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MOURNING DOVE STATUS REPORT, 1975

Special Scientific Report — Wildlife No. 207

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**UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE**



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by James L. Ruos and David D. Dolton, compilers

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Washington, D.C. • 1977

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Mourning Dove Status Report, 1975

Compiled by

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Abstract

Mourning dove (*Zenaidura macroura*) population indices, as determined from the nationwide Call-Count Survey, increased from 1974 to 1975 by 10% in the Eastern Management Unit, remained unchanged in the Central Management Unit, and decreased by 3% in the Western Management Unit. The change in the Eastern Unit was statistically significant ($P < 0.01$). The 1975 indices were below the 10-year means (1965-74) by 4% in the Eastern and Central Units, but the index was 18% above the long-term mean in the Western Unit. Regression analyses of the call-count data for 1965-75 indicate a downward trend in dove breeding populations in all management units; mean rates of annual decline were 2% in the Eastern and Central Units, and less than 1% in the Western Unit. The trend for the Eastern Unit was statistically significant ($P < 0.01$). From 1971 to 1975, Western Unit population indices increased by 60% ($P < 0.01$).

Changes in population indices are described by State and physiographic region. The 1975 indices were generally higher than those in 1974 for the eastern States, portions of the Southwest, the Columbia Plateau, and in western California. Lower population indices occurred principally in portions of the Basin and Range Province, southern Great Plains, and the coastal plain of Texas. Regression analyses of 11 years' data (1965-75) showed statistically significant ($P > 0.05$) upward population trends in eight States totaling 16% of the Nation's land area. Trends were significantly downward in 13 States representing 28% of the U.S. land area.

A major part of mourning dove (*Zenaidura macroura*) management in the United States involves regulating hunting to achieve proper harvest. The mourning dove Call-Count Survey, conducted annually since 1953 by Federal, State, and independent observers, provides population data that wildlife administrators use to set annual hunting regulations. This report describes the methods employed to obtain and analyze these data and presents the status of the breeding population of mourning doves in 1975.

Two versions of the Mourning Dove Status Report, one preliminary and one final, are prepared annually. In 1975, the preliminary report was mailed to members of the Dove Regulations Committee 1 week before the June regulations meeting in Washington, D. C. This timely distribution was possible because cooperators sent their data directly to the Office of Migratory Bird Management at Laurel, Maryland, immediately after completing their surveys. This report is the final version and contains additional analyses of survey data.

Basic procedures for collecting and analyzing data in this report were similar to those used in 1974 (Ruos 1977).

Procedures

The Call-Count Survey

Field studies have demonstrated the feasibility of the Call-Count Survey as a method for detecting annual changes in mourning dove breeding populations (Foote and Peters 1952). Currently, there are more than 1,000 randomly located routes throughout the United States. Each call-count route has twenty 3-min listening stations spaced at 1.6-km intervals; the routes are usually on lightly traveled secondary roads.

Each route is surveyed between 20 May and 10 June. Beginning in 1972, cooperators were instructed to survey their routes between 20 and 31 May. An extension to 10 June was provided to cooperators unable to complete their assignments during the desired period. Intensive studies in the eastern United States (Foote and Peters 1952) indicated that dove calling is relatively stable during the survey period. Call-count surveys are not conducted when wind velocities exceed 19.3 km/h or when it is raining.

The total number of doves heard calling during the

differences in land area that each State represented within the unit. Current weighting values for States and physiographic regions within management units appear in Tables 3 and 4.

Determination of Population Changes

Year-to-year changes in breeding population levels were determined from comparable data (Table 1). Routes run under acceptable conditions by the same observer in successive years were deemed comparable, and data from different observers were accepted when changes in number of doves heard did not exceed predetermined, expected values between years (Ruos 1972). Since the composition of these comparable routes changes with each 2-year comparison, long-term data are adjusted to a Base-Year Index (BYI): the proportional change which occurs between successive 2-year comparisons is applied to the State's BYI. Each State's BDI is adjusted to the BYI for each year, then is weighted by its land area to provide management unit indices.

New Base Year Indices Established

Inasmuch as management unit indices are derived from State values, it is important that each State's BYI accurately reflects that State's relative dove density within a management unit. Representative BYI's are best derived from randomly located routes. Previous efforts were directed toward the gradual reselection of BYI's to coincide with the year that each State first established random routes (Anon. 1959; Tomlinson 1965; Ruos and Tomlinson 1968). By 1967, 44 States had run randomized routes for 2 or more years. To provide a more uniform basis for comparison, 1967 was selected as the BYI for these States representing the mean BDI derived from comparable routes run in both 1966 and 1967 (Ruos and MacDonald 1968). The four excepted States were not randomized until 1970. These States were assigned a 1971 BYI and represented the mean of comparable data from the 1970 and 1971 surveys (Ruos 1972).

A new BYI is provided here in an effort to obtain a more representative index than has been possible in the past. For each State, 1971 was selected as the BYI representing the mean BDI for the 6-year period, 1968 to 1973. Base Year data from comparable routes accepted in each of the 2-year comparisons were used, thus the new BYI includes the mean of 12 data points. For example, the 1968 BDI used in the analysis of the 1967-68 data, as well as the 1968 BDI used in the analysis of the 1968-69 data, were included in the calculation of the BYI.

The 1971 BYI is derived entirely from data collected

on randomly located call-count survey routes and is subjected to standardized quality controls. Four States did not have random route data for all 6 years. The BYI was based on 5 years of data derived from random routes in Rhode Island and Vermont, and 4 years of data in Maine and New Hampshire.

The selection of the new BYI reduces the influence of a possible atypical year and should provide more reliable population indices used in the calculation of both short- and long-term trends. A comparison of data adjusted to the former and new BYI's between 1974 and 1975 in the Eastern Management Unit indicates a 10.2% increase with the former method compared with a 9.5% increase under the new system. In the Central Unit, a 0.9% decrease was indicated under the previous method compared with a 0.2% increase with the new one. The Western Unit showed a 6.2% decrease from 1974 to 1975 under the former Base Year compared with a 3.1% decrease with the new.

Regression analyses of long-term (1965 to 1975) data adjusted to the former and current BYI's also revealed similar values. By management unit, the mean annual changes for both the previous and new methods were: Eastern - 1.2 vs. - 1.9%; Central - 0.9 vs. - 1.6%; and Western 0.0 vs. - 0.1%. The statistical significance of these trends at either the 1% or 5% level did not change for each method.

Although these comparisons show similarity in population trends, the 1965-74 10-year means for all management units are higher by 4% in the Eastern Unit, 13% in the Central Unit, and 15% in the Western Unit, when the new procedure is used.

Determination of Changes in Factors Associated With the Survey

Factors associated with the survey which were recorded included the survey date, temperature at the start of the survey, and disturbance. Analysis of these factors was similar to methods described for determining year-to-year changes in the BDI (Ruos 1972).

Statistical Evaluation of Data

The Call-Count Survey was designed to detect major year-to-year changes in the breeding population index for each management unit (Foote 1959). In recent years, analysis of data revealed that observed differences of about 8, 9 and 13% between years within the Eastern, Central, and Western Management Units, respectively, would be statistically significant at the 5% level. Although the survey was not designed to detect a change between years in the BDI's of States or physiographic regions, data from these areas were also subjected to statistical analysis.

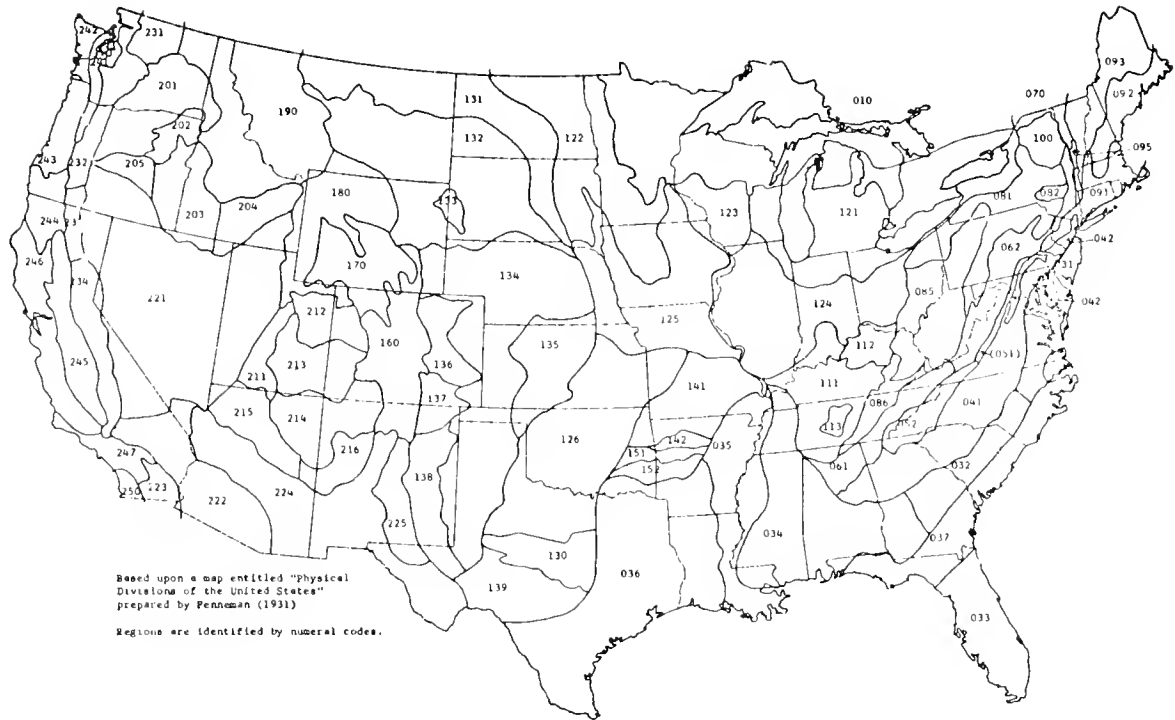


Fig. 2. Physiographic regions used in analysis of mourning dove population data, Revised 1970. See page 5 for strata codes.

Long-term BDI's, adjusted to a Base Year for all physiographic regions, States, and management units, were examined to determine whether significant trends were present. Trends were determined by linear regression analysis.

Determination of Population Distribution

The geographic distribution of dove densities has been determined from a study of BDI values adjusted to a Base Year for each physiographic region and State. For graphic presentation, the 1976 data have been assigned to one of five density classes (Figs. 3,4). Changes in the adjusted BDI's greater than 10% between 1975 and 1976 within physiographic region and State also were determined (Figs. 5,6).

Findings

This report is highlighted by the extensive increase in population indices which occurred east of the Great Plains from 1974 to 1975. Population indices increased from 1974 to 1975 by 10% in the Eastern Management

Unit, remained unchanged in the Central Management Unit, and decreased by 3% in the Western Management Unit. All management unit indices for the 11-year period 1965-75 are represented by downward trends. Since 1971, however, the trend in the Western Unit has been upward. The 1975 Eastern and Central Unit indices are below their preceding 10-year means. The Western Unit index for 1975 is substantially above this long-term mean.

Status of the United States Dove Population

In 1974, dove hunting was permitted in 31 of the 48 contiguous States, which represent 73% of the land area and 74% of the 1975 breeding population. In 1975, the mean breeding population index was 21.6 doves per route in the United States; in hunting States it was 22.0 and in non-hunting States it was 20.3 doves (Table 1).

1975 Population Distribution

The areas of highest dove density were in South Dakota, Nebraska, Kansas, and Oklahoma (Fig. 3), especially in portions of the southern Great Plains and

Physiographic regions used in analysis of mourning dove population data, revised 1970.
 Modified after Fenneman 1931

<u>Description</u>	<u>Stratum Code</u>	<u>Description</u>	<u>Stratum Code</u>	<u>Description</u>	<u>Stratum Code</u>
Laurentian Upland Division		Interior Plains Division		Intermontane Plateaus Division	
Superior Upland Province	010	Interior Low Plateaus Province		Columbia Plateaus Province	
Atlantic Plain Division		Highland Rim section	111	Walla Walla Plateau	201
Coastal Plain Province		Nashville Basin	112	Blue Mountain section	202
Embayed section	031	Central Lowland Province		Snake River Plain	203
Upper Coastal Plain	032	Eastern Lake section	121	Harney section	204
Floridian section	033	Western Lake section	122	Colorado Plateaus Province	211
East Gulf Coastal Plain	034	Wisconsin Driftless section	123	High Plateaus of Utah	212
Mississippi Alluvial Plain	035	Till Plains	124	Uinta Basin	213
West Gulf Coastal Plain	036	Dissected Till Plains	125	Canyon Lands	214
Lower Coastal Plain	037	Ozage Plains	126	Navajo section	215
Appalachian Highlands Division		Great Plains Province		Grand Canyon section	216
Piedmont Province		Central Texas section	130	Datil section	
Piedmont Uplands	041	Missouri Plateau, glaciated	131	Basin and Range Province	221
Piedmont Lowlands	042	Missouri Plateau, unglaciated	132	Great Basin	222
Blue Ridge Province		Black Hills	133	Sonoran Desert	223
Northern section	051	High Plains	134	Salton Trough	224
Southern section	052	Plains Border	135	Mexican Highland	225
Valley and Ridge Province		Colorado Piedmont	136	Sacramento section	
Tennessee section	061	Raton section	137		
Middle and Hudson Valley section	062	Pecos Valley	138		
St. Lawrence Valley Province		Edwards Plateau	139		
Chumplain and Northern section	070	Interior Highlands Division			
Appalachian Plateaus Province		Ozark Plateaus Province			
Mohawk and Allegheny section	081	Springfield-Salem plateaus	141		
Catskill section	082	Boston "Mountains"	142		
Kanawha section	085	Ouachita Province			
Cumberland section	086	Arkansas Valley	151		
New England Province		Ouachita Mountains	152		
Southern New England section	091	Rocky Mountain Division			
Northern New England section	092	Southern Rocky Mountains Province	160		
Mountain section	093	Wyoming Basin Province	170		
Teconic section	095	Middle Rocky Mountains Province	180		
Adirondack Province	100	Northern Rocky Mountains Province	190		
				Cascade Sierra Mountains Province	231
				Northern Cascade Mountains	232
				Middle Cascade Mountains	233
				Southern Cascade Mountains	234
				Sierra Nevada	
				Pacific Border Province	
				Puget Trough	241
				Olympic Mountains	242
				Oregon Coast Range	243
				Klamath Mountains	244
				California Trough	245
				California Coast Ranges	246
				Los Angeles Ranges	247
				Lower Californian Province	250

TABLE 1.--CHANGES IN MOURNING DOVE BREEDING DENSITY INDICES ON
20-STOP CALL COUNT SURVEY ROUTES, 1974-75.

EASTERN MANAGEMENT UNIT

STATES	ROUTES	MEAN NUMBER OF DOVES HEARD PER ROUTE A/ ADJUSTED WITHIN YEAR ADJUSTED TO BASE-YEAR PERCENT				
		1974	1975	1974	1975	CHANGE B/
HUNTING STATES						
ALA.	28	20.8	25.4	21.2	25.9	22.4**
DEL.	1	14.0	19.0	26.4	35.8	35.7
FLA.	22	10.9	13.0	10.6	12.6	18.9
GA.	21	29.2	32.4	20.4	22.7	11.0
ILL.	8	24.3	27.8	24.4	27.9	14.3
KY.	17	23.5	21.2	24.3	21.9	-9.8
LA.	15	6.3	6.4	6.1	6.1	0.8
MD.	11	16.4	11.7	23.5	16.8	-28.7**
MISS.	21	24.9	28.9	25.2	29.2	16.1
N.C.	18	15.9	14.1	18.4	16.3	-11.5
PA.	15	7.5	6.4	8.1	7.0	-14.1
R.I.	2	12.0	13.0	9.2	10.0	8.3
S.C.	18	22.8	21.5	27.6	26.1	-5.5
TENN.	20	23.3	24.4	18.4	19.3	4.7
VA.	9	23.9	26.1	23.3	25.4	9.1
W. VA.	9	3.4	2.6	4.5	3.5	-23.2
SUBTOTAL	235			18.2	19.3	6.0*
NONHUNTING STATES						
CONN.	2	9.0	15.5	16.5	28.4	72.2
IND.	13	31.9	32.0	24.3	24.3	0.1
MASS.	3	5.0	9.8	5.0	9.9	97.5
MAINE	5	0.0	0.0	0.0	0.0	0.0
MICH.	18	8.6	10.4	6.9	8.3	20.8
N.H.	3	4.4	3.7	2.7	2.3	-16.7
N.J.	2	12.0	7.5	16.9	10.6	-37.5*
N.Y.	14	14.4	17.8	8.6	10.6	23.2
OHIO	11	22.7	30.6	25.4	34.3	35.0***
VT.	3	1.3	1.4	0.1	0.1	11.1
WISC.	22	12.0	13.6	10.4	11.8	13.7
SUBTOTAL	96			11.6	13.8	19.1***
TOTAL	331			15.9	17.4	9.5***

TABLE 1.--CHANGES IN MOURNING DOVE BREEDING DENSITY INDICES ON
20-STOP CALL COUNT SURVEY ROUTES, 1974-75--CONTINUED.

CENTRAL MANAGEMENT UNIT

STATES	ROUTES	MEAN NUMBER OF DOVES HEARD PER ROUTE A/ ADJUSTED WITHIN YEAR ADJUSTED TO BASE-YEAR PERCENT				
		1974	1975	1974	1975	CHANGE B/
HUNTING STATES						
ARK.	13	23.8	22.5	25.1	23.7	-5.4
COLO.	15	13.2	12.0	20.8	19.0	-8.9
KANS.	21	45.5	46.5	45.0	46.0	2.2
MO.	15	25.2	28.2	29.2	32.7	12.0
N. MEX.	17	7.2	10.9	8.9	13.5	51.9
OKLA.	9	43.3	43.5	79.5	79.9	0.5
TEX.	98	24.5	20.4	21.2	17.7	-16.5**
WYO.	13	19.6	20.7	22.9	10.5	5.7
SUBTOTAL	201			26.0	25.7	-1.1
NONHUNTING STATES						
IOWA	15	21.6	22.8	21.9	23.2	5.8
MINN.	11	18.4	21.5	16.0	18.8	17.3
MOONT.	8	6.0	7.7	4.7	6.0	28.1
N. DAK.	19	27.8	24.4	32.9	28.9	-12.2
NEBR.	22	37.6	36.3	43.8	42.2	-3.7
S. DAK.	15	47.1	49.7	41.0	43.2	5.5
SUBTOTAL	90			23.7	24.2	2.1
TOTAL	291			25.1	25.1	0.2

TABLE 1.--CHANGES IN MOURNING DOVE BREEDING DENSITY INDICES ON
20-STOP CALL COUNT SURVEY ROUTES, 1974-75--CONTINUED.

WESTERN MANAGEMENT UNIT

STATES	ROUTES	MEAN NUMBER OF DOVES HEARD PER ROUTE A/ ADJUSTED WITHIN YEAR ADJUSTED TO BASE-YEAR PERCENT				
		1974	1975	1974	1975	CHANGE B/
HUNTING STATES						
ARIZ.	39	19.8	21.6	48.7	53.2	9.2
CALIF.	53	19.2	15.1	16.3	12.8	-21.3
ICAHN	16	11.2	8.2	14.6	10.7	-26.6**
NEV.	18	4.0	4.2	21.2	22.0	3.6
OREG.	14	3.3	3.1	11.5	11.1	-3.1
UTAH	13	19.3	13.6	12.2	8.6	-29.7
WASH.	17	6.4	8.0	12.1	15.1	24.5
TOTAL	170			20.5	19.9	-3.1

UNITED STATES SUMMARY

STATES	ROUTES	MEAN NUMBER OF DOVES HEARD PER ROUTE A/ ADJUSTED WITHIN YEAR ADJUSTED TO BASE-YEAR PERCENT				
		1974	1975	1974	1975	CHANGE B/
HUNT	606			22.0	22.0	0.2
NCNHUNT	186			19.1	20.3	6.2*
TOTAL	792			21.2	21.6	1.7

A/ INDICES OBTAINED FROM COMPARABLE, RANDOMIZED ROUTE DATA ADJUSTED FOR VARIATION IN THE LAND AREA OF EACH PHYSIOGRAPHIC REGION AREA PRESENTED WITHIN YEAR. STATE DATA ADJUSTED TO A BASE-YEAR ARE SHOWN HERE AND IN TABLE 3. UNIT AND SUBUNIT MEANS ARE DERIVED FROM STATE DATA ADJUSTED TO A BASE-YEAR AND WEIGHTED BY TOTAL STATE LAND AREA VALUES.

B/ CALCULATIONS PERFORMED USING THREE SIGNIFICANT POSITIONS. THE NUMBER OF ASTERISKS REPRESENT THE STATISTICAL SIGNIFICANCE LEVEL : * 10 PERCENT; ** 5 PERCENT; *** 1 PERCENT. SIGNIFICANCE LEVELS FOR STATE AND UNIT CHANGES ARE DETERMINED FROM ANALYSES OF DATA PRESENTED WITHIN YEAR.

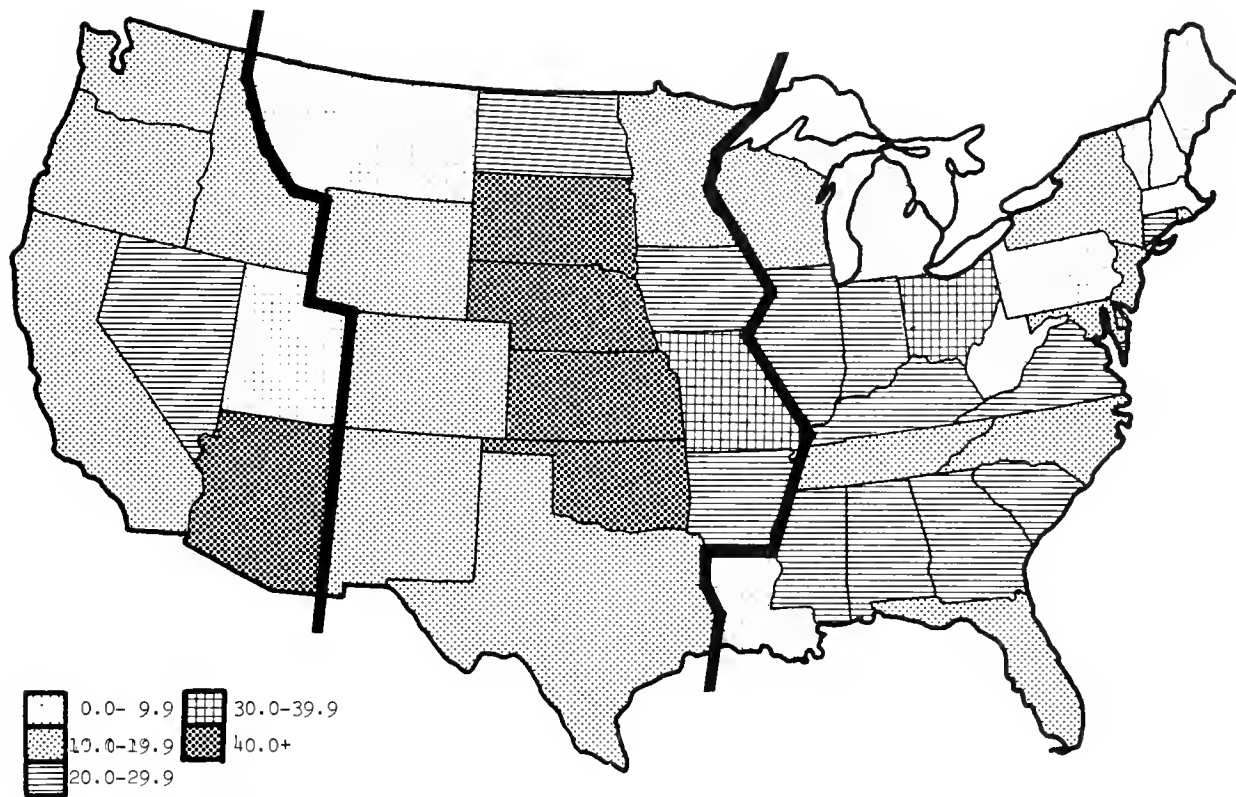


Fig. 3. Numbers of mourning doves heard per route by State, adjusted to a base year, 1975.

