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American Woodcock Population Status, 2003

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AMERICAN WOODCOCK POPULATION STATUS, 2003

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Abstract: Singing-ground and Wing-collection surveys were conducted to assess the population status of the American woodcock (*Scolopax minor*). Singing-ground Survey data indicated that the number of displaying woodcock in the Eastern and Central Regions were unchanged from 2002 ($P>0.1$), although the point estimates of the trends were positive. Trends from the Singing-ground Survey during 1993-03 were –1.3 and –1.6% per year for the Eastern and Central regions, respectively ($P<0.05$). There were long-term (1968-03) declines ($P<0.01$) of 2.3% per year in the Eastern Region and 1.8% per year in the Central Region. The 2002 recruitment index for the Eastern Region (1.4 immatures per adult female) was the same as the 2001 index, but was 18% below the long-term regional average. The 2002 recruitment index for the Central Region (1.6 immatures per adult female) was 17% higher than the 2001 index (1.3 immatures per adult female), and was similar to the long-term regional average. The index of daily hunting success in the Eastern Region increased slightly from 1.8 woodcock per successful hunt in 2001 to 1.9 in 2002, but seasonal hunting success declined from 6.9 woodcock per successful hunter in 2001 to 6.6 in 2002. In the Central Region, the daily success index was 2.1 woodcock per successful hunt in 2001 and 2002; but seasonal hunting success increased from 10.0 woodcock per successful hunter in 2001 to 11.0 in 2002.

The American woodcock is a popular game bird throughout eastern North America. The management objective of the U. S. Fish and Wildlife Service (FWS) is to increase populations of woodcock to levels consistent with the demands of consumptive and non-consumptive users (U. S. Fish and Wildlife Service 1990). Reliable annual population estimates, harvest estimates and information on recruitment and distribution are essential for comprehensive woodcock management. Unfortunately, this information is difficult and often impractical to obtain. Woodcock are difficult to find and count because of their cryptic coloration, small size, and preference for areas with dense vegetation. Up until the recent advent of the Harvest Information Program, a sampling frame for woodcock hunters had been lacking. Because of these difficulties, the Wing-collection Survey and the Singing-ground Survey were developed to provide indices of recruitment, hunting success and changes in abundance.

This report summarizes the results of these surveys and presents an assessment of the population status of woodcock as of June 2003. The report is intended to assist managers in regulating the sport harvest of woodcock and to draw attention to areas where management actions are needed.

The primary purpose of this report is to facilitate the prompt distribution of timely information. Results are preliminary and may change with the inclusion of additional data.

Cover picture of incubating hen woodcock courtesy of Stephen Maxson, Minnesota Department of Natural Resources.

METHODS

Woodcock Management Units

Woodcock are managed on the basis of 2 regions or populations, Eastern and Central, as recommended by Owen et al. (1977) (Fig. 1). Coon et al. (1977) reviewed the concept of management units for woodcock and recommended the current configuration over several alternatives. This configuration was biologically justified because analysis of band recovery data indicated that there was little crossover between the regions (Krohn et al. 1974, Martin et al. 1969). Furthermore, the regional boundaries conform to the boundary between the Atlantic and Mississippi Flyways. The results of the Wing-collection and Singing-ground surveys are reported by state or province, and region.

Singing-ground Survey

The Singing-ground Survey was developed to exploit the conspicuous courtship display of the male woodcock. Early studies demonstrated that counts of singing males provide indices to woodcock populations and could be used to monitor annual changes (Mendall and Aldous 1943, Goudy 1960, Duke 1966, and Whitcomb 1974). Before 1968, counts were conducted on non-randomly-located routes. Beginning in 1968, routes were relocated along lightly-traveled secondary roads in the center of randomly-chosen 10-minute blocks within each state and province in the central and northern portions of the woodcock's breeding range (Fig. 1). Data collected prior to 1968 are not included in this report.

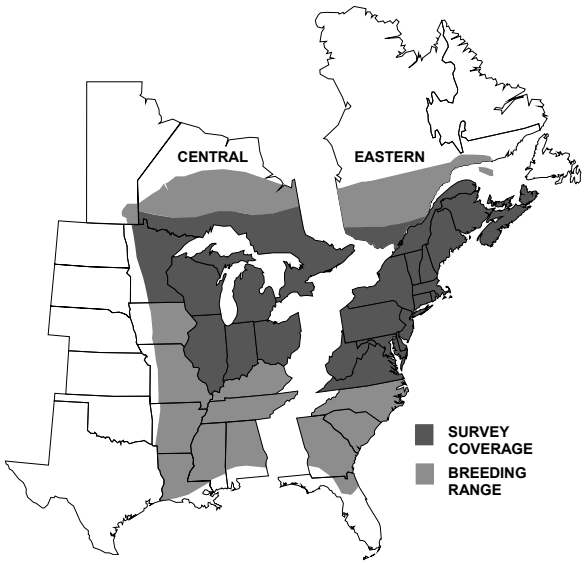

Fig. 1. Woodcock management regions, breeding range, and Singing-ground Survey coverage.

Each route was 3.6 miles (5.4 km) long and consisted of 10 listening points. The routes were surveyed shortly after sunset by an observer who drove to each of the 10 stops and recorded the number of woodcock heard peenting (the vocalization by displaying male woodcock on the ground). Acceptable dates for conducting the survey were assigned by latitude to coincide with peaks in courtship behavior of local woodcock. In most states, the peak of courtship activity (including local woodcock and woodcock still migrating) occurred earlier in the spring and local reproduction may have already been underway when the survey was conducted. However, it was necessary to conduct the survey during the designated survey dates in order to avoid counting migrating woodcock. Because adverse weather conditions may affect courtship behavior and/or the ability of observers to hear woodcock, surveys were only conducted when wind, precipitation, and temperature conditions were acceptable.

The survey consists of about 1,500 routes. In order to avoid expending unnecessary manpower and funds, approximately one half of these routes are surveyed each year. The remaining routes are carried as "constant zeros." Routes for which no woodcock are heard for 2 consecutive years enter this constant zero status and are not run for the next 5 years. If woodcock are heard on a constant zero route when it is next run, the route reverts to normal status and is run again each year. Data from constant zero routes are included in the analysis only for the years they were actually surveyed. Sauer and Bortner (1991) reviewed the implementation and analysis of the Singing-ground Survey in more detail.

Trend Estimation.—Trends were estimated for each route by solving a set of estimating equations (Link and Sauer 1994). Observer data were used as covariables to adjust for differences in observers' ability to hear woodcock. To estimate state and regional trends, a weighted average from individual routes was calculated for each area of interest as described by Geissler (1984). Regional estimates were weighted by state and provincial land areas. Variances associated with the state, provincial, and regional slope estimates were estimated using a bootstrap procedure (Efron 1982). Trend estimates were expressed as percent change per year and trend significance was assessed using normal-based confidence intervals. Short-term (2002-03), intermediate-term (1993-03) and long-term (1968-03) trends were evaluated.

The reported sample sizes are the number of routes on which trend estimates are based. These numbers may be less than the actual number of routes surveyed for several reasons. The estimating equations approach requires at least 2 non-zero counts by the same observer for a route to be used. With the exception of the 2002-03 analysis, routes that did not meet this requirement during the interval of interest were not included in the sample size. For the 2002-03 analysis, a constant of 0.1 was added to counts of low-abundance routes to allow their use in the analysis. Each route should be surveyed during the peak time of singing activity. For editing purposes, "acceptable" times were between 22 and 58 minutes after sunset (or, between 15 and 51 minutes after sunset on overcast evenings). Due to observer error, some stops on some routes were surveyed before or after the peak times of singing activity. Earlier analysis revealed that routes with 8 or fewer acceptable stops tended to be biased low. Therefore, only route observations with at least 9 acceptable stops were included in the analysis. Routes for which data were received after 30 May 2003 were not included in this analysis but will be included in future trend estimates. Data for 2002 and 2003 were not received from Prince Edward Island. Therefore, short-term trends could not be estimated for the province; however, intermediate and long-term trends were estimated for 1993-2001 and 1968-2001, respectively.

Annual indices.—Annual indices were calculated for the 2 regions and each state and province by finding the deviation between the observed count on each route and that predicted by the 1968-2003 regional or state/provincial trend estimate. These residuals were averaged by year and added to the fitted trend to produce annual indices of abundance for each region, state and province. Yearly variation in woodcock abundance was superimposed on the long-term fitted trends (see Sauer and Geissler 1990). Thus, the indices calculated with this method portray year-to-year variation around the predicted trend line, which can be useful for exploratory data analysis (e.g., observing periods of departure from the long-term trend). However, the indices should be viewed in a descriptive context. They are not used to

assess statistical significance and a change in the indices over a subset of years does not necessarily represent a significant change. Observed patterns must be verified using trend estimation methods to examine the period of interest (Sauer and Geissler 1990, Link and Sauer 1994).

Wing-collection Survey

The Wing-collection Survey was incorporated into a national webless migratory game bird wing-collection survey in 1997. Only data on woodcock will be presented in this report. As with the old survey, the primary objective of the Wing-collection Survey is to provide data on the reproductive success of woodcock. The survey also produces information on the chronology and distribution of the harvest and data on hunting success. The survey is administered as a cooperative effort between woodcock hunters, the FWS and state wildlife agencies. Participants in the 2002 survey included hunters who either: (1) participated in the 2001 survey; or (2) indicated on the 2001-02 Annual Questionnaire Survey of U. S. Waterfowl Hunters or Harvest Information Program Survey that they hunted woodcock. Wing-collection Survey participants were provided with prepaid mailing envelopes and asked to submit one wing from each woodcock they bagged. Hunters were asked to record the date of the hunt, and the state and county where the bird was shot. Hunters were not asked to submit envelopes for unsuccessful hunts. The age and sex of the birds were determined by examining plumage characteristics (Martin 1964, Sepik 1994) during the annual Woodcock Wingbee, a cooperative work session. Wings from the 2002-03 hunting season were accepted through 25 April 2003.

The ratio of immature birds per adult female in the harvest provided an index to recruitment of young into the population. The 2002 recruitment indices were compared to long-term (1963-2001) averages. Annual indices were calculated as the average number of immatures per adult female in each state, weighted by the relative contribution of each state to the total number of wings received during 1963-2001 (to maintain comparability between years).

Daily and seasonal bags of hunters who participated in the Wing-collection Survey in both 2001 and 2002 were used as indices of hunter success. These indices were weighted to compensate for changes in the proportion of the estimated woodcock harvest attributed to each state and adjusted to a base-year value (1969) for comparison with previous years (Clark 1970, 1972, 1973). Only data on successful hunts from prior years were used so that they would be comparable to data from the new survey. A successful hunt was defined as any envelope returned with complete information in which $\geq$1 woodcock wing was received.

