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American Woodcock

Population Status, 2007

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AMERICAN WOODCOCK POPULATION STATUS, 2007

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Abstract: Singing-ground Survey data indicated that the numbers of displaying American woodcock (*Scolopax minor*) in the Eastern Region in 2007 declined 11.6% from 2006; however, the Central Region was unchanged. There was no significant trend in woodcock heard in either the Eastern or Central Region during 1997-07. This represents the fourth consecutive year that the 10-year trend estimate did not indicate a significant decline. There were long-term (1968-07) declines of 2.0% per year in the Eastern Region and 1.8% per year in the Central Region. The 2006 recruitment index for the U.S. portion of the Eastern Region (1.5 immatures per adult female) was 7% lower than the 2005 index, and 8% lower than the long-term regional average. The 2006 recruitment index for the U.S. portion of the Central Region (1.6 immatures per adult female) was 11% higher than the 2005 index, and 2% higher than the long-term regional average. The Harvest Information Program indicated that U.S. woodcock hunters in the Eastern Region spent 144,200 days afield and harvested 78,000 birds during the 2006-07 season. In the Central Region, U.S. hunters spent 344,300 days afield and harvested 232,600 woodcock.

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. The Singing-ground Survey (SGS) was developed to provide indices to changes in abundance. The Wing-collection Survey (WCS) provides annual indices to woodcock recruitment. The Harvest Information Program (HIP) utilizes a sampling frame of woodcock hunters to estimate harvest and days spent afield.

This report summarizes the results of these surveys and presents an assessment of the population status of woodcock as of early June 2007. 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.

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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 boundary between the 2 regions conforms to the boundary between the Atlantic and Mississippi Flyways. The results of the Wing-collection and Singing-ground surveys, as well as the Harvest Information Program, are reported by state or province, and region.

Singing-ground Survey

The SGS 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

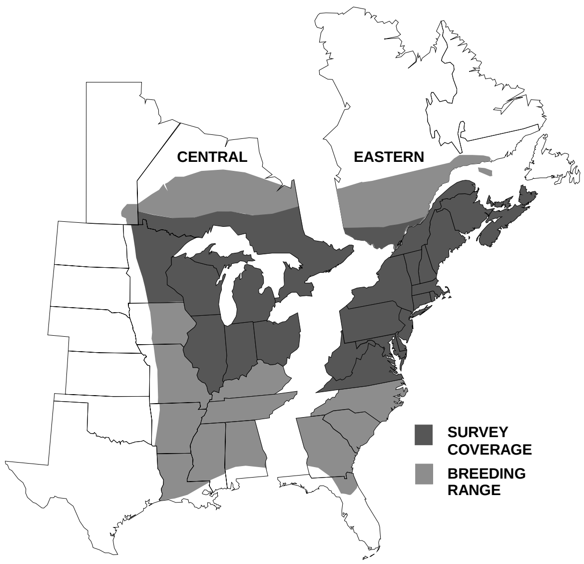

Fig. 1. Woodcock management regions, breeding range, and Singing-ground Survey coverage.

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.

Each route is 3.6 miles (5.4 km) long and consists of 10 listening points. The routes are surveyed shortly after sunset by an observer who drives to each of the 10 stops and records the number of woodcock heard peenting (the vocalization by displaying male woodcock on the ground). Acceptable dates for conducting the survey are 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) occurs earlier in the spring and local reproduction may already be underway when the survey is conducted. However, it is 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 are 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 SGS in more detail. Trends were estimated for each route using two different estimation techniques: 1) the traditional method of route-regression that solves a set of estimating equations, and 2) hierarchial log-linear modeling.

Estimating equations.—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 (2006-07), 10-year (1997-07) and long-term (1968-07) 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 2006-07 analysis, routes that did not meet this requirement during the interval of interest were not included in the sample. For the 2006-07 analysis, a constant of 0.1 was added to counts of low-abundance routes to allow their use in the analysis.

Each route was to 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 1 June 2007 were not included in this analysis but will be included in future trend estimates.

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 1968-2007 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).

Hierarchial modeling.— Sauer et al. (In Press) describe a hierarchical log-linear model for estimation of population change from SGS data. In this model, the log of the expected value of the counts is modeled as a linear combination of a route and observer effect, a year effect, a trend, a start-up effect on the route for first year counts of observers, and overdispersion. Most of these factors are treated as random effects, in that the regional estimates are assumed to follow a distribution. The hierarchical model is fit using Markov-chain Monte Carlo methods, an iterative process in which sequences of results over time converge to a series which follows the distribution of the parameters of interest. Once the convergence occurs, means, medians, and credible intervals for the parameters can be estimated from the replicates. Annual indices are defined as exponentiated year and trend effects, and trends are defined as ratios of the year effects at the start and end of the interval of interest, taken to the appropriate power to estimate a yearly change. See Sauer et al. (In Press) and Link and Sauer (2002) for a detailed description of the statistical model and fitting process.

In practice, this approach provides trend and annual index values that are generally comparable to the estimates provided by the earlier route regression approach. The hierarchical model, however, has a more rigorous and realistic theoretical basis than the weightings used in the route regression approach, and for the first time the indexes and trends are directly comparable as the same data are used to calculate each. With hierarchical model fit using Bayesian methods, it is customary to provide Bayesian Confidence intervals, also called Credible Intervals (CI), to describe uncertainty around the estimates. If the CI does not overlap 0 for a trend estimate, the trend is called significant (Sauer et al.; In Press). We present the median and percentile credible intervals of 10,000 estimates, which were calculated after an initial 325,000 iterations to allow the series' to converge.

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 (Mail Questionnaire 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 providing 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.

Wing-collection Survey

The Wing-collection Survey (WCS) was incorporated into a national webless migratory gamebird 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 WCS is to provide data on the reproductive success of woodcock. The survey is administered as a cooperative effort between woodcock hunters, the FWS and state wildlife agencies. Participants in the 2006 survey included hunters who either: (1) participated in past surveys; (2) were a subset of hunters that indicated on the HIP survey that they hunted woodcock, or (3) contacted the FWS to volunteer to be included in the survey. 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 conducted by state, federal, and private biologists. Information from wings from the 2006-07 hunting season received through 1 March 2007 was included in analyses. Wings received after 1 March were processed for inclusion in the permanent database.