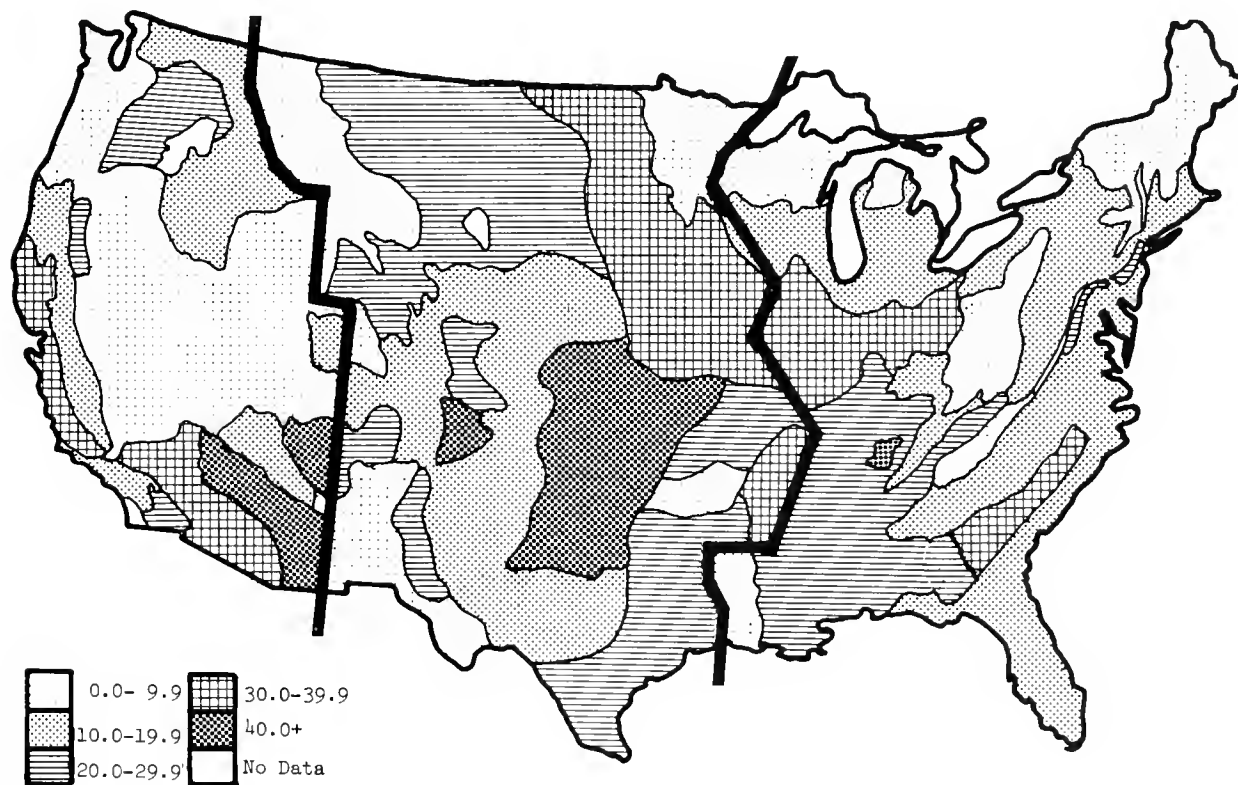


Fig. 4. Numbers of mourning doves heard per route by physiographic region, adjusted to a base year, 1975.

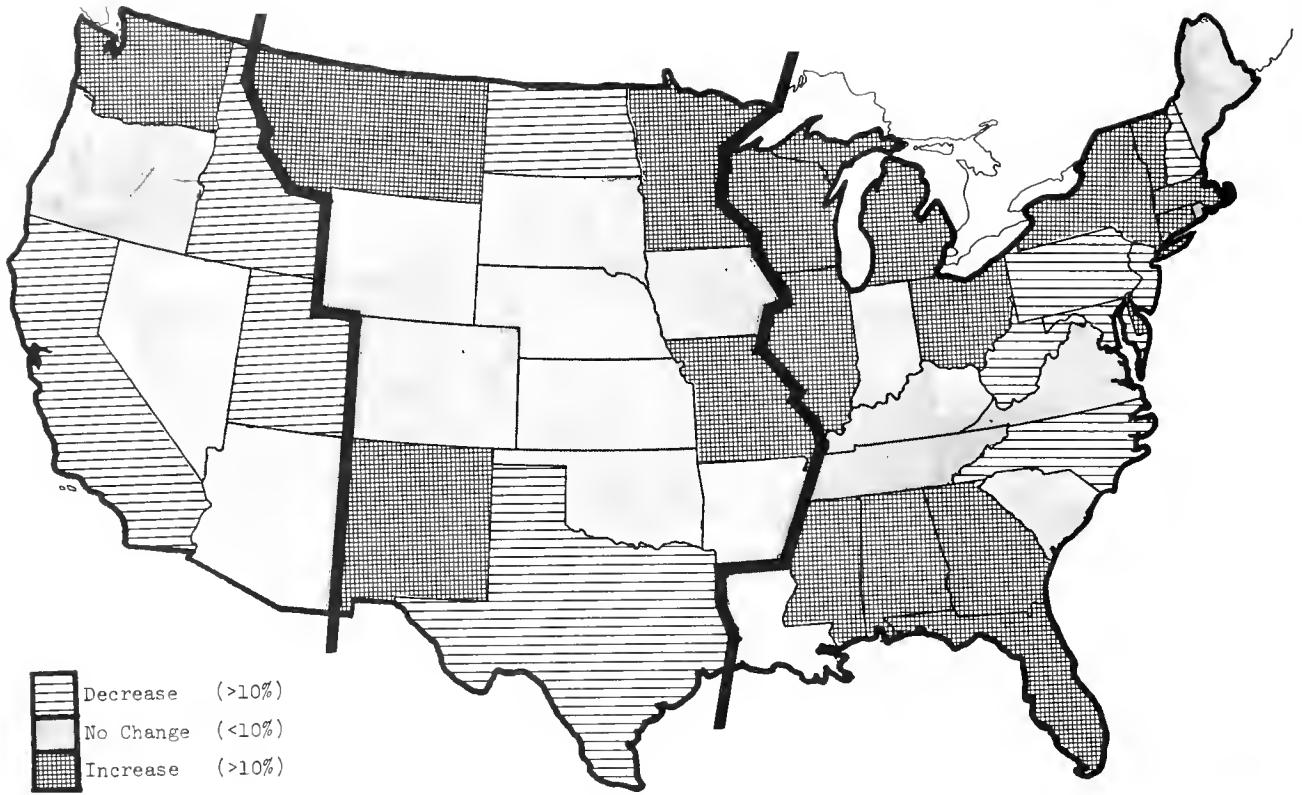


Fig. 5. Changes in numbers of mourning doves heard per route by State, 1974-1975.

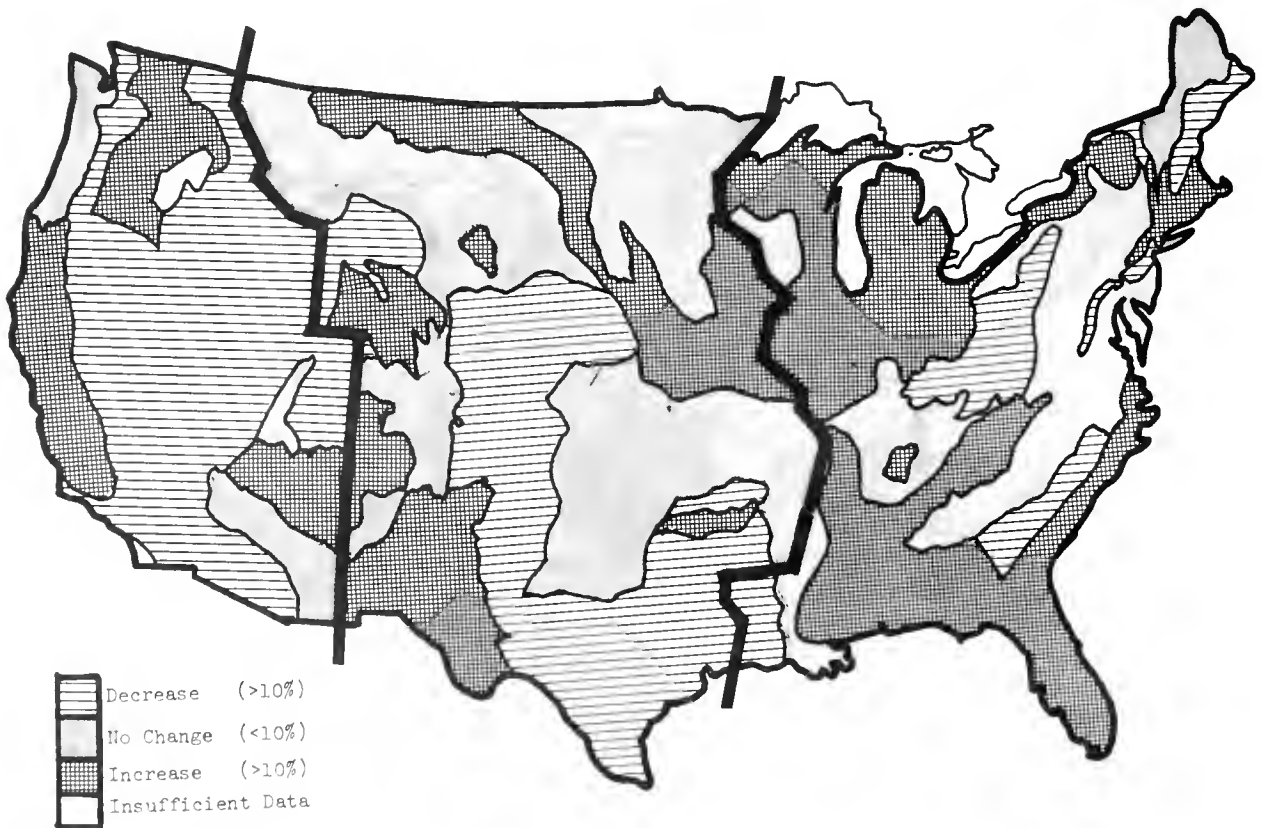


Fig. 6. Changes in numbers of mourning doves heard per route by physiographic region, 1974-1975.

adjacent Central Lowlands (Regions 135 and 126, respectively, Figs. 2,4). Low breeding population levels were distributed along the Continental Divide, throughout much of the northern Appalachian States, and in the Great Basin of several western States.

1974 to 1975 Population Changes

The United States BDI increased 1.7% from 21.3 doves heard per route in 1974 to 21.6 in 1975 (Table 1). Population indices increased in physiographic regions (Fig. 2) representing 56% of the U.S. land area, decreased in 41% of the land area, and showed no change in 3% of the land area. Changes greater than 10% in the BDI are illustrated by State (Fig. 5) and physiographic region (Fig. 6). The index increased in many of the States east of the Great Plains, and in Montana, New Mexico, and Washington. Population indices decreased in widely scattered areas of the mid-Atlantic States, western Great Plains, and far-western States. From 1974 to 1975, the combined hunting States index remained unchanged, whereas the combined nonhunting States index increased by 6.2%.

Analyses of several factors associated with the 1974 and 1975 surveys revealed no important year-to-year differences in mean survey date, temperature at the start of the survey, or the percentage of survey stops with disturbance great enough to jeopardize the audibility of calling doves (Table 2). Routes conducted in the Eastern Management Unit, in 1975 however, were run under warmer conditions than in 1974. About 8% of the survey route stops were subject to high disturbance.

1965 to 1975 Long-term Population Trends

The 1975 population indices for the United States, the combined hunting States, and combined nonhunting States are above their record lows established in 1970 and 1971. The 1975 population index for the United States was 0.9% above its preceding 10-year mean of 21.4 doves heard per route (Fig. 7). The current combined hunting States index was also above its mean by 2.3%, whereas the combined nonhunting States index was 4.2% below its long-term mean (Fig. 8).

Adjusted BDI's plotted in Figs. 7 and 8 reflect the trend in population indices since 1965. Linear regression analyses of these data (Table 3) are shown in Fig. 9. The indices decreased at an average annual rate of 1.4% in the United States, 0.9% in the hunting States, and 2.7% in nonhunting States. The study reveals a gradual overall decrease in nationwide dove breeding population between 1965 and 1975.

Regression analyses of State values for the 11-year period showed 8 States (16% of the land area) with significant upward trends in the population index, com-

pared with 13 States (28% of the land area) with downward trends (Table 3, Fig. 10). A similar study of physiographic region data from 1965 to 1975 is also presented in Table 4 and Fig. 11. Population indices have been increasing in an area extending from the Texas Gulf Coast Plain to the Lower Mississippi River Plain and in sections of the Columbia Plateau. Declining trends were prevalent east of the Appalachians, in the western Great Plains, and throughout the Great Basin regions of the West.

Status of the Eastern Management Unit Population

The Eastern Management Unit consists of 27 of the 48 contiguous States, including 30% of the land area and 24% of the current dove breeding population in the country. In the Eastern Unit, dove hunting is permitted in 16 States representing 66% of the land area and 73% of the currently estimated dove population. In 1975, the mean breeding population index was 17.4 doves heard per route for the Unit, with 19.3 doves heard per route for the combined hunting States and 13.8 doves heard per route for the combined nonhunting States (Table 1).

1975 Population Distribution

Extensive areas of high dove densities were reported from the Central Lowlands (Region 124) and the Upper Atlantic Coastal Plain (Region 032). States with a mean of 30 or more doves heard per route included Ohio and Delaware (Table 3, Fig. 3). Densities were generally low in the Appalachian Highlands, northern uplands, and the lower Atlantic Coastal Plain (Table 4, Fig. 4). Louisiana and seven northern States had means of fewer than 10 doves heard calling per route in 1975.

1974 to 1975 Population Changes

The Eastern Unit BDI increased 9.5% from 15.9 doves heard per route in 1974 to 17.4 doves heard per route in 1975 (Table 1). Population indices increased in those physiographic regions (Fig. 1) representing 76% of the total land area, decreased in 20% of the area, and showed no change in 4% of the area. The most extensive areas of increase included the Central Lowlands (Regions 121, 123, 124) and the Gulf and Atlantic Coastal Plains (Regions 033, 034, 037), representing most southern and western States in this management unit. Substantially lower population indices occurred in the Upper Coastal Plain (Region 032), portions of the Appalachian Plateaus, and several mid-eastern States (Fig. 5,6). From 1974 to 1975 the combined hunting States index increased 6.0% and the combined nonhunting States index increased 19.1% (Table 1).

TABLE 2.--FACTORS ASSOCIATED WITH THE MOURNING DOVE CALL-COUNT SURVEY 1974-75.

EASTERN MANAGEMENT UNIT												
STATES	DATE OF SURVEY		CHANGE		TEMPERATURE		SIARI		HIGH DISURBANCE			
	1974	1975	1974	1975	1974	1975	1974	1975	1974	1975		
ALA.	28	MAY 25	MAY 26	1	27	65.3	65.5	0.1	26	10.7	12.5	1.8
DEL.	1	MAY 24	MAY 27	3	1	64.0	60.0	-4.0	1	15.0	5.0	-10.0
FLA.	18	MAY 23	MAY 26	3**	18	68.0	67.1	-0.9	18	8.4	8.1	-0.3
GA.	21	MAY 27	MAY 25	-2	21	64.0	67.4	3.4**	20	9.7	12.4	2.7
ILL.	8	MAY 24	MAY 29	5*	8	62.8	62.5	-0.4	7	3.9	6.1	2.2
KY.	16	MAY 25	MAY 26	1	15	58.3	64.3	5.9**	15	7.3	28.7	21.4
LA.	13	MAY 24	MAY 22	-2	12	67.7	69.1	1.4	13	14.3	8.1	-6.2*
MD.	11	MAY 30	MAY 28	-2	11	56.2	62.1	5.9*	11	11.4	14.3	2.8
MISS.	21	MAY 24	MAY 25	1	21	67.4	66.4	-1.0	19	14.2	14.0	-0.2
N.C.	18	MAY 28	MAY 26	-2	18	60.4	66.7	6.3	13	10.1	8.5	-1.6
PA.	14	MAY 27	MAY 30	3	14	52.3	55.3	3.0	12	14.1	15.8	1.7
R.I.	2	MAY 22	JUNE 7	16***	2	47.5	52.0	4.5	2	10.0	10.0	0.0
S.C.	18	MAY 24	MAY 28	4***	18	64.8	67.9	3.1***	15	11.2	10.0	-1.2
TENN.	20	MAY 26	MAY 25	-1	19	64.2	63.7	-0.5	19	12.3	17.6	5.3
VA.	9	MAY 24	MAY 24	0	9	55.0	63.3	8.2***	9	9.4	10.5	1.1
W. VA.	7	MAY 29	MAY 28	-1	6	56.4	62.4	6.0	7	12.8	17.9	5.2
SUBTOTAL	225	MAY 25	MAY 26	1	220	62.6	64.8	2.2***	207	10.5	12.8	2.3
NONHUNTING STATES												
CONN.	2	MAY 23	MAY 21	-2***	2	61.5	61.5	0.0	2	5.0	12.5	7.5***
IND.	13	MAY 26	MAY 28	2	13	59.2	61.3	2.1	13	10.6	10.8	0.2
MASS.	3	MAY 26	MAY 26	0	3	46.3	49.7	3.4	1	15.0	5.0	-10.0
MAINE	1	MAY 31	MAY 29	-2	1	45.0	45.0	0.0	1	15.0	5.0	-10.0
MICH.	16	MAY 29	MAY 30	1	16	52.3	54.4	2.1	14	16.7	7.6	-9.1
N.H.	2	MAY 26	MAY 25	-1	2	50.0	55.0	5.0	2	0.0	17.5	17.5
N.J.	2	MAY 22	MAY 23	1	2	53.5	60.5	7.0	2	22.5	10.0	-12.5
N.Y.	8	MAY 30	MAY 27	-3	8	53.3	58.3	4.9	8	5.3	4.7	-0.6
OHIO	11	MAY 23	MAY 25	2	11	54.6	62.3	7.7***	11	8.4	5.3	-3.1
VT.	1	MAY 21	MAY 24	3	1	37.0	60.0	23.0*	1	5.0	15.0	10.0
MISC.	21	MAY 31	MAY 29	-2	21	53.3	53.9	0.5	17	5.2	5.1	-0.1
SUBTOTAL	80	MAY 28	MAY 28	0	80	53.6	56.8	3.1**	72	9.9	6.9	-3.0
TOTAL	305	MAY 26	MAY 27	1	300	59.8	62.3	2.5***	279	10.3	11.0	0.6

TABLE 2.---FACTORS ASSOCIATED WITH THE MORNING DOVE CALL-COUNT SURVEY 1974-75---CONTINUED.

CENTRAL MANAGEMENT UNIT												
STATES	DATE OF SURVEY		TEMPERATURE		WIND		HIGH DISTURBANCE		CHANGE			
	1974	1975	1974	1975	1974	1975	1974	1975				
ARK.	13	MAY 26	MAY 28	2	13	65.6	66.9	1.4	10	8.8	6.9	-1.8
CALIF.	14	MAY 25	MAY 27	2	14	40.5	41.3	0.9	13	4.7	3.9	-0.8
KANS.	21	MAY 27	MAY 29	2	21	59.1	56.1	-2.9	20	10.0	12.3	2.3
MO.	15	MAY 28	MAY 30	2	15	65.6	67.7	2.1	13	5.5	3.8	-1.7
N. MEX.	16	MAY 24	MAY 26	2	16	51.9	48.3	-3.5	14	8.9	7.9	-0.9
OKLA.	9	MAY 30	MAY 29	-1	9	61.9	61.4	-0.6	7	10.4	2.6	-7.8
TEX.	98	MAY 22	MAY 23	1***	98	67.3	66.5	-0.8	87	5.5	6.4	0.9
WYO.	8	MAY 26	MAY 27	1**	8	40.7	40.5	-0.2	6	0.6	9.2	8.7
SUBTOTAL	194	MAY 25	MAY 25	1**	194	57.6	57.0	-0.7	170	6.4	6.7	0.3
HUNTING STATES												
IOWA	15	MAY 28	MAY 28	0	15	51.5	52.4	0.9	14	7.0	9.2	2.2
MINN.	7	MAY 27	MAY 27	0	7	51.9	46.7	-5.2	7	8.7	12.3	3.6
MONT.	5	JUNE 1	MAY 27	-5***	5	41.8	38.1	-3.7	5	2.7	2.0	-0.7
N. DAK.	19	MAY 29	MAY 27	-2	19	42.9	42.7	-0.1	18	5.8	6.2	0.4
NEBR.	22	MAY 26	MAY 28	2*	22	53.2	49.9	-3.3*	19	5.6	10.8	5.2
S. DAK.	15	MAY 27	MAY 27	0	15	43.0	46.1	3.1***	13	7.7	7.7	0.0
SUBTOTAL	83	MAY 28	MAY 27	-1	83	47.1	45.5	-1.6	76	6.2	7.9	1.7
NONHUNTING STATES												
TOTAL	277	MAY 26	MAY 27	1	277	53.9	52.9	-1.0	246	6.3	7.1	0.8

TABLE 2.--FACTORS ASSOCIATED WITH THE MORNING DOVE CALL-COUNT SURVEY 1974-75--CONTINUED.

WESTERN MANAGEMENT UNIT

STATES	DATE OF SURVEY A/		TEMPERATURE AT STARI B/		HIGH DISTURBANCE (31 A,B/							
	1974	1975	CHANGES	1974	1975	CHANGES						
ARIZ.	38	MAY 26	MAY 29	3***	38	52.6	52.6	-0.0	33	3.4	8.1	4.7**
CALIF.	40	MAY 28	MAY 28	0	39	53.4	53.6	0.1	36	12.5	11.5	-1.0
ICAHO	15	MAY 28	MAY 31	3**	14	41.4	43.6	2.2	14	13.3	11.3	-2.0
NEV.	13	MAY 25	MAY 28	3	11	43.8	44.1	0.2	9	1.2	1.8	0.6
OREG.	10	MAY 26	MAY 28	2	10	40.0	43.6	3.6	10	11.1	8.8	-2.3
UTAH	10	MAY 29	MAY 30	1	10	52.5	47.5	-5.1*	9	2.5	8.6	6.1
WASH.	11	MAY 27	MAY 29	2	9	40.7	49.1	8.4**	11	12.9	7.1	-5.8
TOTAL	137	MAY 27	MAY 29	2**	131	47.8	48.6	0.8	122	8.0	8.3	0.3

HUNTING STATES

UNITED STATES SUMMARY

STATES	DATE OF SURVEY A/		TEMPERATURE AT STARI B/		HIGH DISTURBANCE (31 A,B/							
	1974	1975	CHANGES	1974	1975	CHANGES						
HUNT	556	MAY 26	MAY 27	1***	545	56.0	56.6	0.6	499	8.0	8.9	0.9
NONHUNT	163	MAY 28	MAY 28	0	163	49.5	49.6	0.1	148	7.5	7.5	0.0
TOTAL	719	MAY 26	MAY 27	1**	708	54.3	54.8	0.5	647	7.9	8.6	0.7

A/ DATA FROM COMPARABLE RANDOMIZED ROUTES ADJUSTED FOR VARIATION IN LAND AREA OF EACH PHYSIOGRAPHIC REGION. CALCULATIONS PERFORMED USING 3 SIGNIFICANT POSITIONS. CHANGE EQUALS THE ARITHMETIC DIFFERENCE. THE NUMBER OF ASTERISKS REPRESENT THE STATISTICAL SIGNIFICANCE LEVEL OF CHANGE: * 10 PERCENT; ** 5 PERCENT; *** 1 PERCENT.

B/ PERCENT OF STOPS (LISTENING STATIONS) WITH THE LEVEL OF DISTURBANCE GREAT ENOUGH TO SERIOUSLY LIMIT AN OBSERVER'S ABILITY TO HEAR CALLING DOVES. 20-STOP SURVEY ROUTE.

TABLE 3.--TRENDS IN MORNING DOVE BREEDING DENSITY INDICES BY STATE, 1965-75.