Harvest Information Program

The Harvest Information Program (HIP) was cooperatively developed by the FWS and state wildlife agencies to provide reliable annual estimates of hunter activity and harvest for all migratory game birds (Elden et al. 2002). In the past, the annual FWS migratory bird harvest survey was based on a sampling frame that consisted solely of hunters who purchased a federal duck stamp. However, people that hunt only non-waterfowl species such as woodcock and doves are not required to purchase a duck stamp, and therefore were not included in that sampling frame. The HIP sampling frame consists of all migratory game bird hunters, thus it will provide more reliable estimates of woodcock hunter numbers and harvest than we have had in the past. Under this program, state wildlife agencies collect the name, address, and some additional information from each migratory bird hunter in their state, and send that information to the FWS. The FWS then selects random samples of those hunters and asks them to voluntarily provide detailed information about their hunting activity. For example, hunters selected for the woodcock harvest survey are asked to complete a daily diary about their woodcock hunting and harvest during the current year's hunting season. Their responses are then used to develop nationwide woodcock harvest estimates. These estimates should be considered preliminary as refinements are still being made in the sampling frame and estimation techniques.

RESULTS AND DISCUSSION

Singing-ground Survey

Trend Estimation.— The number of woodcock displaying during the 2003 Singing-ground Survey in the Eastern and Central Regions were not significantly different ($P>0.1$) from the 2002 levels, however the point estimate of the trends were positive (Table 1, Fig. 2). Trends for all states and provinces are reported in Table 1, but results based on fewer than 10 routes should be considered unreliable.

Trends for the 1993-03 period were computed for 341 routes in the Eastern Region and 404 routes in the Central Region. Eastern and Central region breeding populations declined ($P<0.05$) 1.3 and 1.6% per year, respectively, during this period (Table 1).

Long-term (1968-03) trends were estimated for 609 routes in the Eastern Region and 614 routes in the Central Region. There were long-term declines ($P<0.10$) in the breeding population throughout most states and

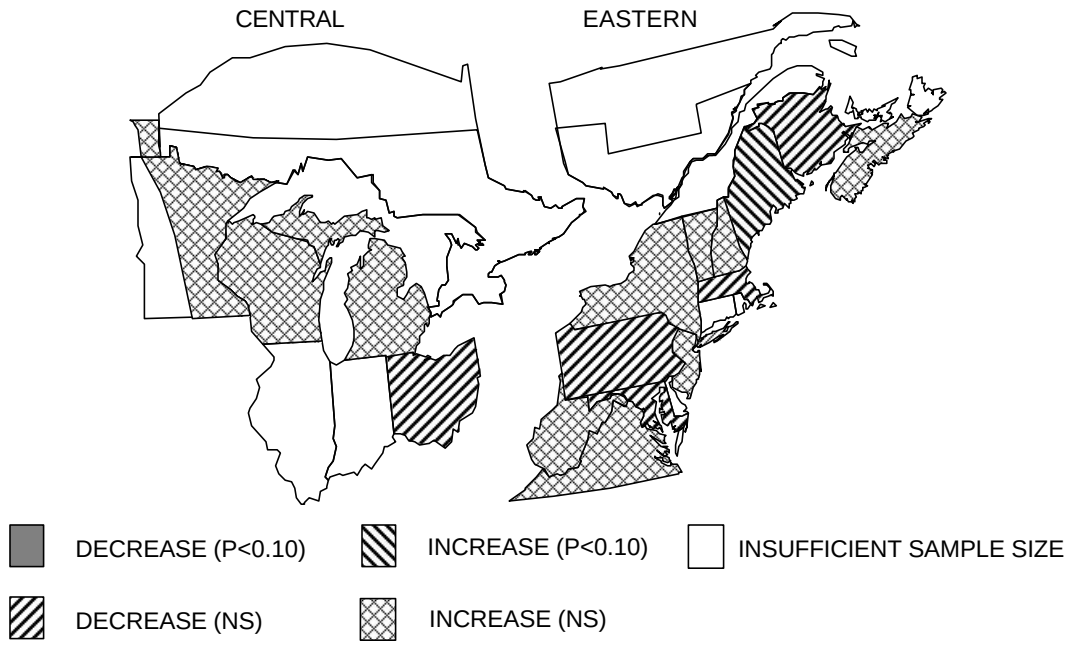

Fig. 2. Short-term trends in the number of American woodcock heard on the Singing-ground Survey, 2002-2003.

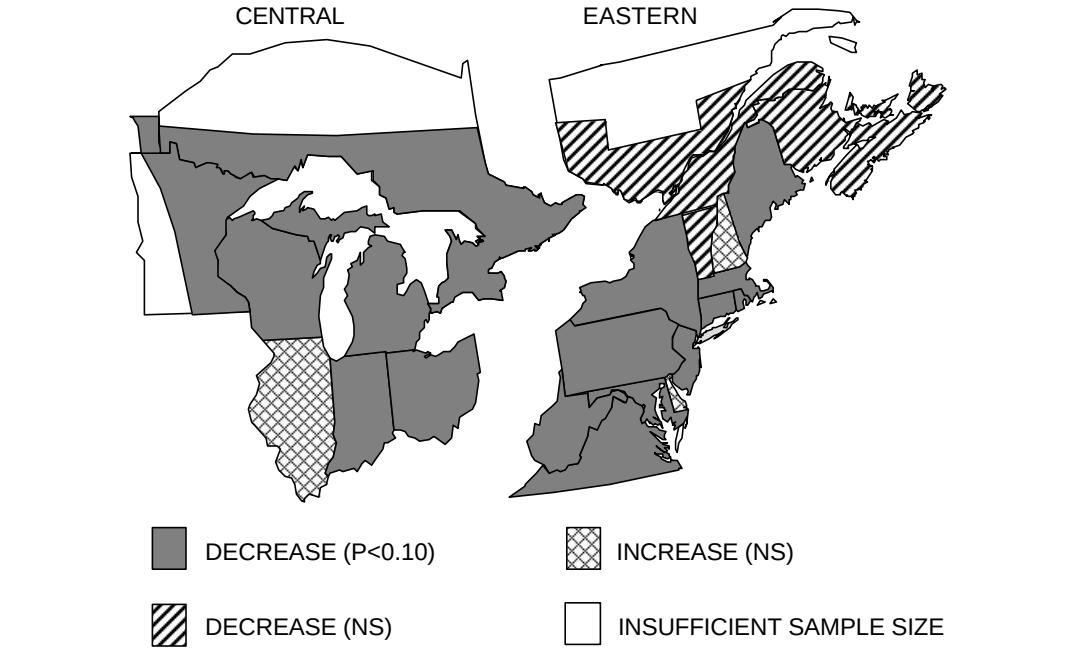

Fig. 3. Long-term trends in the number of American woodcock heard on the Singing-ground Survey, 1968-2003.

provinces in the Eastern and Central Regions (Table 1, Fig. 3). The long-term trend estimates were -2.3 and -1.8% per year ($P<0.01$) for the Eastern and Central regions, respectively.

Annual Breeding Population Indices.—In the Eastern Region, the 2003 breeding population index of 1.78 singing-males per route was higher than the predicted value of 1.66 (Table 2, Fig. 4). The Central Region population index of 2.16 males per route was higher than the predicted value of 2.13.

The major causes of these declines are thought to be degradation and loss of suitable habitat on both the breeding and wintering grounds, resulting from forest succession and various human uses (Dwyer et al. 1983, Owen et al. 1977, Straw et al. 1994). If current trends in land use practices persist, continued long-term population declines are likely. In an effort to halt such declines, the International Association of Fish and Wildlife Agencies has created a Woodcock Task Force to develop a woodcock conservation plan.

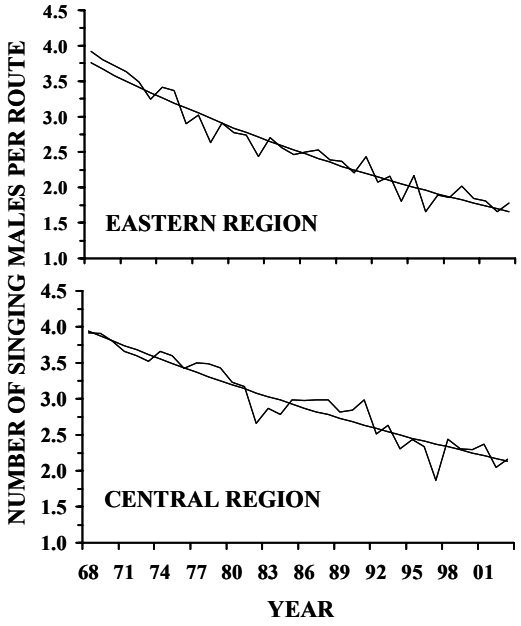

Fig. 4. Long-term trends (smooth line) and annual indices of the number of woodcock heard on the Singing-ground Survey, 1968-2003.

Wing-collection Survey

A total of 6,803 potential woodcock hunters in states with woodcock seasons were contacted and asked to participate in the 2002 Wing-collection Survey. Eighteen percent (Table 3) cooperated by sending in 9,002 woodcock wings (Table 4).

Recruitment.—The 2002 recruitment index in the Eastern Region (1.4 immatures per adult female) was the same as the 2001 index, but was 18% below the long-term (1963-01) regional average of 1.7 immatures per adult female (Table 4, Fig 5). In the Central Region the 2002 recruitment index (1.6 immatures per adult female) was 17% higher than the 2001 index (1.3), and was similar to the long-term regional average. The preliminary 2002 recruitment index for eastern Canada (Ontario, New Brunswick, and Nova Scotia combined) was 2.5 immatures per adult female (Canadian Wildlife Service, unpublished data).

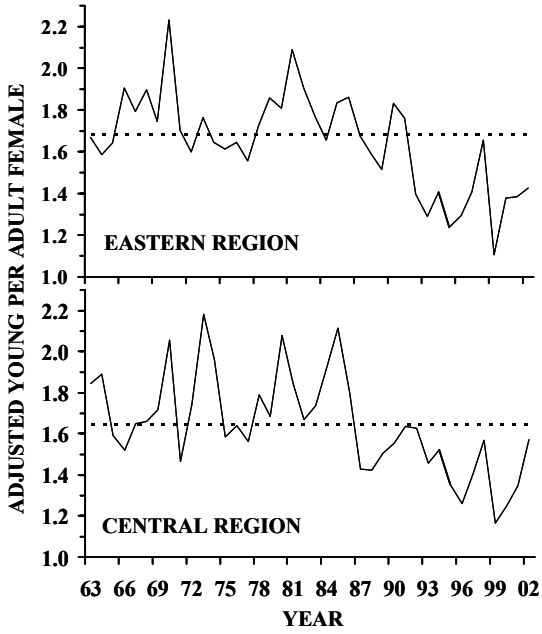

Fig. 5. Adjusted annual indices of recruitment (U.S.), 1963-2002. The dashed line is the 1963-2001 average.

Hunting Success.— The only change in Federal frameworks for woodcock hunting seasons in the U.S. during 2002-03 was moving the framework opening date in the Eastern Region from October 6 to October 1 (Appendix 1). The 2002 index of daily hunting success in the Eastern Region (1.9 woodcock per successful hunt) was slightly higher than the 2001 index of 1.8 (Table 5). The index of seasonal hunting success in the Eastern Region declined from 6.9 woodcock per successful hunter in 2001 to 6.6 in 2002. In the Central Region, the 2002 daily success index (2.1 woodcock per successful hunt) was similar to the 2001 index. Central Region hunters experienced an increase in the seasonal success index from 10.0 woodcock per successful hunter in 2001 to 11.0 woodcock per hunter in 2002. Base-year adjusted indices of daily and seasonal hunting success were below long-term averages in both regions (Figs. 6 and 7).

