

U. S. Fish and Wildlife Service

# Mourning Dove

## Population Status, 2006



**Cover photograph: Mourning Dove by Jim Matthews**

**Suggested citation:**

Dolton, D.D. and R.D. Rau. 2006. Mourning dove population status, 2006. U.S. Fish and Wildlife Service, Laurel, Maryland, USA.

Available on the web at: <http://www.fws.gov/migratorybirds/reports/reports.html>

# MOURNING DOVE POPULATION STATUS, 2006

DAVID D. DOLTON, U.S. Fish and Wildlife Service, Division of Migratory Bird Management, PO Box 25486 DFC, Denver, CO 80225-0486

REBECCA D. RAU, U.S. Fish and Wildlife Service, Division of Migratory Bird Management, Patuxent Wildlife Research Center, 11510 American Holly Dr., Laurel, MD 20708-4002

*Abstract:* This report includes Mourning Dove Call-count Survey information gathered over the last 41 years within the conterminous United States. Between 2005 and 2006, the average number of doves heard per route did not change significantly in the Eastern Management Unit, decreased significantly in the Central Unit, and increased significantly in the Western Unit. Over the most recent 10 years, no significant trend was indicated for doves heard in either the Eastern or Western Management Units while the Central Unit showed a significant decline. Over the 41-year period, all 3 units exhibited significant declines. In contrast, for doves seen over the 10-year period, a significant increase was found in the Eastern Unit while no trends were found in the Central and Western Units. Over 41 years, no trend was found for doves seen in the Eastern and Central Units while a significant decline was indicated for the Western Unit.

The mourning dove (*Zenaidura macroura*) is a migratory bird, thus, authority and responsibility for its management is vested in the Secretary of the Interior. This responsibility is conferred by the Migratory Bird Treaty Act of 1918 which, as amended, implements migratory bird treaties between the United States and other countries. Mourning doves are included in the treaties with Great Britain (for Canada) and Mexico. These treaties recognize sport hunting as a legitimate use of a renewable migratory bird resource. In recent years, less than 6% of the fall population of mourning doves was estimated to have been harvested annually. As one of the most abundant species in both urban and rural areas of North America, it is familiar to millions of people. Maintenance of mourning dove populations in a healthy, productive state is a primary management goal. To this end, management of doves includes assessment of population status, regulation of harvest, and habitat management. Call-count surveys are conducted annually in the 48 conterminous states by state, federal, local, and tribal biologists to monitor mourning dove populations. The resulting information on status and trends is used by wildlife administrators in setting annual hunting regulations.

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.

## DISTRIBUTION AND ABUNDANCE

Mourning doves breed from the southern portions of Canada throughout the United States into Mexico, Bermuda, the Bahamas and Greater Antilles, and scattered locations in Central America (Fig. 1). While mourning doves winter throughout much of the breeding range, the majority winter in the southern United States, Mexico, and south through Central America to western Panama (Aldrich 1993, Mirarchi and Baskett 1994).

The mourning dove is one of the most widely distributed and abundant birds in North America (Peterjohn et al. 1994, Fig. 1). Although not known precisely, the fall population for the United States was estimated to be about 475 million in the 1970's (Dunks et al. 1982, Tomlinson et al. 1988).

## POPULATION MONITORING

The Mourning Dove Call-count Survey (CCS) was developed to provide an annual index to population size (Dolton 1993). This survey is based on work by McClure (1939) in Iowa. Field studies demonstrated the feasibility of the survey as a method for detecting annual changes in mourning dove breeding populations (Foote and Peters 1952). In the United States, the survey currently includes more than 1,000 randomly selected routes, stratified by physiographic region. The total number of doves heard on each route is used to determine trends in populations and is used to develop an index to population size during the breeding season.

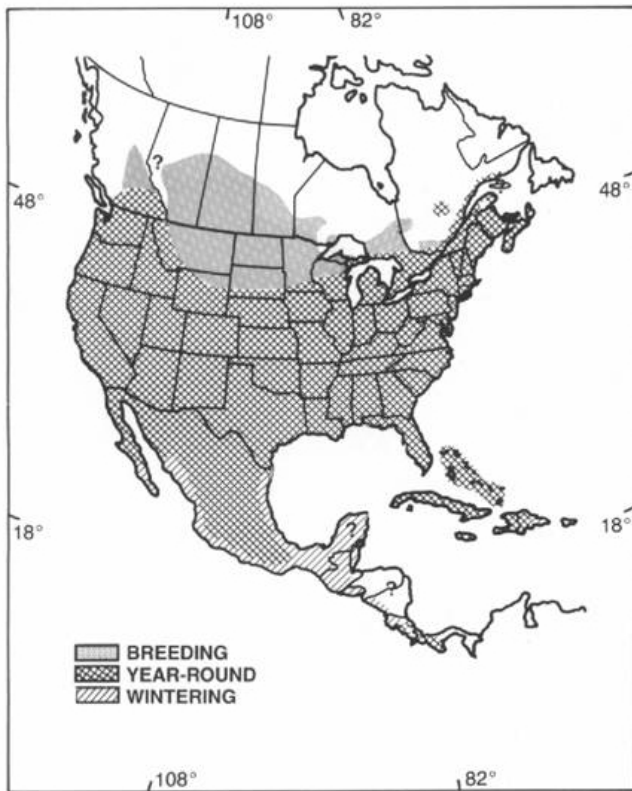


Fig. 1. Breeding and wintering ranges of the mourning dove (adapted from Mirarchi and Baskett 1994).

Indices for doves seen are also presented in this report, but only as supplemental information for comparison with indices of doves heard. Even though both the numbers of doves heard and seen are counted during the survey, they are recorded separately.

Within the United States, there are 3 zones that contain mourning dove populations that are largely independent of each other (Kiel 1959). These zones encompass the principal breeding, migration, and U.S. wintering areas for each population. As suggested by Kiel (1959), these 3 areas were established as separate management units in 1960 (Kiel 1961). Since that time, management decisions have been made within the boundaries of the Eastern (EMU), Central (CMU), and Western (WMU) Management Units (Fig. 2).

The EMU was further divided into 2 groups of states for analyses. States permitting dove hunting were combined into one group and those prohibiting dove hunting into another. Wisconsin became a hunting state for the first time in 2003 while Minnesota became a hunting state in 2004. Additionally, some states were grouped to increase sample sizes. Maryland and Delaware were combined; Vermont, New Hampshire, Maine, Massachusetts,

Connecticut, and Rhode Island were combined to form a New England group. Due to its small size, Rhode Island, which is a hunting state, was included in this nonhunting group of states for analysis.

## METHODS

### The Call-count Survey

Each call-count route is usually located on secondary roads and has 20 listening stations spaced at 1-mile intervals. At each stop, the number of doves heard calling, the number seen, and the level of disturbance (noise) that impairs the observer's ability to hear doves are recorded. The number of doves seen while driving between stops is also noted.

Counts begin one-half hour before sunrise and continue for about 2 hours. Routes are run once between 20 May and 5 June. Intensive studies in the eastern United States (Foote and Peters 1952) indicated that dove calling is relatively stable during this period. Surveys are not conducted when wind velocities exceed 12 miles per hour or when it is raining.

### Estimation of Population Trends

A population trend is defined as an interval-specific rate of change. For two years, the change is the ratio of the dove population in an area in one year to the population in the preceding year. For more than 2 years of data, the trend is expressed as an average annual rate of change. A trend was first estimated for each route by numerically 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 or see doves. The reported sample sizes are the number of routes on which a given trend estimate is based. This number 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 at least one observer for a route to be used. Routes that did not meet this requirement during the interval of interest were not included in the sample size. State and management unit trends were obtained by calculating a mean of all route trends weighted by land area, within-route variance in counts, and density (mean numbers of doves counted on each route). Variances of state and management unit trends were estimated by bootstrapping route trends (Geissler and Sauer 1990).

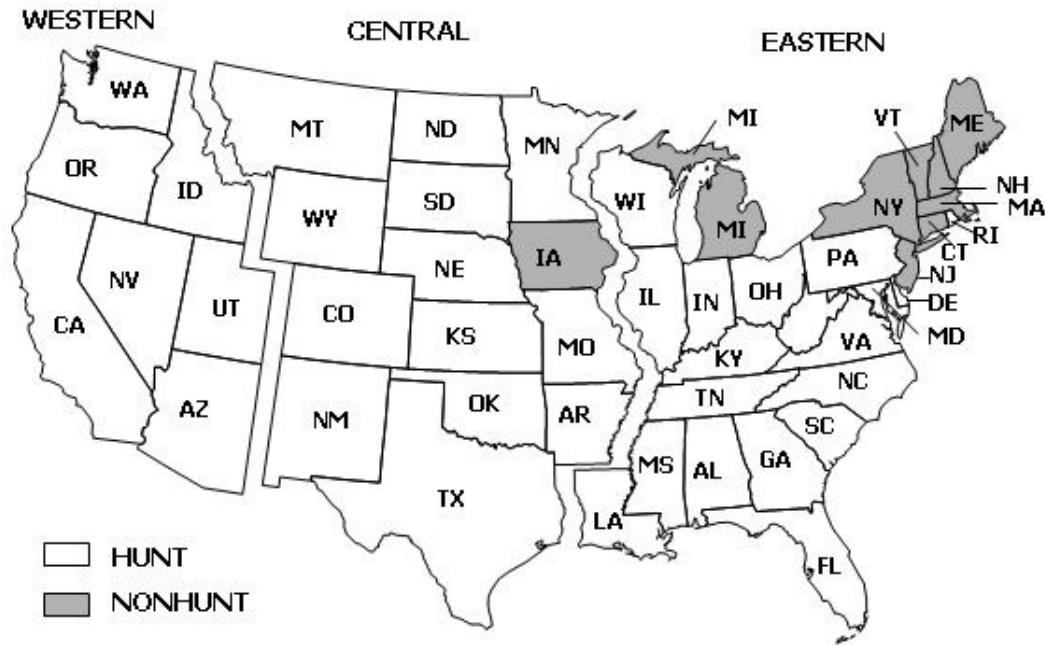


Fig. 2. Mourning dove management units with 2005 hunting and nonhunting states.

The annual change, or trend, for each area in doves heard over the most recent 2- and 10-year intervals and for the entire 41-year period were estimated. Additionally, trends in doves seen were estimated over the 10- and 41-year periods as supplemental information for comparison.

For purposes of this report, statistical significance was defined as  $P < 0.05$ , except for the 2-year comparison where  $P < 0.10$  was used because of the low power of the test. Significance levels are approximate for states with less than 10 routes.

### Estimation of Annual Indices

Annual indices show population fluctuations about fitted trends (Sauer and Geissler 1990). The estimated indices were determined for state and management units by finding the deviation between observed counts on a route and those predicted from the area trend estimate. These residuals were averaged by year for all routes in the area of interest. To adjust for variation in sampling intensity, residuals were weighted by the land area of the physiographic regions within each state. These weighted average residuals were then added to the fitted trend for the area to produce the annual index of abundance. This method of determining indices superimposes yearly variation in counts on the long-term fitted trend. These indices should provide an accurate representation of the fitted trend for regions that are adequately sampled by survey routes. Since the indices are adjusted for observer

differences and trend, the index for an area may be quite different from the actual count. In order to estimate the percent change from 2005 to 2006, a short-term trend was calculated. The percent change estimated from this short-term trend analysis is the best estimator of annual change. Attempts to estimate short-term trends from the breeding population indices (which were derived from residuals of the long-term trends) will yield less precise results. The annual index value incorporates data from a large number of routes that are not comparable between the two years 2005 and 2006, i.e., routes not run by the same observers. Therefore, the index is much more variable than the trend estimate.