The ratio of immature birds per adult female in the harvest provides an index to recruitment of young into the population. The 2006 recruitment index for each state with ≥125 submitted wings was calculated as the number of immatures per adult female. The regional indices for 2006 were weighted by the relative contribution of each state to the cumulative number of adult female and immature wings received during 1963-2005.

RESULTS AND DISCUSSION

Singing-ground Survey

Estimating equations.— The number of woodcock heard displaying during the 2007 SGS in the Eastern Region declined 11.6% from 2006 levels; however, the Central Region was unchanged (Table 1, Fig. 2). Trends for individual states and provinces are reported in Table 1 (see also Fig. 3).

Trends for 1997-2007 were computed for 363 routes in the Eastern Region and 383 routes in the Central Region. Eastern and Central Region populations were unchanged during this period (Table 1). This represents the fourth consecutive year that the 10-year trend estimate did not indicate a significant decline.

Long-term (1968-2007) trends were estimated for 635 routes in the Eastern Region and 635 routes in the Central Region. There were long-term declines in the breeding population throughout most states and provinces in the Eastern and Central Regions (Table 1, Fig. 4). The long-term trend estimates were -2.0 and -1.8% per year for the Eastern and Central regions, respectively.

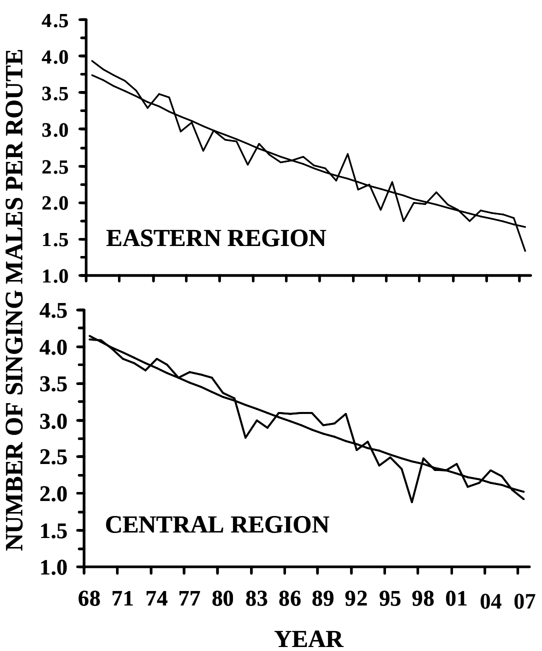

Fig. 2. Long-term trends (smooth line) and annual indices of the number of woodcock heard on the Singing-ground Survey, 1968-2007.

Annual Breeding Population Indices.—In the Eastern Region, the 2007 breeding population index of 1.34 singing-males per route was lower than the predicted value of 1.67 (Table 2, Fig. 2). The Central Region population index of 1.93 males per route was lower than the predicted value of 2.03.

Hierarchial modeling.— For the first time, we present results of trend estimation using hierarchial modeling. It is our intent for the next several years to provide results for both estimation methods to assess comparability.

The number of woodcock heard displaying during the 2007 SGS in the Eastern and Central Regions were unchanged from 2006 levels. Trends for individual states and provinces are reported in Table 3.

Eastern and Central Region populations were unchanged during 1997-2007 (Table 4). There were long-term (1968-2007) declines in the breeding population throughout most states and provinces in the Eastern and Central Regions (Table 5). The long-term trend estimates were -1.1 and -0.9% per year for the Eastern and Central regions, respectively.

In general, trends from hierarchial modeling for the 3 time periods examined were similar to those from the estimating equations method (Tables 3-5). With the exception of the one year trend for the Eastern Region (Table 3), indication of significance in trends was similar for the 2 methods. Similarly, the directionality of the point estimates of trend estimates for the 2 methods was similar; except for the 1997-2007 period (both trends non-significant; Table 4).

Wing-collection Survey

A total of 1,980 potential woodcock hunters in states with woodcock seasons were contacted and asked to participate in the 2006 Wing-collection Survey. Sixty three percent (Table 6) cooperated by sending in 14,312 usable woodcock wings (Table 7).

Recruitment.— The 2006 recruitment index in the U.S. portion of the Eastern Region (1.5 immatures per adult female) was 7% lower than the 2005 index (1.6), and 8% lower than the long-term (1963-05) regional average (Table 7, Fig 5; percent change calculated using un-rounded estimates). In the Central Region, the 2006 recruitment index (1.6 immatures per adult female) was 11% higher than the 2005 index (1.5), but was similar to the long-term regional average.

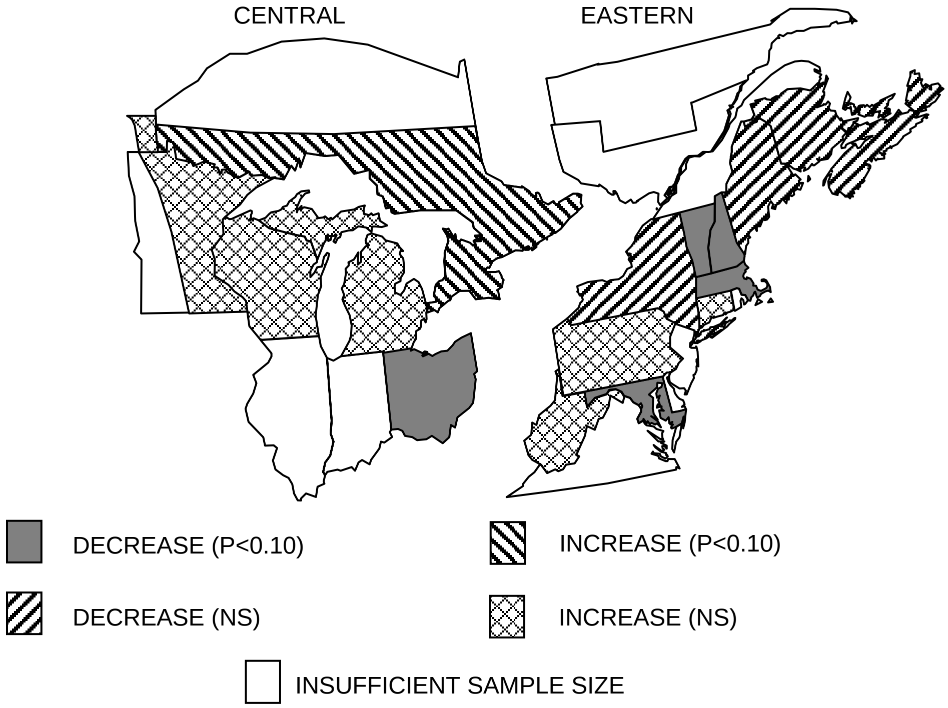

Fig. 3. Short-term trends in the number of American woodcock heard on the Singing-ground Survey, 2006-2007, as determined by the estimating equations method.