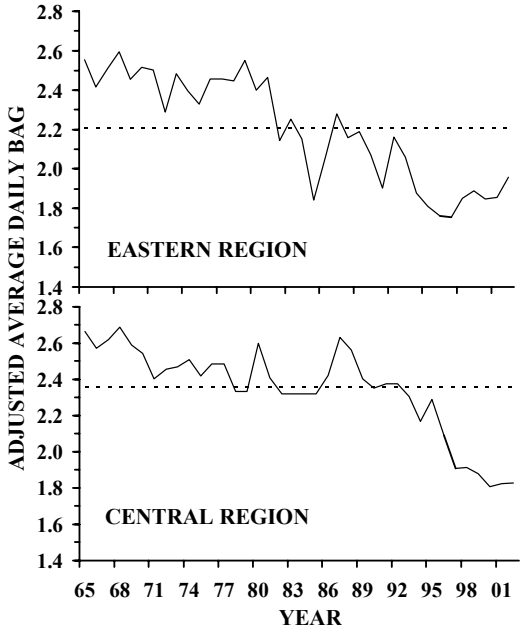

Fig. 6. Base-year adjusted indices of daily hunting success in the U.S., 1965-2002. The base year is 1969; the dashed line is the 1965-2001 average.

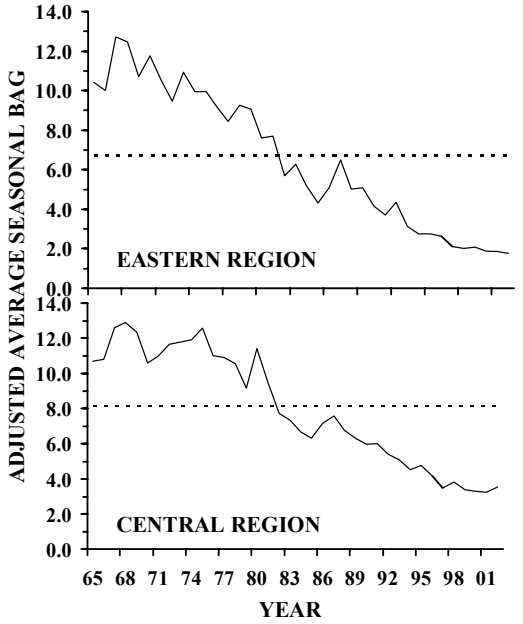

Fig. 7. Base-year adjusted indices of seasonal hunting success in the U.S., 1965-2002. The base year is 1969; the dashed line is the 1965-2001 average.

Indices to seasonal hunting success indicate that the annual woodcock harvest has been declining among participants in the survey for over a decade. This is consistent with the results of the Annual Questionnaire Survey of U.S. Waterfowl Hunters (Martin 1979, and FWS unpublished data), which indicates that the woodcock harvest and the number of woodcock hunters have generally declined since the early 1980s (Fig. 8).

These results should be interpreted cautiously because of the limitations of both of these surveys. A comprehensive critique of these limitations is beyond the scope of this report; interested readers should see Owen et al. (1977), Martin (1979), and Straw et al. (1994). Briefly, historic indices based on the Wing-collection Survey are potentially biased because of the non-random sampling procedure by which survey participants were selected. Because the Annual Questionnaire Survey of U. S. Waterfowl Hunters does not provide information on the woodcock harvest by non-waterfowl hunters, it does not provide an estimate of total harvest or the total number of hunters. Nevertheless, results from this survey should at least approximate trends in harvest and hunter participation. The 2001-02 estimates are the last ones generated from the Annual Questionnaire Survey, which has been replaced by HIP. Estimates of harvest and hunter numbers from the Annual Questionnaire Survey for 1964-2001 are presented in Tables 6 and 7 for historical purposes.

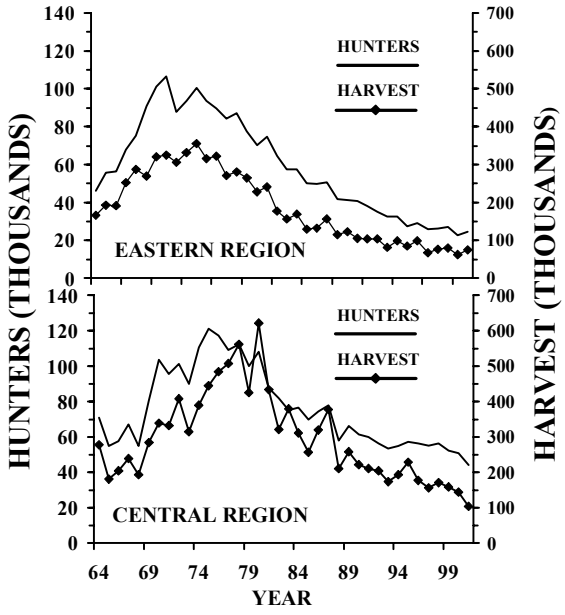

Fig. 8. U. S. harvest of American woodcock by duck stamp purchasers, and hunter numbers, 1964-2001 (Martin 1979, and FWS unpublished data, Division of Migratory Bird Management, Laurel, Maryland).

Harvest Information Program

Estimates of active woodcock hunters, days afield, and woodcock harvest from the 2001-02 and 2002-03 HIP surveys are provided in Table 8. In the Eastern Region woodcock hunters spent approximately 161,200 days afield and harvested 84,800 birds during 2002-03. Woodcock hunters in the Central Region spent 476,800 days afield and harvested 235,100 birds during the 2002-03 season. Although HIP provides statewide estimates of woodcock hunter numbers (Table 8), it is not possible to develop regional estimates, due to the occurrence of some hunters visiting more than one state to hunt.

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Rebecca Rau (FWS) mailed and processed Singing-ground Survey forms, corresponded with cooperators, keypunched portions of data, participated in the wingbee, and continued development of the new web site that allowed cooperators to submit survey data electronically. T. Nguyen and H. Bellary (FWS) played vital roles in web site and database development. Personnel from the FWS, Biological Resources Division (BRD) of the U. S. Geological Survey, Canadian Wildlife Service (CWS), and many state and provincial agencies, and other individuals assisted in collecting the Singing-ground Survey data and processing wings at the Woodcock Wingbee. Special thanks to M. Bateman (CWS), G. Haas (FWS) and S. Kelly (FWS) for help in coordinating the Singing-ground Survey. Special appreciation is extended to A. Stewart, V. Tuovila and the Michigan Department of Natural Resources for hosting the 2003 wingbee. Individuals that participated in the wingbee were: D. Dessecker and A. Bump (Ruffed Grouse Society); F. Kimmel and M. Olinde (Louisiana Department of Wildlife and Fisheries); D. McAuley (BRD); W. Palmer (Pennsylvania Game Commission); A. Stewart and V. Tuovila (Michigan DNR); R. Stonebraker (Indiana DNR); E. Oppelt and J. Bruggink (Northern Michigan U.), M. Neal (U. of Michigan-Flint) and T. Edwards, C. Horton, J. Kelley, R. Rau, P. Stinson, R. Speer, K. Sturm and L. Wolff (FWS). Thanks to the 1,198 woodcock hunters that sent in wings. M. Bateman (CWS) provided preliminary estimates of woodcock recruitment for eastern Canada. The Harvest Surveys Section of the Division of Migratory Bird Management (FWS) mailed Wing-collection Survey materials, organized wing submissions, assisted with data management, and provided Harvest Information Program estimates of woodcock harvest (special thanks to P. Padding, M. Moore, E. Martin, and J. Bezek-Balcombe). E. Martin also provided the entire dataset on woodcock harvest and hunter numbers from the Annual Questionnaire Survey. B. H. Powell (BRD) developed the computer programs for administering the Wing-collection Survey. J. Sauer (BRD) developed computer programs for calculating trends and indices from Singing-ground Survey data. W. Kendall (BRD) performed the trend analyses and assisted with interpretation. R. Rau, W. Kendall, P. Padding, J. Sauer, and M. Otto reviewed a draft of parts or all of this report and provided helpful comments. Portions of this report were copied in whole or in part from previous woodcock status reports.

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Table 1. Trends (% change per year[a]) in the number of American woodcock heard in the Singing-ground Survey as determined by the estimating equations technique (Link and Sauer 1994), 1968-2003.

State, Province or Region	No. of routes[b]	2002-2003				1993-2003				1968-2003			
		n[c]	% change	90%	CI	n	% change	90%	CI	n	% change	90%	CI
CT	4	2	0.0	0.0	0.0	4	17.7	0.0	35.5	9	-10.0 ** [d]	-16.5	-3.5
DE	2	0				2	-10.0 *	-19.9	-0.1	2	4.2	-11.3	19.7
ME	44	29	23.1 *	1.0	45.1	53	-0.6	-2.0	0.8	64	-2.3 ***	-3.1	-1.4
MD	6	2	-26.7	-110.8	57.4	6	-15.3	-43.0	12.5	21	-10.8 ***	-17.2	-4.4
MA	7	6	-7.1	-43.8	29.6	9	5.2 **	1.0	9.5	20	-4.1 **	-7.4	-0.7
NB	32	25	-2.1	-17.3	13.2	51	0.9	-1.5	3.3	62	-0.7	-1.9	0.5
NH	13	12	34.0	-8.6	76.7	13	0.7	-3.5	4.9	18	0.5	-2.2	3.3
NJ	7	2	28.7	-1.8	59.2	5	-4.1	-13.6	5.5	17	-10.1 ***	-13.5	-6.8
NY	59	38	12.0	-14.7	38.6	70	-2.9 **	-4.9	-0.9	105	-2.8 ***	-3.8	-1.8
NS	30	19	1.9	-23.9	27.7	38	1.1	-1.9	4.0	56	-0.3	-1.6	0.9
PA	34	13	-12.8	-41.9	16.3	26	-1.6	-7.2	4.1	56	-4.7 ***	-6.9	-2.5
PEI	0	0				7	-2.8[f]	-7.2	1.6	12	-1.4[g]	-2.9	0.1
QUE	26	0				13	-2.9 **	-5.1	-0.7	54	-1.8	-4.9	1.2
RI	1	0								2	-15.7 ***	-23.1	-8.2
VT	17	10	29.6	-11.2	70.3	18	0.7	-2.3	3.6	21	-1.5	-3.2	0.1
VA	26	4	17.0	-145.5	179.4	12	-10.7 *	-20.2	-1.2	47	-10.7 ***	-13.9	-7.4
WV	27	8	27.7	-58.1	113.6	14	-5.7 **	-9.8	-1.6	43	-2.7 ***	-4.3	-1.0
Eastern	335	173	6.4	-4.9	17.7	341	-1.3 **	-2.4	-0.3	609	-2.3 ***	-2.8	-1.8
IL	14	0				4	13.0	-17.2	43.2	23	23.4	-10.2	57.1
IN	17	2	0.0	0.0	0.0	7	-12.4	-28.3	3.6	38	-6.1 *	-11.5	-0.7
MB[e]	18	9	31.7	-3.8	67.3	20	-4.0 *	-7.8	-0.2	20	-3.5 **	-6.2	-0.9
MI	89	43	11.3	-6.1	28.6	109	-1.2	-2.6	0.1	143	-1.7 ***	-2.5	-0.8
MN	72	46	5.5	-13.3	24.3	79	-0.4	-2.2	1.4	99	-1.1 **	-2.0	-0.3
OH	30	9	-9.9	-62.5	42.7	27	-10.6 **	-18.7	-2.6	55	-6.3 ***	-10.0	-2.7
ON	34	0				87	-3.2	-7.9	1.5	136	-1.6 ***	-2.3	-0.9
WI	69	41	7.9	-12.1	27.8	71	-1.7	-3.7	0.3	100	-1.9 ***	-2.7	-1.0
Central	343	151	8.7	-1.7	19.2	404	-1.6 ***	-2.5	-0.7	614	-1.8 ***	-2.2	-1.3
Continent	678	324	7.7 *	0.7	14.8	745	-1.5 ***	-2.2	-0.8	1223	-1.9 ***	-2.3	-1.6

[a] Mean of weighted route trends within each state, province or region. To estimate the total percent change over several years, use: $(100((\%\ change/100)+1)^{y})-100$ where y is the number of years. Note: extrapolating the estimated trend statistic (% change per year) over time (e.g., 30 years) may exaggerate the total change over the period.