In a separate analysis, the mean number of doves heard calling per route in 2006 was calculated for each state or groups of states. In contrast to the estimated annual indices presented in Table 3 (which illustrate population changes over time based on the regression line), the estimated densities shown in Figs. 3, 7, and 11 illustrate the average actual numbers of doves heard per route in 2005 and 2006.

## RESULTS

### Eastern Management Unit

The Eastern Management Unit includes 27 states comprising 30% of the land area of the contiguous

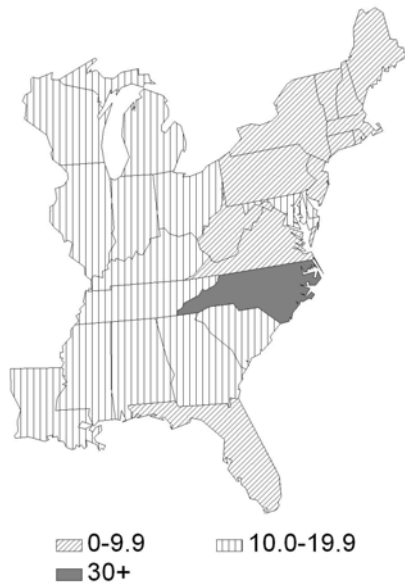


Fig. 3. Mean number of mourning doves heard per route by state in the Eastern Management Unit, 2005-2006.

United States. Dove hunting is permitted in 19 states, representing 80% of the land area of the unit (Fig. 2).

*2005-2006 Population Distribution.*—North Carolina had the highest count in the Unit with an average of 39 actual doves heard per route over the 2 years (Fig. 3). Florida, Pennsylvania, Virginia, West Virginia, the North Atlantic states, New Jersey, and New York averaged <10 per route. All other states had mean counts in the range of 10-20 doves heard per route.

*2005 to 2006 Population Changes.*—The average number of doves heard per route in this Unit did not change significantly (2.4%) (Table 1). The index also did not change significantly between years in the combined hunting states (0.0%), but increased significantly in the combined nonhunting states (18.3%).

The 2006 population index of 16.3 doves heard per route for the Unit is slightly above the predicted count based on the long-term estimate of 15.7 (Fig. 4, Table 3). In the hunting states, the index of 17.0 is also above the predicted estimate of 16.4 and, in the nonhunting states, the index of 13.3 is above the predicted estimate of 12.7.

The number of doves heard increased significantly in North Carolina while it decreased significantly in Indiana, Louisiana, and South Carolina (Table 1). No significant changes were detected for the other states.

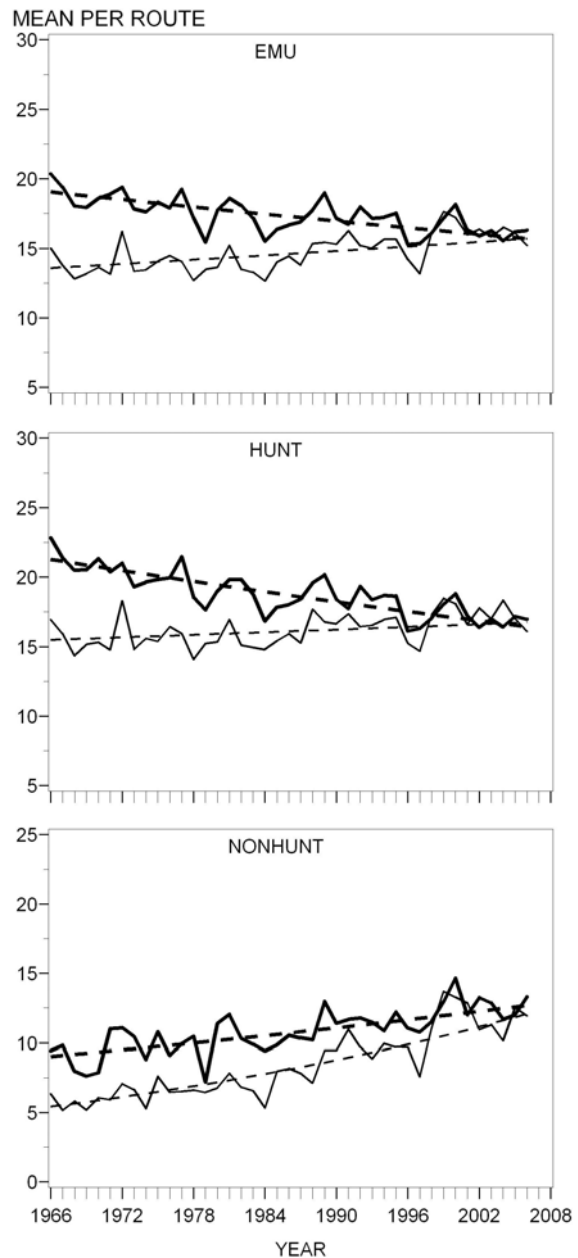


Fig. 4. Population indices and trends of breeding mourning doves in the Eastern Management Unit (EMU), combined EMU hunting states (HUNT), and combined nonhunting states (NONHUNT), 1966-2006. Heavy solid line = doves heard; light solid line = doves seen. Light and heavy dashed lines = predicted trends.

*Population Trends: 10 and 41-year.*—Over the most recent 10 years, there was no significant trend in either of the 2 groups of combined states or the Unit as a whole (Table 1). For the 41-year period, a declining trend was found in both the combined hunting states and the Unit while no trend was indicated for the combined nonhunting states. Annual indices both for doves heard

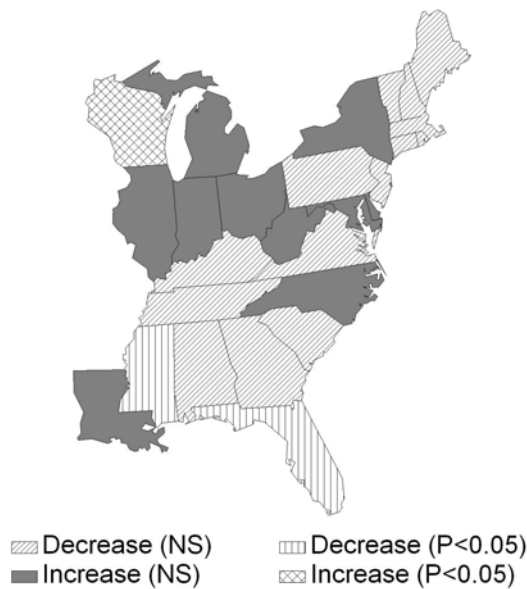


Fig. 5. Trends in number of mourning doves heard per route by state in the Eastern Management Unit, 1997-2006.

and seen are shown in Fig. 4. In contrast to doves heard, an analysis of doves seen over 10 years indicated a significant increasing trend for both combinations of states and the Unit (Table 2). Over 41 years, a significant increase was detected for the combined nonhunting states; no trend was shown for the combined hunting states or the Unit (Table 2).

State population trends for doves heard are shown in Fig. 5 (10-year interval) and Fig. 6 (41-year interval) and Table 1. Over 10 years, an increase was found for Wisconsin while Florida and Mississippi showed declines. Between 1966 and 2006, an increase was noted in New England while a downward trend was noted in Georgia, Indiana, Mississippi, Ohio, South Carolina, and Tennessee.

### Central Management Unit

The Central Management Unit consists of 14 states, containing 46% of the land area of the contiguous United States. It has the highest population index of the 3 Units.

Within the Unit, dove hunting is permitted in 13 states (Fig. 2).

*2005-2006 Population.*—North Dakota and Kansas had the highest actual average number of doves heard per route over the 2 years (38 and 32, respectively) (Fig. 7). Historically, these states often have the highest average counts in the Nation (Table 3). Missouri, Montana, and

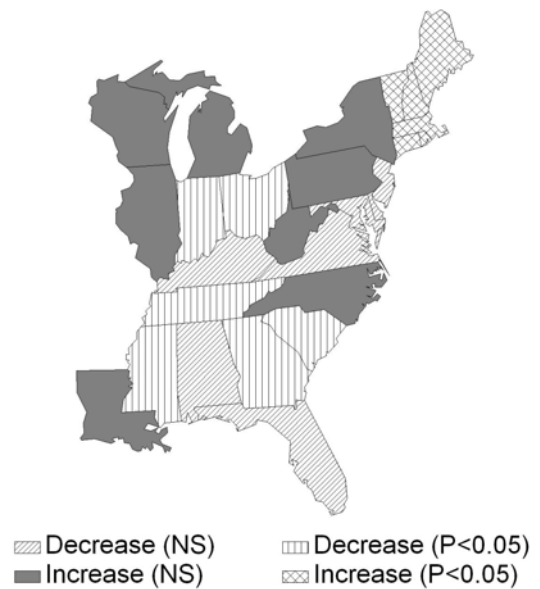


Fig. 6. Trends in the number of mourning doves heard per route by state in the Eastern Management Unit, 1966-2006.

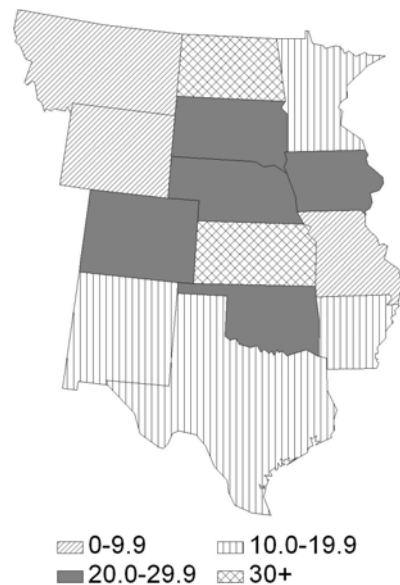


Fig. 7. Mean number of mourning doves heard per route by state in the Central Management Unit, 2005-2006.

Wyoming were the only states with less than 10 doves per route. The remaining states had intermediate values (Fig. 7).