STATE	EASTERN MANAGEMENT UNIT										LINEAR REGRESSION, 1965-75				
	LAND AREA		ADJUSTED AVERAGE DOVES HEARD CALLING PER ROUTE A.B./								PERCENT CHANGE		STAT.		
	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	TOTAL ANNUAL		SIGN.	
ALA.	33.32	23.0	23.0	22.2	18.9	23.2	20.3	18.5	22.2	19.7	21.2	25.9	0.7	0.1	N.S.
DEL.	1.29	9.4	18.8	13.2	19.3	28.2	5.4	11.3	26.4	26.4	26.4	35.8	168.1	10.4	P .05
FLA.	35.82	15.4	13.8	10.8	11.9	13.0	8.7	10.3	10.1	10.6	12.6		-26.9	-3.1	P .05
GA.	37.82	29.1	20.6	24.3	22.4	24.5	29.9	19.9	16.8	18.2	20.4	22.7	-27.7	-2.7	N.S.
ILL.	35.09	23.7	27.3	28.1	27.6	23.1	31.0	24.9	27.8	27.6	24.4	27.9	3.5	0.3	N.S.
KY.	26.08	30.8	33.5	28.4	26.0	25.9	26.5	26.2	26.5	25.5	24.3	21.9	-26.1	-3.0	P .01
LA.	31.14	10.6	7.1	8.1	6.9	6.8	6.5	6.6	7.7	5.7	6.1	6.1	-34.2	-4.1	P .05
MD.	6.55	15.1	14.3	18.9	16.6	15.9	18.9	17.9	24.9	22.3	23.5	16.8	44.1	3.7	P .05
MISS.	30.63	28.3	25.9	21.3	20.4	22.0	23.5	26.4	27.0	25.1	25.2	29.2	11.9	1.1	N.S.
N.C.	22.51	45.1	48.0	39.0	41.4	32.2	34.3	22.8	21.4	27.1	18.4	16.3	-66.9	-10.4	P .01
PA.	29.01	10.7	12.5	17.1	11.4	12.5	9.1	8.6	10.2	8.2	8.1	7.0	-46.1	-6.0	P .05
R.I.	0.67	23.8	16.7	21.4	10.7	10.0	3.5	10.0	7.3	7.7	9.2	10.0	-72.1	-11.9	P .05
S.C.	19.99	31.3	30.4	30.3	29.7	32.0	26.4	27.6	22.5	29.4	27.6	26.1	-17.1	-1.9	P .05
TENN.	27.07	20.1	20.1	14.8	16.0	15.4	23.9	21.4	25.6	19.0	18.4	19.3	13.5	1.3	N.S.
VA.	26.05	28.7	34.8	28.2	38.0	29.2	25.9	22.4	13.4	16.1	23.3	25.4	-42.7	-5.4	P .05
W. VA.	15.41	21.2	9.2	4.7	4.7	5.3	6.1	5.3	8.3	5.3	4.5	3.5	-77.2	-13.6	P .10
SUBTOTAL	378.45	23.7	22.9	21.5	20.7	20.1	21.5	18.4	18.7	18.3	18.2	19.3	-22.3	-2.5	P .01
CCNN.	3.23	1.9	2.9	4.6	5.0	0.8	3.3	3.6	3.3	3.3	16.5	28.4	477.2	85.3	P .05
IND.	23.36	14.8	27.1	28.1	30.2	27.6	28.2	35.7	30.3	26.8	24.3	24.3	14.7	1.4	N.S.
MAINE	19.85	0.3	0.6	0.0	1.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	-100.0	-51.2	N.S.
MASS.	5.31	7.7	11.1	14.6	5.0	1.4	5.5	4.9	6.3	6.3	5.0	9.9	-34.3	-4.1	N.S.
MICH.	37.18	5.1	7.8	7.6	5.8	7.5	6.7	9.4	9.9	7.5	6.9	8.3	31.1	2.7	N.S.
N.H.	5.80	2.6	1.8	1.2	1.1	1.0	1.1	3.8	2.7	5.6	2.7	2.3	139.7	9.2	N.S.
N.J.	4.91	25.2	23.7	19.7	19.1	16.6	20.8	23.1	24.9	22.6	16.9	10.6	-28.2	-3.3	N.S.
N.Y.	30.49	12.4	13.9	13.6	12.1	10.5	9.5	8.6	11.3	10.1	8.6	10.6	-30.8	-3.6	P .05
OHIO	26.42	23.8	32.7	31.8	33.7	38.2	42.4	32.7	34.4	27.5	25.4	34.3	1.8	0.2	N.S.
VT.	5.95	0.2	0.8	0.8	0.6	0.3	1.0	0.1	0.1	0.1	0.1	0.1	-88.0	-18.4	P .10
WISC.	36.07	17.0	11.7	14.2	12.1	10.5	9.1	12.3	11.8	13.2	10.4	11.8	-21.9	-2.4	N.S.
SUBTOTAL	198.57	11.8	14.3	14.6	14.0	13.8	14.1	14.7	14.8	13.1	11.6	13.8	-1.8	-0.2	N.S.
TOTAL	577.02	19.6	19.9	19.1	18.4	18.0	18.9	17.1	17.3	16.5	15.9	17.4	-17.5	-1.9	P .01

TABLE 3.--TRENDS IN MORNING DOVE BREEDING DENSITY INDICES BY STATE, 1965-75--CONTINUED.

STATE	LAND AREA WEIGHT	CENTRAL MANAGEMENT UNIT										LINEAR REGRESSION, 1965-75				
		ADJUSTED AVERAGE DOVES HEARD CALLING PER ROUTE A.B./										PERCENT CHANGE	STAT.			
		1965	1966	1967	1968	1969	1970	1971	1972	1973	1974			1975	TOTAL	ANNUAL
		HUNTING STATES														
ARK.	34.37	14.3	15.9	20.0	19.3	21.5	22.1	23.5	23.3	24.7	25.1	23.7	60.1	4.8	P .01	
COLO.	67.18	9.3	12.0	13.0	11.1	15.9	16.6	15.2	16.6	16.0	20.8	19.0	90.4	6.7	P .01	
KANS.	52.43	47.1	50.7	59.0	57.7	63.9	59.1	57.4	60.3	56.0	45.0	46.0	-6.2	-0.6	N.S.	
MO.	45.10	40.4	44.2	41.1	44.8	28.5	35.2	33.0	44.7	33.5	29.2	32.7	-25.1	-2.9	P .10	
N. MEX.	77.98	34.5	50.8	15.2	22.7	15.6	14.7	12.1	15.2	8.7	8.9	13.5	-84.6	-16.6	P .01	
OKLA.	44.40	59.7	50.6	65.5	68.9	52.2	45.7	25.2	75.3	72.8	79.5	79.9	39.8	3.4	N.S.	
TEX.	170.03	17.2	18.7	17.6	18.1	17.3	19.7	19.6	25.2	19.8	21.2	17.7	18.3	1.7	N.S.	
WYO.	62.33	10.0	13.1	10.8	7.7	17.1	16.2	7.9	7.9	7.4	9.9	10.5	-22.0	-2.5	N.S.	
SUBTOTAL	553.82	25.8	29.3	25.8	26.8	25.3	25.5	22.1	29.6	25.5	26.0	25.7	-4.2	-0.4	N.S.	
		NONHUNTING STATES														
IOWA	36.15	40.3	46.1	47.4	42.6	35.9	23.8	28.8	27.1	25.2	21.9	23.2	-56.7	-8.0	P .01	
MINN.	54.09	16.4	16.4	14.6	16.0	9.4	7.7	11.5	11.6	10.4	16.0	18.9	-5.8	-0.6	N.S.	
MONT.	94.47	24.7	26.8	29.3	8.9	10.3	7.9	10.3	7.5	6.1	4.7	6.0	-94.3	-22.8	P .01	
NEBR.	49.69	50.9	44.4	36.7	43.9	43.9	42.8	41.6	43.9	44.6	43.8	42.2	-5.0	-0.5	N.S.	
N. DAK.	45.54	33.3	29.6	29.5	34.4	28.8	23.9	24.4	25.6	33.1	32.9	28.9	-6.0	-0.6	N.S.	
S. DAK.	49.20	34.3	44.2	27.5	30.4	27.9	29.7	35.5	36.6	39.3	41.0	43.2	25.2	2.3	N.S.	
SUBTOTAL	329.14	31.6	32.9	29.8	25.8	23.2	20.4	23.0	22.7	23.4	23.7	24.2	-30.1	-3.5	P .01	
TOTAL	882.96	28.0	30.6	27.3	26.4	24.5	23.6	22.4	27.0	24.7	25.1	25.1	-14.7	-1.6	P .10	

TABLE 3.--TRENDS IN MOURNING DOVE BREEDING DENSITY INDICES BY STATE, 1965-75--CONTINUED.

STATE	LAND AREA WEIGHT	WESTERN MANAGEMENT UNIT										LINEAR REGRESSION, 1965-75				
		ADJUSTED AVERAGE Doves HEARD CALLING PER ROUTE	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	PERCENT CHANGE	ANNUAL	STAT. SIGN.
HUNTING STATES																
ARIZ.	72.65	46.9	53.6	48.6	42.5	47.5	35.2	23.1	30.9	51.4	48.7	53.2	-5.5	-0.6	N.S.	
CALIF.	101.71	24.8	19.8	16.2	13.6	13.1	12.4	12.7	13.4	12.6	16.3	12.8	-40.7	-5.1	P .05	
IDAHO	54.37	10.3	10.0	9.5	9.6	9.1	11.6	12.1	15.7	13.8	14.6	10.7	47.2	3.9	P .05	
NEV.	71.27	4.7	6.9	7.7	14.2	10.9	9.9	5.7	11.4	9.3	21.2	22.0	250.1	13.5	P .05	
OREG.	62.27	11.5	11.4	10.5	10.7	12.1	8.3	9.6	9.1	9.2	11.5	11.1	-9.3	-1.0	N.S.	
UTAH	53.34	13.9	15.0	22.5	12.8	9.5	7.9	13.9	9.3	8.0	12.2	8.6	-47.7	-6.3	P .10	
WASH.	43.87	8.8	8.9	7.6	7.0	7.5	8.3	8.3	8.1	8.7	12.1	15.1	67.4	5.3	P .05	
TOTAL	452.48	18.9	19.3	18.4	16.7	16.6	14.1	12.5	14.6	17.0	20.5	19.9	-1.4	-0.1	N.S.	

UNITED STATES SUMMARY

STATE	LAND AREA WEIGHT	UNITED STATES SUMMARY										LINEAR REGRESSION, 1965-75			
		ADJUSTED AVERAGE Doves HEARD CALLING PER ROUTE	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	PERCENT CHANGE	ANNUAL
HUNT	1391.75	22.9	24.2	22.1	21.8	21.0	20.6	17.9	21.7	20.7	22.0	22.0	-8.4	-0.9	N.S.
NCNHUNI	527.71	24.2	25.9	24.1	21.4	19.7	18.0	19.9	19.7	19.5	19.1	20.3	-24.2	-2.7	P .01
TOTAL	1919.46	23.3	24.7	22.7	21.7	20.7	19.9	18.4	21.1	20.4	21.2	21.6	-13.0	-1.4	P .10

A/ THE AVERAGE NUMBER OF Doves HEARD PER ROUTE ADJUSTED ANNUALLY TO A BASE YEAR ACCORDING TO THE PERCENT CHANGE FROM PRECEDING YEAR ON COMPARABLE ROUTES. FOR EACH STATE, 1971 SELECTED AS THE BASE YEAR REPRESENTING THE MEAN BDI FOR THE 6-YEAR PERIOD 1968 TO 1973. BASE YEAR DATA FROM COMPARABLE ROUTES ACCEPTED IN EACH OF THE 2-YEAR COMPARISONS, THUS INCLUDE THE MEAN OF 12 DATA POINTS. SEE TEXT FOR ADDITIONAL INFORMATION.

B/ UNIT AND SUBUNIT INDICES DERIVED FROM WEIGHTED STATE VALUES (THIS TABLE) CARRIED TO 3 POSITIONS.

C/ STATISTICAL SIGNIFICANCE OF TRENDS: N.S. = NOT SIGNIFICANT ($P > .10$); N.E. = NO ESTIMATE AVAILABLE.

TABLE 4. ---TRENDS IN MORNING DOVE BREEDING DENSITY INDICES BY PHYSIOGRAPHIC REGION, 1965-75.

LAND AREA WEIGHT		EASTERN MANAGEMENT UNIT														LINEAR REGRESSION, 1965-75		
		ADJUSTED AVERAGE DOVES HEARD CALLING PER BOWIE A.B./														PERCENT CHANGE C/ STAT.		
REGION		1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	TOTAL	ANNUAL	SIGN.	D/		
10	32.10	13.6	5.9	5.5	5.0	4.5	3.2	5.5	5.5	6.8	4.0	5.0	-51.6	-7.0	N.S.			
31	15.34	24.8	25.5	24.0	21.5	16.5	19.6	21.7	24.4	20.8	19.5	19.8	-18.3	-2.0	N.S.			
32	16.40	58.1	43.1	50.2	51.0	49.4	44.0	44.5	37.6	41.9	46.9	38.8	-24.0	-2.7	P .05			
33	24.79	19.4	14.7	14.6	12.6	13.7	16.2	9.4	13.2	12.5	11.0	14.2	-28.6	-3.3	P .10			
34	63.72	27.1	23.1	20.8	17.9	20.1	21.2	15.8	23.3	21.2	19.3	21.7	-12.2	-1.3	N.S.			
35	20.50	19.9	20.4	21.4	21.9	20.4	21.5	29.1	24.6	23.1	28.3	26.8	39.6	3.4	P .01			
36	15.69	8.9	7.2	7.8	6.0	6.8	5.7	6.3	6.6	4.7	6.6	4.9	-35.6	-4.3	P .01			
37	33.14	22.4	23.5	21.8	19.3	29.3	32.3	15.5	9.6	14.1	12.0	16.1	-47.3	-6.2	P .10			
41	39.35	22.7	24.8	20.7	27.8	21.5	20.0	16.4	11.7	14.7	17.5	19.1	-38.2	-4.7	P .05			
42	3.51	19.8	32.7	33.4	30.6	30.2	26.2	30.3	31.8	35.9	34.6	27.1	17.7	1.6	N.S.			
51 E/	1.93	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.			
52	6.09	5.8	7.7	6.5	7.8	4.4	8.9	7.9	9.3	9.3	6.1	7.3	22.1	2.0	N.S.			
61	17.62	19.5	19.5	15.6	12.5	14.5	25.1	18.8	24.3	19.6	19.5	22.2	28.9	2.6	N.S.			
62	18.99	24.1	21.8	17.3	22.2	23.8	20.5	15.6	17.1	14.3	16.9	17.9	-31.2	-3.7	P .05			
70	2.40	N.E.	N.E.	0.9	1.2	0.7	0.7	0.7	0.7	0.7	0.7	0.5	-44.6	-7.1	P .05			
81	27.02	10.1	12.5	19.7	15.1	11.5	9.8	9.7	12.5	10.6	9.8	10.0	-29.5	-3.4	N.S.			
82	1.32	N.E.	3.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-100.0	-64.5	N.S.			
85	32.72	5.8	7.0	5.3	3.6	4.6	4.1	5.7	5.3	4.7	4.3	3.7	-29.2	-3.4	P .10			
86	7.27	15.0	14.5	10.6	12.5	12.8	12.5	9.4	11.5	9.8	13.9	12.7	-14.8	-1.6	N.S.			
91	9.28	N.E.	11.7	14.4	7.3	2.0	4.3	4.9	5.0	5.0	6.3	10.7	-41.1	-5.7	N.S.			
92	10.00	N.E.	N.E.	0.6	1.0	1.1	0.6	2.2	1.6	3.3	1.6	1.3	167.6	13.1	N.S.			
93	20.12	N.E.	N.E.	N.E.	N.E.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	N.S.			
95 E/	1.64	N.E.	N.E.	3.7	3.7	3.7	9.7	1.5	3.0	3.0	N.E.	N.E.	N.E.	N.E.	N.E.			
100	6.71	N.E.	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	449.4	20.8	N.S.			
111	25.51	34.8	36.3	31.6	30.9	28.6	29.5	31.8	31.8	26.2	28.0	29.7	-18.7	-2.0	P .05			
112	6.70	11.9	20.4	11.1	13.4	19.6	20.1	20.6	19.8	18.7	16.4	14.7	20.3	1.9	N.S.			
113	2.07	31.2	31.2	12.6	20.3	17.5	20.3	14.3	24.3	21.6	31.8	40.8	36.6	3.2	N.S.			
121	46.46	11.7	18.3	18.4	14.8	17.0	14.9	18.0	17.5	14.6	13.4	16.1	-1.3	-0.1	N.S.			
123	12.09	23.3	18.8	22.2	19.6	15.1	14.6	18.1	19.1	16.1	13.3	14.5	-35.0	-4.2	P .01			
124	56.27	23.6	27.5	29.5	30.5	29.4	36.7	31.3	32.1	30.1	27.3	31.5	14.8	1.4	N.S.			
141 E/	0.27	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.			
TOTAL / AVERAGE	577.02	19.6	19.9	19.1	18.4	18.0	18.9	17.1	17.3	16.5	15.9	17.4	-17.5	-1.9	P .01			

TABLE 4.--TRENDS IN MOURNING DOVE BREEDING DENSITY INDICES BY PHYSIOGRAPHIC REGION, 1965-75--CONT.

LAND AREA WEIGHT		CENTRAL MANAGEMENT UNIT														LINEAR REGRESSION, 1965-75		
		ADJUSTED AVERAGE DOVES HEARD CALLING PER BOWIE A.B./														TOTAL	ANNUAL	PERCENT CHANGE C/ STAT. SIGN. D/
REGION	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1975	1975	1975	1975	1975	1975	1975
10	30.37	0.0	7.1	6.3	6.3	3.9	2.8	4.7	4.7	3.4	6.3	7.8	0.0	****	N.S.			
35	16.60	24.7	27.6	27.4	24.9	28.3	37.4	33.8	31.4	35.6	38.4	36.3	52.8	4.3	P .01			
36	77.45	12.8	17.6	17.5	16.8	16.2	15.7	19.7	20.4	21.2	27.7	20.6	65.1	5.1	P .01			
122	64.68	29.8	32.4	29.4	30.5	26.3	22.0	26.9	27.5	32.7	31.8	33.2	6.1	0.6	N.S.			
123	2.54	11.0	12.0	25.0	N.E.	15.6	14.7	17.4	13.7	18.3	13.7	14.9	-4.4	-0.7	N.S.			
124 E/	0.82	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.			
125	58.68	39.2	46.8	43.4	51.7	38.0	33.5	38.7	45.4	35.5	30.3	37.0	-22.7	-2.5	P .10			
126	71.40	34.3	34.8	41.9	41.4	35.0	39.8	35.7	48.0	42.2	40.2	42.8	19.8	1.8	P .10			
130	14.35	49.0	65.3	36.0	47.5	43.6	39.9	36.1	38.0	21.8	20.9	13.6	-67.9	-10.7	P .01			
131	46.47	31.4	26.7	21.9	24.0	25.2	20.5	23.2	25.0	22.0	18.9	21.2	-27.3	-3.1	P .05			
132	81.54	38.8	42.5	35.0	21.6	19.8	17.2	21.7	19.1	19.5	21.4	22.4	-55.8	-7.8	P .05			
133 E/	2.89	5.0	5.0	N.E.	N.E.	52.1	90.2	29.5	39.9	38.2	N.E.	N.E.	N.E.	N.E.	N.E.			
134	97.09	29.7	23.8	21.6	25.1	24.3	23.4	23.1	23.7	23.3	23.7	19.9	-16.9	-1.8	P .05			
135	25.78	54.8	57.3	66.6	64.1	70.1	72.2	66.7	73.7	72.0	64.7	59.7	12.7	1.2	N.S.			
136	16.40	24.3	22.5	21.5	18.7	28.9	21.0	16.2	30.4	28.3	32.0	22.6	25.8	2.3	N.S.			
137	10.54	1.0	5.0	1.9	4.7	5.7	8.5	7.1	3.9	37.5	114.7	55.9	****	278.0	P .05			
138	19.75	195.92	82.9	49.2	119.4	42.8	49.8	14.1	26.0	12.0	12.3	18.4	-100.0	-76.3	P .01			
139	22.05	2.0	1.8	27.1	23.0	52.2	44.9	25.3	32.0	22.9	17.6	15.2	51.2	4.2	N.S.			
141	27.75	32.1	27.7	34.5	35.5	29.4	32.1	25.9	38.9	25.4	23.5	21.9	-24.7	-2.8	N.S.			
142	3.11	40.4	15.4	10.4	4.8	7.2	4.8	4.0	12.8	4.8	4.8	0.8	-100.0	-70.7	P .05			
151	4.70	6.3	19.0	12.2	19.7	23.4	17.3	22.5	28.5	16.2	27.6	9.5	48.5	4.0	N.S.			
152	6.98	0.9	0.9	1.0	5.1	5.1	3.4	5.1	4.9	5.3	3.2	6.4	294.7	14.7	P .01			
160	28.53	7.7	13.5	6.9	11.6	19.8	13.9	11.5	15.4	8.2	13.2	13.4	25.3	2.3	N.S.			
170	24.23	9.5	12.6	15.0	7.2	11.8	15.7	10.7	11.3	9.9	15.6	20.8	54.7	4.5	N.S.			
180	23.58	1.6	2.4	2.7	3.2	3.2	3.2	3.2	3.2	1.9	4.0	3.0	42.9	3.6	N.S.			
190	33.18	0.4	4.3	2.8	2.6	3.0	3.2	5.4	2.5	3.9	4.6	4.0	101.2	7.2	P .10			
212	4.68	5.0	9.0	15.0	14.4	39.6	14.4	19.8	16.4	12.0	8.5	6.9	-10.3	-1.1	N.S.			
213 E/	6.02	0.0	10.0	32.0	N.E.	N.E.	19.9	14.1	13.2	14.1	14.9	13.9	-22.7	-5.0	N.S.			
214	11.49	1.2	3.5	7.0	3.5	6.4	6.1	6.1	9.0	21.9	14.1	27.3	****	238.9	P .01			
216	7.07	16.8	15.0	5.3	5.3	2.3	1.9	15.4	8.8	4.2	4.6	6.9	-60.1	-8.8	N.S.			
224	31.91	15.8	13.5	4.5	9.6	10.9	7.3	14.8	18.3	13.3	8.8	9.7	-1.1	-0.1	N.S.			
225	10.33	N.E.	13.7	5.4	10.1	15.5	31.5	3.6	22.9	22.9	19.7	29.5	177.1	12.0	P .10			
TOTAL/	882.96	28.0	30.6	27.3	26.4	24.5	23.6	22.4	27.0	24.7	25.1	25.1	-14.7	-1.6	P .10			

TABLE 4.--TRENDS IN MORNING DOVE BREEDING DENSITY INDICES BY PHYSIOGRAPHIC REGION, 1965-75--CONT.

WESTERN MANAGEMENT UNIT

REGION	LAND AREA WEIGHT	ADJUSTED AVERAGE DOVES HEARD CALLING PER ROUTE A,B,C, D														LINEAR REGRESSION, 1965-75		STAT. SIGN.
		1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	TOTAL ANNUAL	PERCENT CHANGE				
180	8.00	13.7	21.4	24.9	33.3	8.3	13.1	10.3	8.8	3.8	3.8	2.9	-89.7	-20.4	P .05			
190	32.19	14.2	13.4	9.9	8.2	9.6	11.1	12.0	16.5	12.5	12.3	10.7	3.7	0.4	N.S.			
201	27.15	8.7	9.7	8.8	10.9	8.9	8.2	9.7	9.0	11.4	13.6	20.6	100.7	7.2	P .05			
202 E/	5.05	6.1	6.7	5.4	7.8	5.5	7.0	7.0	5.8	5.3	5.8	N.F.	N.E.	N.E.	N.E.			
203	19.43	4.5	10.6	14.0	10.9	11.5	12.4	15.1	14.8	14.1	19.9	12.3	91.7	6.7	P .05			
204	11.00	8.2	15.7	15.0	14.1	9.7	15.3	12.2	21.5	23.4	15.6	9.8	36.8	3.2	N.S.			
205	6.17	14.4	12.6	7.5	61.8	48.0	68.9	44.6	24.3	21.4	10.7	7.4	3.0	-100.0	P .01			
211	8.20	7.6	10.1	9.4	5.0	0.0	2.3	4.9	9.5	0.0	0.0	0.0	-97.4	-30.6	P .05			
212	5.56	6.2	20.5	55.3	9.8	10.7	4.0	18.3	2.6	12.0	14.8	12.0	-56.5	-8.0	N.S.			
213	12.24	11.5	1.6	3.4	3.6	5.4	7.1	11.5	7.1	8.7	9.6	8.9	88.6	6.6	N.S.			
214	12.54	21.8	39.8	14.8	20.6	19.9	14.8	8.2	34.8	37.2	24.3	47.0	70.7	5.5	N.S.			
215	13.78	9.8	16.8	19.5	14.3	45.5	22.4	19.6	27.2	9.9	15.4	18.6	4.3	0.4	N.S.			
216	1.46	1.8	1.8	3.5	1.5	0.0	3.2	6.9	4.1	3.8	0.5	0.8	9.6	0.9	N.S.			
221	115.89	11.6	12.0	14.7	14.2	10.7	9.1	9.1	9.0	6.8	11.8	9.4	-33.6	-4.0	P .05			
222	35.86	92.1	91.2	67.8	57.4	51.5	34.9	26.9	32.6	51.2	59.5	36.2	-61.2	-9.0	P .05			
223	4.20	22.8	19.7	20.1	16.6	17.6	23.5	25.1	25.1	23.9	36.1	21.3	45.9	3.8	P .10			
224	24.20	56.2	52.4	61.0	48.4	47.2	46.1	21.3	28.4	142.91	9.31	21.0	198.4	11.6	P .10			
231	7.99	22.9	16.4	16.1	16.5	20.6	15.2	12.9	13.5	13.4	14.3	18.2	-26.0	-3.0	N.S.			
232	14.07	5.0	5.2	3.5	3.1	1.9	1.3	2.8	0.9	1.4	4.3	1.6	-65.6	-10.1	P .10			
233 E/	4.42	25.2	10.8	10.3	N.E.	N.E.	N.E.	20.3	25.9	31.8	32.7	27.7	37.2	8.2	N.S.			
234	16.87	11.0	12.2	11.9	10.9	9.2	10.5	8.8	9.4	8.4	10.7	8.4	-25.8	-2.9	P .05			
241	8.84	0.5	0.0	1.5	1.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	-90.0	-20.6	N.S.			
242	2.95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	N.S.			
243	8.29	11.3	4.0	1.6	10.7	0.7	2.3	1.6	6.2	0.0	6.0	6.0	-47.5	-6.2	N.S.			
244	10.48	3.0	2.4	2.2	3.0	3.2	3.1	4.0	2.5	6.0	6.0	12.1	592.6	21.4	P .01			
245	13.01	21.2	15.8	13.0	13.7	13.9	11.5	14.5	14.9	9.2	11.3	15.6	-30.0	-3.5	P .10			
246	19.64	32.2	27.0	23.5	24.2	21.9	21.0	21.1	24.9	18.5	25.1	38.6	3.6	0.4	N.S.			
247	8.10	14.5	10.2	8.4	3.6	11.7	11.7	6.3	3.5	17.9	19.1	11.0	41.8	3.6	N.S.			
250 E/	1.50	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.			
TOTAL/AVERAGE	459.48	18.9	19.3	18.4	16.7	16.6	14.1	12.5	14.6	17.0	20.5	19.9	-1.4	-0.1	N.S.			