[b] Total number of routes surveyed in 2003 for which data were received by 30 May.

[c] Number of comparable routes (2002 versus 2003) with at least 2 non-zero counts.

[d] Indicates slope is significantly different from zero: * P<0.10, ** P<0.05. *** P <0.01; significance levels are approximate for states where n<10.

[e] Manitoba began participating in the Singing-ground Survey in 1990.

[f] Data were not received from PEI and ON for the 2002 and 2003 surveys. Trend estimate is for 1993-2001.

[g] Data were not received from PEI and ON for the 2002 and 2003 surveys. Trend estimate is for 1968-2001.

Table 2. Breeding population indices for American woodcock from the Sing-ground Survey, 1968-2003. These indices are based on the 1968-2003 trend and should be used for exploratory data analysis only; observed patterns should be verified using trend estimation methods (Sauer and Geissler 1990).

State, Province or Region	Year																	
	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Eastern Region																		
CT[a]	--[b]	7.94	7.92	6.14	7.49	5.48	5.31	5.63	3.08	3.60	2.18	2.16	1.89	2.57	3.18	2.44	1.61	1.38
DE[a]	0.62	0.48	0.55	0.40	0.46	0.77	0.72	1.20	0.38	0.51	0.48	0.41	--	--	--	1.63	0.59	0.60
ME	5.19	5.36	5.63	5.11	4.81	5.15	5.11	5.46	4.84	4.37	4.03	4.40	3.87	4.24	2.92	3.75	3.75	3.81
MD	8.94	7.89	7.00	6.51	5.45	6.04	4.26	4.51	3.06	2.90	3.08	2.43	3.00	2.56	2.52	1.68	1.32	1.33
MA	--	3.63	4.26	4.99	3.67	4.94	3.99	2.33	3.09	2.40	2.80	3.06	2.20	2.26	1.93	1.44	2.54	1.99
NB	--	5.25	5.57	5.46	5.69	5.05	5.60	6.35	4.66	5.80	4.15	4.61	4.12	4.16	4.33	4.54	3.67	3.98
NH	--	2.87	3.31	2.68	3.38	2.63	3.61	3.06	3.79	3.12	3.14	3.22	3.91	4.09	2.40	2.81	2.50	2.65
NJ	7.52	6.50	8.13	10.09	5.98	8.41	8.36	6.23	3.77	4.16	2.41	4.12	2.55	1.96	1.99	2.31	2.73	1.95
NY	5.03	5.54	4.25	4.79	4.49	4.52	4.76	3.98	3.93	4.04	3.20	3.61	4.16	3.78	3.06	3.53	2.84	3.59
NS	3.61	2.62	2.23	2.76	2.64	2.56	3.20	2.74	2.42	2.44	2.82	2.29	2.18	2.02	1.80	2.25	2.15	2.16
PA	3.67	3.38	3.71	3.22	2.86	3.09	2.23	2.50	2.42	2.40	1.91	2.17	1.98	1.96	1.59	1.80	1.90	1.48
PEI[a]	--	3.81	2.84	5.26	3.07	2.46	3.27	4.99	4.19	3.70	2.96	3.67	2.72	2.05	2.18	3.46	3.95	2.88
QUE[a]	--	--	--	4.51	4.26	3.22	3.82	3.82	2.64	2.92	3.57	3.62	3.96	3.08	2.96	3.67	2.88	3.52
RI[a]	--	2.83	2.82	5.32	4.06	4.06	3.03	2.35	2.35	--	0.78	1.35	1.35	0.78	3.19	2.18	1.92	0.64
VT	--	2.53	4.30	3.29	3.71	3.28	3.22	3.75	3.40	4.07	3.11	3.00	2.67	2.38	1.79	2.62	2.66	2.10
VA	--	4.66	4.83	3.85	3.35	2.41	3.53	3.00	2.49	2.38	1.81	1.98	1.68	1.65	1.55	1.20	1.72	0.87
WV	1.48	1.66	1.19	1.15	1.40	1.12	1.08	1.24	1.08	1.09	0.76	1.10	0.91	1.25	1.10	1.14	0.94	0.89
Region	3.92	3.80	3.72	3.63	3.49	3.24	3.42	3.37	2.90	3.02	2.63	2.91	2.77	2.74	2.44	2.70	2.56	2.46
Central Region																		
IL	--	--	0.02	0.02	0.03	0.03	0.03	0.06	0.05	0.07	0.07	0.08	0.10	0.15	0.13	0.19	0.22	0.39
IN	2.40	2.08	1.98	1.53	1.85	1.89	1.39	1.34	1.32	1.28	1.15	1.43	1.05	1.09	0.80	0.84	0.82	0.67
MB	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MI	6.26	6.12	5.83	5.63	5.33	5.47	6.35	6.39	5.88	5.38	5.69	5.60	5.51	4.61	4.87	4.25	4.68	4.89
MN	--	4.64	3.98	4.27	3.63	4.13	4.80	4.17	4.20	4.16	4.17	4.11	4.57	4.19	3.78	3.44	3.06	3.66
OH	--	--	3.50	3.55	2.97	2.46	3.16	2.37	2.57	2.93	2.33	1.80	1.78	2.03	1.46	1.83	1.70	1.47
ON	6.22	6.81	6.47	6.15	6.82	6.09	6.53	5.74	5.51	6.00	6.49	6.24	6.38	5.92	4.49	4.64	4.88	5.02
WI	4.28	4.22	4.57	4.05	3.87	3.94	4.03	3.91	3.75	4.07	4.29	4.19	3.58	3.05	2.99	3.00	3.28	3.03
Region	3.91	3.90	3.80	3.66	3.60	3.52	3.66	3.60	3.42	3.50	3.48	3.43	3.23	3.17	2.66	2.87	2.78	2.98
Continent	3.76	3.67	3.58	3.50	3.42	3.34	3.27	3.19	3.12	3.05	2.98	2.91	2.84	2.78	2.71	2.65	2.59	2.53

[a] Annual indices are unreliable due to small sample size.

[b] Insufficient data.

Table 2. Continued.

State, Province or Region	Year																	
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Eastern Region																		
CT[a]	2.00	0.92	2.33	0.98	0.85	0.90	0.62	0.51	0.64	0.81	0.74	0.65	0.62	1.32	0.89	0.33	0.31	0.30
DE[a]	--[b]	--	--	--	0.72	0.39	0.24	--	--	--	0.72	0.72	1.42	0.42	0.93	0.67	0.72	0.72
ME	3.94	4.31	4.06	4.15	2.85	3.58	2.98	3.22	2.84	3.02	2.31	2.56	2.41	3.06	2.99	2.58	2.46	2.67
MD	1.17	0.92	0.97	1.10	0.87	0.72	0.30	0.58	0.52	0.31	0.44	0.51	0.24	0.34	0.35	0.63	0.29	0.19
MA	2.04	2.12	2.12	1.67	1.52	1.83	1.51	1.28	1.44	1.05	1.37	1.47	1.35	2.05	1.38	1.28	1.32	1.46
NB	3.33	3.97	4.26	5.53	4.38	4.19	3.97	5.34	5.14	4.34	3.93	4.80	3.99	4.96	4.54	4.89	3.91	4.75
NH	4.51	3.23	3.19	3.31	2.87	3.94	2.29	2.85	2.42	4.76	3.76	4.14	3.81	4.69	3.22	3.41	3.63	3.97
NJ	1.90	2.22	1.67	1.59	1.08	1.03	0.85	0.80	0.34	0.81	0.97	0.20	0.67	0.84	0.59	0.58	0.38	0.33
NY	3.06	2.81	3.27	2.53	3.03	3.27	2.79	2.26	2.26	2.35	2.19	2.17	2.24	2.19	1.97	2.02	1.80	1.98
NS	2.53	2.27	2.47	2.69	1.85	2.28	2.50	2.74	2.07	2.54	2.61	1.99	2.32	2.32	2.75	2.56	2.06	2.16
PA	1.70	1.61	1.60	1.15	1.52	1.68	1.23	1.31	0.65	1.21	0.99	1.06	1.17	0.92	0.61	0.76	0.80	0.77
PEI[a]	3.78	2.64	4.23	4.02	3.29	2.45	2.40	2.27	2.31	2.69	3.06	2.66	2.86	2.42	2.84	3.05	0.87	--
QUE[a]	3.39	3.53	2.51	3.73	2.89	3.54	2.98	3.54	2.75	3.28	1.19	2.29	2.35	2.95	2.43	2.29	2.58	2.54
RI[a]	0.64	--	0.96	0.96	--	0.20	--	--	--	--	--	0.08	--	--	--	--	0.05	0.02
VT	2.66	2.86	3.39	3.15	3.01	2.95	1.93	2.04	2.06	2.32	1.75	2.29	2.56	2.57	3.47	2.22	1.83	2.08
VA	0.90	0.93	0.66	0.58	0.57	0.55	0.43	0.49	0.38	0.29	0.25	0.34	0.25	0.26	0.23	0.19	0.18	0.16
WV	0.86	0.99	0.79	0.80	0.85	0.78	0.78	0.69	0.60	1.04	0.65	0.72	0.62	0.65	0.74	0.61	0.51	0.62
Region	2.50	2.53	2.39	2.37	2.21	2.43	2.07	2.16	1.80	2.17	1.66	1.89	1.86	2.02	1.84	1.81	1.66	1.78
Central Region																		
IL	0.32	0.48	0.49	0.60	0.52	0.79	1.06	1.27	1.33	1.21	3.78	1.69	--	2.75	3.81	6.30	4.46	6.96
IN	0.90	0.65	0.61	0.62	0.69	0.71	0.55	0.59	0.51	0.53	0.45	0.35	0.73	0.47	0.40	0.46	0.26	0.29
MB	--	--	--	--	--	--	2.61	3.43	2.47	2.77	2.49	1.47	1.80	1.73	1.88	2.36	1.45	1.93
MI	4.96	4.59	5.02	4.79	4.68	5.50	3.93	3.95	3.58	3.86	3.70	3.61	4.30	3.46	3.61	3.35	3.42	3.53
MN	3.86	3.69	4.13	3.57	4.11	3.84	3.26	3.47	3.03	3.29	2.97	2.60	3.22	3.18	3.45	3.55	2.72	2.95
OH	1.14	1.24	1.48	1.01	1.32	1.04	0.92	0.95	0.79	0.80	0.84	0.61	0.72	0.56	0.63	0.54	0.49	0.47
ON	4.94	5.17	5.10	5.39	5.08	5.05	4.85	4.38	3.80	4.75	3.47	4.00	3.99	3.96	4.66	3.88	5.94	4.18
WI	3.56	3.55	3.55	3.29	3.21	3.25	2.59	2.55	2.38	2.40	2.52	2.36	2.30	2.78	2.55	2.34	2.19	2.32
Region	2.97	2.98	2.98	2.82	2.84	2.98	2.51	2.63	2.31	2.43	2.33	1.87	2.44	2.31	2.29	2.37	2.04	2.16
Continent	2.47	2.41	2.36	2.30	2.25	2.20	2.15	2.10	2.05	2.00	1.96	1.91	1.87	1.83	1.78	1.74	1.70	1.66

[a] Annual indices are unreliable due to small sample size.