*2005 to 2006 Population Changes.*—The average number of doves heard per route in the Unit decreased significantly between the 2 years (-10.9%) (Table 1). The 2006 index for the Unit of 21.1 doves heard per route is similar to the predicted long-term trend estimate

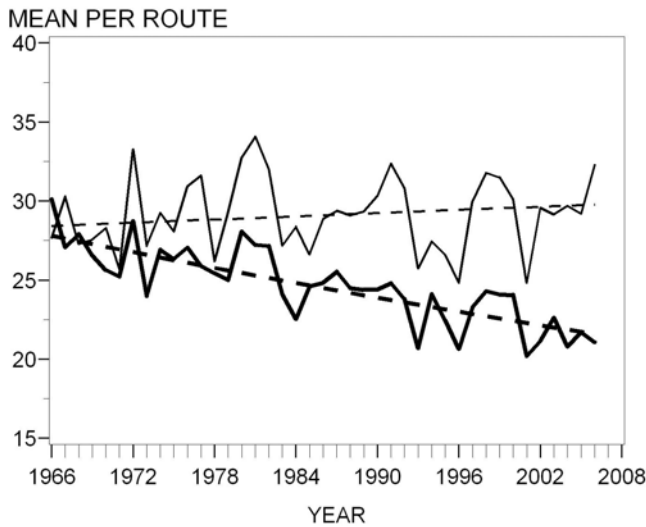


Fig. 8. Population indices and trends of breeding mourning doves in the Central Management Unit, 1966-2006. Heavy solid line = doves heard; light solid line = doves seen. Light and heavy dashed lines = predicted trends.

of 21.6 (Fig. 8, Table 3). The population decreased significantly in North Dakota and Texas; no significant increases were found in any of the other states (Table 1).

*Population Trends: 10 and 41-year.*—A significant decline in doves heard was indicated for the Unit over both the short and long-term periods (Table 1). In contrast, trends in doves seen were not significant for either time period (Table 2).

State trends in doves heard over 10 years are illustrated in Fig. 9 and Table 1. Iowa showed an increase while Texas had a decline during this time. Fig. 10 portrays trends over 41 years. No significant increase was found in doves heard for any state, but a significant downward trend was found in Colorado, Missouri, and Nebraska (Table 1).

### Western Management Unit

Seven states comprise the Western Management Unit and represent 24% of the land area of the contiguous United States. All states within the unit permit mourning dove hunting (Fig. 2).

*2005-2006 Population Distribution.*—Arizona, California, and Washington averaged 19, 10, and 11 actual doves heard per route, respectively (Fig. 11). The other states in the Unit averaged < 10 birds per route.

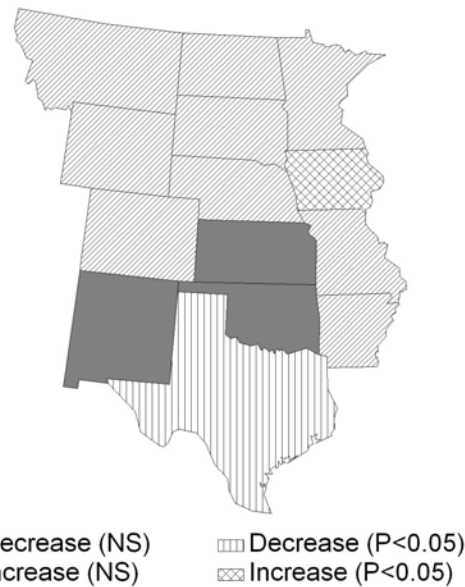


Fig. 9. Trends in number of mourning doves heard per route by state in the Central Management Unit, 1997-2006.

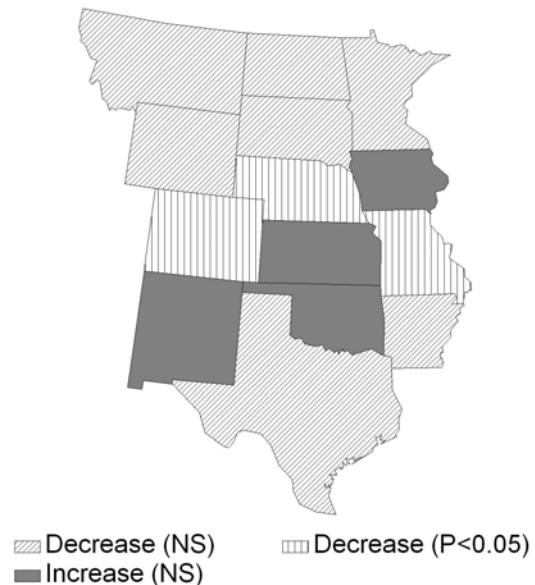


Fig. 10. Trends in mourning doves heard per route by state in the Central Management Unit, 1966-2006.

*2005 to 2006 Population Changes.*—The average number of doves heard per route increased significantly between years (24.1%; Table 1). The 2006 population index of 10.5 doves heard per route is above the predicted count of 8.5 based on the long-term trend estimate (Fig. 12, Table 3). The number of doves heard per route increased significantly in Nevada and Utah, and decreased significantly in Washington (Table 1). No significant differences were found in other states.





Fig. 11. Mean number of mourning doves heard per route by state in the Western Management Unit, 2005-2006.

*Population Trends: 10 and 41-year.*—Unit-wide, no significant trend in numbers of doves heard was indicated over the most recent 10 years although a significant decline was apparent over 41 years (Table 1). Analyses of doves seen gave the same pattern of results (Table 2).

Trends by state are illustrated in Figs. 13 and 14, and Table 1. Oregon showed a significant increase over 10 years while no state showed a decline. All states in the Unit except Idaho and Washington have a significant decline between 1966 and 2006.

### Breeding Bird Survey Results

There has been considerable discussion about utilizing the North American Breeding Bird Survey (BBS) as a measure of mourning dove abundance. Consequently, we are including 1966-05 BBS trend information in this report to allow comparisons to those from CCS results over the same time period (Dolton and Rau 2005) for consistency in intervals of years. Sauer et al. (1994) discussed the differences in the methodology of the 2 surveys. The BBS is based on 24.5 mile routes that are surveyed in June. Each route consists of 50 stops or point count locations at 0.5 mile intervals. Data for doves heard and seen at stops are combined for BBS analyses while those data are analyzed separately for the CCS. BBS data are not available in time for use in regulations development during the year of the survey. Trends calculated from BBS data for the 10-year period

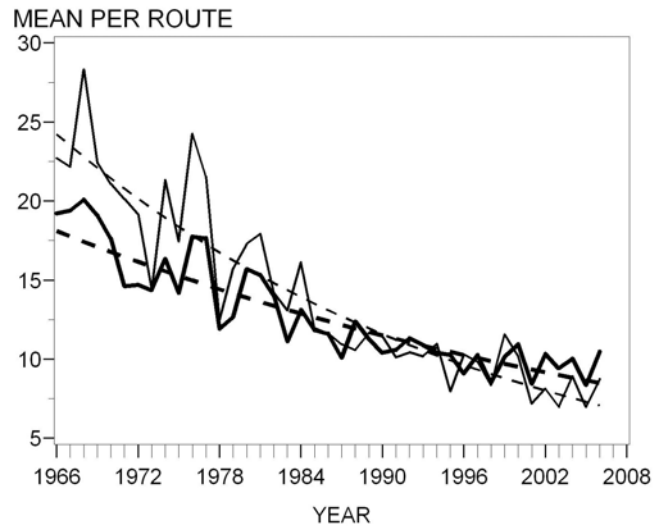


Fig. 12. Population indices and trends of breeding mourning doves in the Western Management Unit, 1966-2006. Heavy solid line = doves heard; light solid line = doves seen. Light and heavy dashed lines = predicted trends.

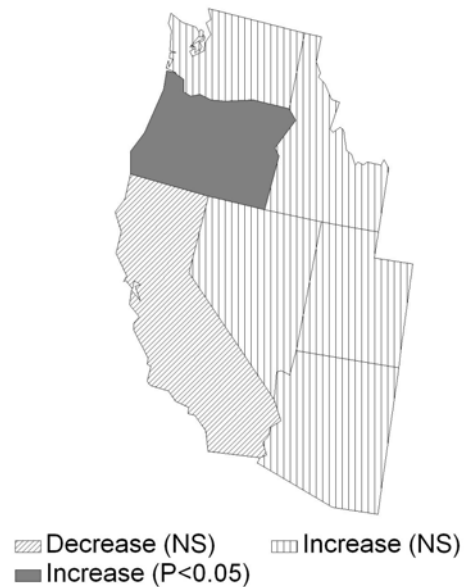


Fig. 13. Trends in number of mourning doves heard per route by state in the Western Management Unit, 1997-2006.

(1996-2005) and over 40 years (1966-2005) are presented in Table 4.

In general, trends indicated by the BBS tend to indicate fewer declines. The major differences occur in the Eastern Unit. This is likely due to the larger sample size of BBS survey routes and greater consistency of coverage by BBS routes in the Unit (Sauer et al. 1994), although additional analyses are needed to clarify some differences in results between surveys within states.

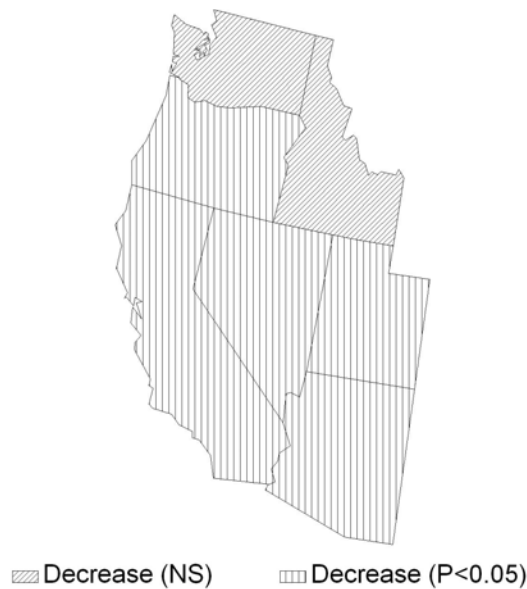


Fig. 14. Trends in number of doves heard per route by state in the Western Management Unit, 1966-2006.

For the 10-year period, 1996-05, in the EMU as a whole, there was no trend indicated with the CCS while the BBS showed a significant increase. For the combined hunting states in the Unit, the CCS indicated no trend in doves heard compared to a significant increase with the BBS. In the nonhunting states, the CCS showed no trend while the BBS again showed a significant increase. In the CMU, the CCS showed a significant decline while the BBS showed no trend. In the WMU, both surveys showed no significant trend.

Over 40 years in the Eastern Unit, the CCS analyses indicated a significant decline. In contrast, the BBS showed a significant increase. For the combined hunting states of the EMU, the CCS showed a significant decline compared with no trend with the BBS. In the nonhunting states of the EMU, both surveys indicated significant increasing trends. In the CMU, both the CCS and BBS indicated a significant decline. In the Western Management Unit, significant declines were also indicated by both surveys.

## HARVEST ESTIMATES

### State Surveys

In past years, a compilation of non-uniform, periodic state harvest surveys have been used to obtain rough

estimates of the number of mourning doves killed and the number of dove hunters. Although those data are no longer used, a summary provided by Sadler (1993) is reviewed here for historical purposes. In general, mourning dove harvest in the EMU was relatively constant from 1966-87, with between 27.5 and 28.5 million birds taken. A survey conducted in 1989 indicated that harvest had dropped to about 26.4 million birds shot by an estimated 1.3 million hunters. In the CMU, although hunting pressure and harvest varied widely among states, dove harvest in the Unit generally increased between 1966-87 to an annual average of about 13.5 million birds. In 1989, almost 11 million doves were taken by about 747,000 hunters. Dove harvest in the WMU has declined significantly over the years following a decline in the breeding population. In the early 1970's, about 7.3 million doves were taken by an estimated 450,000 hunters. By 1989, the harvest had dropped to about 4 million birds shot by approximately 285,000 hunters.