TABLE 4. -- TRENDS IN MORNING DOVE BREEDING DENSITY INDICES BY PHYSIOGRAPHIC REGION, 1965-75.

FOOTNOTES

- A/ THE AVERAGE NUMBER OF DOVES HEARD PER ROUTE ADJUSTED ANNUALLY TO A BASE YEAR ACCORDING TO THE PERCENT CHANGE FROM PRECEDING YEAR ON COMPARABLE ROUTES. FOR EACH PHYSIOGRAPHIC REGION, 1971 SELECTED AS THE BASE YEAR REPRESENTING THE MEAN BDI FOR THE 6-YEAR PERIOD 1968 TO 1973. BASE YEAR DATA FROM COMPARABLE ROUTES ACCEPTED IN EACH OF THE 2-YEAR COMPARISONS, THUS INCLUDE THE MEAN OF 12 DATA POINTS. SEE TEXT FOR ADDITIONAL INFORMATION. N.E. = NO ESTIMATE AVAILABLE.
- B/ THE MANAGEMENT UNIT BREEDING INDICES ARE OBTAINED FROM TABLE 3.
- C/ REGRESSION ANALYSIS: (1) 0.0 CALCULATED AS 0.0001.
(2) ANNUAL PERCENT CHANGE GREATER THAN 999 EQUALS NO ESTIMATE (N.E.).
- D/ STATISTICAL SIGNIFICANCE OF TREND: N.S. = NOT SIGNIFICANT ($p > .10$); N.E. = NO ESTIMATE AVAILABLE.
- E/ LINEAR REGRESSION ANALYSIS FROM MOST RECENT AVAILABLE DATA, RESULTS NOT COMPARABLE TO OTHER ANALYSES.

The mean survey date was 27 May in 1975 and 26 May in 1974 in the Eastern Unit (Table 2). In 1975, the mean temperature at the start of the survey was 1.4 C warmer than in 1974. There was no important difference in the percentage of high disturbance recorded per route between 1974 and 1975. The Eastern Unit had the greatest proportion of survey route stops affected by high disturbance (11%) of any unit in 1975.

1965 to 1975 Long-term Population Trends

Population indices for the Eastern Management Unit, the combined hunting States, and the combined nonhunting States in 1975 were above their historic lows established in 1974. The current indices for the Eastern Unit and the combined hunting States were below their most recent 10-year means by 3.9% and 5.4%, respectively, whereas the combined non-hunting States index was 0.7% above its long-term mean (Table 3, Figs. 7, 12).

Regression analysis showed a significant downward trend in the Eastern Unit population index between 1965 and 1975: the mean rate of decline was 1.9% per year (Table 3, Fig. 9). During the same period the combined hunting States index declined at a mean annual rate of 2.5%, and the combined nonhunting States index decreased at 0.2% per year. Long-term trends by State and physiographic region are shown in Figs. 10 and 11. Only three States (2% of the Unit's land area) had statistically significant upward population index trends, compared with nine States (38% of the area) with downward trends. The trend in the Mississippi Alluvial Plain (Region 035) showed an increase. Population indices declined primarily in the Appalachian States, Florida, and Louisiana.

Status of the Central Management Unit Population

The Central Management Unit consists of 14 of the 48 contiguous States, representing 46% of the land area and 54% of the current breeding population in the country. Within the Central Unit, dove hunting is permitted in eight States representing 63% of the land area and 64% of the estimated dove population. In 1975, the mean breeding population index was 25.1 doves heard per route for the Unit; it was 25.7 doves heard per route for the combined hunting States and 24.2 doves for the combined nonhunting States (Table 1).

1975 Population Distribution

Extensive areas of high dove densities were reported from the southern portion of the Great Plains and over

much of the Central lowlands (Regions 126, 135, 137). States represented by a mean of 30 or more doves heard per route included South Dakota, Nebraska, Kansas, and Oklahoma (Table 1, Fig. 3). Densities were generally low throughout most of the Rocky Mountain States (Table 4, Fig. 4). Montana had a mean of less than 10 doves heard per route in 1975 (Table 1, Fig. 4).

1974 to 1975 Population Changes

The Central Unit population index was unchanged from 25.1 doves heard per route in 1974 (Table 1). Changes greater than 10% in the breeding index are illustrated by State (Fig. 5) and physiographic region (Fig. 6). Extensive areas of population increase were associated with those regions adjacent to the Missouri River and in the central and southern Rocky Mountain States. Areas showing decreases greater than 10% included the western Great Plains south and east through the Texas Gulf Coastal Plain. From 1974 to 1975, the combined hunting States index declined 1.1%, whereas the nonhunting States index increased 2.1%.

No important differences in mean survey temperatures or in high-disturbance factors along survey routes occurred between 1974 and 1975. The 1975 survey, however, was run slightly later than in 1974 in the combined hunting States of the Central Unit (Table 2).

1965 to 1975 Long-term Population Trends

The Central Unit BDI has remained relatively unchanged since 1972 (Table 3, Fig. 7). This evidence provides some support to the contention that Unit populations may be stabilizing following an 11-year decline ending in 1971. The current population index is 3.5% below its preceding 10-year mean of 26.0 doves heard per route (Fig. 7). Since 1965 the combined hunting States indices have remained nearly stable: the 1975 index was 1.9% below its long-term mean (Table 3, Fig. 12). The current combined nonhunting States index is 5.8% below the 1965-74 long-term mean: however, following five consecutive years of increase, it is 19% above its lowest point in 1970.

Regression analysis shows that a significant downward trend in breeding population indices occurred from 1965 to 1975 in the combined nonhunting States. No significant trend in the population indices was shown for the combined hunting States or the Unit as a whole (Table 3, Fig. 9). Annual rates of decline in the BDI's were as follows: Central Unit - 1.6%; combined hunting States - 0.4%; and combined nonhunting States - 3.5%. The annual rate for nonhunting States represents the greatest rate of decrease of any Unit or

subunit. Long-term trends by State and physiographic region are shown in Figs. 10 and 11. Two States (12% of the Unit's land area) had statistically significant upward population trends, compared with three States (24% of the area) with downward trends. Increasing trends were limited to the Gulf Coastal Plain, and in regions along the Colorado-New Mexico border. Decreasing trends were prevalent throughout most of the western Great Plains (Fig. 11).

Status of the Western Management Unit Population

The Western Management Unit is composed of 7 States, representing 24% of the land area and 22% of the current breeding population in the 48 contiguous States. All States in the Western Unit permit dove hunting. In 1975, the mean breeding population index was 19.9 doves heard per route (Table 1).

1975 Population Distribution

Highest population indices in the Western Unit were generally restricted to the Intermontane Plateaus of Arizona and the California Coast Range (Regions 214, 222, 224, 246). Arizona was represented by 30 or more doves heard per route in 1975 (Figs. 3, 4). Low population indices were distributed throughout much of the Great Basin and Rocky Mountain regions, and in the Pacific Northwest.

1974 to 1975 Population Changes

The Western Unit BDI decreased 3.1% from 20.5 doves heard per route in 1974 to 19.9 in 1975 (Table 1). Population indices increased between 1974 and 1975 in those physiographic regions representing 28% of the land area; they decreased in 64% of the area and did not change in the remaining 8% of the land area (Fig. 6). Only in Washington did the index increase by more than 10% (Table 1, Fig. 5).

Analyses of several factors associated with the 1974 and 1975 surveys showed no important differences between years in the temperature at the start of the survey, or in the extent of high disturbance along routes (Table 2). The mean survey date in 1975 was 2 days later than in 1974.

1965 to 1975 Long-term Population Trends

The population index for the Western Unit in 1975 was 17.8% above its preceding 10-year mean of 16.9

doves heard per route (Fig. 7). Linear regression analysis of data from 1965 to 1975 shows a stable population trend. From 1971 to 1975, however, a similar analysis revealed the population to be increasing at 13.3% per year (Table 3). Long-term trends by State and physiographic region are shown in Figs. 10 and 11. Since 1965, three States (37% of the Unit's land area) have had significant upward population trends, compared with one State, California (22% of the area), showing a downward trend.

Statistical Significance of Data

1974 to 1975 Population Changes

A significant ($P < 0.05$) increase occurred in the BDI of the Eastern Management Unit and the combined nonhunting States in that Unit between 1974 and 1975 (Table 1). None of the indices for the other units or their combined hunting States or combined nonhunting States differed significantly ($P < 0.05$) between these years. Although not designed to detect population changes within States, the survey showed significant ($P < 0.05$) increases in Alabama and Ohio. Significant ($P < 0.05$) decreases occurred in Maryland, Texas, and Idaho between 1974 and 1975.

A study of physiographic region data within Management Units revealed a significant ($P < 0.05$) decrease from 1974 to 1975 in the BDI of the Upper Coastal Plain (Region 032) in the Eastern Unit (Fig. 1). In the Central Unit, significant decreases occurred in the West Gulf Coastal Plain (Region 036), Central Texas Section (Region 130), and the High Plains (Region 134) from 1974 to 1975. Increases in the Unit were found in the Dissected Till Plains (Region 125), Pecos Valley (Region 138), and the Quachita Mountains (Region 152). Decreases in the Western Unit occurred in the Payette Section (Region 203), Sonoran Desert (Region 222), and the Middle Cascade Mountains (Region 232). No significant increases occurred in the Eastern and Western Units.

The analyses of several factors associated with the Call-Count Survey showed that the survey was run in warmer weather in 1975 than in 1974 in the Eastern Unit and in both the combined hunting and combined nonhunting States of this Unit (Table 2). Although the change in temperature is statistically significant, the difference is not believed to be of biological significance. The 1975 survey was conducted later in the combined hunting States of the Central Unit and in the Western Unit. No other statistically significant ($P < 0.05$) differences occurred between years for any Unit or subunit in the analysis of the ancillary data.

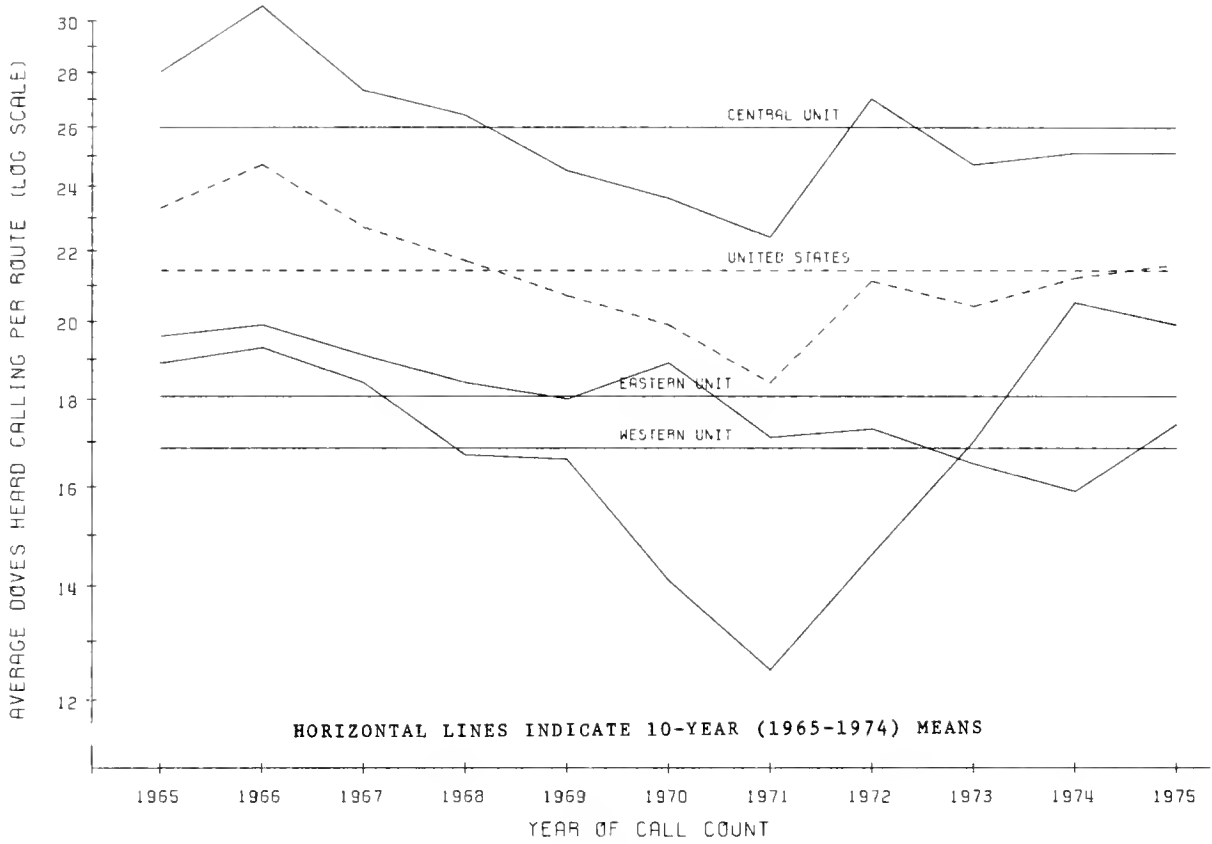


Fig. 7. Population indices of breeding mourning doves by management unit, 1965-75.

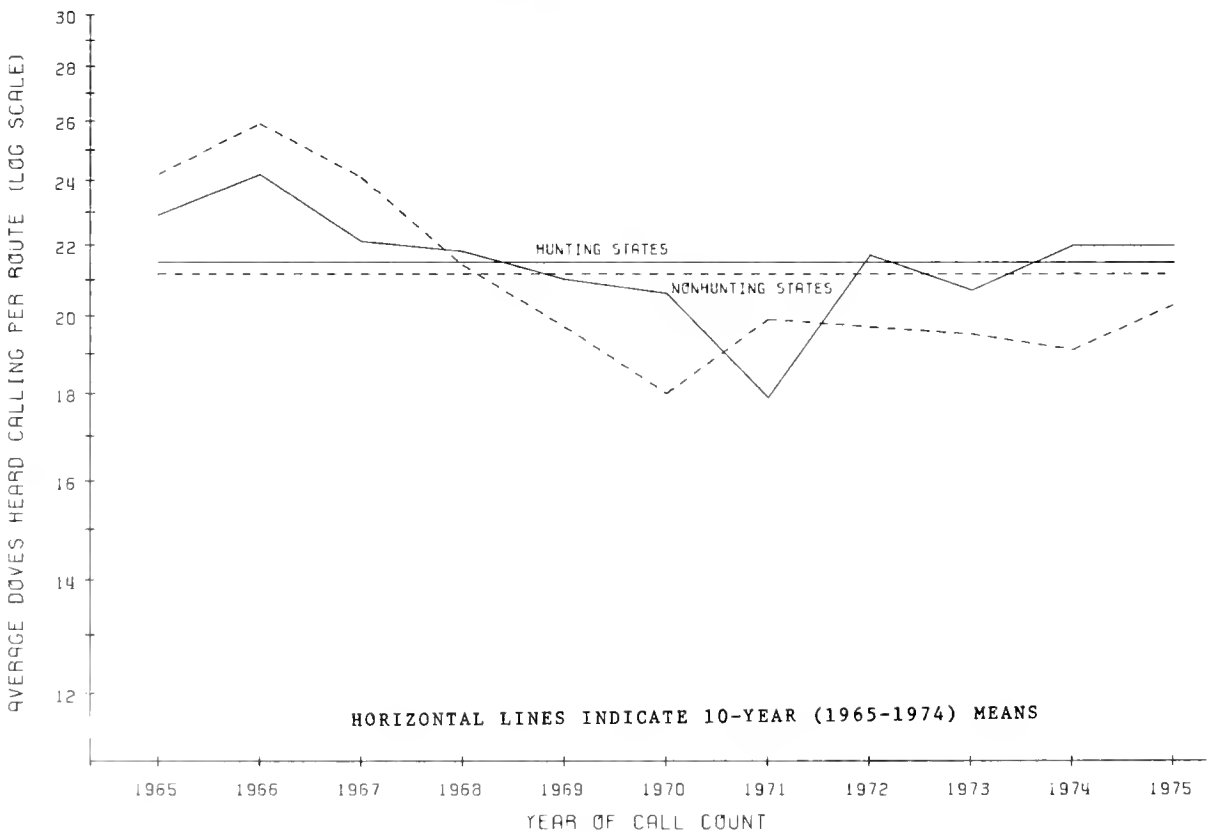


Fig. 8. Population indices of breeding mourning doves in hunting and nonhunting States, 1965-75.

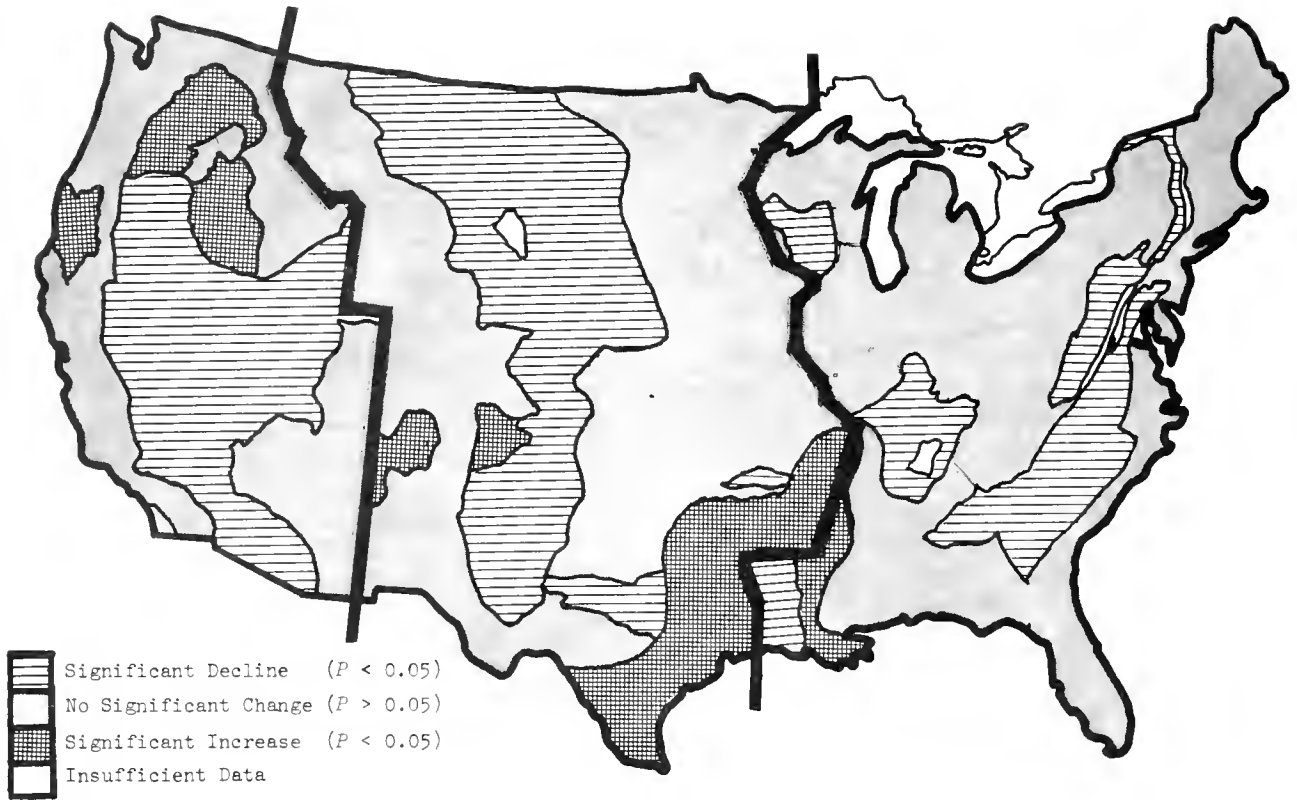


Fig. 11. Trends in numbers of mourning doves heard per route by physiographic region, determined from linear regression analysis, 1965-1975.

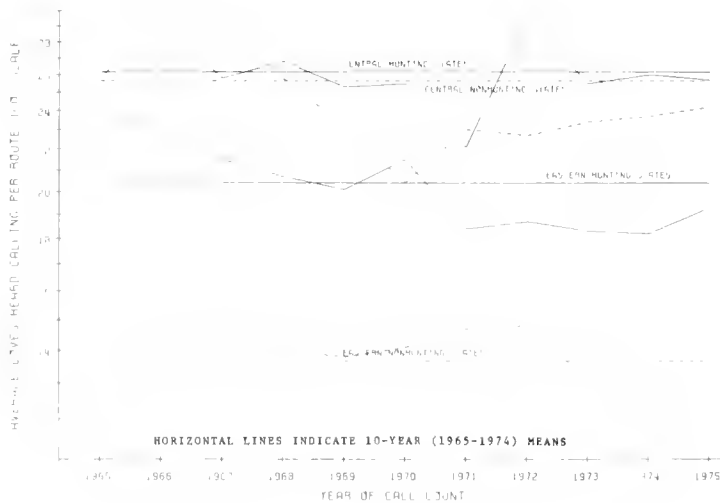


Fig. 12. Population indices for breeding mourning doves in the Eastern and Central management unit hunting and nonhunting States, 1965-75.

1965 to 1975 Long-term Population Trends

Linear regression analyses of the 1965-75 data revealed significant ($P < 0.05$) downward trends in BDI's for the Eastern Unit as well as for the combined hunting States of the Eastern Unit, combined non-hunting States of the Central Unit, and combined non-hunting States of the United States (Table 3). Although no significant 11-year trend was determined for the Western Unit, the data from 1965 to 1971 were represented by a significant ($P < 0.05$) downward trend, and data from 1971 to 1975 by a significant upward trend.

Analyses of long-term data by State (Table 3) revealed that eight States representing 15% of the Nation's land area had significant ($P < 0.05$) upward population trends between 1965 and 1975. Thirteen States, totaling 28% of the land area, had significant long-term downward population trends (Table 3, Fig. 10). From 1965 to 1975, 9 of 79 physiographic regions, constituting 10% of the total land area, had significant ($P < 0.05$) upward trends, and 19 regions (30% of the land area) had significant downward trends (Table 4, Fig. 11).

Acknowledgments

This report would not be possible without the cooperation of the State conservation departments and the many individuals who conscientiously assisted in data collection. Preparation of this report represents a

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Mourning Dove Status Report, 1976

Compiled by
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Abstract

Mourning dove (*Zenaidura macroura*) population indices, as determined from the nationwide Call-Count Survey, increased from 1975 to 1976 in the Central and Western Management Units by 8% and 32%, respectively, but decreased by 1% in the Eastern Unit. The change in the Western Unit was statistically significant ($P < 0.01$). The 1976 indices were above the most recent 10-year mean (1966-75) by 5% in the Central Unit and 54% in the Western Unit, but the index was below the long-term mean by 3% in the Eastern Unit. Linear regression analyses of the call-count data for 1966-77 indicate downward trends in the Eastern and Central Management Units with mean annual rates of annual decrease of 2% and 1%, respectively. The trend for the Eastern Unit was statistically significant ($P < 0.01$). Analysis of the Western Unit, however, shows an upward trend with a 3% mean annual rate of increase. From 1971 to 1976, Western Unit population indices increased by 110% ($P < 0.01$).