[b] Insufficient data.

Table 3. Distribution of U.S. hunters contacted and hunters that submitted woodcock wings in the 2002-03 Wing-collection Survey.

State of residence	No. of hunters contacted	No. of hunters that submitted wings	Percent that submitted wings
AL	32	0	0
AR	29	0	0
CT	207	21	10
DE	24	1	4
FL	98	0	0
GA	77	6	8
IL	161	4	2
IN	138	29	21
IA	73	6	8
KS	16	0	0
KY	32	2	6
LA	194	20	10
ME	403	119	30
MD	84	10	12
MA	421	70	17
MI	777	242	31
MN	535	75	14
MS	23	0	0
MO	145	13	9
NE	39	0	0
NH	224	77	34
NJ	180	37	21
NY	459	94	20
NC	104	5	5
ND	7	0	0
OH	190	20	11
OK	37	0	0
PA	495	61	12
RI	49	5	10
SC	78	10	13
TN	72	3	4
TX	71	3	4
VT	179	68	38
VA	167	18	11
WV	42	16	38
WI	941	163	17
Total	6,803	1,198	18

Table 4. Numbers of woodcock wings received from hunters, and indices of recruitment in the U.S. Recruitment indices for individual states were calculated as the ratio of immatures per adult female. The regional indices for 2002 were calculated as the average of the state values, adjusted for comparability with the 1963-2001 average. Recruitment indices were not calculated for states where the sample of wings was <125.

State or Region of harvest	Wings received						Recruitment index	
	Total		Adult females		Immatures			
	1963-01	2002	1963-01	2002	1963-01	2002	1963-01	2002
Eastern Region								
CT	13,149	89	2,909	19	8,066	57	2.8	
DE	418	3	54	0	294	2	5.4	
FL	660	0	150	0	410	0	2.7	
GA	2,927	29	901	10	1,270	7	1.4	
ME	73,296	969	21,567	301	36,667	486	1.7	1.6
MD	3,843	42	958	16	2,150	19	2.2	
MA	19,253	428	5,820	142	9,550	182	1.6	1.3
NH	27,456	702	8,876	227	12,697	333	1.4	1.5
NJ	24,357	222	5,660	60	14,331	105	2.5	1.8
NY	51,328	748	16,975	251	23,890	317	1.4	1.3
NC	3,007	65	890	30	1,489	30	1.7	
PA	27,589	351	8,705	109	12,777	146	1.5	1.3
RI	2,246	13	420	2	1,519	8	3.6	
SC	2,312	105	712	25	1,102	44	1.5	
VT	20,311	457	6,513	173	9,494	197	1.5	1.1
VA	3,948	121	942	53	2,274	44	2.4	
WV	5,156	76	1,572	22	2,611	32	1.7	
Region	281,256	4,420	83,624	1,440	140,591	1,872	1.7	1.4
Central Region								
AL	910	0	243	0	425	0	1.7	
AR	515	0	165	0	207	0	1.3	
IL	1,289	18	293	4	727	13	2.5	
IN	6,819	138	1,717	37	3,802	61	2.2	1.6
IA	922	36	311	12	407	16	1.3	
KS	44	0	9	0	22	0	a	
KY	1,010	23	238	6	524	15	2.2	
LA	28,894	318	6,479	64	18,711	211	2.9	3.3
MI	100,620	2,239	32,536	677	50,320	1122	1.5	1.7
MN	28,604	538	9,708	224	12,840	183	1.3	0.8
MS	1,719	0	488	0	875	0	1.8	
MO	2,703	84	668	22	1,360	45	2.0	
NE	13	0	5	0	6	0	a	
OH	13,648	118	4,137	34	6,476	59	1.6	1.8
OK	170	2	38	0	89	2	2.3	
TN	1,008	10	250	2	517	4	2.1	
TX	986	1	261	1	501	0	1.9	
WI	62,678	1,057	20,444	353	30,429	492	1.5	1.4
Region	252,552	4,582	77,990	1,436	128,238	2,478	1.6	1.6

Table 5. State and regional indices of daily and seasonal woodcock hunting success in the U.S. during 2001 and 2002. State and regional indices were calculated for states represented by ≥10 hunters that participated in the Wing-collection Survey both years. Regional indices were weighted as described by Clark (1970).

State of harvest	No. of successful hunters	No. of successful hunts		Woodcock bagged		Woodcock per successful hunt		Woodcock per season	
		2001	2002	2001	2002	2001	2002	2001	2002
Eastern Region									
CT	8	26	21	49	45				
DE	1	2	1	4	3				
GA	4	5	11	6	26				
ME	84	391	363	875	795	2.2	2.2	10.4	9.5
MD	6	12	6	25	12				
MA	33	132	152	247	275	1.9	1.8	7.5	8.3
NH	46	266	249	576	512	2.2	2.1	12.5	11.1
NJ	16	63	60	132	135	2.1	2.3	8.3	8.4
NY	60	278	290	507	559	1.8	1.9	8.5	9.3
NC	4	30	28	68	61				
PA	39	143	129	319	272	2.2	2.1	8.2	7.0
RI	4	7	7	10	12				
SC	9	27	43	60	99				
VT	40	170	171	309	331	1.8	1.9	7.7	8.3
VA	7	45	45	104	86	2.2	2.2	12.6	10.1
WV	6	14	13	22	26				
Region	367	1,611	1,589	3,313	3,249	1.8	1.9	6.9	6.6
Central Region									
IA	6	21	20	33	35				
IL	3	6	9	10	15				
IN	14	47	50	94	93	2.0	1.9	6.7	6.6
KY	2	15	12	31	23				
LA	13	83	107	220	306	2.7	2.9	16.9	23.5
MI	186	1,076	955	2,224	1,932	2.1	2.0	12.0	10.4
MN	64	311	239	634	490	2.0	2.1	9.9	7.7
MO	5	22	27	50	60				
OH	12	78	51	168	112	2.2	2.2	14.0	9.3
TN	2	14	5	25	7				
TX	1	4	1	6	1				
WI	120	545	406	1,111	840	2.0	2.1	9.3	7.0
Region	428	2,222	1,882	4,606	3,914	2.1	2.1	10.0	11.0

Table 6. State and regional estimates of the number of American woodcock bagged (retrieved kill) by duck stamp buyers in the U.S., 1964-2001. Data from Martin (1979) and unpublished FWS administrative reports. Information was not available to reassign hunters from the District of Columbia to state of harvest.