In summary, it appears that the dove harvest throughout the United States is on the decrease. However, the mourning dove remains an extremely important game bird, as more doves are harvested than all other migratory game birds combined. A 1991 survey indicated that doves provided about 9.5 million days of hunting recreation for 1.9 million people (U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, Bureau of the Census 1993). A survey conducted in 1996 estimated that doves were hunted about 8.1 million days by 1.6 million people (U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, Bureau of the Census 1997).

### Harvest Information Program (HIP)

Wildlife professionals have long recognized that reliable harvest estimates are needed to monitor the impact of hunting. To remedy problems associated with state surveys, the U.S. Fish and Wildlife Service and state wildlife agencies initiated the national, cooperative Harvest Information Program in 1992. This program is designed to enable the Service to conduct nationwide surveys that provide reliable annual estimates of the harvest of mourning doves and other migratory game bird species. Under the Harvest Information Program, states provide the Service with the names and addresses of all licensed migratory bird hunters each year, and the Service conducts surveys to estimate the harvest in each

state. All states except Hawaii are participating in the program.

Preliminary results of the mourning dove harvest survey for the 2004-05 and 2005-06 hunting seasons are presented in Tables 5 and 6, respectively. The total estimated harvest for the 2005-06 season by management unit and for the U.S. are as follows: Eastern: 9,793,000  $\pm$  6%; Central: 9,891,400  $\pm$  9%; Western: 2,465,500  $\pm$  7%; and, U.S.: 22,149,900  $\pm$  5%. It is important to note that these estimates do not necessarily indicate that the harvest has declined from past years when harvest estimates were compiled from state surveys. And, they cannot be compared directly with the earlier estimates since they are based on a different sampling scheme. The reliability of these estimates depends primarily upon the quality of the sample frame provided by each participating state. If a state's sample frame does not include all migratory bird hunters in that state, the survey results underestimate hunter activity and harvest for the state.

The Division of Migratory Bird Management's Branch of Harvest Surveys is continuing to work with states to improve the accuracy and precision of the harvest estimates.

## ACKNOWLEDGMENTS

Personnel of state wildlife agencies and the U.S. Fish and Wildlife Service (USFWS) cooperated in collecting the data presented in this report. Special thanks to J. Powers (AL), M. Rabe (AZ), T. Edwards (AR), K. Fothergill (CA), E. Gorman (CO), J. Dickson (CT), D. Pence (USFWS), K. Hodges (FL), D. McGowan (GA), T. Hemker (ID), J. Cole (IL), W. A. Phelps (IN), T. Bogenschutz (IA), H. Hands (KS), R. Ford (USFWS), M. Mills (USFWS), B. Harvey (MD), T. Moruzzi (MA), A. Stewart (MI), S. Kelly (USFWS), B. Strader (USFWS), J. Schulz (MO), J. Hansen (MT), S. Taylor (NE), C. Mortimore (NV), E. Robinson (NH), J. Garris (NJ), T. Mitchusson (NM), B. Swift (NY), J. Fuller (NC), M. Szymanski (ND), S. Hull (OH), M. O'Meilia (OK), H. Browers (USFWS), T. Mumma (PA), B. Tefft (RI), B. Dukes (SC), C. Huxoll (SD), R. Applegate (TN), J. Roberson (TX), T. Aldrich (UT), J. Austin (VT), A. Daisey (USFWS), D. Kraege (WA), S. Wilson (WV), and R. Rothwell (WY). J. Alachan and T. Pushparaj (USFWS) provided invaluable assistance with data entry. J. R. Sauer (BRD) analyzed the data and provided statistical support. P. Padding and K. Richkus (USFWS)

provided the HIP data and explanation. J. Kelley and J. Alachan (USFWS) reviewed a draft of this report.

## LITERATURE CITED

- Aldrich, J.W. 1993. Classification and distribution. Pages 47-54 in T.S. Baskett, M.W. Sayre, R.E. Tomlinson, and R.E. Mirarchi, eds., Ecology and management of the mourning dove. Stackpole Books, Harrisburg, Pennsylvania, USA.
- Dolton, D.D. 1993. The call-count survey: historic development and current procedures. Pages 233-252 in T.S. Baskett, M.W. Sayre, R.E. Tomlinson, and R.E. Mirarchi, eds., Ecology and management of the mourning dove. Stackpole Books, Harrisburg, Pennsylvania, USA.
- Dolton, D.D. and R. D. Rau. 2005 Mourning dove breeding population status, 2005 U.S. Fish and Wildlife Service, Laurel, Maryland, USA.
- Dunks, J.H., R.E. Tomlinson, H.M. Reeves, D.D. Dolton, C.E. Braun and T.P. Zapatka. 1982. Mourning dove banding analysis, Central Management Unit, 1967-77. Special Scientific Report--Wildl. No. 249. U.S. Fish and Wildlife Service, Washington, D.C., USA.
- Foote, L.E. and H.S. Peters. 1952. Pages 1-2 in Investigations of methods of appraising the abundance of mourning doves. U.S. Fish and Wildlife Service, Special Scientific Report--Wildlife 17.
- Geissler, P.H. and J.R. Sauer. 1990. Topics in route regression analysis. Pages 54-57 in J.R. Sauer and S. Droege, eds. Survey designs and statistical methods for the estimation of avian population trends. U.S. Fish and Wildlife Service, Biological Report 90(1).
- Kiel, W.H. 1959. Mourning dove management units, a progress report. U.S. Fish and Wildlife Service, Special Scientific Report--Wildlife 42.
- Kiel, W.H. 1961. The mourning dove program for the future. Transactions of the North American Wildlife and Natural Resources Conference 26:418-435.
- Link, W.A. and J.R. Sauer. 1994. Estimating equations

- estimates of trends. *Bird Populations* 2:23-32.
- McClure, H.E. 1939. Cooing activity and censusing of the mourning dove. *Journal of Wildlife Management* 3:323-328.
- Mirarchi, R.E. and T.S. Baskett. 1994. Mourning dove (*Zenaida macroura*). In A. Poole and F. Gill, eds., *The birds of North America*, No. 117. The Academy of Natural Sciences, Philadelphia and The American Ornithologists' Union, Washington, D.C., USA.
- Peterjohn, B.G., J.R. Sauer and W.A. Link. 1994. The 1992 and 1993 summary of the North American breeding bird survey. *Bird Populations* 2:46-61.
- Sadler, K.C. 1993. Mourning dove harvest. Pages 449-458 in T.S.Baskett, M.W. Sayer, R.E. Tomlinson and R.E. Mirarchi, eds., *Ecology and management of the mourning dove*. Stackpole Books, Harrisburg, Pennsylvania, USA.
- Sauer, J.R. and P.H. Geissler. 1990. Annual indices from route regression analyses. Pages 58-62 in J.R. Sauer and S. Droege, eds. *Survey designs and statistical methods for the estimation of avian population trends*. U.S. Fish and Wildlife Service, Biological Report. 90(1).
- Sauer, J.R., D.D. Dolton, and S. Droege. 1994. Mourning dove population trend estimates from Call-count and North American Breeding Bird Surveys. *Journal of Wildlife Management*. 58(3):506-515.
- Tomlinson, R.E., D.D. Dolton, H.M. Reeves, J.D. Nichols and L.A. McKibben. 1988. Migration, harvest, and population characteristics of mourning doves banded in the Western Management Unit; 1964-1977. *Fish and Wildlife Technical Report 13*, U.S. Fish and Wildlife Service, Washington, D.C., USA.
- U. S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, Bureau of the Census. 1993. 1991 National survey of fishing, hunting, and wildlife-associated recreation. U.S. Government Printing Office, Washington, D.C., USA.
- U. S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, Bureau of the Census. 1997. 1996 National survey of fishing, hunting, and wildlife-associated recreation. U.S. Government Printing Office, Washington, D.C., USA.

Table 1. Trends (% change<sup>a</sup> per year as determined by linear regression) in number of mourning doves heard along call-count survey routes, 1966-2006.