Changes in population indices are described by State and physiographic region. The 1976 indices were generally higher than those in 1975 throughout much of the western half of the Nation and the Appalachian Plateaus. Population levels decreased in the southeastern Atlantic Coastal Plain, part of the northern Appalachian Highlands, and in the northern Great Plains Province. Regression analyses of data from 1966 through 1976 showed statistically significant ($P < 0.05$) upward population trends in eight States representing 16% of the nation's land area. Trends were significantly downward in 10 States representing 21% of the Nation's land area.

The mourning dove (*Zenaidura macroura*) is classified as a game bird in the migratory bird treaties with Great Britain (for Canada) and Mexico. Responsibility for management of doves in the United States pursuant to treaties and implementing acts is vested in the Secretary of the Interior. The primary objective is to safeguard the resource. The goal of management is to maintain dove populations in a healthy, productive state so that they may continue to provide enjoyment by nonhunters and a reasonable sport harvest.

Mourning dove management in the United States primarily involves regulating hunting to achieve proper harvest. The Call-Count Survey, conducted annually since 1953 by Federal, State, and independent observers, provides population data that wildlife administrators use to set annual hunting regulations. This report describes the methods employed to obtain and analyze these data and presents the status of the breeding population of mourning doves in 1976.

Two versions of the dove status report, one preliminary and one final, are prepared annually. In 1976, the preliminary report was mailed to members of the Dove Regulations Committee 1 week before the June regula-

tions meeting in Washington, D.C. This timely distribution was possible because cooperators sent their data directly to the Office of Migratory Bird Management at Laurel, Maryland, immediately after completing their surveys. This report is the final version and contains additional analyses of survey data.

Basic procedures for collecting and analyzing data in this report were similar to those used in 1975 (Ruos and Dolton 1977).

Procedures

The Call-Count Survey

Field studies have demonstrated the feasibility of the Call-Count Survey as a method for detecting annual changes in mourning dove breeding populations (Foote and Peters 1952). Currently, there are more than 1,000 randomly located routes throughout the United States. Each call-count route has twenty 3-min listening stations spaced at 1.6-km intervals; the routes are usually on lightly traveled secondary roads.

Each route is surveyed between 20 May and 10 June.

Beginning in 1972, cooperators were instructed to survey their routes between 20 and 31 May. An extension to 10 June was provided to cooperators unable to complete their assignments during the desired period. Intensive studies in the eastern United States (Foote and Peters 1952) indicated that dove calling is relatively stable during the survey period. Call-count surveys are not conducted when wind velocities exceed 19.3 km/h or when it is raining.

The total number of doves heard calling during the twenty 3-min listening periods for each route is used for determining the population index. The number of calls per dove and of doves seen are currently not used in the calculation of population indices. However, these supplemental data are being analyzed.

Routes on which doves were not heard or seen for two successive years are identified as "automatic zero routes" and are included as zeros in the survey analysis. Once designated, these routes are no longer surveyed annually; however, they are subject to periodic reexamination.

Population indices derived from the Call-Count Survey are believed to be biologically and statistically valid for detecting major year-to-year changes in breeding population levels for management units and for determining long-term population trends for States and management units. However, additional field research is needed to more accurately relate changes in the survey index to changes in the population of mated doves. Specific relationships between calling doves and breeding pairs have been difficult to establish (Stone 1966).

Quality Checks of Field Data

As in previous years, all 1976 survey reports were examined for accuracy, completeness, and data comparability between routes which were surveyed in both the current and preceding years. In this report, indices for years since 1967 have been derived from data meeting the standardized criteria for quality first used in 1972 (Ruos 1974).

Randomization of Call-Count Routes

The original call-count survey routes, established between 1951 and 1956, were frequently selected in areas of high dove density. These were gradually replaced by more than 900 randomly selected routes between 1957 and 1970 in the 48 contiguous States.

Breeding Density Index

The Breeding Density Index (BDI) is the mean num-

ber of doves heard calling per route. Before 1966, State indices were represented by unadjusted values. Management unit (Fig. 1) indices, however, were adjusted by the proportional area of dove habitat that each State represented within a management unit. Beginning in 1966, State BDI's were determined from indices within each physiographic region (Fig. 2) weighted by the proportional land area that the region represented within a State. Management unit indices were then obtained from State BDI's adjusted for differences in land area that each State represented within the unit. Current weighting values for States and physiographic regions within management units appear in Tables 3 and 4.

Determination of Population Changes

Year-to-year changes in breeding population levels were determined from comparable data (Table 1). Routes run under acceptable conditions by the same observer in successive years were deemed comparable, and data from different observers were accepted when changes in number of doves heard did not exceed predetermined, expected values between years (Ruos 1972).

Long-term population trends were determined by applying the percentage change in the BDI between successive years to a Base Year Index (BYI), since the composition of the comparable routes changes with each 2-year comparison. Each State's BDI is adjusted to the BYI for each year, then is weighted by its land area to provide management unit indices.

For each State except Maine, New Hampshire, Rhode Island, and Vermont, 1971 was selected as the BYI representing the mean BDI for the 6-year period, 1968 to 1973 (Ruos and Dolton 1977). The BYI was based on 4 years of data in Maine and New Hampshire, and 5 years of data in Rhode Island and Vermont (Tables 1,3).

Long-term trend data have also been determined for each physiographic region and adjusted to a 1971 BYI (Table 4).

Determination of Changes in Factors Associated With the Survey

Annual changes in the mean survey date, temperature at the start of the survey, and percentage of route listening stations with high disturbance are presented in Table 2. Analysis of these factors was similar to methods described for determining year-to-year changes in the BDI (Ruos 1972).

Changes in the Status of Nonhunting States

Nebraska and Ohio first became hunting States in 1975. These will be carried as nonhunting States for several years for comparability in the long-term trend analysis.

Statistical Evaluation of Data

The Call-Count Survey was designed to detect major year-to-year changes in the breeding population index for each management unit (Foote 1959). In recent years, analysis of data revealed that observed differences of about 8, 9 and 13% between years within the Eastern, Central, and Western Management Units, respectively, would be statistically significant at the 5% level. Although the survey was not designed to detect a change between years in the BDI's of States or physiographic regions, data from these areas were also subjected to statistical analysis.

Long-term BDI's, adjusted to a Base Year for all physiographic regions, States, and management units, were examined to determine whether significant trends were present. Trends were determined by linear regression analysis.

Determination of Population Distribution

The geographic distribution of dove densities has been determined from a study of BDI values adjusted to a Base Year for each physiographic region and State. For graphic presentation, the 1976 data have been assigned to one of five density classes (Figs. 3,4). Changes in the adjusted BDI's greater than 10% between 1975 and 1976 within physiographic region and State also were determined (Figs. 5,6).

Findings

This report is highlighted by the extensive increase in population indices which occurred in the western half of the Nation from 1975 to 1976. Population indices increased from 1975 to 1976 by 8% and 32% in the Central and Western Management Units, respectively, but decreased by 1% in the Eastern Management Unit. Eastern and Central Management Unit indices for the 11-year period 1966-76 are represented by downward trends, whereas the Western Unit shows an upward trend, especially since 1971. The 1976 Central and Western Unit indices are above their most recent 10-

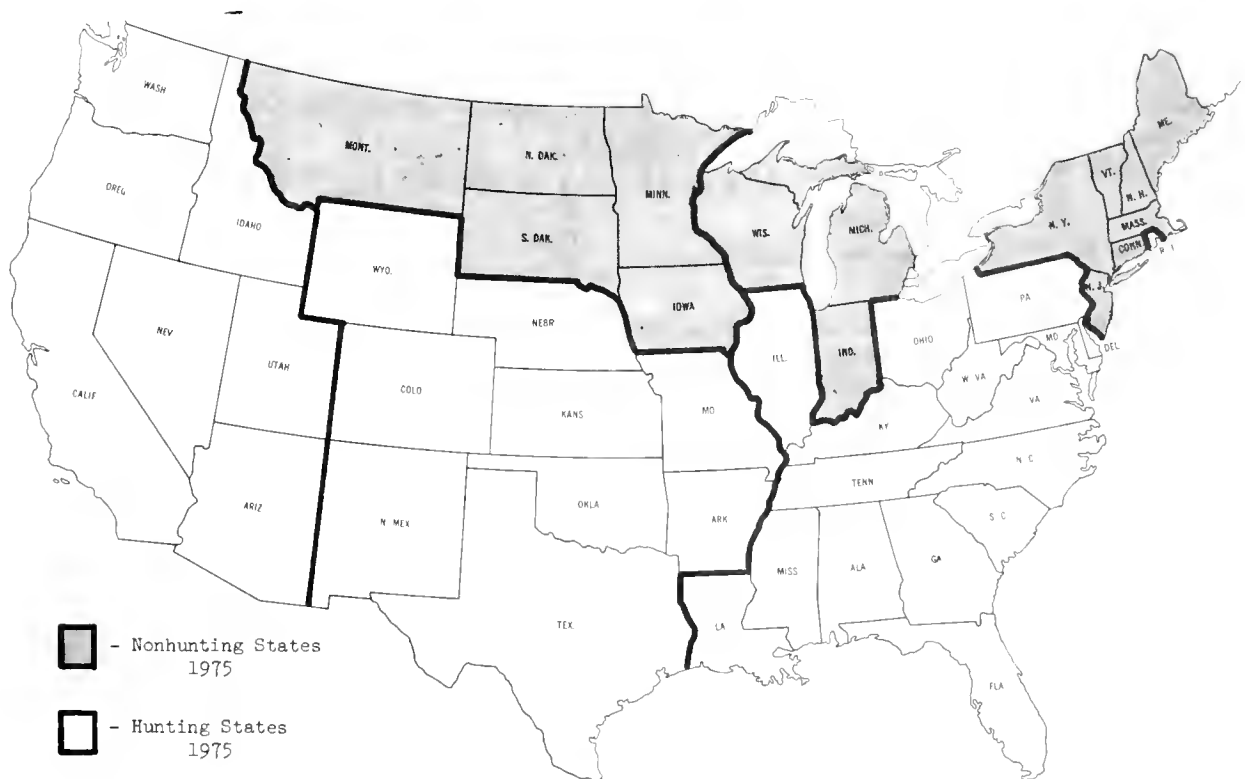


Fig. 1. Mourning dove management units.

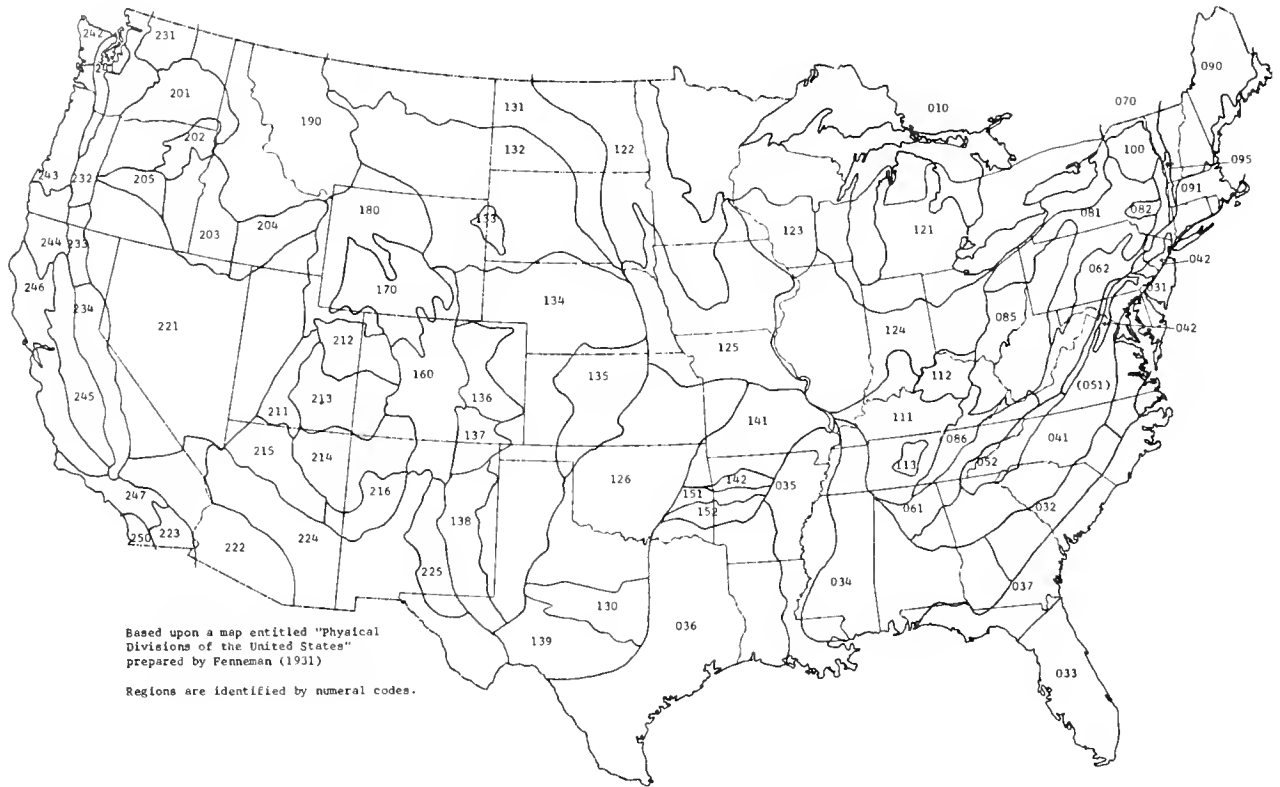


Fig. 2. Physiographic regions used in analysis of mourning dove population data, revised 1970. See page 5 for strata codes.

year means, but the Eastern Unit is below its long-term mean. The Western Unit index for 1976 is substantially above this long-term mean.

Status of the United States Dove Population

In 1975, dove hunting was permitted in 33 of the 48 contiguous States, which represent 76% of the land area and 82% of the 1976 breeding population. In 1976, the mean breeding population index was 23.9 doves per route in the United States; in hunting States it was 24.7, and for nonhunting States it was 21.8 (Table 1).

1976 Population Distribution

The areas of highest dove density were from North Dakota to Oklahoma, and in Arizona and Nevada (Fig. 3), especially in portions of the southern Great Plains, Central Lowlands, and Southern Basin and Range (Regions 135, 126, 222, 224, Figs. 2,4). Low breeding population levels were widely distributed in the Pacific Mountain region, Continental Divide, Great Lakes area, Appalachian Plateaus, and New England.

1975 to 1976 Population Changes

The United States BDI increased 10.7% from 21.6 doves heard per route in 1975 to 23.9 in 1976 (Table 1). Population indices increased in physiographic regions (Fig. 2) totaling 65% of the U.S. land area, decreased in 32% of the land area, and showed no change in 3% of the land area. Changes greater than 10% in the BDI are illustrated by State (Fig. 5) and physiographic region (Fig. 6). The index increased in many States distributed throughout the Nation. Population indices decreased in parts of the Northeast and Southeast, and in Montana. From 1975 to 1976 the combined hunting States and the combined nonhunting States index increased by 12.3% and 7.6%, respectively.

Analyses of several factors associated with the 1975 and 1976 surveys revealed no important year-to-year differences in mean survey date, temperature at the beginning of the survey, or the percentage of survey stops with disturbance great enough to jeopardize the audibility of calling doves (Table 2). Routes conducted in the Eastern Management Unit, however, were run in cooler weather in 1976 than in 1975. About 8% of the survey route stops were subject to high disturbance.

Physiographic regions used in analysis of mourning dove population data, revised 1970.
 [Modified after Fenneman (1931)]

<u>Description</u>	<u>Stratum Code</u>	<u>Description</u>	<u>Stratum Code</u>	<u>Description</u>	<u>Stratum Code</u>
Laurentian Upland Division		Interior Plains Division		Intermontane Plateaus Division	
Superior Upland Province	010	Interior Low Plateaus Province		Columbia Plateaus Province	
		Highland Rim section	111	Walla Walla Plateau	201
Atlantic Plain Division		Lexington Plain	112	Blue Mountain section	202
Coastal Plain Province		Nashville Basin	113	Payette section	203
Embayed section	031	Central Lowland Province		Snake River Plain	204
Upper Coastal Plain	032	Eastern lake section	121	Harney section	205
Floridian section	033	Western lake section	122	Colorado Plateaus Province	
East Gulf Coastal Plain	034	Wisconsin Driftless section	123	High Plateaus of Utah	211
Mississippi Alluvial Plain	035	Till Plains	124	Uinta Basin	212
West Gulf Coastal Plain	036	Dissected Till Plains	125	Canyon Lands	213
Lower Coastal Plain	037	Osage Plains	126	Navajo section	214
		Great Plains Province		Grand Canyon section	215
Appalachian Highlands Division		Central Texas section	130	Datil section	216
Piedmont Province		Missouri Plateau, glaciated	131	Basin and Range Province	
Piedmont Uplands	041	Missouri Plateau, unglaciated	132	Great Basin	221
Piedmont Lowlands	042	Black Hills	133	Sonoran Desert	222
Blue Ridge Province		High Plains	134	Salton Trough	223
Northern section	051	Plains Border	135	Mexican Highland	224
Southern section	052	Colorado Piedmont	136	Sacramento section	225
Valley and Ridge Province		Raton section	137		
Tennessee section	061	Pecos Valley	138		
Middle and Hudson Valley section	062	Edwards Plateau	139		
St. Lawrence Valley Province				Pacific Mountain Division	
Champlain and Northern section	070	Interior Highlands Division		Cascade Sierra Mountains Province	
Appalachian Plateaus Province		Ozark Plateaus Province		Northern Cascade Mountains	231
Mohawk and Allegheny section	081	Springfield-Salem plateaus	141	Middle Cascade Mountains	232
Catskill section	082	Boston "Mountains"	142	Southern Cascade Mountains	233
Kanawha section	085	Duachite Province		Sierra Nevada	234
Cumberland section	086	Arkansas Valley	151	Pacific Border Province	
New England Province		Ouachita Mountains	152	Puget Trough	241
Southern New England section	091			Olympic Mountains	242
Northern New England section	092	Rocky Mountain Division		Oregon Coast Range	243
Mountain section	093	Southern Rocky Mountains Province	160	Klamath Mountains	244
Taconic section	095	Wyoming Basin Province	170	California Trough	245
		Middle Rocky Mountains Province	180	California Coast Ranges	246
Adirondack Province	100	Northern Rocky Mountains Province	190	Los Angeles Ranges	247
				Lower Californian Province	250

TABLE 1.--CHANGES IN MOURNING DOVE BREEDING DENSITY INDICES ON
20-STOP CALL COUNT SURVEY ROUTES, 1975-76.

EASTERN MANAGEMENT UNIT

STATES	ROUTES	MEAN NUMBER OF DOVES HEARD PER ROUTE A/ ADJUSTED WITHIN YEAR ADJUSTED TO BASE-YEAR PERCENT				
		1975	1976	1975	1976	CHANGE B/
HUNTING STATES						
ALA.	28	25.4	26.0	25.9	26.5	2.4
DEL.	1	19.0	15.0	35.8	28.3	-21.1
FLA.	24	13.3	11.6	12.6	11.0	-12.9
GA.	19	29.0	23.2	22.7	18.2	-19.8*
ILL.	14	27.2	25.4	27.9	26.0	-6.8
KY.	16	21.2	18.7	21.9	19.4	-11.5
LA.	18	6.2	5.8	6.1	5.7	-6.9
MD.	10	14.1	14.2	16.8	17.0	1.1
MISS.	22	28.8	29.8	29.2	30.2	3.4
N.C.	20	14.5	15.9	16.3	18.0	10.2
PA.	15	6.4	5.4	7.0	5.9	-15.8
R.I.	2	13.0	13.0	10.0	10.0	0.0
S.C.	14	24.7	26.6	26.1	28.1	7.6
TENN.	23	24.6	25.6	19.3	20.1	4.0
VA.	8	23.3	23.6	25.4	25.7	1.3
W. VA.	8	2.8	5.5	3.5	6.9	96.3
SUBTOTAL	242			19.3	18.7	-2.9
NONHUNTING STATES						
CONN.	2	15.5	11.5	28.4	21.1	-25.8
IND.	15	32.5	36.0	24.3	26.9	10.5
MASS.	2	2.6	4.4	9.9	16.8	69.4
MAINE	5	0.0	0.0	0.0	0.0	0.0
MICH.	17	9.0	10.1	8.3	9.3	11.9
N.H.	2	5.9	4.9	2.3	1.9	-16.7
N.J.	3	10.8	12.7	10.6	12.5	17.6
N.Y.	17	13.3	10.8	10.6	8.6	-19.0
OHIO C/	14	30.8	29.7	34.3	33.0	-3.7
VT.	3	1.4	0.3	0.1	0.0	-80.0
WISC.	18	11.6	15.0	11.8	15.2	29.1
SUBTOTAL	98			13.8	14.5	5.3
TOTAL	340			17.4	17.3	-0.6

TABLE 1.--CHANGES IN MOURNING DOVE BREEDING DENSITY INDICES ON
20-STOP CALL COUNT SURVEY ROUTES, 1975-76--CONTINUED.

CENTRAL MANAGEMENT UNIT

STATES	ROUTES	MEAN NUMBER OF DOVES HEARD PER ROUTE A/ ADJUSTED WITHIN YEAR ADJUSTED TO BASE-YEAR				PERCENT CHANGE B/
		1975	1976	1975	1976	
HUNTING STATES						
ARK.	14	24.3	28.3	23.7	27.7	16.8
CCLO.	12	13.6	16.9	19.0	23.7	24.7
KANS.	19	51.0	53.8	46.0	48.6	5.6
MO.	15	27.8	27.3	32.7	32.1	-1.7
N. MEX.	26	17.0	17.1	13.5	13.6	0.4
OKLA.	11	37.7	42.5	79.9	90.0	12.6*
TEX.	102	20.0	20.2	17.7	17.9	0.9
WYO.	14	14.0	12.8	10.5	9.6	-8.7
SUBTOTAL	213			25.7	27.5	7.0
NONHUNTING STATES						
IOWA	13	26.4	26.8	23.2	23.5	1.5
MINN.	12	26.1	25.5	18.8	18.3	-2.5
MONT.	16	9.5	8.5	6.0	5.4	-10.3
N. DAK.	24	28.5	40.4	28.9	41.0	42.0***
NEBR. C/	24	35.8	39.6	42.2	46.7	10.6
S. DAK.	16	43.1	42.6	43.2	42.7	-1.2
SUBTOTAL	105			24.2	26.2	8.5
TOTAL	318			25.1	27.0	7.7

TABLE 1.--CHANGES IN MOURNING DOVE BREEDING DENSITY INDICES ON
20-STOP CALL COUNT SURVEY ROUTES, 1975-76--CONTINUED.

WESTERN MANAGEMENT UNIT

STATES	ROUTES	MEAN NUMBER OF DOVES HEARD PER ROUTE A/ ADJUSTED WITHIN YEAR ADJUSTED TO BASE-YEAR PERCENT				
		1975	1976	1975	1976	CHANGE B/
HUNTING STATES						
ARIZ.	44	22.7	24.7	53.2	57.7	8.4
CALIF.	61	16.8	22.0	12.8	16.7	30.8**
ICAHO	17	8.7	10.8	10.7	13.3	24.1**
NEV.	15	2.4	5.1	22.0	46.4	111.1
OREG.	18	5.7	5.2	11.1	10.2	-7.7
UTAH	13	9.9	10.7	8.6	9.3	8.5
WASH.	19	8.0	11.9	15.1	22.5	49.1**
TOTAL	187			19.9	26.2	31.8***

UNITED STATES SUMMARY

STATES	ROUTES	MEAN NUMBER OF DOVES HEARD PER ROUTE A/ ADJUSTED WITHIN YEAR ADJUSTED TO BASE-YEAR PERCENT				
		1975	1976	1975	1976	CHANGE B/
HUNT	642			22.0	24.7	12.3**
NONHUNT	203			20.3	21.8	7.6
TOTAL	845			21.6	23.9	10.7**

A/ INDICES OBTAINED FROM COMPARABLE, RANDOMIZED ROUTE DATA ADJUSTED FOR VARIATION IN THE LAND AREA OF EACH PHYSIOGRAPHIC REGION AREA PRESENTED WITHIN YEAR. STATE DATA ADJUSTED TO A BASE-YEAR ARE SHOWN HERE AND IN TABLE 3. UNIT AND SUBUNIT MEANS ARE DERIVED FROM STATE DATA ADJUSTED TO A BASE-YEAR AND WEIGHTED BY TOTAL STATE LAND AREA VALUES.