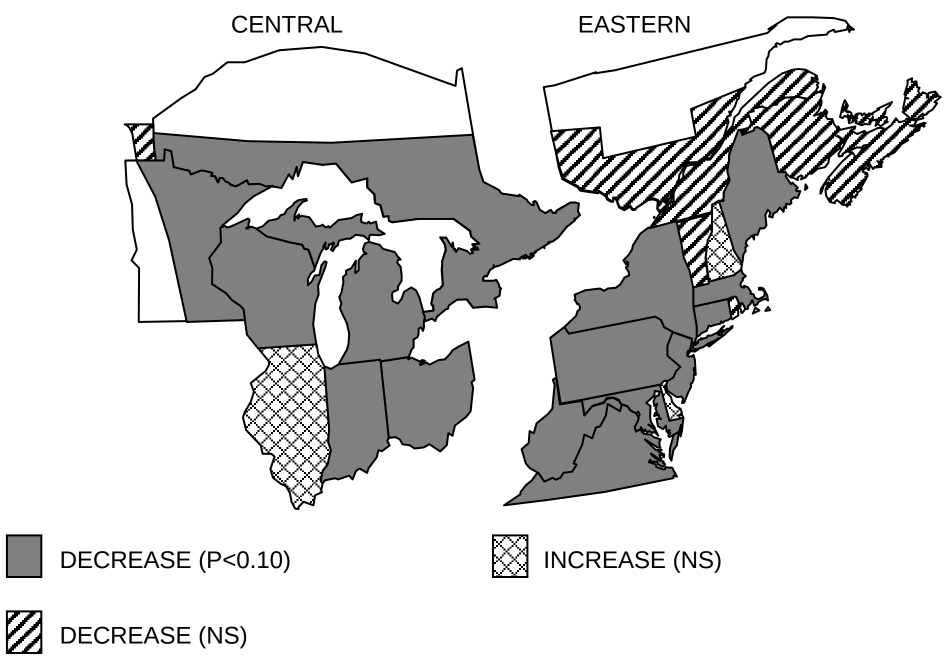

Fig. 4. Long-term trends in the number of American woodcock heard on the Singing-ground Survey, 1968-2007, as determined by the estimating equations method.

Harvest Information Program

Estimates of woodcock harvest, number of active hunters, days afield, and seasonal hunting success from the 2006-07 HIP survey are provided in Table 8. In the Eastern Region woodcock hunters spent approximately 144,200 days afield and harvested 78,000 birds during 2006-07. Woodcock hunters in the Central Region spent approximately 344,300 days afield and harvested 232,600 birds during the 2006-07 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 being registered for HIP in more than one state. Therefore, regional estimates of seasonal hunting success rates cannot be determined on a per hunter basis.

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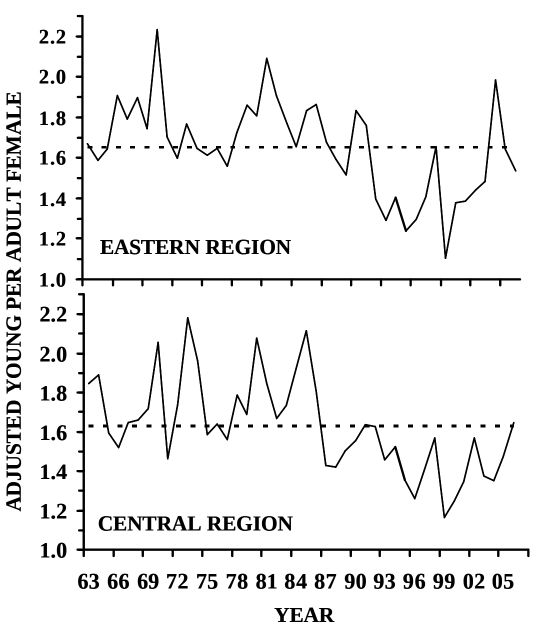

Fig. 5. Weighted annual indices of recruitment (U.S.), 1963-2006. The dashed line is the 1963-2005 average.

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Table 1. Trends (% change per year[a]) in the number of American woodcock heard in the Singing-ground Survey during 1968-2007, as determined by the estimating equations technique (Link and Sauer 1994).