	2005-2006				10 year (1997-2006)				41 year (1966-2006)						
	N	% Change <sup>b</sup>	90% CI		N	% Change <sup>b</sup>	90% CI		N	% Change <sup>b</sup>	90% CI				
<b>EASTERN UNIT</b>															
Hunt															
AL	27	-1.2	-19.9	17.5	31	-0.7	-1.9	0.4	44	-0.7	-1.5	0.1			
DE/MD	12	1.8	-27.7	31.2	14	1.7	-1.0	4.4	19	-1.4	-3.0	0.1			
FL	16	11.0	-16.6	38.6	24	-4.3	***	-6.5	-2.1	29	-0.6	-1.6	0.4		
GA	17	-3.7	-29.3	21.9	24	-1.7		-4.0	0.5	31	-1.1	***	-1.7	-0.5	
IL	15	4.4	-9.0	17.7	20	1.0		-1.4	3.3	22	0.3		-0.9	1.4	
IN	11	-23.2	***	-33.0	-13.5	15	1.9		-0.4	4.2	18	-1.4	**	-2.3	-0.4
KY	14	-20.2		-41.4	1.0	20	-0.5		-2.2	1.1	26	-0.7		-1.9	0.5
LA	17	-15.6	*	-27.9	-3.3	19	0.4		-2.5	3.3	23	1.2	*	0.1	2.3
MS	18	10.7		-15.3	36.7	22	-3.9	**	-6.5	-1.2	31	-2.0	**	-3.6	-0.4
NC	21	27.1	***	13.1	41.0	21	1.2		-0.2	2.6	24	0.1		-0.8	0.9
OH	36	9.7		-9.4	28.8	37	0.4		-1.3	2.0	57	-1.1	***	-1.7	-0.5
PA	14	43.6		2.4	84.7	18	-0.1		-3.1	2.9	18	0.9		-0.6	2.4
SC	16	-15.3	*	-27.6	-3.0	21	-2.5		-5.0	0.1	27	-1.2	**	-2.1	-0.4
TN	17	-11.7		-25.1	1.6	25	-1.6		-4.1	0.8	34	-1.7	**	-2.8	-0.7
VA	20	-8.6		-28.2	10.9	33	-1.3		-3.3	0.6	33	-1.9	*	-3.7	-0.2
WI	18	-13.9		-31.0	3.2	23	5.9	***	4.3	7.5	23	0.9		-0.4	2.2
WV	9	52.5		-15.1	120.1	11	1.1		-1.7	3.9	12	1.5		-0.3	3.3
Subunit	298	0.0		-5.3	5.4	378	-0.4		-1.1	0.2	471	-0.6	***	-1.0	-0.3
Nonhunt															
MI	10	23.1		-1.7	47.9	20	3.7		-0.2	7.5	23	0.7		-0.8	2.2
N.England <sup>c</sup>	26	-1.1		-19.1	17.0	42	0.0		-2.2	2.2	76	1.1	**	0.3	1.8
NJ	10	20.0		-48.7	88.7	11	-2.9		-5.9	0.1	20	-2.2		-4.8	0.4
NY	9	34.3		4.6	63.9	19	3.9		-1.1	8.9	22	1.9		-0.2	4.0
Subunit	55	18.3	*	2.8	33.7	92	2.5	*	0.1	4.8	141	0.8		-0.1	1.8
Unit	353	2.4		-2.7	7.5	470	0.0		-0.7	0.6	612	-0.5	**	-0.8	-0.2
<b>CENTRAL UNIT</b>															
AR	13	8.7		-10.1	27.5	20	-1.7		-5.5	2.0	21	-1.0		-2.2	0.3
CO	11	26.6		-5.1	58.3	16	-5.9		-12.4	0.6	21	-1.0	**	-1.7	-0.3
IA	13	24.6		-6.0	55.3	17	2.1	**	0.5	3.7	19	0.2		-0.6	1.0
KS	18	-5.5		-14.2	3.1	29	0.4		-1.9	2.8	35	0.1		-0.6	0.8
MN	8	1.3		-5.3	8.0	12	-5.2		-10.2	-0.3	13	-1.8	*	-3.3	-0.3
MO	10	-1.6		-30.1	27.0	20	-1.8		-4.3	0.7	28	-1.9	**	-3.4	-0.5
MT	13	10.7		-16.8	38.2	17	-0.6		-4.8	3.7	29	-1.8	*	-3.4	-0.2
NE	19	-6.5		-18.8	5.8	24	-2.0	*	-3.7	-0.2	28	-1.0	**	-1.7	-0.4
NM	18	2.3		-13.2	17.7	28	2.0		-4.6	8.7	31	0.9		-0.2	2.0
ND	22	-26.5	***	-40.3	-12.6	27	-0.8		-2.4	0.8	30	-0.4		-1.7	0.8
OK	16	-10.2		-29.6	9.2	16	1.5		-0.6	3.6	25	0.7		-2.7	4.0
SD	15	10.7		-20.7	42.1	21	-1.7		-5.7	2.2	30	-0.6		-2.1	0.9
TX	112	-17.8	***	-26.4	-9.2	142	-3.7	***	-4.9	-2.6	210	-0.7	*	-1.3	0.0
WY	9	11.9		-20.7	44.5	17	-8.1	*	-15.4	-0.9	23	-2.5	*	-4.6	-0.4
Unit	297	-10.9	***	-16.1	-5.8	406	-2.3	***	-3.1	-1.6	543	-0.6	***	-1.0	-0.3
<b>WESTERN UNIT</b>															
AZ	30	-6.5		-27.6	14.5	55	1.5		-1.0	4.0	71	-0.9	**	-1.6	-0.3
CA	47	-6.9		-17.3	3.6	60	-1.9	*	-3.5	-0.3	84	-2.4	***	-3.4	-1.5
ID	12	89.1		-11.5	189.7	23	4.2		-0.1	8.6	28	-1.5		-3.5	0.5
NV	16	217.9	*	41.2	394.7	22	4.9		-1.5	11.4	33	-3.5	***	-5.3	-1.7
OR	9	12.8		0.8	24.9	19	3.7	**	1.6	5.8	25	-1.8	**	-3.2	-0.5
UT	11	55.9	*	7.9	103.8	16	1.6		-0.1	3.3	20	-3.9	**	-6.3	-1.4
WA	19	-11.9	**	-20.2	-3.6	23	4.6		-0.8	9.9	28	-2.3	*	-4.5	-0.1
Unit	144	24.1	**	7.9	40.3	218	1.0		-0.3	2.3	289	-1.9	***	-2.4	-1.4

<sup>a</sup> Mean of route trends weighted by land area and population density. The estimated count in the next year is  $(\%/100+1)$  times the count in the current year where % is the annual change. Note: Extrapolating the estimated trend statistic (% change per year) over time (e.g., 41 years) may exaggerate the total change over the period.

<sup>b</sup> \* $P<0.1$ ; \*\* $P<0.05$ ; \*\*\* $P<0.01$ . For purposes of this report, statistical significance was defined as  $P<0.05$ , except for the 2-year comparison where  $P<0.10$  was used because of the low power of the test.

<sup>c</sup> New England consists of CT, ME, MA, NH, RI, and VT.

Table 2. Trends (% change<sup>a</sup> per year as determined by linear regression) in number of mourning doves seen along call-count survey routes, 1966-2006.

	10 year (1997-2006)					41 year (1966-2006)				
	N	% Change <sup>b</sup>		90% CI		N	% Change <sup>b</sup>		90% CI	
<b>EASTERN UNIT</b>										
Hunt										
AL	31	-1.2		-4.8	2.4	44	-1.2	*	-2.2	-0.1
DE/MD	15	2.2	***	1.3	3.2	20	0.6		-0.8	2.0
FL	25	0.5		-2.5	3.5	29	3.7	***	2.4	4.9
GA	24	-1.1		-5.4	3.2	31	0.4		-0.8	1.6
IL	20	5.8	***	3.0	8.6	22	-0.5		-2.4	1.3
IN	15	5.1	*	0.6	9.5	18	-1.9		-4.8	1.0
KY	20	0.4		-1.8	2.5	24	1.0		-0.3	2.3
LA	18	3.7	**	1.5	6.0	23	2.3	***	1.4	3.2
MS	21	-2.2		-5.9	1.5	31	-1.4		-3.3	0.4
NC	21	4.4	***	2.0	6.8	24	-0.1		-1.1	0.9
OH	37	0.1		-2.2	2.3	57	0.9		-0.6	2.3
PA	18	-3.5		-7.1	0.1	18	0.9		-0.8	2.6
SC	21	0.6		-3.7	4.8	27	1.2	*	0.2	2.1
TN	25	0.3		-2.2	2.8	34	-0.7		-1.8	0.4
VA	33	1.7		-2.0	5.4	33	-1.1		-3.4	1.1
WI	22	6.0	***	2.7	9.4	23	3.0	***	2.0	4.0
WV	11	-1.6		-6.7	3.5	12	3.5	***	2.1	4.8
Subunit	377	1.4	**	0.4	2.4	470	0.2		-0.5	0.9
Nonhunt										
MI	20	3.8	**	1.3	6.2	23	2.0	**	0.9	3.2
N.England <sup>c</sup>	41	2.9		-1.8	7.6	73	1.8	*	0.3	3.3
NJ	11	1.0		-2.1	4.1	20	-1.0		-2.7	0.7
NY	18	0.8		-4.9	6.5	22	3.0	*	0.4	5.6
Subunit	90	3.1	**	1.1	5.0	138	2.0	***	1.1	2.9
Unit	467	1.6	***	0.6	2.5	608	0.4		-0.3	1.0
<b>CENTRAL UNIT</b>										
AR	20	2.9		-0.8	6.6	21	-1.1	**	-1.9	-0.3
CO	16	-3.3		-8.7	2.1	20	-0.4		-1.7	1.0
IA	17	5.5	***	2.6	8.3	19	0.2		-0.9	1.3
KS	29	2.6		-1.2	6.5	35	-0.3		-1.0	0.4
MN	12	-7.6	*	-13.6	-1.6	14	-1.1		-2.7	0.5
MO	20	0.6		-2.3	3.5	28	-3.1	***	-4.8	-1.4
MT	20	4.1		-2.2	10.4	28	1.2		-0.3	2.6
NE	24	-0.9		-3.2	1.5	28	-0.6		-2.0	0.7
NM	27	4.3	*	0.9	7.8	31	0.1		-2.8	2.9
ND	27	-2.9	**	-4.7	-1.1	30	0.0		-1.2	1.2
OK	16	3.1	**	0.9	5.3	25	0.4		-0.8	1.5
SD	21	-0.4		-4.4	3.6	30	-0.4		-2.5	1.7
TX	141	-0.9		-2.5	0.6	210	0.8	**	0.2	1.5
WY	14	-12.8	**	-20.4	-5.2	21	-3.5	*	-6.6	-0.5
Unit	404	-0.2		-1.3	0.8	540	0.1		-0.3	0.6
<b>WESTERN UNIT</b>										
AZ	54	-1.3		-5.3	2.8	72	-4.0	***	-5.9	-2.2
CA	56	-1.2		-3.3	0.8	83	-2.4	***	-3.4	-1.3
ID	22	4.3		-4.8	13.5	28	-2.7		-5.7	0.2
NV	20	1.0		-4.8	6.7	33	-2.1		-4.9	0.7
OR	18	-3.4		-9.8	2.9	23	-4.5	**	-7.1	-1.8
UT	15	-7.4	*	-13.3	-1.5	20	-5.4	**	-9.1	-1.7
WA	23	3.4		-2.1	8.9	25	0.8		-1.6	3.2
Unit	208	-0.6		-2.4	1.2	284	-3.0	***	-3.9	-2.2

<sup>a</sup> Mean of route trends weighted by land area and population density. The estimated count in the next year is  $(\%/100+1)$  times the count in the current year where % is the annual change. Note: Extrapolating the estimated trend statistic (% change per year) over time (e.g., 41 years) may exaggerate the total change over the period.

<sup>b</sup> \* $P<0.1$ ; \*\* $P<0.05$ ; \*\*\* $P<0.01$ . For purposes of this report, statistical significance was defined as  $P<0.05$ , except for the 2-year comparison where  $P<0.10$  was used because of the low power of the test.

<sup>c</sup> New England consists of CT, ME, MA, NH, RI, and VT.

Table 3. Breeding population indices<sup>a</sup> based on mourning doves heard along Call-count routes, 1966-2006.