B/ CALCULATIONS PERFORMED USING THREE SIGNIFICANT POSITIONS. THE NUMBER OF ASTERISKS REPRESENT THE STATISTICAL SIGNIFICANCE LEVEL : * 10 PERCENT; ** 5 PERCENT; *** 1 PERCENT. SIGNIFICANCE LEVELS FOR STATE AND UNIT CHANGES ARE DETERMINED FROM ANALYSES OF DATA PRESENTED WITHIN YEAR.

C/ HUNT STATE BEGINNING IN 1975; SEE TEXT FOR DETAILS.

TABLE 2.--FACTORS ASSOCIATED WITH THE MOURNING DOVE CALL-COUNT SURVEY 1975-76.

EASTERN MANAGEMENT UNIT

STATES	DATE OF SURVEY A/		TEMPERATURE AT START B/		HIGH DISTURBANCE (3) A.R./							
	RCQIES	1976	CHANGE	1975	1976	CHANGE						
ALA.	28	MAY 26	25	-1	27	65.5	57.5	-8.0***	28	11.6	10.1	-1.5
DEL.	1	MAY 27	MAY 28	1	1	60.0	54.0	-6.0	1	5.0	5.0	0.0
FLA.	22	MAY 26	MAY 25	-1	22	67.6	65.1	-2.5*	21	7.5	11.9	4.4
GA.	19	MAY 25	MAY 26	1	18	66.7	59.7	-6.9***	18	10.4	8.5	-1.9
ILL.	14	MAY 30	MAY 27	-3*	13	58.9	53.9	-5.0	12	2.5	3.7	1.3
KY.	15	MAY 26	MAY 28	2	14	64.3	55.1	-9.2***	15	12.5	12.7	0.2
LA.	15	MAY 23	MAY 23	0	15	69.6	61.0	-8.6***	15	7.9	11.7	3.8
MD.	10	MAY 27	MAY 27	0	10	62.5	51.2	-11.3***	10	11.4	7.4	-4.1
MISS.	22	MAY 25	MAY 24	-1	22	66.1	60.4	-5.7***	21	13.7	12.4	-1.3
N.C.	20	MAY 26	MAY 26	0	20	67.0	54.6	-12.3**	20	41.4	17.7	-23.7
PA.	14	MAY 30	MAY 28	-2	14	55.3	46.8	-8.5***	13	14.5	14.0	-0.4
R.I.	2	JUNE 7	JUNE 6	-1	2	52.0	55.0	3.0**	2	10.0	17.5	7.5**
S.C.	14	MAY 29	MAY 30	1	14	67.9	56.8	-11.1***	13	5.4	2.4	-3.0
TENN.	23	MAY 25	MAY 26	1	23	64.7	58.2	-6.5***	23	16.1	19.7	3.5
VA.	8	MAY 24	MAY 27	3*	8	64.2	55.1	-9.1***	8	13.1	6.3	-6.8
W. VA.	5	MAY 28	MAY 27	-1	5	61.6	48.6	-13.0**	5	7.3	4.3	-3.0
SUBTOTAL	232	MAY 26	MAY 26	0	228	64.7	57.0	-7.7***	225	12.1	10.6	-1.5

NONHUNTING STATES

CCNN.	2	MAY 21	MAY 24	3	2	61.5	48.5	-13.0***	2	12.5	7.5	-5.0
IND.	15	MAY 28	MAY 26	-2	15	61.0	51.3	-9.7***	15	10.5	15.5	5.1
MASS.	2	MAY 29	MAY 26	-3	2	46.3	45.3	-1.0	1	0.0	0.0	0.0
MAINE	1	MAY 29	MAY 26	-3	1	45.0	46.0	1.0	1	5.0	0.0	-5.0
MICH.	15	MAY 30	MAY 29	-1	15	55.6	47.9	-7.7	15	8.3	10.9	2.6
N.H.	1	MAY 21	MAY 25	4	1	63.0	40.0	-23.0*	1	0.0	0.0	0.0
N.J.	3	MAY 24	MAY 28	4	3	60.4	50.0	-10.4	3	7.5	3.1	-4.4
N.Y.	14	MAY 28	MAY 29	1	13	56.3	46.1	-10.2***	12	4.2	3.1	-1.1
OHIO C/	14	MAY 25	MAY 26	1	14	62.5	49.6	-13.0***	14	5.3	4.6	-0.7
VT.	1	MAY 24	MAY 22	-2	1	60.0	44.0	-16.0	1	15.0	15.0	0.0
MISC.	17	MAY 28	MAY 26	-2	17	54.0	47.7	-6.4	14	6.1	6.3	0.2
SUBTOTAL	85	MAY 28	MAY 27	-1	84	56.5	48.1	-8.8***	79	6.8	7.4	0.6
ICIAL	317	MAY 27	MAY 26	-1	312	62.1	54.1	-8.0***	304	10.4	9.6	-0.8

TABLE 2.--FACTORS ASSOCIATED WITH THE MORNING DOVE CALL-COUNT SURVEY 1975-76--CONTINUED.

		CENTRAL MANAGEMENT UNIT										
		TEMPERATURE AT START B/		HIGH DISURBANCE (3) A.B/								
STATES	RCUIES	1975	1976	CHANGE	RCUIES	1975	1976	CHANGE				
HUNTING STATES												
ARK.	14	MAY 27	MAY 23	-4***	14	66.8	54.8	-12.0***	14	6.1	7.9	1.8
CCLO.	12	MAY 25	MAY 24	-1	12	41.3	41.6	0.4	12	3.3	4.2	0.9
KANS.	19	MAY 28	MAY 25	-3**	19	56.0	56.7	0.7	18	13.1	9.5	-3.6
MO.	15	MAY 29	MAY 27	-2	15	67.1	58.9	-8.2***	14	3.3	8.5	5.2
N. MEX.	25	MAY 25	MAY 24	-1	25	47.9	49.4	1.5	21	4.6	5.8	1.1
OKLA.	11	MAY 25	MAY 29	0	11	61.7	61.0	-0.8	8	5.4	7.1	1.7
TEX.	102	MAY 24	MAY 20	-4***	102	67.6	62.4	-5.1***	99	6.3	7.5	1.3
WYO.	9	MAY 28	MAY 28	0	9	40.2	43.5	3.2	7	9.9	3.4	-6.6**
SUBTOTAL	207	MAY 26	MAY 24	-2***	207	57.0	54.6	-2.4***	193	6.4	6.7	0.3
NONHUNTING STATES												
IOWA	13	MAY 29	MAY 26	-3**	13	50.1	53.3	3.1	12	8.8	8.9	0.1
MINN.	8	MAY 26	MAY 27	1	8	51.2	51.6	0.4	8	10.9	2.7	-8.1
MCNT.	14	MAY 28	MAY 26	-2	13	39.1	45.9	6.7***	12	4.3	6.9	2.6
N. DAK.	24	MAY 27	MAY 26	-1	24	44.6	49.1	4.5***	21	5.3	6.5	1.2
NEBR. C/	24	MAY 28	MAY 26	-2	24	50.4	50.6	0.2	21	11.2	8.3	-2.9
S. DAK.	16	MAY 28	MAY 27	-1	16	46.4	47.4	1.0	14	9.3	2.9	-6.4
SUBTOTAL	99	MAY 28	MAY 26	-2**	98	45.8	49.0	3.2***	88	7.8	6.0	-1.8
TOTAL	306	MAY 27	MAY 25	-2***	305	52.8	52.5	-0.3	281	6.9	6.4	-0.5

TABLE 2.--FACTORS ASSOCIATED WITH THE MORNING DOVE CALL-COUNT SURVEY 1975-76--CONTINUED.

WESTERN MANAGEMENT UNIT

STATES	DATE OF SURVEY A/ 1975		TEMPERATURE AT STARI B/ 1976		HIGH DISTURBANCE (%) A.B/ 1975		HIGH DISTURBANCE (%) A.B/ 1976		CHANGE			
	ROUTES	ROUTES	ROUTES	ROUTES	ROUTES	ROUTES	ROUTES					
ARIZ.	44	MAY 29	MAY 27	-2**	44	53.9	56.0	2.0*	40	7.5	6.8	-0.8
CALIF.	50	MAY 28	MAY 27	-1	49	55.6	54.9	-0.6	46	8.1	12.6	4.4
ICAHO	16	MAY 31	MAY 29	-2	15	44.2	41.1	-3.0	15	10.7	11.8	1.2
NEV.	12	MAY 29	MAY 27	-2	11	47.4	44.3	-3.1	12	1.2	2.9	1.7
OREG.	14	MAY 26	MAY 23	-3	14	42.6	44.0	1.5	13	10.3	10.7	0.4
UTAH	11	MAY 30	MAY 28	-2	11	45.5	48.3	2.9	9	7.8	3.7	-4.1
WASH.	13	MAY 31	MAY 28	-3	13	49.3	39.1	-10.2***	13	8.3	6.5	-1.8
TOTAL	160	MAY 29	MAY 27	-2**	157	49.4	48.4	-1.0	148	7.4	8.2	0.8

UNITED STATES SUMMARY

STATES	DATE OF SURVEY A/ 1975		TEMPERATURE AT STARI B/ 1976		HIGH DISTURBANCE (%) A.B/ 1975		HIGH DISTURBANCE (%) A.B/ 1976		CHANGE			
	ROUTES	ROUTES	ROUTES	ROUTES	ROUTES	ROUTES	ROUTES					
HUNT	599	MAY 27	MAY 26	-1***	592	56.6	53.3	-3.4***	566	8.3	8.3	-0.0
NCNHUNT	184	MAY 28	MAY 26	-2**	182	49.6	48.7	-1.0	167	7.5	6.5	-1.0
TOTAL	783	MAY 27	MAY 26	-1***	774	54.7	52.0	-2.7***	733	8.1	7.8	-0.3

A/ DATA FROM COMPARABLE RANDOMIZED ROUTES ADJUSTED FOR VARIATION IN LAND AREA OF EACH PHYSIOGRAPHIC REGION. CALCULATIONS PERFORMED USING 3 SIGNIFICANT POSITIONS. CHANGE EQUALS THE ARITHMETIC DIFFERENCE. THE NUMBER OF ASTERISKS REPRESENT THE STATISTICAL SIGNIFICANCE LEVEL OF CHANGE: * 10 PERCENT; ** 5 PERCENT; *** 1 PERCENT.

B/ PERCENT OF STOPS (LISTENING STATIONS) WITH THE LEVEL OF DISTURBANCE GREAT ENOUGH TO SERIOUSLY LIMIT AN OBSERVER'S ABILITY TO HEAR CALLING DOVES. 20-STOP SURVEY ROUTE.

C/ HUNT STATE BEGINNING IN 1975; SEE TEXT FOR DETAILS.

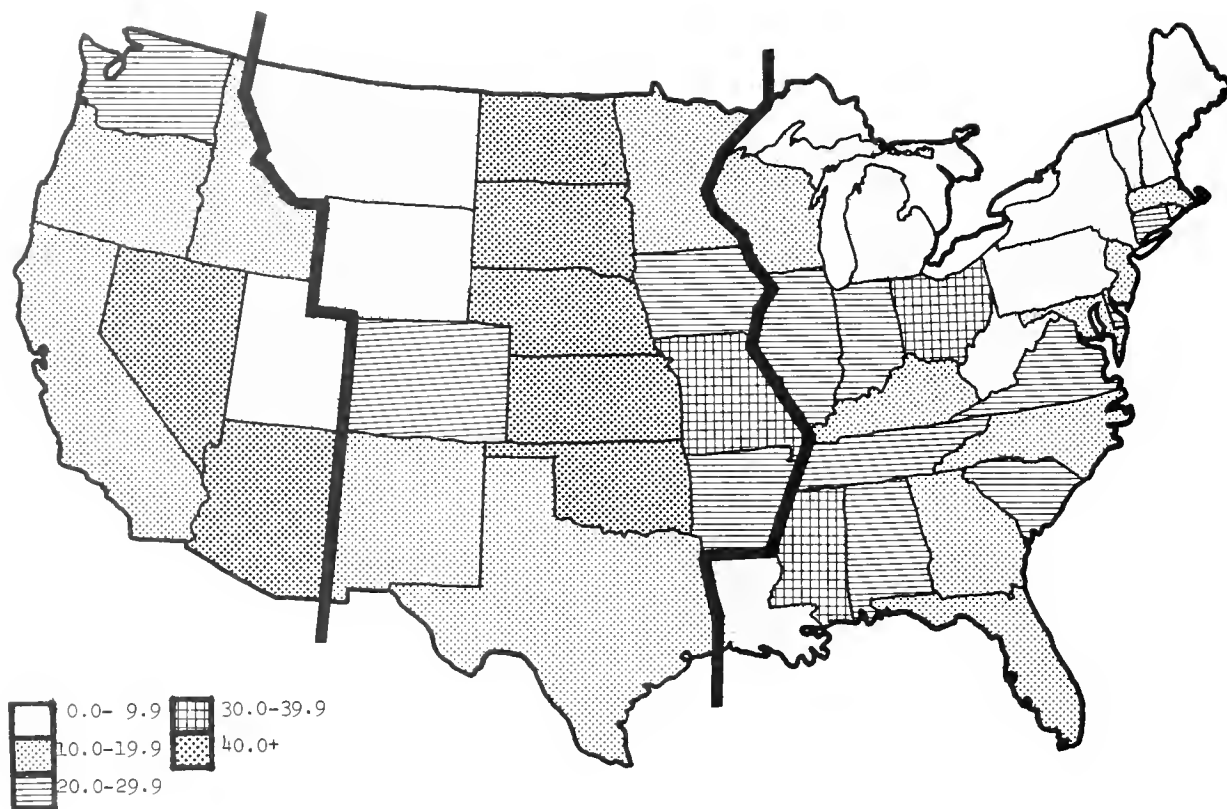


Fig. 3. Numbers of mourning doves heard per route by State, adjusted to a base year, 1976.

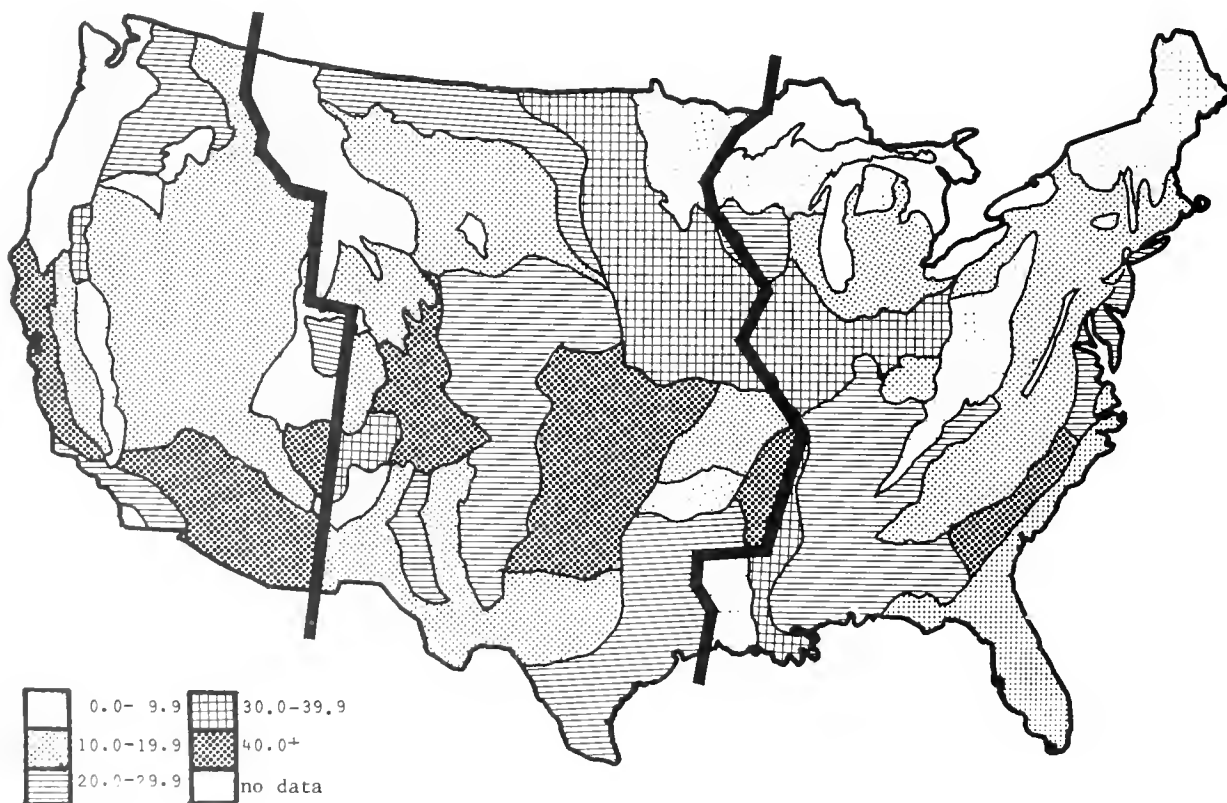


Fig. 4. Numbers of mourning doves heard per route by physiographic region, adjusted to a base year, 1976.

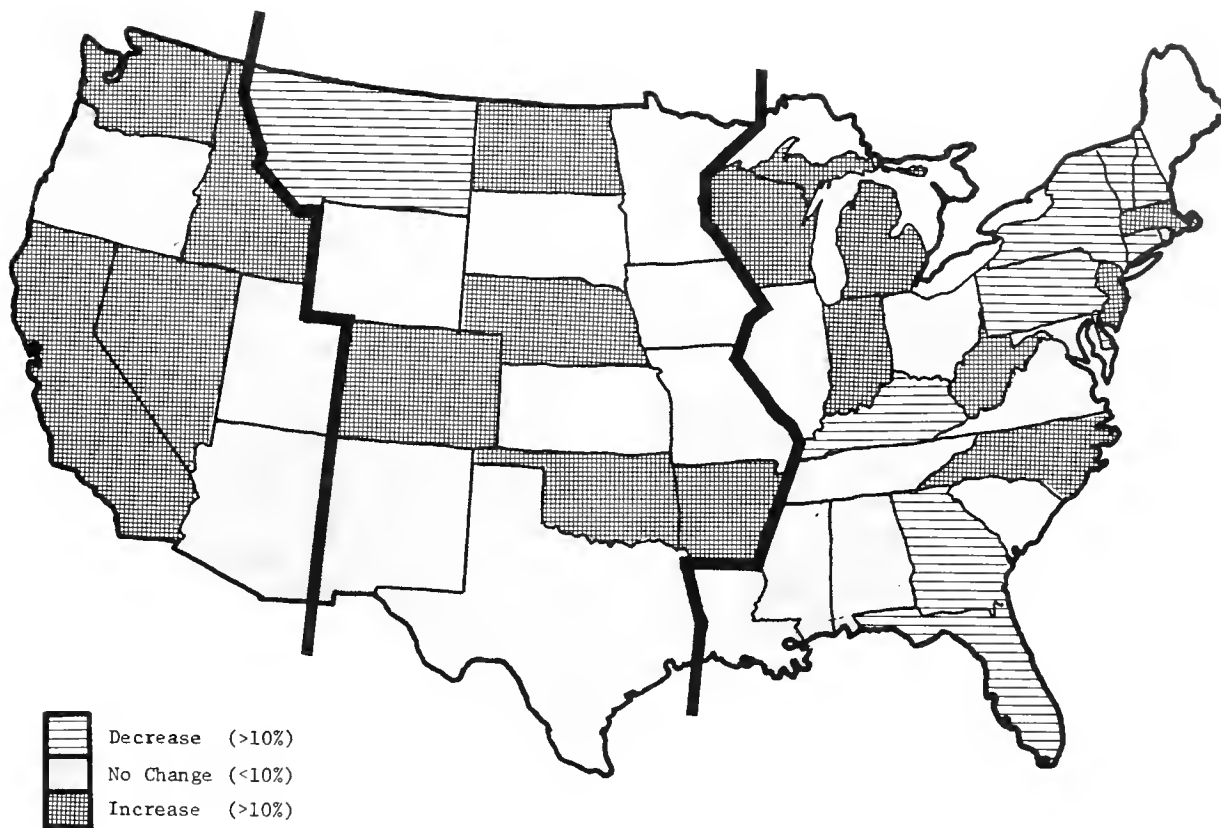


Fig. 5. Changes in numbers of mourning doves heard per route by State, 1975-1976.

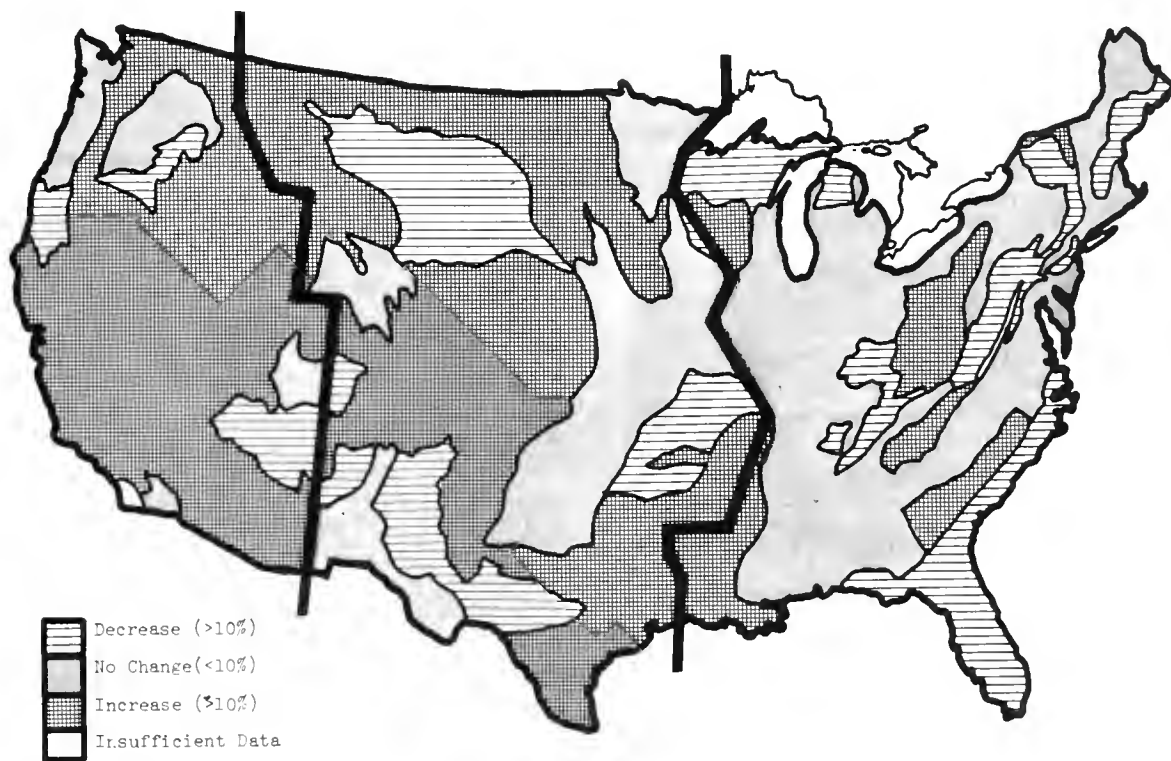


Fig. 6. Changes in numbers of mourning doves heard per route by physiographic region, 1975-1976.

1966 to 1976 Long-term Population Trends

The 1976 population indices for the United States, the combined hunting States, and combined nonhunting States are above their record lows established in 1970 and 1971. The 1976 population index for the United States was 12.7% above its preceding 10-year mean of 21.2 doves heard per route (Fig. 7). The current combined hunting States index was also above its mean by 15.4% while the combined nonhunting States index was 4.8% above its long-term mean (Fig. 8).

Adjusted BDI's plotted in Figs. 7 and 8 reflect the trend in population indices since 1966. Linear regression analyses of these data (Table 3) are shown in Fig. 9. The indices decreased at an average annual rate of 0.4% in the United States and 1.8% in nonhunting States. In contrast, hunting States increased at an annual rate of 0.1%. The study reveals a gradual overall decrease in the nationwide dove breeding population between 1966 and 1976.

Regression analyses of State values for the 11-year period showed 8 States (16% of the land area) with significant upward trends in the population index, compared with 10 States (21% of the land area) with downward trends (Table 3, Fig. 10). A similar study of physiographic region data from 1966 to 1976 is also presented in Table 4 and Fig. 11. Population indices have been increasing in an area extending from the Texas Gulf Coastal Plain to the Lower Mississippi River Plain, in sections of the Columbia Plateau, and the Southwest. Decreasing trends were prevalent in the northern Appalachians, Interior Low Plateaus, Ozark Plateaus, Lower Coastal Plain, and in the northern Great Plains.