State, Province, or Region	Number of routes[b]	2006-2007				1997-2007				1968-2007			
		n[c]	% change	90% CI		n	% change	90% CI		n	% change	90% CI	
CT	4	2	36.7	-2.2	75.6	4	-6.1	-38.9	26.8	9	-10.3 **[d]	-17.0	-3.7
DE	2	0				2	-17.6	-27.2	-8.0	2	2.8	-8.6	14.2
ME	43	23	-4.2	-24.9	16.4	51	-1.0	-2.7	0.6	67	-2.0 ***	-2.8	-1.1
MD	6	2	-56.1**	-62.1	-50.1	5	-6.3	-33.3	20.6	21	-9.4 **	-16.3	-2.6
MA	8	3	-59.1**	-70.5	-47.8	8	-2.2	-8.9	4.4	20	-4.5 *	-8.5	-0.4
NB	46	25	-7.2	-21.1	6.6	59	2.3**	0.8	3.9	69	-0.5	-1.6	0.5
NH	16	10	-35.4**	-55.6	-15.2	14	-2.3	-5.5	0.9	18	0.6	-1.6	2.9
NJ	5	0				5	-16.7	-34.3	0.9	17	-8.9 ***	-10.7	-7.1
NY	67	38	-16.0	-32.1	0.2	75	-1.9	-4.2	0.4	110	-2.6 ***	-3.8	-1.5
NS	36	16	-8.1	-30.9	14.6	45	-1.2	-4.4	2.0	60	-0.5	-2.1	1.0
PA	32	11	0.3	-31.5	32.1	27	-2.6	-6.4	1.1	58	-3.4 ***	-5.3	-1.6
PEI	9	5	-21.4	-55.2	12.4	7	-4.3	-14.3	5.7	12	-1.5	-3.2	0.2
QUE	7	0				17	2.5	-4.0	9.1	56	-1.4	-4.5	1.7
RI	0	0				0				2	-16.4	-24.0	-8.7
VT	14	9	-34.8***	-48.7	-20.9	17	-1.7	-5.5	2.0	22	-0.7	-2.4	0.9
VA	24	0				10	-24.2**	-37.8	-10.5	47	-11.7 ***	-15.3	-8.2
WV	23	3	34.6	-12.9	82.1	17	-6.8	-14.6	1.1	45	-2.7 ***	-4.2	-1.1
Eastern	342	149	-11.6**	-20.5	-2.6	363	-0.8	-1.8	0.2	635	-2.0 ***	-2.6	-1.5
IL	10	0				5	18.5	-19.7	56.6	25	24.4	-6.7	55.6
IN	20	0				8	-14.0	-27.1	-1.0	39	-7.4 **	-12.3	-2.5
MB[e]	10	5	20.4	-14.6	55.4	23	2.9	-1.2	7.0	23	-1.9	-4.8	0.9
MI	105	71	4.5	-7.3	16.3	111	-1.4	-3.2	0.4	148	-1.7 ***	-2.5	-0.9
MN	70	37	1.6	-12.3	15.5	77	0.6	-1.7	2.9	102	-0.9 *	-1.8	-0.1
OH	35	9	-49.7**	-76.1	-23.2	26	-1.2	-10.4	8.1	57	-6.7 ***	-9.4	-3.9
ON	38	9	27.8*	4.0	51.6	59	1.8	-1.3	4.9	138	-1.8 ***	-2.5	-1.1
WI	61	39	12.7	-4.1	29.4	74	0.8	-1.4	2.9	103	-1.8 ***	-2.5	-1.2
Central	349	172	4.7	-2.5	12.0	383	0.0	-1.1	1.1	635	-1.8 ***	-2.2	-1.4
Continent	691	321	-0.2	-6.0	5.5	746	-0.3	-1.1	0.5	1270	-1.9 ***	-2.2	-1.6

[a] Mean of weighted route trends within each state, province or region. To estimate the total percent change over several years, use: $(100((\% \text{ change}/100)+1)^{y})-100$ 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 2007 for which data were received by 1 June.

[c] Number of comparable routes (2006 versus 2007) 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/provinces where $n<10$.

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

Table 2. Breeding population indices for American woodcock from the Singing-ground Survey, 1968-2007. These indices are based on the 1968-2007 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	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Eastern Region																				
CT[a]	--[b]	9.12	9.10	7.05	8.60	6.28	6.09	6.46	3.53	4.12	2.49	2.48	2.17	2.94	3.64	2.79	1.84	1.57	2.28	1.06
DE[a]	0.57	0.44	0.52	0.37	0.44	0.73	0.68	1.14	0.36	0.48	0.46	0.39	--[b]	--[b]	--[b]	1.56	0.58	0.58	--[b]	--[b]
ME	4.89	5.05	5.31	4.84	4.56	4.94	4.91	5.27	4.62	4.18	3.92	4.27	3.73	4.12	2.84	3.64	3.66	3.72	3.86	4.22
MD	8.95	7.97	7.1	6.68	5.64	6.24	4.62	4.93	3.35	3.24	3.47	2.76	3.44	2.93	2.92	1.97	1.59	1.61	1.41	1.15
MA	--[b]	4.14	4.86	5.68	4.17	5.60	4.52	2.61	3.45	2.66	3.09	3.38	2.43	2.47	2.11	1.56	2.76	2.16	2.17	2.22
NB	--[b]	5.48	5.83	5.75	6.00	5.34	5.92	6.72	4.95	6.17	4.41	4.91	4.40	4.48	4.60	4.82	3.96	4.25	3.58	4.27
NH	--[b]	2.72	3.14	2.55	3.21	2.5	3.43	2.92	3.61	2.98	3.00	3.07	3.73	3.90	2.30	2.68	2.39	2.53	4.31	3.09
NJ	6.56	5.73	7.24	8.96	5.45	7.7	7.73	5.79	3.72	4.1	2.39	4.1	2.52	1.97	2.05	2.34	2.77	2.03	2.02	2.33
NY	5.17	5.7	4.38	4.95	4.64	4.69	4.93	4.14	4.08	4.21	3.34	3.77	4.35	3.94	3.22	3.72	2.99	3.78	3.22	2.96
NS	3.71	2.69	2.29	2.82	2.70	2.61	3.26	2.80	2.47	2.54	2.96	2.34	2.28	2.11	1.89	2.32	2.2	2.25	2.61	2.25
PA	3.20	3.02	3.33	2.83	2.59	2.88	2.09	2.35	2.31	2.28	1.86	2.12	1.93	1.95	1.63	1.86	1.98	1.57	1.75	1.73
PEI[a]	--[b]	3.99	2.98	5.50	3.21	2.57	3.42	5.21	4.36	3.85	3.08	3.82	2.83	2.13	2.25	3.57	4.09	2.97	3.91	2.74
QUE[a]	--[b]	--[b]	--[b]	4.54	4.29	3.26	3.88	3.90	2.70	2.99	3.66	3.71	4.08	3.20	3.14	3.93	3.04	3.71	3.53	3.72
RI[a]	--[b]	4.38	4.37	8.21	6.19	6.19	4.62	3.58	3.58	--[b]	1.19	2.06	2.06	1.19	4.86	3.39	2.92	0.97	0.97	--[b]
VT	--[b]	2.20	3.73	2.91	3.28	2.91	2.88	3.41	3.1	3.73	2.88	2.79	2.53	2.26	1.71	2.51	2.59	2.05	2.61	2.88
VA	--[b]	7.05	7.31	5.82	5.01	3.56	5.22	4.42	3.6	3.35	2.56	2.79	2.35	2.24	2.10	1.55	2.27	1.13	1.17	1.19
WV	1.54	1.70	1.23	1.20	1.46	1.17	1.12	1.29	1.13	1.15	0.79	1.15	0.95	1.31	1.15	1.19	0.98	0.93	0.90	1.04
Region	3.93	3.82	3.74	3.66	3.53	3.29	3.48	3.43	2.97	3.09	2.71	2.98	2.85	2.83	2.52	2.80	2.66	2.55	2.58	2.63
Central Region																				
IL	--[b]	--[b]	0.01	0.01	0.01	0.02	0.02	0.04	0.03	0.04	0.04	0.05	0.06	0.10	0.08	0.12	0.15	0.26	0.22	0.33
IN	3.51	3.02	2.84	2.18	2.60	2.64	1.89	1.77	1.71	1.63	1.44	1.77	1.28	1.31	0.96	1.00	0.97	0.79	1.04	0.75
MB	--[b]	--[b]	--[b]	--[b]	--[b]	--[b]	--[b]	--[b]	--[b]	--[b]	--[b]	--[b]	--[b]	--[b]	--[b]	--[b]	--[b]	--[b]	--[b]	--[b]
MI	6.56	6.40	6.09	5.88	5.57	5.71	6.62	6.65	6.12	5.60	5.91	5.81	5.72	4.79	5.06	4.41	4.85	5.08	5.14	4.77
MN	--[b]	4.71	4.06	4.38	3.73	4.25	4.95	4.3	4.33	4.3	4.32	4.27	4.74	4.36	3.94	3.6	3.22	3.85	4.06	3.88
OH	--[b]	--[b]	4.24	4.3	3.59	2.97	3.81	2.85	3.07	3.5	2.76	2.14	2.1	2.38	1.69	2.13	1.95	1.67	1.3	1.4
ON	6.58	7.19	6.8	6.48	7.18	6.36	6.8	5.97	5.71	6.21	6.71	6.42	6.54	6.07	4.58	4.75	4.97	5.12	5.04	5.25
WI	4.45	4.39	4.74	4.22	4.02	4.09	4.20	4.07	3.89	4.22	4.43	4.36	3.72	3.16	3.11	3.12	3.41	3.14	3.71	3.71
Region	4.10	4.09	3.98	3.83	3.77	3.67	3.83	3.75	3.57	3.65	3.62	3.57	3.37	3.30	2.76	2.99	2.89	3.10	3.08	3.10
Continent	3.99	3.94	3.84	3.73	3.63	3.47	3.64	3.58	3.25	3.35	3.12	3.26	3.10	3.06	2.64	2.90	2.77	2.81	2.82	2.86