Management unit/state	year									
	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
<b>EASTERN UNIT</b>										
Hunt										
AL	26.4	23.5	21.2	21.5	21.8	17.9	25.6	22.4	17.0	21.6
DE/MD	16.3	20.0	14.0	14.9	18.4	15.8	17.1	16.9	18.0	12.9
FL	13.4	12.7	10.8	11.5	14.6	12.2	12.5	12.6	14.8	15.2
GA	30.5	28.6	24.5	26.2	33.1	26.1	24.8	27.2	28.1	30.5
IL	22.8	19.7	23.4	20.3	23.4	21.4	22.0	21.5	18.2	25.2
IN	36.8	33.9	33.3	32.3	31.3	42.2	37.0	33.1	31.6	33.3
KY	25.2	22.7	22.1	23.2	27.8	24.9	20.9	24.8	28.7	20.1
LA	10.2	10.4	9.7	11.3	7.0	10.2	11.2	8.8	10.3	10.7
MS	42.3	36.3	30.8	28.2	31.2	31.7	35.3	31.6	25.2	26.5
NC	35.0	28.4	30.0	42.8	49.4	28.8	23.3	44.4	25.4	14.3
OH	24.8	23.3	21.1	24.0	23.8	24.6	25.6	20.4	24.8	37.9
PA	9.2	9.8	9.1	8.7	5.7	6.6	9.2	6.0	8.9	6.1
SC	33.8	36.9	37.4	36.1	33.9	29.7	26.4	30.0	28.0	27.7
TN	32.7	23.8	24.5	24.2	32.7	23.1	29.2	22.2	23.6	22.5
VA	25.5	21.3	24.2	21.4	27.3	22.0	13.2	15.5	21.3	23.8
WI	10.0	12.9	12.9	9.9	10.8	15.6	16.3	10.9	11.5	14.6
WV	6.5	5.4	5.6	6.0	5.5	5.0	6.6	3.9	4.1	2.4
Subunit	22.8	21.4	20.5	20.5	21.3	20.4	21.0	19.3	19.7	19.8
Nonhunt										
MI	13.4	14.6	9.5	9.8	7.8	15.6	16.5	13.2	11.3	12.7
N.England <sup>b</sup>	6.4	6.8	6.2	5.3	6.2	6.5	7.2	8.4	5.3	5.0
NJ	20.7	17.7	22.0	20.2	27.2	25.5	26.8	23.7	23.0	16.5
NY	6.5	6.5	6.2	5.8	7.5	8.8	7.0	7.2	7.5	13.4
Subunit	9.4	9.8	8.0	7.6	7.9	11.0	11.1	10.5	8.8	10.8
Unit	20.4	19.4	18.1	18.0	18.6	18.9	19.4	17.8	17.6	18.3
<b>CENTRAL UNIT</b>										
AR	22.7	23.6	22.7	21.7	23.5	23.5	22.0	24.8	22.8	21.9
CO	24.5	24.0	21.9	29.8	29.8	21.6	27.4	16.9	26.9	19.7
IA	32.3	29.0	31.5	28.3	20.5	25.2	33.8	31.8	25.4	23.6
KS	45.8	47.2	49.0	49.6	45.8	46.6	52.1	46.4	46.1	44.3
MN	32.1	25.6	27.5	20.3	16.1	23.2	26.7	20.1	27.9	30.5
MO	38.3	36.1	45.4	27.5	38.0	32.0	43.4	32.6	27.9	32.9
MT	28.5	26.3	20.7	22.9	18.3	26.0	20.7	14.9	17.3	23.6
NE	47.0	41.2	52.5	51.3	49.6	47.0	45.0	43.1	44.6	42.0
NM	14.0	10.3	14.5	11.1	10.9	10.2	11.8	8.5	10.3	12.9
ND	41.9	40.1	54.7	45.4	40.2	41.2	42.6	46.7	44.9	32.6
OK	17.9	22.1	26.1	25.2	19.9	15.6	25.8	24.4	25.8	23.4
SD	52.8	33.1	45.3	38.5	45.9	40.4	40.2	42.4	50.8	42.9
TX	27.7	22.9	22.6	20.4	21.6	20.9	27.9	22.2	23.5	21.2
WY	19.0	19.9	10.5	17.2	16.6	9.5	13.1	13.1	18.8	16.7
Unit	30.1	27.1	27.9	26.6	25.6	25.2	28.7	24.0	26.9	26.3
<b>WESTERN UNIT</b>										
AZ	28.6	28.8	25.7	30.7	30.8	20.8	23.4	28.3	24.5	26.9
CA	28.6	27.0	24.9	24.6	24.1	18.0	21.9	21.0	22.8	19.2
ID	14.2	14.4	13.5	14.5	13.5	11.0	10.5	13.2	11.4	8.0
NV	10.2	9.6	22.8	16.3	11.7	7.1	9.6	6.8	9.1	6.0
OR	15.3	10.2	12.0	11.0	8.4	7.4	7.2	7.2	12.7	9.6
UT	24.0	36.7	18.5	17.5	20.3	28.4	16.5	14.2	16.2	17.3
WA	12.5	18.4	17.2	13.7	13.9	16.4	11.7	10.7	13.4	14.5
Unit	19.2	19.4	20.1	19.1	17.6	14.6	14.7	14.4	16.4	14.2

<sup>a</sup>Annual indices are the predicted value from the trend analysis plus the deviation from the expected value in a year. Large but nonsignificant changes due to small sample sizes produce exaggerated indices over the 41-year period.

<sup>b</sup>New England consists of CT, ME, MA, NH, RI, and VT.

Table 3. Continued.

Management unit/state	year									
	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
<b>EASTERN UNIT</b>										
Hunt										
AL	20.8	22.9	25.1	24.1	24.1	23.0	23.5	23.5	19.7	25.1
DE/MD	15.8	14.5	15.3	14.8	14.1	13.5	14.2	10.0	11.4	12.5
FL	14.0	15.4	12.0	13.0	10.4	9.1	10.7	12.4	8.5	10.9
GA	24.0	24.9	27.3	23.8	24.1	26.7	28.7	25.6	20.9	26.7
IL	24.8	26.5	20.3	17.7	18.0	20.3	24.7	25.5	20.6	17.7
IN	33.6	37.6	20.4	21.6	27.4	31.7	22.5	19.4	21.1	18.5
KY	25.1	23.5	25.1	17.2	16.7	28.3	24.2	13.4	21.6	22.4
LA	10.8	8.9	10.4	8.9	12.4	10.6	13.3	12.3	11.7	10.5
MS	27.0	27.7	31.2	26.6	25.2	25.2	31.8	26.7	19.6	25.9
NC	17.5	46.7	24.9	29.6	28.7	28.2	23.7	28.0	31.4	21.8
OH	27.5	26.4	13.9	13.6	16.2	19.7	18.7	20.0	18.7	17.4
PA	6.2	5.1	6.2	6.9	8.3	9.8	9.4	9.3	8.5	9.4
SC	27.3	23.2	30.6	26.0	32.6	31.7	32.7	31.1	28.2	28.3
TN	22.2	24.3	30.1	20.6	22.3	18.8	25.3	19.6	16.7	21.5
VA	22.8	30.4	22.5	19.9	19.3	16.7	18.4	18.3	17.8	16.7
WI	14.7	19.4	7.9	11.5	15.0	20.3	11.4	13.4	10.5	10.9
WV	6.0	5.7	6.5	7.2	8.4	6.7	6.4	6.1	5.4	6.6
Subunit	20.0	21.5	18.5	17.7	19.0	19.8	19.8	18.8	16.8	17.8
Nonhunt										
MI	12.9	11.0	12.6	7.4	13.7	15.7	11.4	10.2	10.9	12.0
N.England <sup>b</sup>	4.7	8.7	7.3	6.1	7.5	9.1	7.5	7.9	6.8	7.5
NJ	20.7	22.7	18.0	19.2	17.9	14.5	16.8	20.1	12.6	12.7
NY	7.9	7.9	9.6	6.5	11.6	9.8	10.5	9.8	9.7	8.8
Subunit	9.1	9.9	10.5	7.2	11.4	12.1	10.3	9.9	9.4	9.9
Unit	17.9	19.3	17.2	15.5	17.8	18.6	18.1	17.2	15.5	16.4
<b>CENTRAL UNIT</b>										
AR	26.6	21.6	15.3	12.4	20.5	22.4	26.0	19.5	13.9	13.7
CO	27.9	25.7	28.4	23.4	27.0	30.4	29.5	16.2	20.3	24.1
IA	29.1	22.6	25.4	21.7	29.3	32.4	23.3	16.6	24.5	27.0
KS	48.7	46.2	36.3	53.1	57.8	55.3	52.7	59.5	47.2	61.1
MN	26.4	30.4	29.3	29.8	32.1	28.1	24.7	21.6	18.4	20.0
MO	29.2	33.9	21.7	20.7	32.4	27.4	24.1	23.4	22.3	21.3
MT	17.1	20.9	20.1	20.1	18.3	17.2	21.9	17.6	13.3	18.4
NE	47.3	47.8	39.3	42.0	53.5	50.8	49.5	45.1	42.9	44.1
NM	12.6	11.3	11.4	7.7	12.6	12.5	9.8	13.2	14.3	12.3
ND	52.4	43.2	45.8	42.7	48.3	48.5	45.4	43.3	33.9	44.2
OK	24.6	32.0	24.7	24.2	25.3	25.2	26.4	27.0	20.5	20.1
SD	46.1	40.4	43.6	42.7	42.8	38.6	45.9	39.7	44.2	41.5
TX	20.7	19.8	20.5	25.4	24.2	21.9	21.1	19.6	19.2	19.8
WY	15.5	9.8	16.0	12.6	11.3	12.4	16.1	11.0	10.0	11.7
Unit	27.1	25.9	25.4	25.0	28.1	27.2	27.2	24.1	22.5	24.6
<b>WESTERN UNIT</b>										
AZ	27.8	25.0	25.1	24.5	22.0	24.8	28.3	22.1	27.1	21.9
CA	23.0	17.7	15.9	12.3	20.9	17.3	21.4	13.2	18.4	13.0
ID	14.7	18.0	10.0	9.7	10.4	11.5	11.9	9.4	11.0	10.2
NV	9.8	10.0	5.9	8.7	12.7	9.3	5.2	4.7	4.7	6.0
OR	10.0	11.4	6.1	6.3	9.5	8.1	8.0	6.1	7.7	8.5
UT	19.8	23.2	10.2	12.6	15.1	20.0	11.0	12.0	13.5	8.9
WA	14.0	15.2	9.8	13.8	9.4	11.3	10.5	8.9	7.8	9.8
Unit	17.8	17.7	11.9	12.7	15.7	15.3	14.0	11.1	13.1	11.8

<sup>a</sup>Annual indices are the predicted value from the trend analysis plus the deviation from the expected value in a year.

Large but nonsignificant changes due to small sample sizes produce exaggerated indices over the 41-year period.

<sup>b</sup>New England consists of CT, ME, MA, NH, RI, and VT.



Table 3. Continued.