Status of the Eastern Management Unit Population

The Eastern Management Unit consists of 27 of the 48 contiguous States, including 30% of the land area and 22% of the current dove breeding population in the country. In the Eastern Unit, dove hunting is permitted in 17 States representing 70% of the land area and 80% of the currently estimated dove population. In 1976, the mean breeding population index was 17.3 doves heard per route for the Unit, with 18.7 doves heard per route for the combined hunting States and 14.5 doves heard per route for the combined nonhunting States (Table 1).

1976 Population Distribution

Extensive areas of high dove densities were reported from the Central Lowlands (Region 124) and the Upper Atlantic Coastal Plain (Region 032). States with a

mean of 30 or more doves heard per route included Ohio and Mississippi (Table 3, Fig. 3). Densities were generally low in the Appalachian Highlands, northern uplands, and the lower Atlantic Coastal Plain (Table 4, Fig. 4). Louisiana and seven northern States had means of fewer than 10 doves heard calling per route in 1976.

1975 to 1976 Population Changes

The Eastern Unit BDI decreased 0.6% from 17.4 doves heard per route in 1975 to 17.3 doves heard per route in 1976 (Table 1). Population indices increased in those physiographic regions (Fig. 1) representing 37% of the total land area, decreased in 59% of the area, and showed no change in 4% of the area. The most extensive areas of increase included the Upper Coastal Plain (Region 032), portions of the Appalachian Highlands (Regions 052, 085), and the Central Lowlands (Region 123). Substantially lower population indices occurred in the northern uplands (Region 010), Lower Coastal Plain (Regions 033, 037), portions of the Appalachian Highlands, and including several New England States (Figs. 5,6). From 1975 to 1976 the combined hunting States index decreased 2.9% and the combined nonhunting States index increased 5.3% (Table 1).

The mean survey date was 26 May in 1976 and 27 May in 1975 in the Eastern Unit (Table 2). In 1976, the mean temperature at the beginning of the survey was 4.4 C cooler than in 1975. There was no important difference in the percentage of high disturbance recorded per route between 1975 and 1976. The Eastern Unit had the greatest proportion of survey route stops affected by high disturbance (10%) of any unit in 1976.

1966 to 1976 Long-term Population Trends

Population indices for the Eastern Management Unit, the combined hunting States, and the combined nonhunting States in 1976 were above their historic low established in 1974. The current indices for the Eastern Unit and the combined hunting States were below their most recent 10-year means by 3.4% and 6.5%, respectively, whereas the combined nonhunting States index was 4.3% above its long-term mean (Table 3, Figs. 7, 12).

Regression analysis showed a significant downward trend in the Eastern Unit population index between 1966 and 1976; the mean rate of decrease was 1.6% per year (Table 3, Fig. 9). During the same period the combined hunting States index declined at a mean annual rate of 2.0%, and the combined nonhunting States index decreased at 0.7% per year. Long-term trends by State and physiographic region are shown in Figs. 10 and 11. Only three States (6% of the Unit's land area) had statistically significant upward index trends, compared

with six States (25% of the area) with downward trends. The trend in the Mississippi Alluvial Plain (Region 035) showed an increase. Population indices declined primarily in the Appalachian States and Louisiana.

Status of the Central Management Unit Population

The Central Management Unit consists of 14 of the 48 contiguous States, representing 46% of the land area and 52% of the current breeding population in the country. Within the Central Unit, dove hunting is permitted in nine States representing 68% of the land area and 74% of the estimated dove population. In 1976, the mean breeding population index was 27.0 doves heard per route for the Unit; it was 27.5 doves heard per route for the combined hunting States and 26.2 doves for the combined nonhunting States (Table 1).

1976 Population Distribution

Extensive areas of high dove densities were reported from the southern portion of the Great Plains and over much of the Central Lowlands (Regions 126, 135, 137). States represented by a mean of 30 or more doves heard per route included North Dakota, South Dakota, Nebraska, Kansas, and Oklahoma (Table 1, Fig. 3). Densities were generally low throughout most of the Rocky Mountain States (Table 4, Fig. 4). Montana and Wyoming had a mean of less than 10 doves heard per route in 1976 (Table 1, Fig. 4).

1975 to 1976 Population Changes

The Central Unit population index increased 7.7% from 25.1 doves heard per route in 1975 to 27.0 doves heard per route in 1976 (Table 1). Population indices increased in those physiographic regions representing 73% of the Unit's land area, decreased in 26% of the area, and remained unchanged in 1% of the Unit (Table 4). Changes greater than 10% in the breeding index are illustrated by State (Fig. 5) and physiographic region (Fig. 6). Extensive areas of population increase were found in most of the Great Plains and the Gulf Coastal Plain. Areas showing decreases greater than 10% included parts of the northern and southern Great Plains and the Interior Highlands. From 1975 to 1976, the combined hunting States index increased 7.0% and the nonhunting States index increased by 8.5%.

No important differences in mean survey temperatures or in high-disturbance factors along survey routes occurred between 1975 and 1976. The 1976 survey, however, was run slightly earlier than in 1975 throughout the Unit (Table 2).

1966 to 1976 Long-term Population Trends

The current population index is 5.1% above its most

recent 10-year mean of 25.7 doves heard per route (Fig. 7). Since 1966 the combined hunting States indices have remained nearly stable: the 1976 index was 5.0% above its long-term mean (Table 3, Fig. 12). The current combined nonhunting States index is 5.2% above the 1966-75 long-term mean, and, following five consecutive years of increase, it is 28% above its lowest point in 1970.

Regression analysis shows a slight downward trend in breeding population indices from 1966 to 1976 throughout the Unit. This trend, however, was not significant (Table 3, Fig. 9). Annual rates of decrease in the BDI's were as follows: Central Unit - 0.6%; combined hunting States - 0.3%; and combined nonhunting States - 2.1%. The annual rate for nonhunting States represents the greatest rate of decrease of any Unit or subunit. Long-term trends by State and physiographic region are shown in Figs. 10 and 11. Two States (12% of the Unit's land area) had statistically significant upward population trends, compared with three States (24% of the area) with downward trends. Increasing trends were limited to the Gulf Coastal Plain, and in regions along the Colorado-New Mexico border. Decreasing trends were prevalent throughout the northern Great Plains and the Ozark Plateaus (Fig. 11).

Status of the Western Management Unit Population

The Western Management Unit is composed of 7 States, representing 24% of the land area and 26% of the current breeding population in the 48 contiguous States. All States in the Western Unit permit dove hunting. In 1976, the mean breeding population index was 26.2 doves heard per route (Table 1).

1976 Population Distribution

Highest population indices in the Western Unit were generally restricted to the Intermontane Plateaus of Arizona and the California Coast Range (Regions 214, 222, 224, 246). Arizona and Nevada were represented by 30 or more doves heard per route in 1976 (Figs. 3,4). Low population indices were distributed throughout much of the Great Basin and Rocky Mountain regions, and in the Pacific Northwest.

1975 to 1976 Population Changes

The Western Unit BDI increased 31.8% from 19.9 doves heard per route in 1975 to 26.2 in 1976 (Table 1). Population indices increased between 1975 and 1976 in those physiographic regions representing 85% of the land area; they decreased in 9% of the area and did not change in the remaining 6% of the land area (Table 4).

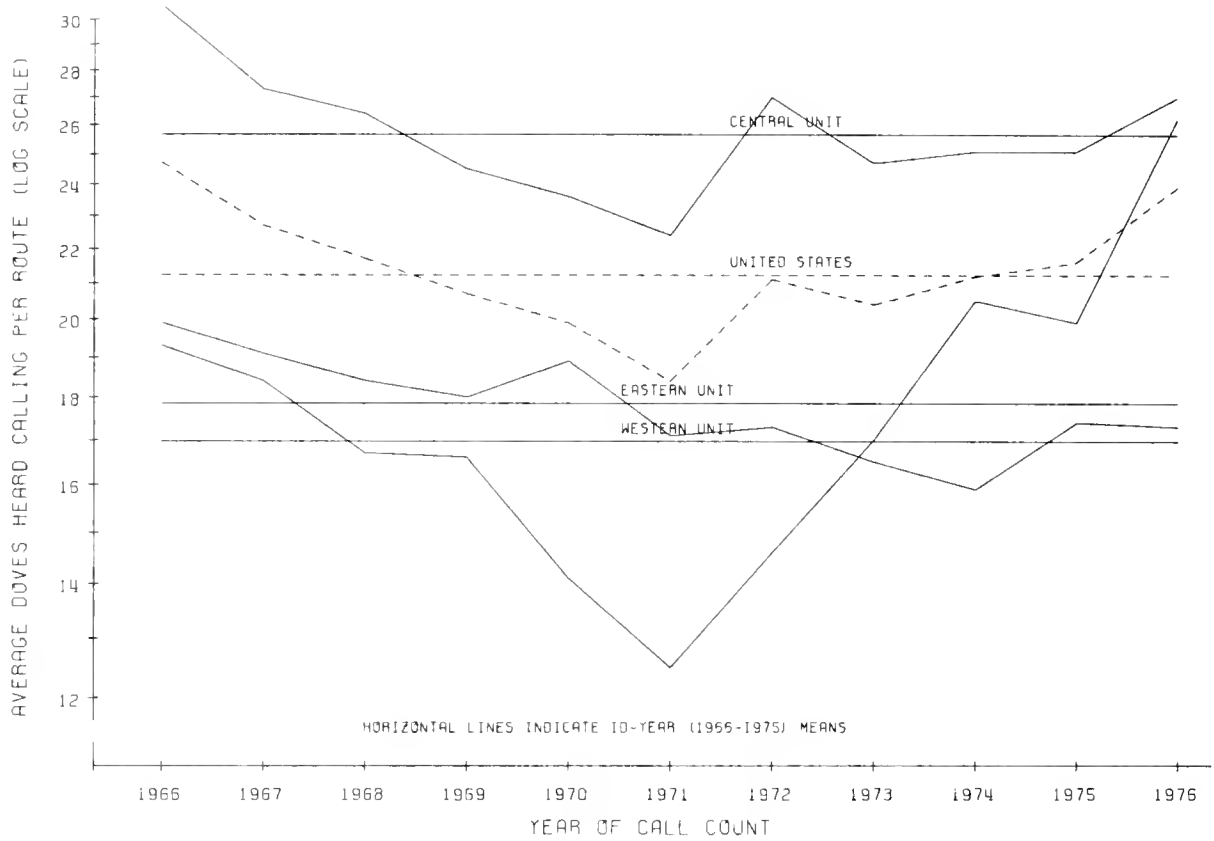


Fig. 7. Population indices of breeding mourning doves by management unit, 1966-76.

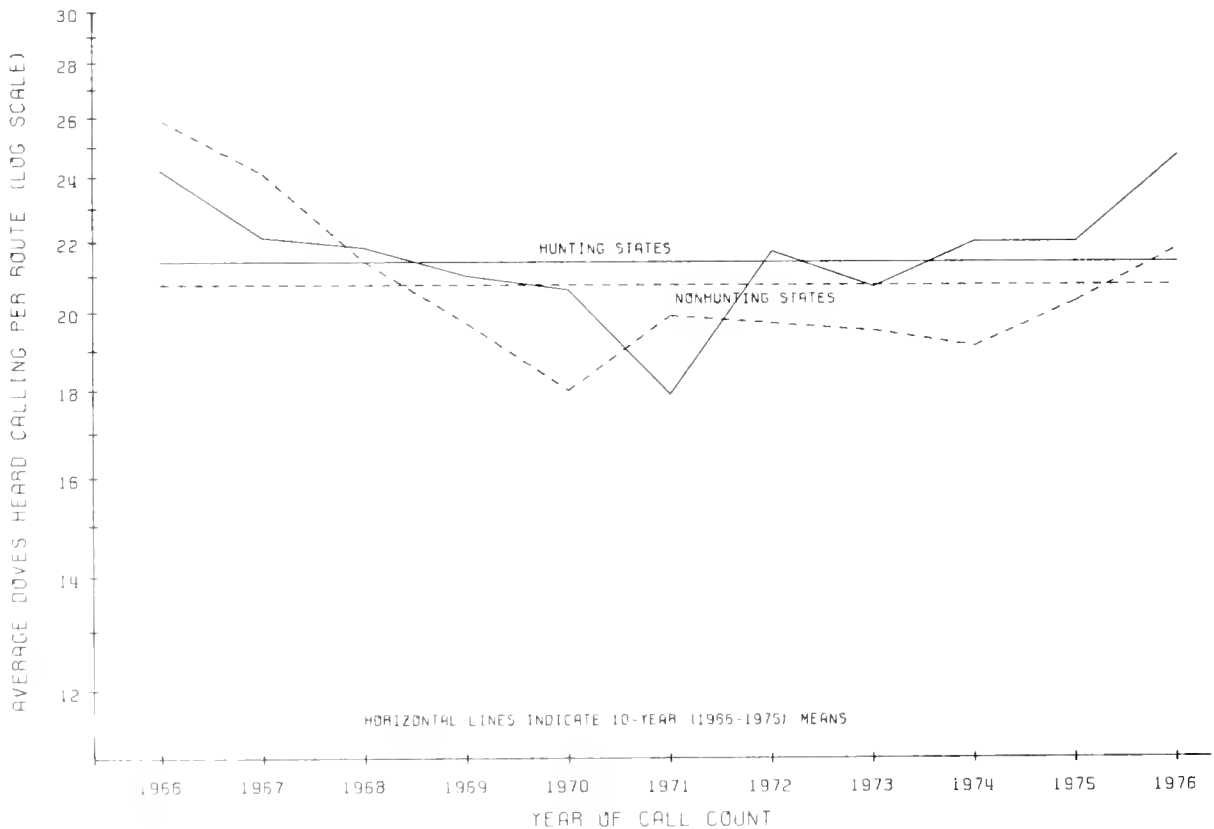


Fig. 8. Population indices of breeding mourning doves in hunting and nonhunting states, 1966-76.

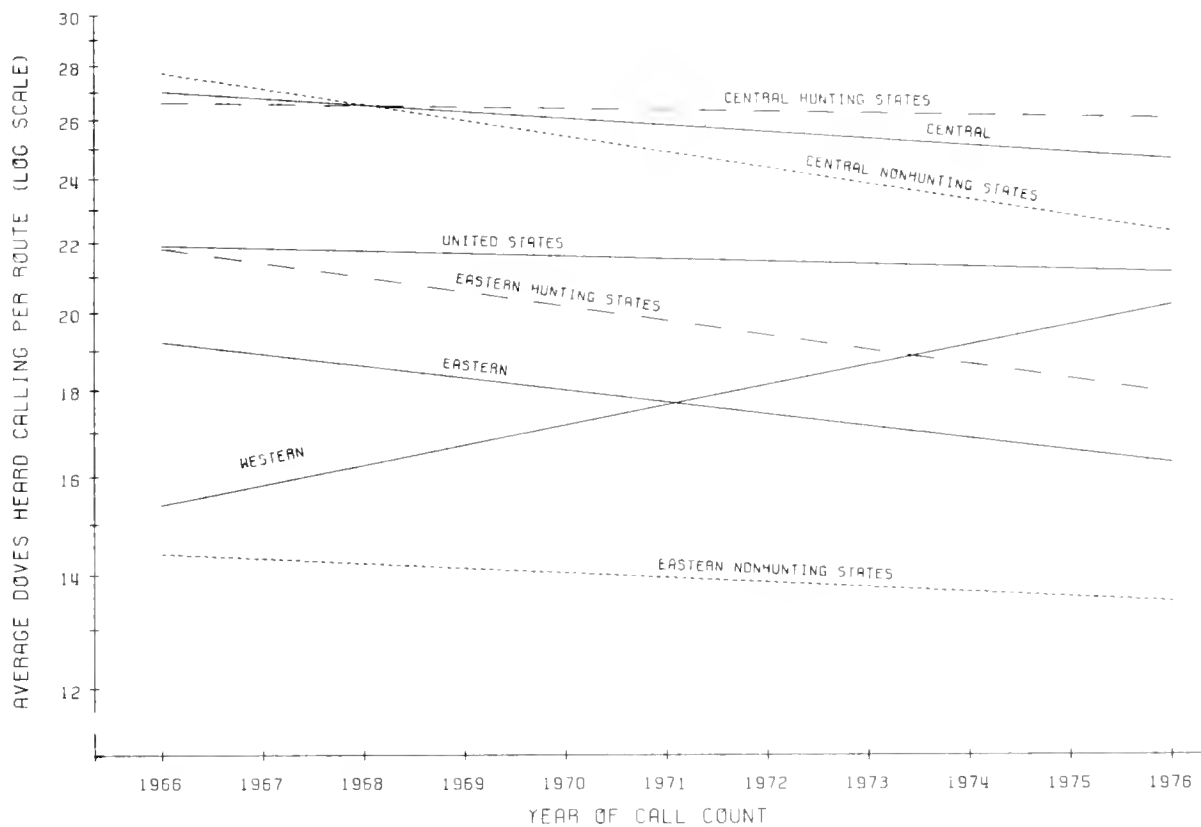


Fig. 9. Linear regression lines of mourning dove call-count data, 1966-76.

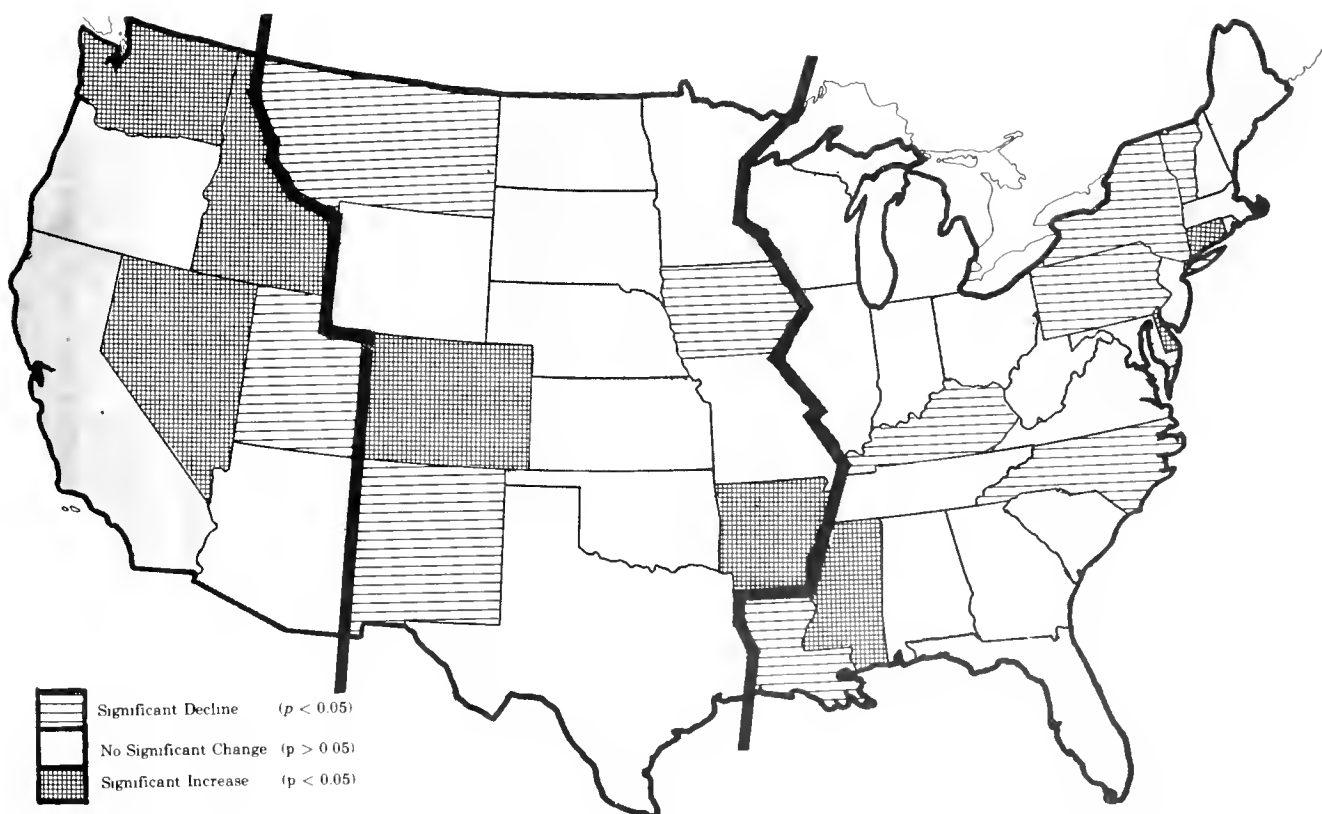


Fig. 10. Trends in numbers of mourning doves heard per route by State, determined from linear regression analysis, 1966-1976.

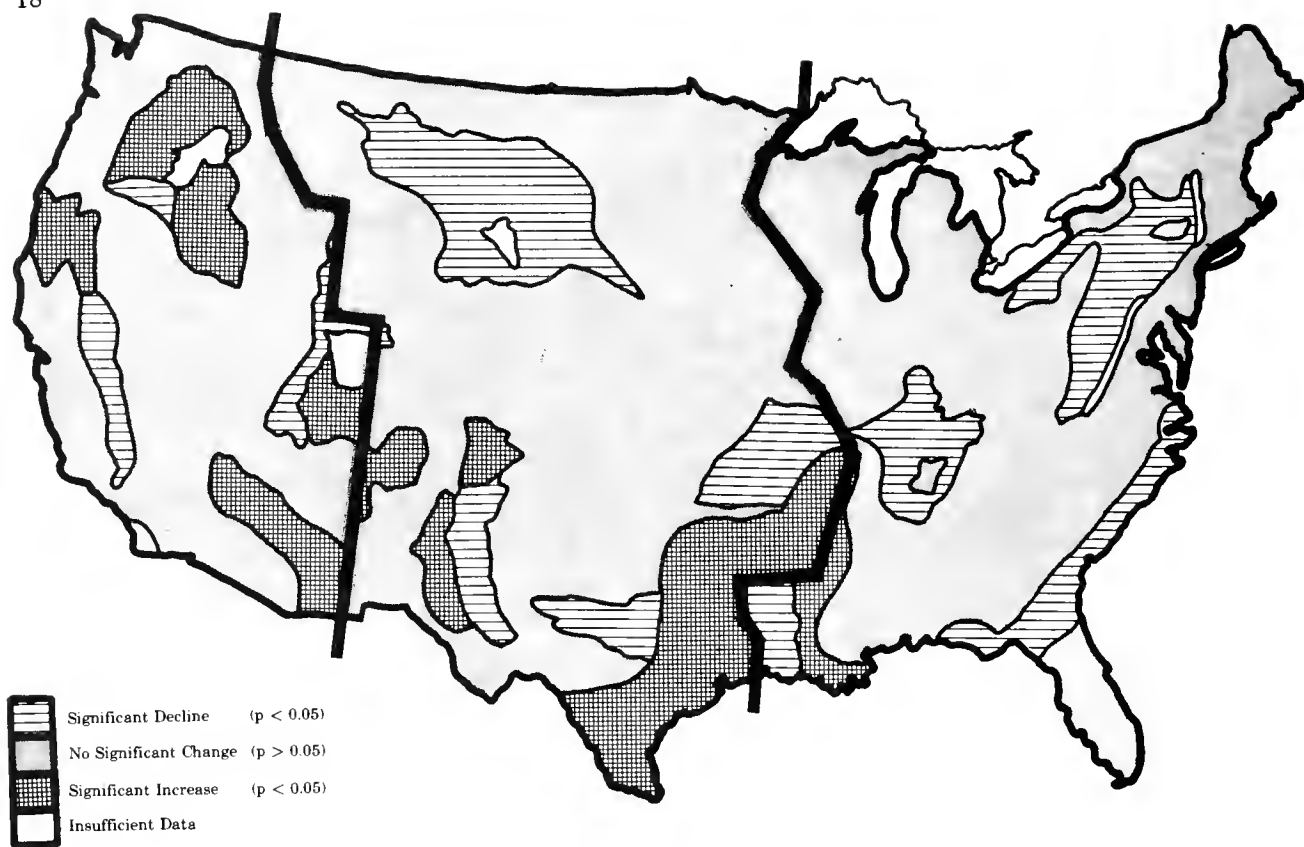


Fig. 11. Trends in numbers of mourning doves heard per route by physiographic region, determined from linear regression analysis, 1966-1976.