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

[b] Insufficient data.

Table 2. Continued.

State, Province or Region	Year 1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Eastern Region																				
CT[a]	2.66	1.11	0.96	1.02	0.70	0.57	0.71	0.92	0.83	0.73	0.70	1.51	1.02	0.38	0.34	0.33	0.30	0.26	0.24	0.25
DE[a]	--[b]	--[b]	0.78	0.39	0.24	--[b]	--[b]	--[b]	0.85	0.85	1.55	0.45	1.01	0.45	0.73	0.73	0.73	0.73	0.73	0.73
ME	4.01	4.11	2.83	3.58	2.87	3.22	2.84	3.03	2.32	2.56	2.4	3.07	3.08	2.54	2.45	2.65	2.65	2.82	2.60	2.33
MD	1.20	1.36	1.10	0.90	0.39	0.71	0.71	0.43	0.61	0.69	0.31	0.43	0.52	0.84	0.39	0.28	0.27	0.21	0.26	0.27
MA	2.23	1.76	1.61	1.93	1.60	1.34	1.53	1.16	1.42	1.51	1.40	2.19	1.47	1.30	1.31	1.39	1.64	0.96	1.19	0.81
NB	4.61	5.99	4.73	4.53	4.24	5.65	5.52	4.66	4.17	5.16	4.22	5.37	4.93	5.21	4.23	5.22	5.08	4.99	4.59	4.28
NH	3.05	3.14	2.74	3.55	2.15	2.73	2.2	4.57	3.49	3.79	3.59	4.67	3.12	3.17	3.48	3.81	4.88	3.9	4.09	2.73
NJ	1.78	1.74	1.19	1.17	0.91	0.84	0.4	0.98	1.16	0.24	0.90	0.85	0.77	0.73	0.48	0.56	0.27	0.36	0.31	0.34
NY	3.46	2.68	3.21	3.46	2.96	2.35	2.38	2.49	2.33	2.30	2.37	2.32	2.13	2.20	2.00	2.06	2.25	1.99	2.02	1.66
NS	2.43	2.66	1.84	2.38	2.47	2.70	2.03	2.49	2.51	1.98	2.31	2.33	2.72	2.50	2.04	2.18	2.35	2.17	1.91	2.22
PA	1.72	1.26	1.70	1.89	1.41	1.46	0.78	1.44	1.15	1.26	1.39	1.10	0.72	0.96	1.01	1.03	0.95	1.07	0.84	0.91
PEI[a]	4.43	4.21	3.43	2.55	2.45	2.30	2.34	2.81	3.19	2.70	3.06	2.05	2.94	2.92	0.87	1.35	1.38	2.54	3.04	2.87
QUE[a]	2.77	3.93	2.93	5.17	3.33	3.80	2.99	3.50	1.27	2.47	2.66	3.21	2.68	2.38	2.57	2.46	2.66	3.34	3.16	0.57
RI[a]	1.46	1.46	--[b]	0.27	--[b]	--[b]	--[b]	--[b]	--[b]	0.07	--[b]	--[b]	--[b]	--[b]	0.07	0.02	0.03	0.02	0.04	--[b]
VT	3.41	3.21	3.07	3.02	1.97	2.15	2.16	2.38	1.81	2.4	2.65	2.70	3.58	2.39	1.95	2.25	2.18	2.64	2.41	2.18
VA	0.78	0.68	0.70	0.67	0.47	0.60	0.40	0.30	0.27	0.37	0.27	0.27	0.23	0.18	0.18	0.16	0.16	0.14	0.13	0.11
WV	0.83	0.82	0.90	0.82	0.81	0.73	0.64	1.06	0.69	0.77	0.65	0.71	0.83	0.66	0.56	0.72	0.57	0.54	0.54	0.62
Region	2.51	2.47	2.30	2.67	2.18	2.25	1.90	2.28	1.75	2.00	1.98	2.14	1.97	1.90	1.75	1.89	1.86	1.84	1.79	1.34
Central Region																				
IL	0.34	0.42	0.37	0.57	0.78	0.94	1.00	0.91	3.06	1.37	--[b]	2.12	3.11	5.70	3.77	6.27	9.19	8.58	12.46	8.26
IN	0.66	0.67	0.74	0.76	0.55	0.63	0.53	0.56	0.47	0.35	0.7	0.47	0.39	0.42	0.24	0.26	0.30	0.31	0.23	0.19
MB	--[b]	--[b]	--[b]	--[b]	3.16	4.16	3.05	3.44	3.08	1.8	2.31	2.13	2.36	3.05	1.85	2.49	1.95	2.77	1.88	2.54
MI	5.22	4.96	4.83	5.65	4.07	4.08	3.71	3.99	3.81	3.7	4.41	3.54	3.72	3.48	3.61	3.64	3.67	3.65	3.28	3.00
MN	4.35	3.77	4.36	4.08	3.45	3.69	3.22	3.51	3.17	2.79	3.44	3.44	3.66	3.89	2.87	3.1	3.14	3.42	3.09	3.06
OH	1.65	1.13	1.47	1.16	0.97	1.00	0.84	0.86	0.90	0.63	0.69	0.51	0.60	0.56	0.51	0.50	0.73	0.61	0.52	0.32
ON	5.17	5.46	5.14	5.09	4.89	4.38	3.82	4.7	3.42	3.95	3.93	3.7	4.59	3.73	5.85	3.45	3.66	3.76	3.69	4.14
WI	3.71	3.44	3.34	3.4	2.72	2.66	2.48	2.49	2.6	2.43	2.38	2.86	2.61	2.3	2.18	2.33	2.27	2.55	2.21	2.36
Region	3.09	2.93	2.95	3.08	2.59	2.71	2.38	2.49	2.34	1.88	2.48	2.33	2.32	2.4	2.09	2.15	2.32	2.24	2.05	1.93
Continent	2.79	2.70	2.61	2.89	2.39	2.48	2.14	2.40	2.04	1.94	2.23	2.25	2.15	2.15	1.92	2.03	2.10	2.05	1.93	1.63