State or Region	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
CT	11,928	16,261	13,137	12,238	15,772	18,815	23,430	14,619	12,953	18,729	13,547	16,181	20,134	17,792	15,905	13,488	15,217	12,245	10,981
DE	1,804	1,879	2,210	1,767	3,798	3,043	3,626	4,109	2,057	4,759	3,772	4,593	4,165	2,535	4,349	3,210	2,929	1,714	1,637
DC	91	240	747	553	330	629	360	1,232	975	135	500	450	191	1,084	399	343	184	193	419
FL	2,126	3,501	3,453	3,999	5,799	4,568	6,868	4,192	5,439	6,012	5,402	4,909	8,881	6,596	5,667	3,956	5,251	4,155	4,355
GA	2,893	2,341	2,594	4,672	6,226	3,645	5,579	6,208	8,186	5,997	10,999	6,714	8,623	9,911	6,747	5,977	6,691	5,440	4,437
ME	26,115	24,158	25,350	27,726	38,617	25,805	33,171	33,923	35,762	34,765	48,123	40,846	35,440	32,347	36,279	33,452	30,132	25,390	18,376
MD	3,025	3,318	3,103	7,011	9,127	10,082	9,781	8,334	4,382	8,475	8,530	7,568	9,883	7,839	11,261	5,267	8,329	10,743	7,788
MA	19,696	28,156	25,056	20,532	29,330	32,221	32,197	25,363	34,958	37,623	31,648	33,971	28,492	21,185	23,949	20,114	20,109	21,688	12,951
NH	6,488	11,259	9,490	8,212	15,483	13,099	9,520	12,556	12,098	13,752	16,754	16,109	16,399	12,936	19,860	15,268	12,780	12,099	6,856
NJ	11,108	13,437	14,094	20,791	24,622	28,207	28,030	39,662	23,906	42,975	42,308	31,377	37,937	24,700	30,933	23,559	27,108	13,901	15,450
NY	38,625	44,261	49,459	75,869	76,528	83,081	74,873	80,334	77,935	82,810	83,600	72,259	59,342	66,796	48,286	71,113	46,196	56,536	33,513
NC	6,790	5,219	9,042	8,308	9,612	6,995	9,181	9,254	9,970	8,186	14,617	8,899	8,936	9,186	9,897	7,252	6,973	13,228	8,959
PA	19,340	29,119	18,236	39,811	30,917	42,136	54,754	57,311	49,599	43,090	45,170	37,573	43,550	33,409	37,391	35,807	23,740	39,689	33,329
RI	541	1,453	1,584	1,758	2,086	3,092	2,585	4,049	2,238	2,472	3,457	2,078	2,624	1,216	2,213	2,708	1,186	1,261	1,283
SC	8,552	2,707	3,000	4,622	8,741	8,716	9,050	7,783	9,280	5,660	9,363	8,010	7,288	7,716	8,926	6,199	7,503	7,298	4,459
VT	4,233	3,421	7,178	9,133	4,553	5,173	11,459	10,384	7,061	8,723	9,234	11,117	16,443	6,367	8,567	6,234	6,185	7,777	6,042
VA	2,648	2,317	3,260	3,988	4,342	6,967	4,120	4,470	4,461	5,911	5,392	10,162	9,421	5,043	6,628	7,696	4,691	5,854	2,770
WV	186	584	413	926	1,213	467	1,454	1,715	4,305	1,892	2,345	2,273	3,868	4,706	3,418	2,563	3,230	1,494	2,874
Eastern Region	166,189	193,361	191,406	251,916	287,076	296,741	320,038	325,498	305,565	331,966	354,761	315,089	321,617	271,364	280,675	264,205	228,433	240,705	176,479
AL	2,224	1,626	5,458	5,182	4,114	7,432	5,424	3,985	6,721	3,035	3,532	6,909	5,796	7,975	4,514	4,788	5,132	2,425	2,874
AR	3,952	3,683	2,684	6,354	3,193	2,619	3,723	4,755	8,139	8,451	6,811	9,475	8,162	20,586	6,081	7,647	6,389	5,445	4,802
IL	4,015	3,124	4,133	4,109	2,083	9,705	7,589	9,684	10,509	8,531	11,480	11,302	10,481	14,347	19,533	13,800	11,346	13,108	12,707
IN	4,761	2,921	4,145	5,048	3,884	6,210	6,293	12,159	8,797	6,993	12,163	15,372	10,583	6,384	8,396	9,309	10,965	7,006	7,131
IA	1,563	433	222	1,668	483	861	1,085	756	2,945	3,416	4,584	2,619	5,025	5,587	8,662	5,460	6,904	3,339	4,015
KS	547	271	268	278	629	885	1,073	735	1,131	2,019	2,297	892	1,115	2,419	935	510	785	831	952
KY	737	427	667	702	692	2,382	788	1,389	790	1,727	2,330	3,126	4,260	1,874	4,963	3,695	2,883	3,892	3,864
LA	71,744	31,855	53,842	62,869	75,271	105,955	95,777	73,272	134,592	47,436	67,492	59,758	121,740	130,271	214,793	146,576	327,751	211,441	112,186
MI	90,662	62,910	68,661	73,928	42,244	54,402	77,671	106,387	95,512	119,723	114,106	157,417	128,568	122,600	98,260	72,738	71,999	56,733	60,222
MN	10,795	4,929	9,952	16,591	7,948	14,182	20,721	20,745	26,589	20,682	25,290	35,806	18,019	44,676	53,865	48,432	52,627	32,205	39,761
MS	7,390	3,095	4,556	6,982	6,337	8,820	9,534	8,409	12,997	12,775	11,082	10,925	17,651	10,540	11,042	11,904	21,742	9,777	8,926
MO	2,646	2,634	2,392	3,245	1,529	3,919	4,294	3,482	2,880	6,376	6,145	6,545	8,733	9,438	12,929	6,540	8,516	6,291	4,076
NE	253	104	56	515	33	192	1,333	299	489	477	520	394	540	536	1,203	378	1,055	1,559	862
ND	44	152	441	0	348	0	74	395	825	325	378	352	150	0	292	0	326	90	246
OH	16,905	13,011	9,776	10,190	15,345	19,445	13,136	18,031	10,511	13,274	16,906	13,955	14,891	14,575	12,112	12,153	14,931	13,216	12,273
OK	327	57	386	2,866	535	1,977	836	1,610	1,696	2,233	2,117	4,648	2,779	2,894	1,384	908	1,265	1,316	904
SD	100	0	90	341	32	84	93	0	82	124	0	135	135	46	0	55	161	58	98
TN	488	856	1,097	1,564	2,602	2,626	1,727	2,926	4,257	3,544	5,724	4,648	4,082	3,668	9,375	6,282	2,822	4,448	4,739
TX	8,115	1,968	4,972	2,329	2,804	6,234	4,353	5,678	5,428	6,817	5,516	10,471	12,207	15,916	6,689	10,392	16,900	5,172	5,893
WI	58,934	48,905	36,190	40,282	27,794	44,894	90,768	65,915	82,265	58,405	101,895	105,416	125,453	114,422	96,926	75,913	77,072	64,617	43,688
Central Region	286,202	182,961	209,988	245,043	197,900	292,824	346,292	340,612	417,155	326,363	400,368	460,165	500,370	528,754	571,954	437,480	641,571	442,969	330,219

Table 6. continued

State or Region	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
CT	9,378	8,989	6,319	4,838	7,374	7,059	5,884	6,890	5,174	4,163	4,630	7,260	6,209	5,496	2,718	2,180	5,306	1,996	3,748
DE	1,210	2,771	849	901	1,694	912	3,230	1,358	1,281	2,322	317	739	641	508	477	595	0	275	392
DC	0	250	65	45	370	365	0	128	120	303	149	114	137	406	216	145	214	164	121
FL	5,661	3,414	2,608	2,195	4,270	1,106	2,405	1,906	741	307	1,422	6,363	187	535	975	329	787	1,007	4,924
GA	5,231	6,927	2,988	3,851	2,203	3,657	2,863	2,758	2,513	971	2,843	2,348	1,989	3,764	898	2,491	1,503	2,211	1,990
ME	19,155	21,023	17,314	22,652	27,404	13,760	16,093	13,489	20,550	23,779	14,551	21,599	18,227	12,322	15,479	19,647	15,028	18,680	14,087
MD	6,812	11,800	7,221	3,647	9,887	5,821	6,574	1,910	3,506	4,095	3,198	2,715	3,253	1,797	2,034	1,849	2,099	2,041	1,973
MA	11,937	12,131	17,139	14,752	15,793	10,871	13,083	11,109	13,751	13,279	8,378	7,773	12,216	7,309	5,233	4,200	5,818	0	5,511
NH	4,701	7,912	7,420	7,800	6,567	7,201	5,808	5,014	6,616	5,915	4,158	4,437	5,023	5,235	3,037	3,793	2,668	3,717	3,792
NJ	11,391	15,962	8,804	7,175	10,885	9,704	10,900	7,542	7,821	2,301	7,882	5,827	4,338	2,081	4,131	8,841	4,286	2,478	4,623
NY	27,789	27,605	17,945	20,208	27,073	18,414	20,041	15,384	12,371	16,287	10,199	12,701	11,955	11,877	10,735	12,421	8,886	5,272	5,593
NC	5,859	5,725	7,299	7,058	5,373	3,502	5,159	3,880	4,750	4,084	2,789	4,669	2,803	3,305	2,962	3,093	4,403	1,868	4,226
PA	27,340	23,927	16,214	20,326	21,354	11,569	15,220	18,089	11,719	13,705	13,476	10,784	7,918	11,087	9,550	9,183	8,020	11,008	11,866
RI	1,915	843	1,988	639	2,530	1,455	491	1,270	2,061	888	481	1,463	538	965	203	719	619	404	187
SC	7,137	5,211	2,094	5,095	6,569	3,487	4,518	2,287	1,759	1,919	3,032	3,863	5,244	6,369	2,521	3,521	5,061	3,455	4,626
VT	4,651	6,172	4,439	5,883	7,198	9,539	5,098	6,004	4,411	3,099	2,384	3,755	4,274	8,165	2,688	787	3,711	4,549	3,446
VA	2,783	6,891	7,112	3,002	6,256	6,491	4,684	5,148	4,343	5,987	1,898	2,317	2,943	18,262	3,234	2,522	10,025	3,605	3,280
WV	3,293	1,650	578	1,664	409	751	854	379	650	125	35	522	389	63	0	158	2,221	130	923
Eastern Region	156,244	169,204	128,394	131,730	163,209	115,664	122,904	104,544	104,259	103,530	81,822	99,254	88,282	99,546	67,091	76,475	80,654	62,859	75,311
AL	2,408	2,849	2,108	1,942	3,298	1,984	1,886	812	651	1,228	356	150	599	796	1,117	1,815	80	1,620	124
AR	2,584	2,473	6,636	3,188	5,682	654	1,220	1,470	1,780	10,166	248	1,621	274	2,304	1,299	2,004	4,053	663	231
IL	8,047	7,266	7,285	6,898	7,672	3,031	8,935	8,031	9,804	11,471	5,849	6,846	5,023	2,736	4,152	4,594	3,071	3,486	3,256
IN	4,865	5,566	4,921	5,882	8,194	4,428	6,685	2,927	2,431	3,011	2,914	4,064	4,978	4,708	3,022	5,831	2,520	1,440	4,974
IA	2,731	2,447	3,888	3,656	3,897	1,269	5,457	2,467	1,972	2,251	1,172	1,306	1,864	1,236	2,478	2,909	895	1,718	948
KS	1,164	916	1,260	1,681	2,108	174	616	421	612	61	225	121	883	597	792	317	3,303	838	442
KY	3,412	3,983	1,991	2,848	1,287	985	3,343	2,523	1,932	2,678	1,265	1,262	1,708	3,081	412	2,044	979	449	3,008
LA	196,201	106,912	78,532	110,850	123,958	43,689	66,615	39,735	37,289	29,494	44,096	40,285	67,428	24,931	12,645	12,904	23,066	32,409	7,026
MI	55,615	64,823	56,885	68,752	70,062	52,266	50,856	61,878	66,833	60,230	54,058	62,462	70,329	54,086	45,417	67,411	61,992	48,231	35,290
MN	35,346	26,304	28,678	34,505	71,966	45,579	45,396	36,136	35,917	27,929	20,260	27,183	31,409	42,001	29,865	24,988	23,456	22,638	16,044
MS	4,839	6,423	6,388	3,370	2,891	1,927	2,065	3,401	994	1,531	889	1,212	2,708	1,265	5,627	886	326	1,624	955
MO	4,133	6,329	4,087	5,917	7,818	3,453	6,279	3,550	3,349	3,578	1,962	993	2,043	2,161	2,483	3,718	1,684	2,392	3,646
NE	3,257	1,035	364	1,125	481	701	1,124	1,072	303	828	153	656	162	712	2,185	771	0	2,247	823
ND	264	474	754	0	0	580	156	150	701	55	569	85	255	842	0	432	0	0	238
OH	12,941	7,381	8,719	8,888	5,866	4,244	15,165	8,464	8,518	9,786	7,950	6,324	4,721	6,675	6,487	7,953	6,273	5,239	6,280
OK	1,408	1,346	2,043	1,321	1,097	1,046	2,268	1,078	716	2,898	524	251	630	355	585	1,738	1,264	811	1,318
SD	275	0	0	769	580	0	219	0	1,521	84	0	0	41	63	21	340	0	257	117
TN	2,479	2,115	3,235	3,269	3,506	1,596	3,996	4,865	1,763	1,146	1,009	2,497	2,813	1,648	9,116	1,839	4,293	1,529	1,341
TX	8,510	9,209	7,922	11,479	9,498	8,216	5,434	3,940	3,775	1,775	2,109	5,757	2,985	2,715	6,002	6,038	2,576	764	2,727
WI	44,112	64,972	42,360	59,843	61,375	46,452	42,965	44,019	36,968	38,255	32,076	36,820	28,706	30,819	30,714	30,443	22,709	19,459	14,253
Central Region	394,591	322,823	268,056	336,183	391,236	222,274	270,680	226,939	217,829	208,455	177,684	199,895	229,559	183,731	164,419	178,975	162,540	147,814	103,041

Table 7. State and regional estimates of the number of duck stamp buyers that hunted American woodcock in the U.S., 1964-2001. Data from Martin (1979) and unpublished FWS administrative reports. Information was not available to reassign hunters from the District of Columbia to state of harvest.

