis.																	55			2				50	107	107
Subtotal		23		2	3		4	11		2			15	60		6	521	385	16	11	3	1	7	84	1,034	1,094
Total	5	545	7	77	85	2	136	122	9	59	3	1	463	1,514	1	7	617	391	16	12	4	1	11	84	1,144	2,658

U. S. GOVERNMENT PRINTING OFFICE : 1974 O - 538-155

As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral, land, park, and recreational resources. Indian and Territorial affairs are other major concerns of this department of natural resources.

The Department works to assure the wisest choice in managing all our resources so that each shall make its full contribution to a better United States now and in the future.

UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
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