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

Table 3. Comparison of American woodcock trend estimates for 2006-2007, derived from hierarchial modeling and estimating equations methods.

State, Province, or Region	n	Hierarchial Modeling % change	Credible interval[a]		Estimating Equations % change	90% CI[b]	
CT	2	-3.0	-35.3	60.3	36.7	-2.2	75.6
DE	0	-0.4	-86.7	610.5	na[c]		
ME	23	-6.7	-23.4	14.1	-4.2	-24.9	16.4
MD	2	-4.6	-26.9	23.9	-56.1**	-62.1	-50.1
MA	3	-7.4	-40.2	23.4	-59.1**	-70.5	-47.8
NB	25	-7.1	-25.7	15.7	-7.2	-21.1	6.6
NH	10	-9.9	-37.7	12.8	-35.4**	-55.6	-15.2
NJ	0	-6.6	-44.0	58.6	na		
NY	38	-5.3	-19.1	8.3	-16.0	-32.1	0.2
NS	16	1.9	-14.9	26.5	-8.1	-30.9	14.6
PA	11	-0.6	-19.6	26.5	0.3	-31.5	32.1
PEI	5	-3.7	-36.4	36.5	-21.4	-55.2	12.4
QUE	0	-4.9	-37.9	26.0	na		
RI	0	-12.2	-62.8	110.6	na		
VT	9	-18.6	-45.0	17.1	-34.8***	-48.7	-20.9
VA	0	-3.9	-33.4	45.0	na		
WV	3	-1.3	-19.5	28.4	34.6	-12.9	82.1
Eastern	149	-5.7	-19.3	6.1	-11.6**	-20.5	-2.6
IL	0	-22.4	-68.5	71.1	na		
IN	0	-4.0	-45.7	70.7	na		
MB	5	3.6	-26.0	54.9	20.4	-14.6	55.4
MI	71	-1.5	-13.5	12.3	4.5	-7.3	16.3
MN	37	2.6	-13.0	21.3	1.6	-12.3	15.5
OH	9	-13.1	-38.5	6.4	-49.7**	-76.1	-23.2
ON	9	12.7	-8.9	41.4	27.8*	4.0	51.6
WI	39	13.2	-5.8	35.8	12.7	-4.1	29.4
Central	172	3.8	-6.5	15.6	4.7	-2.5	12.0
Continent	321	-1.0	-9.4	7.3	-0.2	-6.0	5.5

[a] Credible interval: if the interval overlaps zero, the trend is considered non-significant.

[b] 90% confidence interval; * P<0.10, ** P<0.05, *** P <0.01

[c] Not available; estimating equations requires at least 2 comparable routes to estimate trend.

Table 4. Comparison of American woodcock trend estimates for 1997-2007, derived from hierarchial modeling and estimating equations methods.

State, Province, or Region	n	Hierarchial Modeling % change	Credible interval[a]		Estimating Equations % change	90% CI[b]	
CT	4	-4.4	-8.6	1.0	-6.1	-38.9	26.8
DE	2	-2.5	-22.6	15.2	-17.6	-27.2	-8.0
ME	51	-0.4	-2.5	1.9	-1.0	-2.7	0.6
MD	5	-4.0	-6.8	-0.7	-6.3	-33.3	20.6
MA	8	-2.6	-6.0	1.1	-2.2	-8.9	4.4
NB	59	0.4	-2.0	2.8	2.3**	0.8	3.9
NH	14	-1.3	-5.1	1.2	-2.3	-5.5	0.9
NJ	5	-5.8	-10.4	0.7	-16.7	-34.3	0.9
NY	75	-1.3	-2.8	0.3	-1.9	-4.2	0.4
NS	45	-0.4	-2.3	2.0	-1.2	-4.4	2.0
PA	27	-1.4	-3.6	1.2	-2.6	-6.4	1.1
PEI	7	-1.7	-5.5	2.3	-4.3	-14.3	5.7
QUE	17	0.1	-3.4	3.4	2.5	-4.0	9.1
RI	0	-12.1	-21.2	-2.3	na[c]		
VT	17	-0.9	-4.8	3.1	-1.7	-5.5	2.0
VA	10	-5.9	-10.0	-2.4	-24.2**	-37.8	-10.5
WV	17	-2.9	-5.2	-0.4	-6.8	-14.6	1.1
Eastern	363	-0.5	-1.8	0.9	-0.8	-1.8	0.2
IL	5	1.8	-6.9	11.1	18.5	-19.7	56.6
IN	8	-3.3	-8.6	2.6	-14.0	-27.1	-1.0
MB	23	-0.1	-4.4	5.2	2.9	-1.2	7.0
MI	111	-0.7	-2.1	0.7	-1.4	-3.2	0.4
MN	77	1.5	-0.4	3.6	0.6	-1.7	2.9
OH	26	-2.2	-4.7	0.4	-1.2	-10.4	8.1
ON	59	1.1	-1.2	3.8	1.8	-1.3	4.9
WI	74	1.7	-0.4	4.0	0.8	-1.4	2.9
Central	383	0.7	-0.4	1.8	0.0	-1.1	1.1
Continent	746	0.1	-0.7	1.0	-0.3	-1.1	0.5