State or Region	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
CT	3,129	3,554	3,388	3,874	4,450	6,161	7,286	5,366	5,006	5,731	5,390	5,908	5,987	6,209	5,614	4,836	5,173	5,574	3,749
DE	706	754	829	707	1,163	1,648	1,403	1,553	1,138	1,761	1,423	1,608	1,675	1,370	1,439	913	905	903	778
DC	91	183	197	166	157	228	180	347	195	143	204	237	93	321	199	100	73	96	76
FL	758	1,191	1,331	1,241	1,576	1,565	2,961	1,467	1,265	1,317	1,753	1,166	2,042	1,413	1,382	1,104	1,366	1,295	828
GA	812	771	820	1,295	1,429	1,116	1,558	2,220	1,872	1,488	2,084	1,584	1,428	1,933	1,746	1,927	2,091	1,731	1,509
ME	2,980	3,564	4,115	4,002	5,522	5,511	5,798	6,166	5,503	6,327	7,306	7,812	6,397	6,205	6,910	5,745	5,920	5,881	5,058
MD	1,407	1,484	1,462	2,122	2,551	2,982	3,252	3,047	2,013	2,827	3,084	2,899	3,675	2,584	3,115	2,752	2,117	3,259	2,037
MA	5,548	7,414	6,787	6,123	7,884	8,707	10,148	8,622	9,187	9,304	9,521	8,813	7,824	7,086	6,026	6,409	5,609	6,544	6,169
NH	1,594	2,187	2,128	2,275	2,613	3,478	2,973	3,935	3,388	3,152	4,253	4,380	4,761	4,379	4,448	4,244	3,526	3,823	2,967
NJ	3,462	4,120	4,525	5,229	5,815	7,367	7,728	9,969	6,925	8,696	8,459	7,433	8,337	7,188	8,227	6,209	4,983	4,997	3,993
NY	12,699	15,320	16,712	20,688	21,977	26,656	25,789	29,474	24,284	26,991	25,384	22,889	17,345	19,628	17,330	18,405	15,150	16,894	13,536
NC	1,735	1,313	2,169	1,843	2,138	2,033	2,748	2,458	2,337	2,298	3,007	2,526	2,857	2,373	2,815	1,716	2,470	3,011	2,676
PA	7,317	10,467	7,688	13,588	12,069	17,406	22,030	24,076	17,662	16,494	20,221	18,420	18,700	16,814	19,591	16,136	13,522	13,374	14,972
RI	382	429	492	420	483	704	794	1,064	729	936	1,075	801	990	629	763	772	397	516	578
SC	1,398	1,124	1,165	1,203	2,449	2,124	2,480	2,395	2,136	1,705	2,628	2,148	1,987	2,201	2,603	1,633	2,569	2,021	1,770
VT	1,017	876	1,608	1,374	1,578	1,606	1,859	2,211	1,731	2,512	2,376	2,437	2,782	1,791	2,460	2,060	2,197	2,322	2,152
VA	1,086	993	843	1,472	1,187	1,499	1,611	1,650	1,733	1,837	1,721	2,135	2,132	1,609	1,986	2,017	1,447	1,507	1,434
WV	93	206	197	304	314	252	482	389	688	318	425	387	457	492	501	551	513	464	564
Eastern Region	46,214	55,950	56,450	67,926	75,355	91,043	101,080	106,409	87,792	93,837	100,314	93,583	89,469	84,225	87,155	77,527	70,030	74,571	64,846
AL	828	760	1,424	1,272	1,571	1,701	1,449	1,032	1,585	1,161	1,191	1,648	1,459	1,703	1,406	1,244	1,067	761	798
AR	1,394	934	639	1,563	912	954	1,117	2,102	2,693	1,817	2,348	2,838	2,666	3,035	1,642	2,356	1,976	1,598	1,720
IL	1,328	1,410	1,454	1,797	1,347	3,283	2,483	3,406	4,205	2,989	4,544	3,521	4,108	3,912	6,729	4,437	4,340	3,883	3,711
IN	1,480	1,185	1,387	1,582	1,444	2,404	2,784	3,850	3,227	3,392	3,666	4,182	2,717	2,152	2,794	2,682	2,485	2,165	2,102
IA	570	204	121	380	170	176	452	426	1,374	1,485	2,138	1,554	2,619	3,011	4,110	2,089	2,443	1,742	1,463
KS	364	153	245	347	463	459	1,893	626	638	880	1,364	841	796	1,470	510	469	419	184	512
KY	224	221	351	260	293	259	354	491	429	704	775	1,221	1,249	904	1,750	1,182	706	932	872
LA	10,327	7,395	11,112	10,943	9,733	15,014	17,636	13,943	16,039	9,338	10,063	10,570	16,463	17,795	24,041	19,529	27,508	21,651	19,233
MI	23,631	20,886	20,480	22,323	17,711	22,586	29,894	29,190	28,312	30,922	33,455	36,622	30,685	23,151	20,271	19,878	17,000	14,650	14,406
MN	4,536	2,571	2,932	5,739	3,756	5,365	9,360	8,577	8,621	7,671	10,233	14,683	7,857	14,155	16,925	14,355	17,098	11,164	11,791
MS	1,422	811	1,337	1,722	848	1,894	2,195	1,959	2,486	2,365	2,120	2,762	2,864	2,579	2,683	2,168	2,544	2,100	1,424
MO	1,255	1,181	934	1,150	762	1,718	2,053	1,514	1,414	2,062	1,837	2,299	2,387	3,041	3,288	2,200	2,780	2,509	1,839
NE	207	95	56	81	33	168	172	92	163	236	271	219	270	357	564	278	325	387	435
ND	88	165	110	0	194	41	37	263	214	185	168	70	150	0	182	28	137	57	227
OH	5,357	3,403	2,958	3,662	3,561	5,620	5,268	6,046	4,524	4,791	6,052	6,011	5,623	4,971	3,678	4,469	4,770	4,513	4,490
OK	265	81	192	478	376	572	611	860	716	743	628	1,457	898	856	776	504	444	392	338
SD	33	26	45	137	32	84	46	45	41	31	37	135	67	46	31	47	73	81	87
TN	298	418	676	866	571	1,119	624	1,353	1,416	1,473	1,751	1,665	1,274	1,313	2,378	2,252	1,176	1,461	1,239
TX	1,799	897	1,578	1,407	875	2,215	1,753	2,066	2,016	1,892	1,976	2,891	3,176	3,730	2,556	2,612	3,068	1,591	1,824
WI	18,257	13,548	11,730	13,845	12,182	18,146	27,885	21,696	24,667	19,765	30,420	31,368	35,332	27,274	20,489	21,245	22,111	18,544	16,851
Central Region	73,663	56,344	59,761	69,554	56,834	83,778	108,066	99,537	104,780	93,902	115,037	126,557	122,660	115,455	116,803	104,024	112,470	90,365	85,362

Table 7. continued

State or Region	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
CT	4,385	4,168	3,390	3,089	3,687	2,867	2,958	3,278	3,016	2,717	1,916	2,021	1,929	1,571	1,470	849	1,305	738	1,353
DE	691	901	438	556	731	779	392	530	620	676	226	370	401	290	286	345	0	69	245
DC	0	123	49	39	74	64	33	56	45	78	60	52	48	62	74	63	50	63	53
FL	1,057	841	658	869	1,075	484	551	644	549	142	463	429	189	340	598	313	346	436	352
GA	1,901	1,898	1,312	1,313	1,311	1,041	1,036	1,105	838	463	1,217	883	837	1,135	758	1,318	586	1,025	1,045
ME	4,459	4,604	4,196	4,421	4,195	3,185	3,043	3,068	4,016	3,622	3,718	3,618	3,009	3,446	2,903	3,357	3,791	3,243	3,168
MD	2,512	2,877	3,147	2,589	2,842	2,121	1,365	1,260	1,494	1,438	1,125	1,159	1,161	891	607	650	855	1,020	1,382
MA	4,129	4,696	4,733	4,196	5,117	4,200	4,816	4,656	4,195	3,820	3,617	3,414	2,992	2,883	1,772	1,917	2,033	755	1,510
NH	2,460	2,196	2,380	2,495	2,433	2,178	2,029	2,402	1,666	1,888	1,652	1,788	1,511	1,710	1,031	1,343	956	1,184	1,083
NJ	4,411	3,755	3,274	2,242	2,743	2,482	2,672	2,575	1,793	1,246	2,378	1,970	1,298	1,024	1,269	1,154	1,282	927	1,046
NY	10,515	10,289	9,418	9,633	9,716	7,201	7,901	6,644	6,244	6,045	5,122	5,896	4,837	4,728	4,439	4,528	4,193	3,222	3,493
NC	2,066	2,068	1,885	1,871	1,809	1,319	1,752	1,634	1,855	1,284	1,172	1,482	1,017	1,397	1,192	1,302	1,529	1,114	1,209
PA	12,816	12,531	9,546	10,886	10,055	7,187	7,550	8,039	7,701	7,974	6,464	5,723	5,670	4,886	5,753	5,800	5,885	5,447	5,277
RI	619	500	478	381	567	448	404	415	420	345	262	366	269	292	174	120	221	124	187
SC	2,054	1,463	1,266	1,361	1,912	1,348	1,457	1,062	951	784	1,153	1,077	950	1,214	1,045	1,118	1,477	1,318	1,292
VT	1,828	1,977	1,629	1,838	1,977	1,838	1,299	1,439	1,485	1,257	840	1,144	1,300	1,388	950	576	941	853	920
VA	1,011	2,043	2,168	1,500	2,317	3,047	1,540	1,773	1,427	1,123	944	1,126	1,004	1,477	1,305	1,433	1,564	893	719
WV	543	365	213	361	203	115	197	158	104	125	71	74	158	189	142	69	119	87	212
Eastern Region	57,459	57,295	50,182	49,641	52,764	41,905	40,995	40,740	38,464	35,027	32,397	32,563	28,581	28,923	25,767	26,255	27,131	22,519	24,546
AL	675	900	731	523	605	565	730	334	337	488	250	202	331	284	374	430	323	355	400
AR	1,094	1,146	1,404	1,325	1,638	531	573	579	914	621	113	557	241	584	542	939	1,637	1,033	135
IL	2,938	2,757	2,533	2,496	3,078	1,636	2,913	2,976	3,575	3,084	2,118	2,161	1,831	1,324	1,846	1,433	1,417	1,418	1,655
IN	1,529	1,840	1,349	1,711	1,722	1,092	1,499	1,048	1,125	1,308	1,424	1,216	1,207	1,209	1,010	977	1,304	1,180	1,353
IA	1,546	1,177	1,622	1,412	1,957	845	1,506	1,268	1,292	1,313	489	733	1,060	923	1,244	1,188	721	1,172	772
KS	415	421	600	995	812	248	338	184	140	95	160	157	273	162	275	463	930	341	97
KY	858	1,095	698	935	746	504	910	922	704	613	569	722	909	882	311	589	839	181	891
LA	20,526	15,706	13,907	13,467	14,792	8,030	8,478	6,187	5,981	4,666	7,988	5,831	5,654	5,917	2,816	3,015	5,617	5,956	2,130
MI	12,642	15,620	13,888	14,214	14,563	12,022	14,296	15,990	16,445	14,780	16,547	16,407	18,503	16,988	16,789	17,174	17,539	15,158	12,961
MN	10,414	11,325	10,524	14,104	14,076	13,945	14,212	12,023	11,735	10,350	7,933	11,585	11,745	12,200	11,455	11,504	8,197	10,936	6,923
MS	1,394	1,652	1,116	1,227	828	702	676	486	417	457	330	250	574	228	639	436	177	848	917
MO	1,565	2,385	2,141	2,072	2,252	1,318	1,796	1,326	962	1,452	1,051	669	774	882	1,408	1,329	998	1,243	1,304
NE	737	407	374	509	507	353	260	297	177	216	282	349	185	395	400	259	196	447	396
ND	175	264	177	107	41	249	262	75	201	216	269	69	225	173	75	116	111	86	160
OH	4,188	3,591	3,879	3,348	3,350	2,889	4,189	3,069	3,075	3,974	3,080	2,604	2,617	2,865	3,600	3,137	2,503	2,413	3,221
OK	647	563	668	480	502	342	620	489	333	558	405	343	378	236	250	400	520	154	325
SD	132	57	27	173	137	0	125	46	129	62	0	0	85	57	76	133	0	103	95
TN	765	1,079	1,010	1,124	1,276	905	837	1,343	717	812	536	1,048	899	729	1,016	898	1,145	1,020	903
TX	1,931	2,352	1,502	2,011	2,264	1,432	1,519	1,336	1,288	712	969	1,272	318	860	1,453	1,062	734	1,020	1,720
WI	15,052	16,222	14,874	16,391	17,084	13,033	14,353	13,880	12,787	12,331	11,060	10,907	11,115	11,117	11,389	11,971	8,670	7,397	7,322
Central Region	79,223	80,559	73,024	78,624	82,230	60,641	70,092	63,858	62,334	58,108	55,573	57,082	58,924	58,015	56,968	57,453	53,578	52,461	43,680