Management unit/state	year									
	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
<b>EASTERN UNIT</b>										
Hunt										
AL	22.8	20.3	22.4	19.1	17.9	16.8	19.1	20.8	21.5	22.6
DE/MD	15.0	13.1	12.1	16.9	8.2	12.6	16.1	10.8	13.3	11.9
FL	12.7	11.4	13.7	12.2	11.0	11.9	12.1	10.7	10.1	11.7
GA	23.9	24.9	25.1	25.4	26.1	21.7	30.5	18.8	21.8	26.0
IL	24.5	23.9	27.2	26.6	26.1	26.4	27.3	23.7	26.5	27.2
IN	24.6	24.8	29.9	25.3	27.6	27.8	24.6	25.9	30.8	25.0
KY	20.1	24.7	19.7	26.8	22.3	21.3	16.9	21.6	20.9	20.4
LA	9.6	13.6	10.1	15.7	11.1	11.4	15.2	11.6	12.7	14.5
MS	25.4	22.6	26.7	24.9	20.9	17.3	22.5	24.5	20.6	18.8
NC	30.6	29.7	27.3	32.1	29.2	24.7	24.1	25.0	25.2	27.5
OH	17.0	18.6	21.2	19.9	18.3	19.6	20.4	17.3	19.2	17.5
PA	10.0	11.3	7.6	9.7	9.8	9.9	11.0	12.2	11.5	11.0
SC	24.1	35.0	27.7	26.5	28.7	23.1	22.7	26.6	23.7	19.0
TN	16.2	20.0	19.6	17.7	15.5	18.7	18.2	16.0	19.7	18.1
VA	13.6	14.3	15.6	15.1	12.9	13.6	12.0	13.5	13.3	14.3
WI	11.8	7.7	18.3	18.4	14.7	13.2	20.2	19.4	16.0	13.7
WV	6.2	6.5	7.6	8.1	10.7	9.2	7.4	8.7	9.5	9.9
Subunit	18.0	18.4	19.6	20.2	18.4	17.7	19.3	18.4	18.7	18.7
Nonhunt										
MI	15.4	12.6	15.2	19.1	14.5	11.8	13.7	12.7	12.1	13.5
N.England <sup>b</sup>	8.0	7.6	7.1	7.4	8.2	9.0	9.5	10.1	9.0	11.3
NJ	14.9	13.6	13.2	16.2	12.6	15.4	9.9	15.9	13.8	10.4
NY	7.4	9.9	8.0	12.4	10.9	13.6	11.6	10.3	10.5	11.7
Subunit	10.6	10.4	10.2	13.0	11.4	11.7	11.8	11.5	10.9	12.2
Unit	16.7	16.9	17.8	19.0	17.2	16.7	18.0	17.2	17.2	17.5
<b>CENTRAL UNIT</b>										
AR	14.9	13.9	15.3	21.5	16.7	15.1	18.2	16.7	19.9	18.4
CO	23.1	24.6	26.6	29.9	27.0	17.9	13.5	13.0	23.1	19.3
IA	24.5	23.4	31.7	28.8	32.9	24.4	32.4	24.1	25.2	26.7
KS	42.1	45.7	53.0	47.9	41.8	58.4	56.9	38.5	51.7	61.8
MN	18.2	23.3	23.7	18.8	15.5	19.1	22.2	16.0	19.8	19.7
MO	22.2	24.9	25.1	24.7	20.0	21.9	23.0	22.2	26.9	23.4
MT	19.2	18.5	15.2	19.4	21.2	13.9	14.8	10.8	10.1	12.7
NE	36.8	36.3	36.3	40.3	40.0	40.9	38.4	40.4	37.5	41.0
NM	14.7	17.8	13.3	14.9	16.3	15.1	9.9	11.1	13.9	12.6
ND	40.3	46.0	43.3	44.8	43.3	47.7	51.0	44.3	38.2	40.0
OK	22.7	25.4	22.3	17.1	22.4	22.8	25.9	22.3	29.2	22.1
SD	38.5	33.7	40.0	43.1	44.7	47.1	38.0	34.2	37.2	38.1
TX	21.2	21.0	21.5	16.5	17.4	24.2	22.2	20.2	22.3	16.8
WY	14.5	11.7	7.2	9.0	9.1	9.7	10.2	7.5	10.0	7.4
Unit	24.8	25.5	24.5	24.4	24.4	24.8	23.8	20.7	24.1	22.5
<b>WESTERN UNIT</b>										
AZ	26.0	17.5	19.6	24.3	18.6	23.7	25.4	26.3	23.3	21.8
CA	15.1	11.5	15.4	11.4	11.4	11.1	12.1	14.6	11.9	11.6
ID	7.3	7.5	10.0	10.0	11.0	10.2	9.4	8.4	8.3	7.6
NV	3.9	4.6	6.3	5.4	3.8	5.0	4.2	3.5	3.2	5.4
OR	6.9	6.3	7.8	6.5	7.3	4.6	7.2	6.0	7.1	5.9
UT	12.3	10.7	11.0	11.5	9.8	8.9	11.3	9.5	9.9	6.4
WA	11.6	9.2	9.2	7.9	8.2	10.4	9.2	7.9	8.1	9.0
Unit	11.6	10.1	12.4	11.3	10.4	10.6	11.3	10.9	10.4	10.3

<sup>a</sup>Annual indices are the predicted value from the trend analysis plus the deviation from the expected value in a year.

Large but nonsignificant changes due to small sample sizes produce exaggerated indices over the 41-year period.

<sup>b</sup>New England consists of CT, ME, MA, NH, RI, and VT.

Table 3. Continued.

Management unit/state	year										
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
<b>EASTERN UNIT</b>											
Hunt											
AL	17.6	16.4	18.3	17.6	18.8	17.9	20.9	16.1	18.3	18.4	18.6
DE/MD	11.2	9.3	12.9	9.2	8.8	8.8	7.4	11.7	12.0	11.2	10.3
FL	10.9	10.1	12.4	12.9	12.5	9.0	9.7	10.3	10.1	10.8	11.6
GA	21.9	18.9	18.1	18.3	16.2	22.4	12.3	19.5	17.8	19.5	18.2
IL	21.5	21.8	22.0	20.3	26.4	22.2	23.5	25.5	20.9	24.3	25.6
IN	21.4	21.2	21.3	22.2	24.0	21.1	19.0	19.0	21.1	24.3	19.2
KY	17.4	16.2	21.3	21.8	22.4	18.9	22.0	20.7	17.7	17.2	18.1
LA	11.9	12.0	13.6	14.2	17.2	18.4	14.5	16.8	13.8	16.6	12.0
MS	17.6	16.8	17.3	21.0	18.3	17.5	14.1	16.0	12.5	14.3	15.8
NC	28.0	30.7	30.1	30.8	36.6	40.7	34.5	33.3	28.9	27.8	33.7
OH	14.1	14.0	16.5	17.2	18.2	15.0	17.1	16.5	15.4	15.2	15.6
PA	10.8	10.0	11.7	9.8	12.1	11.0	10.9	9.9	10.2	10.2	12.7
SC	23.7	22.7	25.6	24.3	23.5	23.7	22.2	23.2	22.5	21.1	19.4
TN	15.7	16.7	15.8	16.2	18.0	14.1	14.9	14.6	13.5	13.3	13.2
VA	11.5	14.5	13.6	14.0	15.1	11.8	13.8	10.9	11.9	13.2	12.9
WI	12.3	12.8	10.3	19.7	17.5	17.0	14.4	20.0	20.5	20.7	17.3
WV	4.9	10.3	8.6	10.0	9.6	6.5	9.4	5.6	10.4	9.3	11.3
Subunit	16.1	16.3	17.1	18.1	18.8	17.2	16.4	17.0	16.4	17.2	17.0
Nonhunt											
MI	13.9	13.4	15.4	15.3	17.6	14.9	14.8	16.1	13.2	16.5	17.5
N.England <sup>b</sup>	7.8	7.8	8.5	9.9	10.5	8.7	11.7	9.3	9.2	7.6	8.7
NJ	13.4	7.1	11.7	9.6	12.6	6.7	10.8	9.0	9.2	8.3	9.6
NY	11.0	11.8	10.3	13.7	15.7	13.1	12.9	13.6	13.0	13.5	15.0
Subunit	11.1	10.8	11.6	13.0	14.7	12.0	13.2	12.9	11.7	12.0	13.3
Unit	15.3	15.3	16.1	17.2	18.2	16.3	15.9	16.3	15.6	16.2	16.3
<b>CENTRAL UNIT</b>											
AR	18.7	18.8	19.5	17.5	17.1	16.9	13.0	18.1	15.0	15.1	16.2
CO	14.5	19.6	20.5	22.4	22.3	14.3	17.5	16.6	20.0	14.6	20.1
IA	34.5	28.2	31.1	27.3	24.3	23.7	24.6	32.9	31.8	30.1	36.6
KS	32.7	58.4	54.4	66.9	50.5	31.1	44.3	52.1	43.5	54.9	58.6
MN	18.6	19.7	18.4	16.5	17.0	13.8	19.5	10.1	11.3	15.3	11.4
MO	23.0	22.6	20.4	18.8	19.4	16.6	18.1	20.4	16.9	16.9	19.3
MT	12.9	11.8	14.3	13.3	14.8	10.6	12.8	12.4	12.8	11.6	11.9
NE	34.2	31.5	40.0	36.5	36.5	30.8	29.0	39.4	32.4	33.9	30.7
NM	10.9	14.6	12.3	14.4	16.4	17.0	11.4	16.4	13.9	15.6	15.2
ND	41.7	36.9	33.7	45.9	44.8	35.7	30.1	44.8	28.4	48.8	37.0
OK	23.5	22.6	32.7	29.6	25.0	25.9	24.7	32.3	34.3	32.3	25.8
SD	39.1	33.3	35.5	37.4	40.3	35.9	38.3	37.0	36.2	32.7	39.6
TX	14.4	21.5	21.9	21.5	18.9	19.3	18.9	19.5	15.9	19.1	15.1
WY	8.9	8.6	9.4	7.1	10.1	6.2	8.4	6.8	7.5	5.5	6.3
Unit	20.7	23.3	24.3	24.1	24.1	20.2	21.2	22.6	20.8	21.7	21.1
<b>WESTERN UNIT</b>											
AZ	12.9	19.7	22.6	24.6	25.4	18.9	18.8	16.7	19.8	22.7	21.0
CA	12.0	10.5	11.0	11.4	10.5	9.8	12.5	11.5	12.2	8.7	8.1
ID	7.3	10.5	6.0	8.4	7.8	6.5	10.2	7.4	9.3	7.2	9.8
NV	5.0	4.5	3.9	4.8	3.8	3.2	3.5	3.5	3.4	2.5	6.1
OR	5.5	5.6	4.3	4.4	7.2	4.9	6.2	6.5	5.8	5.3	6.0
UT	7.2	8.9	5.1	8.1	12.6	5.5	7.8	6.3	7.4	4.9	8.4
WA	6.0	7.4	5.1	7.0	7.9	7.5	7.7	8.3	6.8	7.7	7.2
Unit	9.1	10.3	8.5	10.1	11.0	8.4	10.3	9.4	10.0	8.4	10.5

<sup>a</sup>Annual indices are the predicted value from the trend analysis plus the deviation from the expected value in a year.

Large but nonsignificant changes due to small sample sizes produce exaggerated indices over the 41-year period.

<sup>b</sup>New England consists of CT, ME, MA, NH, RI, and VT.

Table 4. Trends (% change<sup>a</sup> per year as determined by linear regression) in number of mourning doves heard and seen along Breeding Bird Survey routes, 1966-2005.