[a] Credible interval: if the interval overlaps zero, the trend is considered non-significant.

[b] 90% confidence interval; * P<0.10, ** P<0.05, *** P <0.01

[c] Not available; estimating equations requires at least 2 comparable routes to estimate trend.

Table 5. Comparison of American woodcock trend estimates for 1968-2007, derived from hierarchial modeling and estimating equations methods.

State, Province, or Region	n	Hierarchial Modeling % change	Credible interval[a]		Estimating Equations % change	90% CI[b]	
CT	9	-4.5	-6.7	-2.2	-10.3 **	-17.0	-3.7
DE	2	-1.3	-7.6	4.7	2.8	-8.6	14.2
ME	67	-1.5	-2.1	-0.8	-2.0 ***	-2.8	-1.1
MD	21	-4.0	-5.6	-2.2	-9.4 **	-16.3	-2.6
MA	20	-2.5	-3.7	-1.3	-4.5 *	-8.5	-0.4
NB	69	-1.1	-2.1	-0.2	-0.5	-1.6	0.5
NH	18	-0.5	-1.8	0.8	0.6	-1.6	2.9
NJ	17	-6.3	-7.9	-4.4	-8.9 ***	-10.7	-7.1
NY	110	-1.5	-2.0	-1.0	-2.6 ***	-3.8	-1.5
NS	60	-1.1	-1.9	-0.3	-0.5	-2.1	1.0
PA	58	-1.7	-2.5	-0.8	-3.4 ***	-5.3	-1.6
PEI	12	-1.4	-2.9	0.2	-1.5	-3.2	0.2
QUE	56	0.0	-1.5	1.4	-1.4	-4.5	1.7
RI	2	-11.6	-17.5	-5.9	-16.4	-24.0	-8.7
VT	22	-0.8	-2.1	0.4	-0.7	-2.4	0.9
VA	47	-5.2	-6.4	-4.0	-11.7 ***	-15.3	-8.2
WV	45	-2.8	-3.7	-1.8	-2.7 ***	-4.2	-1.1
Eastern	635	-1.1	-1.6	-0.6	-2.0 ***	-2.6	-1.5
IL	25	1.9	-1.4	5.1	24.4	-6.7	55.6
IN	39	-4.3	-5.9	-2.8	-7.4 **	-12.3	-2.5
MB	23	-2.8	-5.6	0.3	-1.9	-4.8	0.9
MI	148	-1.1	-1.6	-0.7	-1.7 ***	-2.5	-0.9
MN	102	0.0	-0.7	0.7	-0.9 *	-1.8	-0.1
OH	57	-2.4	-3.4	-1.5	-6.7 ***	-9.4	-3.9
ON	138	-0.4	-1.1	0.3	-1.8 ***	-2.5	-1.1
WI	103	-0.5	-1.1	0.2	-1.8 ***	-2.5	-1.2
Central	635	-0.9	-1.2	-0.5	-1.8 ***	-2.2	-1.4
Continent	1270	-0.9	-1.2	-0.6	-1.9 ***	-2.2	-1.6

[a] Credible interval: if the interval overlaps zero, the trend is considered non-significant.

[b] 90% confidence interval; * P<0.10, ** P<0.05, *** P <0.01

Table 6. Distribution of U.S. hunters contacted and number of hunters that submitted woodcock wings in the 2005 and 2006 Wing-collection Surveys.

State of residence	Number of hunters contacted[a]		Number of hunters that submitted wings[b]		Percent that submitted wings	
	2005	2006	2005	2006	2005	2006
AL	7	2	0	1	0	50
AR	2	2	1	1	50	50
CT	45	60	27	37	60	62
DE	3	1	0	0	0	0
FL	16	10	1	1	6	10
GA	10	7	5	5	50	71
IL	38	32	18	22	47	69
IN	47	40	31	24	66	60
IA	11	23	7	11	64	48
KS	4	7	1	1	25	14
KY	8	3	3	2	38	67
LA	28	33	18	20	64	61
ME	123	111	73	79	59	71
MD	22	18	12	15	55	83
MA	154	145	90	94	58	65
MI	368	280	257	201	70	72
MN	167	172	98	113	59	66
MS	7	2	2	0	29	0
MO	19	30	15	20	79	67
NE	5	6	1	0	20	0
NH	70	82	44	54	63	66
NJ	70	67	38	29	54	43
NY	183	205	114	122	62	60
NC	9	9	6	5	67	56
ND	1	3	1	1	100	33
OH	48	47	32	30	67	64
OK	6	2	0	0	0	0
PA	105	129	61	79	58	61
RI	15	10	7	6	47	60
SC	36	27	9	11	25	41
TN	10	7	4	3	40	43
TX	8	2	1	0	13	0
VT	70	72	54	47	77	65
VA	52	35	19	20	37	57
WV	30	34	15	23	50	68
WI	182	265	132	178	73	67
Total	1,979	1,980	1,197	1,255	60	63

[a] Number of hunters that were sent new envelopes and asked to participate in the survey year indicated. The definition of "number of hunters contacted" differs from status reports published prior to 2004. Numbers in this table refer only to hunters that were sent wing envelopes in the respective survey year. Status reports prior to 2004 defined "number of hunters contacted" as any woodcock hunter that had ever been contacted to participate in the survey.