Table 8. Preliminary state and regional estimates of woodcock hunter numbers, days afield, and harvest from the 2001-02 and 2002-03 Harvest Information Program survey.

	Active woodcock hunters		Days afield		Harvest	
	2001-02	2002-03	2001-02	2002-03	2001-02	2002-03
Eastern region						
CT	1,800 ± 41%	1,600 ± 37%	7,500 ± 46%	9,200 ± 67%	3,600 ± 62%	4,500 ± 39%
DE	400 ± 116%	500 ± 102%	5,200 ± 168%	900 ± 83%	200 ± 72%	500 ± 139%
FL	2,400 ± 133%	1,000 ± 184%	14,600 ± 159%	2,000 ± 187%	9,500 ± 194%	100 ± 138%
GA	3,600 ± 179%	2,600 ± 180%	40,500 ± 192%	5,600 ± 170%	11,000 ± 178%	600 ± 130%
ME	11,900 ± 40%	5,000 ± 54%	64,900 ± 51%	18,500 ± 46%	48,100 ± 56%	18,600 ± 71%
MD	700 ± 140%	600 ± 151%	1,500 ± 73%	1,100 ± 91%	1,700 ± 127%	600 ± 82%
MA	1,200 ± 33%	1,100 ± 34%	5,700 ± 36%	6,000 ± 36%	2,500 ± 36%	3,500 ± 31%
NH	2,000 ± 40%	1,500 ± 35%	9,900 ± 39%	7,500 ± 22%	6,700 ± 35%	5,600 ± 20%
NJ	600 ± 66%	1,000 ± 69%	2,300 ± 23%	5,100 ± 86%	2,200 ± 30%	2,900 ± 57%
NY	5,300 ± 37%	5,600 ± 36%	25,400 ± 41%	31,100 ± 47%	8,800 ± 55%	17,100 ± 62%
NC	4,900 ± 154%	900 ± 67%	25,700 ± 147%	8,800 ± 104%	12,300 ± 126%	1,900 ± 132%
PA	13,400 ± 45%	9,600 ± 44%	53,100 ± 52%	40,900 ± 57%	20,100 ± 52%	10,100 ± 40%
RI	300 ± 88%	200 ± 82%	900 ± 101%	800 ± 73%	300 ± 63%	600 ± 83%
SC	3,900 ± 92%	2,300 ± 129%	10,200 ± 107%	4,900 ± 122%	5,400 ± 171%	3,900 ± 163%
VT	900 ± 39%	1,200 ± 45%	4,700 ± 36%	6,900 ± 55%	3,100 ± 28%	2,000 ± 31%
VA	1,100 ± 128%	2,500 ± 86%	3,800 ± 108%	11,500 ± 96%	1,400 ± 30%	11,900 ± 176%
WV	500 ± 82%	100 ± 21%	1,800 ± 100%	500 ± 30%	1,600 ± 73%	700 ± 42%
Region	na [a]	na	277,800 ± 36%	161,200 ± 22%	138,100 ± 32%	84,800 ± 33%
Central region						
AL	2,800 ± 109%	3,400 ± 93%	11,400 ± 146%	16,800 ± 95%	6,600 ± 191%	10,100 ± 109%
AR	3,800 ± 131%	2,000 ± 172%	17,200 ± 166%	3,200 ± 113%	3,100 ± 132%	700 ± 112%
IA	2,500 ± 78%	1,500 ± 103%	14,800 ± 113%	7,300 ± 134%	10,300 ± 128%	3,500 ± 130%
IL	4,500 ± 81%	3,000 ± 90%	18,400 ± 82%	6,700 ± 86%	19,500 ± 112%	9,000 ± 111%
IN	1,800 ± 106%	1,700 ± 113%	6,800 ± 118%	24,300 ± 172%	2,800 ± 96%	7,000 ± 160%
KS	2,400 ± 110%	2,900 ± 96%	25,300 ± 113%	4,400 ± 111%	14,200 ± 138%	2,900 ± 137%
KY	1,900 ± 174%	2,000 ± 126%	9,700 ± 171%	14,600 ± 150%	7,800 ± 171%	6,800 ± 141%
LA	3,100 ± 139%	3,300 ± 148%	27,500 ± 155%	23,800 ± 166%	5,400 ± 59%	21,500 ± 138%
MI	19,500 ± 23%	25,400 ± 18%	96,500 ± 24%	157,100 ± 37%	73,700 ± 33%	78,900 ± 26%
MS	1,900 ± 133%	2,800 ± 187%	9,400 ± 154%	5,900 ± 179%	10,600 ± 129%	600 ± 64%
MN	14,400 ± 49%	8,200 ± 66%	55,600 ± 47%	48,100 ± 94%	46,400 ± 71%	8,600 ± 31%
MO	2,600 ± 101%	3,200 ± 125%	4,300 ± 89%	5,500 ± 115%	4,400 ± 114%	700 ± 40%
NE	< 50 ± 248%	< 50 ± 155%	100 ± 73%	200 ± 72%	100 ± 99%	200 ± 74%
OH	3,100 ± 135%	5,200 ± 108%	9,200 ± 93%	23,400 ± 137%	6,600 ± 87%	3,400 ± 43%
OK	< 50 ± 155%	2,500 ± 135%	200 ± 82%	6,300 ± 136%	100 ± 96%	2,600 ± 184%
TN	200 ± 177%	4,200 ± 187%	700 ± 195%	4,800 ± 165%	700 ± 195%	8,000 ± 196%
TX	10,400 ± 192%	28,700 ± 112%	12,800 ± 161%	67,000 ± 114%	5,300 ± 196%	38,300 ± 196%
WI	14,800 ± 32%	17,100 ± 31%	68,700 ± 34%	57,500 ± 26%	33,700 ± 38%	32,000 ± 33%
Region	na	na	388,600 ± 22%	476,800 ± 27%	251,400 ± 24%	235,100 ± 38%

[a] Regional estimates of hunter numbers cannot be obtained due to the occurrence of individual hunters being registered in the Harvest Information Program in more than one state.

Appendix 1. History of framework dates, season lengths, and daily bag limits for hunting American woodcock in the U.S. portion of the Eastern and Central Regions, 1918-2002.

Eastern Region				Central Region			
Year (s)	Outside dates	Season length	Daily bag limit	Year (s)	Outside dates	Season length	Daily bag limit
1918-26	Oct. 1 - Dec. 31	60	6	1918-26	Oct. 1 - Dec. 31	60	6
1927	Oct. 1 - Dec. 31	60	4	1927	Oct. 1 - Dec. 31	60	4
1928-39	Oct. 1 - Dec. 31	30	4	1928-39	Oct. 1 - Dec. 31	30	4
1940-47	Oct. 1 - Jan. 6	15	4	1940-47	Oct. 1 - Jan. 6	15	4
1948-52	Oct. 1 - Jan. 20	30	4	1948-52	Oct. 1 - Jan. 20	30	4
1953	Oct. 1 - Jan. 20	40	4	1953	Oct. 1 - Jan. 20	40	4
1954	Oct. 1 - Jan. 10	40	4	1954	Oct. 1 - Jan. 10	40	4
1955-57	Oct. 1 - Jan. 20	40	4	1955-57	Oct. 1 - Jan. 20	40	4
1958-60	Oct. 1 - Jan. 15	40	4	1958-60	Oct. 1 - Jan. 15	40	4
1961-62	Sep. 1 - Jan. 15	40	4	1961-62	Sep. 1 - Jan. 15	40	4
1963-64	Sep. 1 - Jan. 15	50	5	1963-64	Sep. 1 - Jan. 15	50	5
1965-66	Sep. 1 - Jan. 30	50	5	1965-66	Sep. 1 - Jan. 30	50	5
1967-69	Sep. 1 - Jan. 31	65	5	1967-69	Sep. 1 - Jan. 31	65	5
1970-71	Sep. 1 - Feb. 15	65	5	1970-71	Sep. 1 - Feb. 15	65	5
1972-81	Sep. 1 - Feb. 28	65	5	1972-90	Sep. 1 - Feb. 28	65	5
1982	Oct. 5 - Feb. 28	65	5	1991-96	Sep. 1 - Jan. 31	65	5
1983-84	Oct. 1 - Feb. 28	65	5	1997	*Sep. 20 - Jan. 31	45	3
1985-96	Oct. 1 - Jan. 31	45	3	1998	*Sep. 19 - Jan. 31	45	3
1997-01	Oct. 6 - Jan. 31	30	3	1999	*Sep. 25 - Jan. 31	45	3
2002	Oct. 1 - Jan. 31	30	3	2000	*Sep. 23 - Jan. 31	45	3
				2001	*Sep. 22 - Jan. 31	45	3
				2002	*Sep. 21 - Jan. 31	45	3

* Saturday nearest September 22.