	10 year (1996-05)					40 year (1966-05)				
	N	% Change <sup>b</sup>		90% CI		N	% Change <sup>b</sup>		90%CI	
<b>EASTERN UNIT</b>										
Hunt										
AL	93	-1.6	*	-2.7	-0.5	100	-1.4	**	-2.1	-0.8
DE/MD	66	-0.4		-1.2	0.5	78	0.3		-0.3	0.8
FL	73	-0.4		-2.5	1.8	86	2.0	**	1.3	2.8
GA	55	-0.1		-1.7	1.5	67	-1.4	*	-2.3	-0.5
IL	98	4.9	**	3.5	6.4	99	1.2	**	0.4	1.9
IN	55	3.2	**	1.8	4.6	59	0.2		-0.3	0.7
KY	34	3.5	*	1.2	5.8	48	0.5		-0.2	1.3
LA	51	4.2	**	2.1	6.3	69	2.4	**	1.1	3.7
MS	24	-2.7	*	-4.5	-0.8	34	-1.7	**	-2.6	-0.8
NC	69	0.2		-1.4	1.7	82	0.0		-0.8	0.8
OH	60	3.2	**	2.1	4.3	78	0.7	*	0.2	1.3
PA	99	0.5		-0.4	1.4	121	1.7	**	1.1	2.3
SC	31	3.8	**	1.9	5.7	38	0.0		-0.9	0.8
TN	42	1.6		-0.1	3.3	47	-0.6		-1.4	0.2
VA	48	-1.1		-2.2	0.0	55	-0.7	*	-1.2	-0.1
WV	91	3.8	**	3.0	4.7	94	1.4	**	0.7	2.1
WI	47	3.3	**	1.8	4.8	56	5.2	**	4.2	6.1
Subunit	1036	1.6	**	1.1	2.1	1211	0.2		-0.1	0.5
Nonhunt										
MI	59	2.4	**	1.2	3.5	82	0.6		0.0	1.1
N.England <sup>c</sup>	126	-0.1		-0.9	0.8	155	2.9	**	2.2	3.6
NJ	26	0.0		-2.6	2.6	37	0.4		-0.8	1.5
NY	89	1.3		0.2	2.5	116	2.6	**	2.2	3.0
Subunit	300	1.1	**	0.5	1.7	390	1.7	**	1.3	2.2
Unit	1336	1.5	**	1.1	1.9	1601	0.4	**	0.2	0.7
<b>CENTRAL UNIT</b>										
AR	32	2.5	*	0.8	4.1	35	0.8		-0.4	2.1
CO	121	0.6		-1.3	2.5	131	1.0		0.0	2.1
IA	33	4.0	*	1.1	6.9	38	-0.5		-1.4	0.5
KS	60	2.3		0.2	4.4	61	0.1		-0.7	0.9
MN	57	1.6		-0.2	3.5	68	-1.1		-2.1	-0.2
MO	53	0.4		-1.2	2.0	64	-1.7	**	-2.5	-1.0
MT	44	-1.6		-3.7	0.6	53	-1.1	*	-2.0	-0.3
NE	44	0.3		-2.1	2.7	48	-0.7	*	-1.3	-0.1
NM	64	4.5		0.2	8.7	74	0.4		-1.3	2.1
ND	42	0.6		-1.7	3.0	46	0.7		0.1	1.3
OK	54	1.6		0.2	3.0	60	-1.4	**	-2.0	-0.8
SD	42	-1.5		-3.5	0.4	51	0.4		-0.4	1.1
TX	178	-1.0		-2.1	0.1	205	-1.4	**	-1.8	-0.9
WY	72	0.6		-1.7	2.9	104	0.3		-1.2	1.9
Unit	896	0.6		0.0	1.2	1038	-0.5	**	-0.7	-0.2
<b>WESTERN UNIT</b>										
AZ	49	0.7		-0.7	2.2	74	-0.9		-2.5	0.8
CA	164	-0.3		-1.5	0.9	218	-1.1	*	-1.9	-0.4
ID	39	2.4		0.1	4.7	43	-0.8		-1.7	0.2
NV	23	0.0		-4.5	4.6	34	1.8		0.3	3.3
OR	80	-1.1		-4.8	2.7	97	-2.4	**	-3.4	-1.4
UT	85	-2.0		-5.1	1.2	93	-2.3	**	-3.3	-1.3
WA	59	1.1		-1.0	3.1	66	0.2		-1.1	1.5
Unit	499	0.2		-0.6	1.0	625	-1.1	**	-1.7	-0.6

<sup>a</sup>Mean of route trends weighted by land area and population density. The estimated count in the next year is  $(\%/100+1)$  times the count in the current year where % is the annual change. Note: Extrapolating the estimated trend statistic (% change per year) over time (e.g., 40 years) may exaggerate the total change over the period.

<sup>b</sup>\* $P<0.1$ ; \*\* $P<0.05$ ; \*\*\* $P<0.01$ . For purposes of this report, statistical significance was defined as  $P<0.05$ , except for the 2-year comparison where  $P<0.10$  was used because of the low power of the test.

<sup>c</sup>New England consists of CT, ME, MA, NH, RI, and VT.

Table 5. Preliminary estimates of the number of hunters, days hunted, and total bag from Harvest Information Program surveys for the 2004-05 season.

Management Unit	Hunters		Days hunted		Birds bagged	
<b>EASTERN</b>						
AL	43,800	± 8% <sup>1</sup>	124,800	± 28%	724,900	± 14%
DE	3,000	± 19%	11,700	± 40%	54,900	± 25%
FL	15,500	± 17%	55,200	± 27%	255,000	± 21%
GA	47,300	± 11%	146,600	± 17%	963,400	± 21%
IL	39,400	± 8%	123,900	± 11%	890,600	± 11%
IN	14,100	± 15%	46,400	± 14%	291,700	± 14%
KY	27,500	± 18%	78,400	± 25%	593,500	± 25%
LA	26,700	± 18%	82,400	± 28%	388,600	± 23%
MD	11,100	± 19%	46,900	± 46%	176,400	± 25%
MS	32,400	± 10%	89,800	± 16%	627,600	± 17%
NC	20,600	± 27%	41,800	± 28%	215,900	± 25%
OH	17,000	± 21%	74,900	± 28%	325,400	± 27%
PA	26,000	± 16%	112,100	± 39%	296,100	± 29%
RI	300	± 54%	900	± 47%	3,100	± 60%
SC	32,200	± 16%	107,100	± 21%	663,700	± 19%
TN	35,000	± 28%	90,400	± 31%	780,800	± 38%
VA	22,700	± 11%	58,000	± 12%	347,700	± 16%
WV	1,400	± 30%	4,600	± 44%	15,300	± 37%
WI	17,700	± 34%	77,500	± 42%	97,300	± 41%
Unit	433,700		1,373,300	± 7%	7,712,000	± 6%
<b>CENTRAL</b>						
AR	37,900	± 13%	114,000	± 21%	740,600	± 19%
CO	19,400	± 8%	54,800	± 19%	299,900	± 16%
KS	35,800	± 10%	119,300	± 13%	689,400	± 13%
MN	13,700	± 20%	61,100	± 50%	107,000	± 42%
MO	41,600	± 9%	128,800	± 17%	775,900	± 30%
MT	2,600	± 31%	11,300	± 99%	20,900	± 44%
NE	19,100	± 11%	71,400	± 14%	365,900	± 15%
NM	9,900	± 15%	42,000	± 19%	302,800	± 23%
ND	4,500	± 25%	13,000	± 24%	57,500	± 32%
OK	27,100	± 9%	94,000	± 11%	555,300	± 14%
SD	10,000	± 16%	36,700	± 21%	184,100	± 26%
TX	287,700	± 9%	1,089,200	± 13%	5,664,600	± 14%
WY	3,200	± 27%	8,700	± 34%	43,700	± 46%
Unit	512,500		1,844,300	± 8%	9,807,700	± 8%
<b>WESTERN</b>						
AZ	42,500	± 6%	150,100	± 12%	978,200	± 12%
CA	67,900	± 8%	202,500	± 12%	1,060,500	± 10%
ID	11,700	± 17%	38,800	± 20%	132,500	± 21%
NV	3,800	± 20%	8,800	± 20%	36,500	± 26%
OR	6,200	± 18%	20,900	± 26%	72,600	± 30%
UT	12,000	± 14%	37,600	± 22%	119,700	± 20%
WA	6,400	± 24%	17,500	± 28%	70,500	± 20%
Unit	150,500		476,200	± 7%	2,470,600	± 7%
U.S.	1,096,700 <sup>2</sup>		3,693,800	± 5%	19,990,200	± 5%

<sup>1</sup>This represents the 95% confidence interval expressed as percent of the point estimate.

<sup>2</sup>This total is slightly exaggerated because people are counted more than once if they hunted in more than one state.

Table 6. Preliminary estimates of the number of hunters, days hunted, and total bag from Harvest Information Program surveys for the 2005-06 season.

Management Unit	Hunters		Days hunted		Birds bagged	
<b>EASTERN</b>						
AL	63,200	±7% <sup>1</sup>	168,800	± 13%	1,252,600	± 16%
DE	3,000	± 21%	8,700	± 34%	54,200	± 39%
FL	19,200	± 17%	63,000	± 19%	341,800	± 24%
GA	39,200	± 14%	116,500	± 18%	757,200	± 20%
IL	37,600	± 8%	121,300	± 11%	798,800	± 14%
IN	18,400	± 13%	66,600	± 18%	371,900	± 25%
KY	29,700	± 17%	89,400	± 36%	703,100	± 41%
LA	23,800	± 23%	88,400	± 35%	445,900	± 26%
MD	10,800	± 20%	41,900	± 28%	241,700	± 35%
MS	24,100	± 21%	66,400	± 32%	455,900	± 32%
NC	46,000	± 15%	130,400	± 20%	741,800	± 20%
OH	19,100	± 21%	85,700	± 26%	488,800	± 39%
PA	40,900	± 14%	160,000	± 18%	430,300	± 19%
RI	300	± 55%	1,100	± 66%	900	± 88%
SC	65,100	± 6%	222,400	± 10%	1,447,700	± 12%
TN	36,900	± 23%	93,900	± 31%	633,200	± 36%
VA	26,500	± 9%	76,900	± 15%	424,400	± 21%
WV	1,800	± 30%	5,600	± 54%	22,300	± 48%
WI	15,600	± 26%	62,700	± 31%	180,600	± 48%
Unit	521,200		1,669,800	± 5%	9,793,000	± 6%
<b>CENTRAL</b>						
AR	43,400	± 15%	147,300	± 24%	861,600	± 20%
CO	18,400	± 7%	48,700	± 9%	263,400	± 10%
KS	32,400	± 8%	109,500	± 12%	680,400	± 11%
MN	6,000	± 34%	14,700	± 43%	48,800	± 61%
MO	40,200	± 10%	113,400	± 16%	641,800	± 20%
MT	2,000	± 34%	4,800	± 38%	17,800	± 44%
NE	17,800	± 10%	64,300	± 14%	371,100	± 15%
NM	9,300	± 17%	42,000	± 20%	250,100	± 22%
ND	3,100	± 27%	11,800	± 38%	55,500	± 48%
OK	34,500	± 9%	111,500	± 16%	828,500	± 20%
SD	7,100	± 18%	25,200	± 26%	127,700	± 28%
TX	257,200	± 10%	1,030,000	± 13%	5,710,700	± 15%
WY	2,500	± 27%	6,600	± 27%	34,100	± 31%
Unit	473,900		1,729,800	± 8%	9,891,400	± 9%
<b>WESTERN</b>						
AZ	41,900	± 8%	137,100	± 11%	952,600	± 11%
CA	64,700	± 7%	183,100	± 9%	1,013,400	± 10%
ID	9,200	± 19%	32,500	± 25%	122,900	± 28%
NV	4,100	± 17%	10,000	± 19%	47,700	± 25%
OR	8,600	± 27%	24,100	± 40%	85,600	± 51%
UT	13,400	± 16%	35,000	± 24%	137,800	± 29%
WA	7,900	± 23%	24,400	± 32%	105,500	± 29%
Unit	149,800		446,200	± 6%	2,465,500	± 7%
U.S.	1,144,900 <sup>2</sup>		3,845,700	± 4%	22,149,900	± 5%

<sup>1</sup>This represents the 95% confidence interval expressed as percent of the point estimate.

<sup>2</sup>This total is slightly exaggerated because people are counted more than once if they hunted in more than one state.

Division of Migratory Bird Management  
PO Box 25486  
Denver, CO 80225-0486  
303-275-2388

U.S. Fish and Wildlife Service  
<http://www.fws.gov/>

For state transfer relay service  
TTY/Voice: 711

June 2006