[b] Number of hunters that submitted envelopes in current year. This number may include a small number of hunters that we sent envelopes to in prior years and who subsequently submitted wings from birds shot in current survey year.

Table 7. Number of woodcock wings received from hunters, and indices of recruitment in the U.S. Recruitment indices for individual states with ≥125 submitted wings were calculated as the ratio of immatures per adult female. The regional indices for 2006 were weighted by the relative contribution of each state to the cumulative number of adult female and immature wings received during 1963-2005.

State or Region of harvest	Wings received: Total 1963-05	Total 2006	Adult females 1963-05	Adult females 2006	Immatures 1963-05	Immatures 2006	Recruitment index 1963-05	Recruitment index 2006
Eastern Region								
CT	13,470	169	2,986	28	8,267	108	2.8	3.9
DE	439	6	60	1	307	5	5.1	
FL	660	3	150	1	410	2	2.7	
GA	3,053	25	935	13	1,326	2	1.4	
ME	77,145	1,110	22,753	337	38,545	556	1.7	1.6
MD	4,002	60	1,001	14	2,234	33	2.2	
MA	21,092	605	6,461	206	10,360	279	1.6	1.4
NH	30,069	845	9,664	314	13,956	349	1.4	1.1
NJ	25,350	236	5,851	62	14,985	135	2.6	2.2
NY	55,016	1,403	18,368	536	25,350	533	1.4	1.0
NC	3,229	47	966	15	1,600	26	1.7	
PA	29,291	684	9,239	237	13,526	315	1.5	1.3
RI	2,321	28	435	8	1,565	12	3.6	
SC	2,635	128	795	40	1,234	51	1.6	1.3
VT	22,677	828	7,349	287	10,505	357	1.4	1.2
VA	4,487	137	1,117	46	2,523	49	2.3	1.1
WV	5,537	166	1,692	44	2,784	85	1.6	1.9
Region	300,473	6,480	89,822	2,189	149,477	2,897	1.7	1.5
Central Region								
AL	911	3	244	1	425	1	1.7	
AR	522	4	165	1	214	3	1.3	
IL	1,387	19	326	0	776	13	2.4	
IN	7,453	181	1,883	56	4,130	78	2.2	1.4
IA	1,058	68	351	8	468	52	1.3	
KS	45	0	9	0	23	0		
KY	1,126	3	269	1	588	2	2.2	
LA	30,223	513	6,788	109	19,534	360	2.9	3.3
MI	111,991	3,023	36,438	970	55,540	1,443	1.5	1.5
MN	31,845	1,235	10,945	405	14,123	562	1.3	1.4
MS	1,725	0	490	0	878	0	1.8	
MO	3,283	179	851	50	1,632	73	1.9	1.5
NE	13	0	5	0	6	0		
ND	2	0	2	0	0	0		
OH	14,266	106	4,350	36	6,750	44	1.6	
OK	172	0	38	0	91	0	2.4	
TN	1,060	11	269	5	543	4	2.0	
TX	990	0	262	0	503	0	1.9	
WI	68,201	2,487	22,439	865	32,878	1,112	1.5	1.3
Region	276,273	7,832	86,124	2,507	139,102	3,747	1.6	1.6

Table 8. Preliminary estimates of woodcock harvest, hunter numbers, days afield, and hunter success from the 2006-07 Harvest Information Program survey.

	Harvest		Active woodcock hunters		Days afield		Seasonal harvest per hunter	
Eastern Region	Total	± 95% CI	Total	± 95% CI	Total	± 95% CI	Total	± 95% CI
CT	3,504	39	1,257	27	5,523	33	2.8	48
DE	274	93	168	101	465	64	1.6	138
FL	194	151	1,075	178	2,150	178	0.2	234
GA	461	105	1,410	172	5,605	173	0.3	201
ME	15,585	31	7,822	23	33,243	34	2.0	39
MD	2,033	117	770	121	1,787	105	2.6	169
MA	3,052	31	1,327	23	5,931	23	2.3	39
NH	5,900	31	1,550	34	6,794	24	3.8	46
NJ	1,417	41	721	47	2,775	56	2.0	62
NY	10,231	30	4,375	23	18,664	29	2.3	38
NC	4,552	126	1,601	118	6,404	120	2.8	172
PA	18,371	63	10,140	33	36,563	38	1.8	71
RI	0		177	134	532	134	0.0	
SC	6,146	96	2,316	88	8,363	111	2.7	131
VT	2,361	32	799	33	3,361	40	3.0	46
VA	3,069	101	1,601	69	5,286	98	1.9	122
WV	884	58	250	52	768	47	3.5	78
Region	78,033	21	na[a]		144,217	18	na	
Central Region								
AL	300	86	150	66	375	84	2.0	108
AR	2,892	146	2,970	110	6,827	143	1.0	182
IL	2,171	160	1,973	87	8,944	115	1.1	182
IN	2,403	69	1,000	58	4,377	75	2.4	90
IA	1,470	77	2,122	54	4,302	59	0.7	94
KS	68	89	299	185	329	168	0.2	205
KY	343	104	131	45	909	86	2.6	113
LA	19,045	68	3,968	65	10,908	66	4.8	94
MI	116,216	27	30,017	14	155,333	17	3.9	30
MN	38,738	41	14,934	24	60,160	31	2.6	47
MS	647	131	1,212	128	3,866	145	0.5	183
MO	411	52	1,530	96	3,771	118	0.3	109
NE	78	93	585	133	667	117	0.1	162
OH	4,060	51	2,249	68	9,764	67	1.8	85
OK	26	141	522	189	568	174	0.0	235
TN	730	115	139	95	799	104	5.3	149
TX	0		0		0			
WI	42,958	25	19,390	22	72,365	25	2.2	33
Region	232,557	17	na		344,262	12	na	
U.S. Total	310,590	14	na		488,479	10	na	

[a]Regional estimates of hunter numbers and hunter success 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 federal framework dates, season lengths, and daily bag limits for hunting American woodcock in the U.S. portion of the Eastern and Central Regions, 1918-2006.

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
2002-06	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
				2003	*Sep. 20 - Jan. 31	45	3
				2004	*Sep. 25 - Jan. 31	45	3
				2005	*Sep. 24 - Jan. 31	45	3
				2006	*Sep. 23 - Jan. 31	45	3

* Saturday nearest September 22.