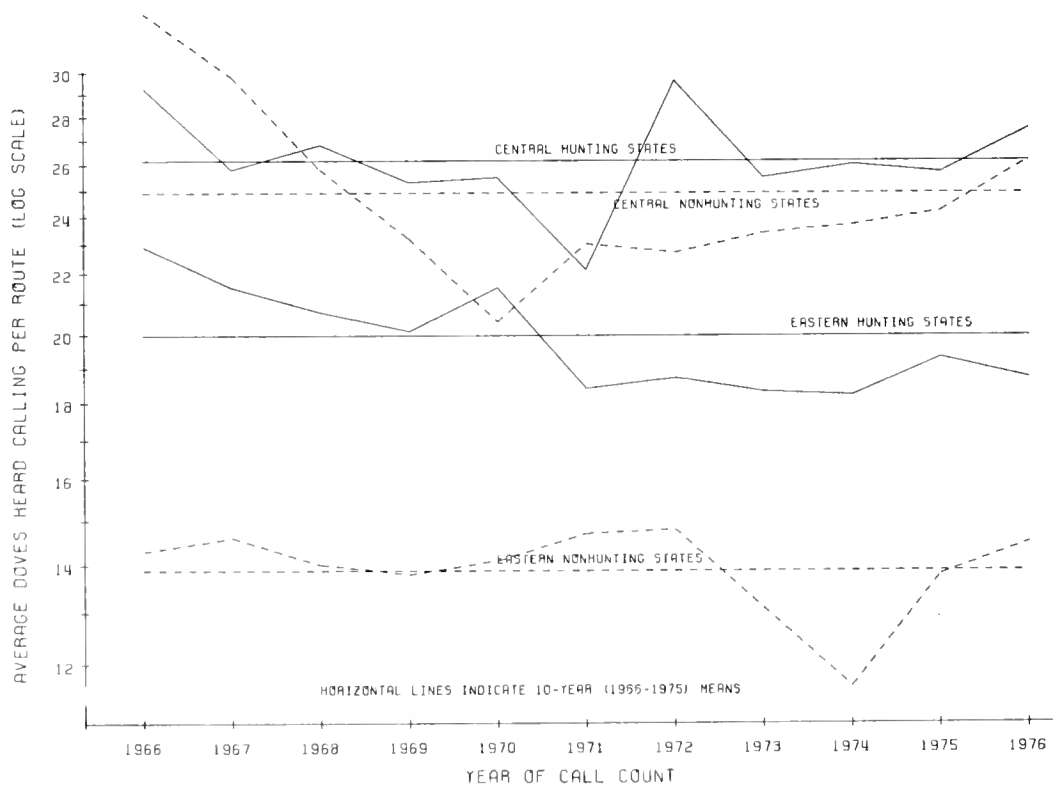


Fig. 12. Population indices for breeding mourning doves in the Eastern and Central management unit and nonhunting States, 1966-76.

TABLE 3.—TRENDS IN MOURNING DOVE BREEDING DENSITY INDICES BY STATE, 1966-76.

EASTERN MANAGEMENT UNIT

STATE	LAND AREA WEIGHT	ADJUSTED AVERAGE DOVES HEARD CALLING PER ROUTE A.B./										LINEAR REGRESSION, 1966-76		
		1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	PERCENT CHANGE	STAT. SIGN.
HUNTING STATES														
ALA.	33.32	23.0	22.2	18.9	23.2	20.3	18.5	22.2	19.7	21.2	25.9	26.5	15.2	N.S.
DEL.	1.29	9.4	18.8	13.2	19.3	28.2	9.4	11.3	26.4	26.4	35.8	28.3	157.3	P .05
FLA.	35.82	13.8	13.3	10.8	11.9	13.0	8.7	10.3	10.1	10.6	12.6	11.0	-17.2	N.S.
GA.	37.82	20.6	24.3	22.4	24.5	29.9	19.9	16.8	18.2	20.4	22.7	18.2	-19.1	N.S.
ILL.	35.09	27.3	28.1	27.6	23.1	31.0	24.9	27.8	27.6	24.4	27.9	26.0	-3.7	N.S.
KY.	26.08	33.5	28.4	26.0	25.9	26.5	26.2	26.5	25.5	24.3	21.9	19.4	-30.5	P .01
LA.	31.14	7.1	8.1	6.9	6.8	6.5	6.6	7.7	5.7	6.1	6.1	5.7	-22.3	P .05
MD.	6.55	14.3	18.9	16.6	15.9	18.9	17.9	24.9	22.3	23.5	16.8	17.0	24.1	N.S.
MISS.	30.63	25.9	21.3	20.4	22.0	23.5	26.4	27.0	25.1	25.2	25.2	30.2	32.5	P .01
N.C.	22.51	48.0	39.0	41.4	32.2	34.3	22.8	21.4	27.1	18.4	16.3	18.0	-68.6	P .01
PA.	29.01	12.5	17.1	11.4	12.5	9.1	8.6	10.2	8.2	8.1	7.0	5.9	-58.2	P .01
R.I.	0.67	16.7	21.4	10.7	10.0	3.5	10.0	7.3	7.7	9.2	10.0	10.0	-53.2	P .10
S.C.	19.99	30.4	30.3	29.7	32.0	26.4	27.6	22.5	29.4	27.6	26.1	28.1	-13.2	N.S.
TENN.	27.07	20.1	14.8	16.0	15.4	23.9	21.4	25.6	19.0	18.4	19.3	20.1	17.3	N.S.
VA.	26.05	34.8	28.2	38.0	29.2	25.9	22.4	13.4	16.1	23.3	25.4	25.7	-39.6	P .10
W. VA.	15.41	9.2	4.7	4.7	5.3	6.1	5.3	8.3	5.3	4.5	3.5	6.9	-20.7	N.S.
SUBTOTAL	378.45	22.9	21.5	20.7	20.1	21.5	18.4	18.7	18.3	18.2	19.3	18.7	-18.2	P .01
NONHUNTING STATES														
CONN.	3.23	2.9	4.6	5.0	0.8	3.3	3.6	3.3	3.3	16.5	28.4	21.1	100.0 E/	P .01
IND.	23.36	27.1	28.1	30.2	27.6	28.2	35.7	30.3	26.8	24.3	24.3	26.9	-10.2	N.S.
MAINE	19.85	0.6	0.0	1.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-100.0	P .10
MASS.	5.31	11.1	14.6	5.0	1.4	5.5	4.9	6.3	6.3	5.0	9.9	16.8	26.5	N.S.
MICH.	37.18	7.8	7.6	5.8	7.5	6.7	9.4	9.9	7.5	6.9	8.3	9.3	21.5	N.S.
N.H.	5.80	1.8	1.2	1.1	1.0	1.1	3.8	2.7	5.6	2.7	2.3	1.9	137.1	N.S.
N.J.	4.91	23.7	19.7	19.1	16.6	20.8	23.1	24.9	22.6	16.9	10.6	12.5	-32.9	P .10
N.Y.	30.49	13.9	13.6	12.1	10.5	9.5	8.6	11.3	10.1	8.6	10.6	8.6	-33.9	P .01
OHIO D/	26.42	32.7	31.8	33.7	38.2	42.4	32.7	34.4	27.5	25.4	34.3	33.0	-11.0	N.S.
VT.	5.95	0.8	0.8	0.6	0.3	1.0	0.1	0.1	0.1	0.1	0.1	0.0	-100.0	P .01
WISC.	36.07	11.7	14.2	12.1	10.5	9.1	12.3	11.8	13.2	10.4	11.8	15.2	8.6	N.S.
SUBTOTAL	198.57	14.3	14.6	14.0	13.8	14.1	14.7	14.8	13.1	11.6	13.8	14.5	-6.4	N.S.
TOTAL	577.02	19.9	19.1	18.4	18.0	18.9	17.1	17.3	16.5	15.9	17.4	17.3	-15.1	P .01

TABLE 3.--TRENDS IN MORNING DOVE BREEDING DENSITY INDICES BY STATE, 1966-76--CONTINUED.

STATE	LAND AREA WEIGHT	CENTRAL MANAGEMENT UNIT										LINEAR REGRESSION, 1966-76		STAT. SIGN.	
		ADJUSTED AVERAGE DOVES HEARD CALLING PER ROUTE	A. B./ 1970	1971	1972	1973	1974	1975	1976	TOTAL ANNUAL	PERCENT CHANGE				
HUNTING STATES															
ARK.	34.37	15.9	20.0	19.3	21.5	22.1	23.5	23.3	24.7	25.1	23.7	27.7	50.1	4.1	P .01
COLD.	67.18	12.0	13.0	11.1	15.9	16.6	15.2	16.6	16.0	20.8	19.0	23.7	90.2	6.6	P .01
KANS.	52.43	50.7	59.0	57.7	63.9	59.1	57.4	60.3	56.0	45.0	46.0	48.6	-17.4	-1.9	P .10
MO.	45.10	44.2	41.1	44.8	28.5	35.2	33.0	44.7	33.5	29.2	32.7	32.1	-26.4	-3.0	P .10
N. MEX.	77.98	50.8	15.2	22.7	15.6	14.7	12.1	15.2	8.7	8.9	13.5	13.6	-78.6	-14.1	P .05
OKLA.	44.40	50.6	65.5	68.9	52.2	45.7	25.2	75.3	72.8	79.5	79.9	90.0	67.8	5.3	P .10
TEX.	170.03	18.7	17.6	18.1	17.3	19.7	19.6	25.2	19.8	21.2	17.7	17.9	7.9	0.8	N.S.
WYO.	62.33	13.1	10.8	7.1	17.1	16.2	7.9	7.4	9.9	10.5	9.6	9.6	-28.8	-3.3	N.S.
SUBTOTAL	553.82	29.3	25.8	26.8	25.3	25.5	22.1	29.6	25.5	26.0	25.7	27.5	-2.5	-0.3	N.S.
NONHUNTING STATES															
IOWA	36.15	46.1	47.4	42.6	35.9	23.8	28.8	27.1	25.2	21.9	23.2	23.5	-59.1	-8.5	P .01
MINN.	54.09	16.4	14.6	16.0	9.4	7.7	11.5	11.6	10.4	16.0	18.8	18.3	23.9	2.2	N.S.
MONT.	54.47	26.8	29.3	8.9	10.3	7.9	10.3	7.5	6.1	4.7	6.0	5.4	-94.7	-23.1	P .01
NEBR./	49.69	44.4	36.7	43.9	43.9	42.8	41.6	43.9	44.6	43.8	42.2	46.7	7.8	0.8	N.S.
N. DAK.	45.54	29.6	29.5	34.4	28.8	23.9	24.4	25.6	33.1	32.9	28.9	41.0	20.0	1.8	N.S.
S. DAK.	49.20	44.2	27.5	30.4	27.9	29.7	35.5	36.6	29.3	41.0	43.2	42.7	34.4	3.0	P .10
SUBTOTAL	329.14	32.9	29.8	25.8	23.2	20.4	23.0	22.7	23.4	23.7	24.2	26.2	-15.5	-2.1	N.S.
TOTAL	882.96	30.6	27.3	26.4	24.5	23.6	22.4	27.0	24.7	25.1	25.1	27.0	-9.1	-0.9	N.S.

TABLE 3.--TRENDS IN MORNING DOVE BREEDING DENSITY INDICES BY STATE, 1966-76--CONTINUED.

STATE	WESTERN MANAGEMENT UNIT											LINEAR REGRESSION, 1966-76				
	LAND AREA	ADJUSTED AVERAGE DOVES HEARD CALLING PER ROUTE A.B./	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	TOTAL	ANNUAL	STAT. SIGN.
			HUNTING STATES													
ARIZ.	72.65	53.6	48.6	42.5	47.5	35.2	23.1	30.9	51.4	48.7	53.2	57.7	13.2	1.2		N.S.
CALIF.	101.71	19.8	16.2	13.6	13.1	12.4	12.7	13.4	12.6	16.3	12.8	16.7	-12.3	-1.3		N.S.
IDAHO	54.37	10.0	9.5	9.6	9.1	11.6	12.1	15.7	13.8	14.6	10.7	13.3	47.4	4.0		P .05
NEV.	71.27	6.9	7.7	14.2	10.9	9.9	5.7	11.4	9.3	21.2	22.0	46.4	558.0	28.6		P .05
CREG.	62.27	11.4	10.5	10.7	12.1	8.3	9.6	9.1	9.2	11.5	11.1	10.2	-5.3	-0.5		N.S.
UTAH	53.34	15.0	22.5	12.8	9.5	7.9	13.9	9.3	8.0	12.2	8.6	9.3	-50.7	-6.8		P .05
WASH.	43.87	8.9	7.6	7.0	7.5	8.3	8.3	8.1	8.7	12.1	15.1	22.5	205.0	11.9		P .01
TOTAL	459.48	19.3	18.4	16.7	16.6	14.1	12.5	14.6	17.0	20.5	19.9	26.2	31.4	2.8		N.S.

UNITED STATES SUMMARY

STATE	UNITED STATES SUMMARY											LINEAR REGRESSION, 1966-76				
	LAND AREA	ADJUSTED AVERAGE DOVES HEARD CALLING PER ROUTE A.B./	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	TOTAL	ANNUAL	STAT. SIGN.
HLNT	1391.75	24.2	22.1	21.8	21.0	20.6	17.9	21.7	20.7	22.0	22.0	24.7	1.3	0.1		N.S.
NCNHUNI	527.71	25.9	24.1	21.4	19.7	18.0	19.9	19.7	19.5	19.1	20.3	21.8	-16.5	-1.8		P .10
TOTAL	1919.46	24.7	22.7	21.7	20.7	19.9	18.4	21.1	20.4	21.2	21.6	23.9	-3.9	-0.4		N.S.

A/ THE AVERAGE NUMBER OF DOVES HEARD PER ROUTE ADJUSTED ANNUALLY TO A BASE YEAR ACCORDING TO THE PERCENT CHANGE FROM PRECEDING YEAR ON COMPARABLE ROUTES. FOR EACH STATE, 1971 SELECTED AS THE BASE YEAR REPRESENTING THE MEAN BDI FOR THE 6-YEAR PERIOD 1968 TO 1973. BASE YEAR DATA FROM COMPARABLE ROUTES ACCEPTED IN EACH OF THE 2-YEAR COMPARISONS, THUS INCLUDE THE MEAN OF 12 DATA POINTS. SEE TEXT FOR ADDITIONAL INFORMATION.

B/ UNIT AND SUBUNIT INDICES DERIVED FROM WEIGHTED STATE VALUES (THIS TABLE) CARRIED TO 3 POSITIONS.

C/ STATISTICAL SIGNIFICANCE OF TRENDS: N.S. = NOT SIGNIFICANT (P>.10); N.E. = NO ESTIMATE AVAILABLE.

D/ HUNT STATE BEGINNING IN 1975; SEE TEXT FOR DETAILS.

E/ ACTUAL CHANGE GREATER THAN 100 PERCENT.

TABLE 4.--TRENDS IN MORNING DOVE BREEDING DENSITY INDICES BY PHYSIOGRAPHIC REGION, 1966-76.

EASTERN MANAGEMENT UNIT

REGION	LAND AREA WEIGHT	ADJUSTED AVERAGE DOVES HEARD CALLING PER ROUTE A.B.V.										LINEAR REGRESSION, 1966-76			
		1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	TOTAL	ANNUAL	STAT. SIGN. D/
10	32.10	5.9	5.5	5.0	4.5	3.2	5.5	5.5	6.8	4.0	5.0	4.6	-8.0	-0.8	N.S.
31	15.34	25.5	24.0	21.5	16.5	19.6	21.7	24.4	20.8	19.5	19.8	21.1	-12.5	-1.3	N.S.
32	16.40	43.1	50.2	51.0	49.4	44.0	44.5	37.6	41.9	46.9	38.8	43.2	-14.9	-1.6	P .10
33	24.79	14.7	14.6	12.6	13.7	16.2	9.4	13.2	12.5	11.0	14.2	11.4	-17.9	-2.0	N.S.
34	63.72	23.1	20.8	17.9	20.1	21.2	19.8	23.3	21.2	19.3	21.7	20.8	0.3	0.0	N.S.
35	20.50	20.4	21.4	21.9	20.4	21.5	29.1	24.6	23.1	28.3	26.8	30.2	44.9	3.8	P .01
36	15.65	7.2	7.8	6.0	6.8	5.7	6.3	6.6	4.7	6.6	4.9	5.5	-27.2	-3.1	P .05
37	33.14	23.5	21.8	19.3	29.3	32.3	15.5	9.6	14.1	12.0	16.1	12.6	-53.9	-7.5	P .05
41	39.35	24.8	20.7	27.8	21.5	20.0	16.4	11.7	14.7	17.5	19.1	18.9	-34.5	-4.1	P .10
42	3.51	32.7	33.4	30.6	30.2	26.2	30.3	31.8	35.9	34.6	27.1	16.0	-21.7	-2.4	N.S.
51 E/	1.93	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.
52	6.09	7.7	6.5	7.8	4.4	8.9	7.9	9.3	9.3	6.1	7.3	11.0	33.5	2.9	N.S.
61	17.62	19.5	15.6	12.5	14.5	25.1	18.8	24.3	19.6	19.5	22.2	23.7	44.1	3.7	P .10
62	18.99	21.8	17.3	22.2	23.8	20.5	15.6	17.1	14.3	16.9	17.9	16.1	-27.3	-3.1	P .05
70	2.40	N.E.	0.9	1.2	0.7	0.7	0.7	0.7	0.7	0.7	0.5	1.5	3.3	0.4	N.S.
81	27.02	12.5	19.7	15.1	11.5	9.8	9.7	12.5	10.6	9.8	10.0	11.0	-37.7	-4.6	P .05
82	1.32	3.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	-100.0	-60.3	N.S.
85	32.72	7.0	5.3	3.6	4.6	4.1	5.7	5.3	4.7	4.3	3.7	4.2	-27.6	-3.2	N.S.
86	7.27	14.5	10.6	12.5	12.8	12.5	9.4	11.5	9.8	13.9	12.7	9.1	-15.4	-1.7	N.S.
91	9.28	11.7	14.4	7.3	2.0	4.3	4.9	5.0	5.0	6.3	10.7	10.4	-19.3	-2.1	N.S.
92	10.00	N.E.	C.6	1.0	1.1	0.6	2.2	1.6	3.3	1.6	1.3	1.1	90.7	7.4	N.S.
93	20.12	N.E.	N.E.	N.E.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	N.S.
95 E/	1.64	N.E.	3.7	3.7	3.7	9.7	1.5	3.0	3.0	3.0	N.E.	N.E.	N.E.	N.E.	N.E.
100	6.71	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	147.7	9.5	N.S.
111	25.51	36.3	31.6	30.9	28.6	29.5	31.8	31.8	26.2	28.0	29.7	28.2	-16.4	-1.8	P .05
112	6.70	20.4	11.1	13.4	19.6	20.1	20.6	19.8	18.7	16.4	14.7	11.4	-12.0	-1.3	N.S.
113	2.07	31.2	12.6	20.3	17.5	20.3	14.3	24.3	21.6	31.8	40.8	28.2	75.8	5.8	N.S.
121	46.46	18.3	18.4	14.8	17.0	14.9	18.0	17.5	14.6	13.4	16.1	16.4	-13.1	-1.4	N.S.
123	12.05	18.8	22.2	19.6	15.1	14.6	18.1	19.1	16.1	13.3	14.5	20.3	-16.9	-1.8	N.S.
124	56.27	27.5	29.5	30.5	29.4	36.7	31.3	32.1	30.1	27.3	31.5	31.1	3.9	0.4	N.S.
141 E/	0.27	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.
TOTAL/ AVERAGE	577.02	19.9	19.1	18.4	18.0	18.9	17.1	17.3	16.5	15.9	17.4	17.3	-15.1	-1.6	P .01

TABLE 4.—TRENDS IN MOURNING DOVE BREEDING DENSITY INDICES BY PHYSIOGRAPHIC REGION, 1966-76---CONT.

REGION	LAND AREA WEIGHT	CENTRAL MANAGEMENT UNIT															LINEAR REGRESSION, 1966-76		
		ADJUSTED AVERAGE DOVES HEARD CALLING PER ROUTE A.B./															PERCENT CHANGE C/		
		1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	TOTAL	ANNUAL	SIGN.	D/			
10	30.37	7.1	6.3	6.3	3.9	2.8	4.7	4.7	3.4	6.3	7.8	7.2	12.7	1.2	N.S.				
35	16.60	27.6	27.4	24.9	28.3	37.4	33.8	31.4	35.6	38.4	36.3	40.9	52.7	4.3	P .01				
36	77.45	17.6	17.5	16.8	16.2	15.7	19.7	20.4	21.2	27.7	20.6	23.3	51.1	4.2	P .01				
122	64.68	32.4	29.4	30.5	26.3	22.0	26.9	27.5	32.7	31.8	33.2	37.9	21.7	2.0	N.S.				
123	2.54	12.0	25.0	N.E.	15.6	14.7	17.4	13.7	18.3	13.7	14.9	20.9	17.8	2.4	N.S.				
124 E/	0.82	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.				
125	58.68	46.8	43.4	51.7	38.0	33.5	38.7	45.4	35.5	30.3	37.0	38.8	-24.5	-2.8	P .10				
126	71.40	34.8	41.9	41.4	35.0	39.8	35.7	48.0	42.2	40.2	42.8	43.9	16.5	1.5	N.S.				
130	14.35	65.3	36.0	47.5	43.6	39.9	36.1	38.0	21.8	20.5	13.6	17.0	-75.1	-13.0	P .01				
131	46.47	26.7	21.9	24.0	25.2	20.5	23.2	25.0	22.0	18.9	21.2	23.9	-12.7	-1.3	N.S.				
132	81.54	42.5	35.0	21.6	19.8	17.2	21.7	19.1	19.5	21.4	22.4	19.4	-48.3	-6.4	P .05				
133 E/	2.89	5.0	N.E.	N.E.	52.1	90.2	29.5	39.9	38.2	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.				
134	57.09	23.8	21.6	25.1	24.3	23.4	23.1	23.7	23.3	23.7	19.9	22.7	-6.9	-0.7	N.S.				
135	25.78	57.3	66.6	64.1	70.1	72.2	66.7	73.7	72.0	64.7	59.7	73.5	8.5	0.8	N.S.				
136	16.40	22.5	21.5	18.7	28.9	21.0	16.2	30.4	28.3	32.0	22.6	29.5	38.3	3.3	N.S.				
137	10.54	5.0	1.9	4.7	5.7	8.5	7.1	3.9	37.5	114.7	55.9	66.1	*****	284.0	P .01				
138	19.75	282.5	45.2	119.4	42.8	49.8	14.1	26.0	12.0	12.3	18.4	13.7	-100.0	-75.8	P .05				
139	22.05	1.8	27.1	23.0	52.2	44.9	25.3	32.0	22.9	17.6	15.2	13.4	-24.6	-2.8	N.S.				
141	27.75	27.7	34.5	35.5	29.4	32.1	25.9	38.9	25.4	23.5	21.9	19.6	-33.8	-4.0	P .05				
142	3.11	15.4	10.4	4.8	7.2	4.8	4.0	12.8	4.8	4.8	0.8	1.6	-84.4	-16.9	P .05				
151	4.70	19.0	12.2	19.7	23.4	17.3	22.5	28.5	16.2	27.6	9.5	7.6	-20.7	-2.3	N.S.				
152	6.98	0.9	1.0	5.1	5.1	3.4	5.1	4.9	5.3	3.2	6.4	5.0	145.6	9.4	P .05				
160	28.53	13.5	6.9	11.6	19.8	13.9	11.5	15.4	8.2	13.2	13.4	46.9	204.1	11.8	N.S.				
170	24.23	12.6	15.0	7.2	11.8	15.7	10.7	11.3	9.9	15.6	20.8	19.5	66.1	5.2	P .10				
180	23.58	2.4	2.7	3.2	3.2	3.2	3.2	3.2	1.9	4.0	3.0	5.0	49.2	4.1	P .10				
190	33.18	4.3	2.8	2.6	3.0	3.2	5.4	2.5	3.9	4.6	4.0	5.9	62.0	4.9	P .10				
212	4.68	9.0	15.0	14.4	39.6	14.4	19.8	16.4	12.0	8.5	6.9	11.9	-41.8	-5.3	N.S.				
213	6.02	10.0	32.0	N.E.	N.E.	19.9	14.1	13.2	14.1	14.9	13.9	12.5	-26.6	-5.0	N.S.				
214	11.49	3.5	7.0	3.5	6.4	6.1	6.1	9.0	21.9	14.1	27.3	30.4	*****	246.7	P .01				
216	7.07	15.0	5.3	5.3	2.3	1.9	15.4	8.8	4.2	4.6	6.9	6.1	-32.4	-3.8	N.S.				
224	31.91	13.5	4.5	9.6	10.9	7.3	14.8	18.3	13.3	8.8	9.7	10.8	18.4	1.7	N.S.				
225	10.33	13.7	5.4	10.1	15.5	31.5	3.6	22.9	22.9	19.7	29.6	25.6	182.6	10.9	P .05				
TOTAL/ AVERAGE	882.96	30.6	27.3	26.4	24.5	23.6	22.4	27.0	24.7	25.1	25.1	27.0	-9.1	-0.9	N.S.				

TABLE 4.--TRENDS IN MOURNING DOVE BREEDING DENSITY INDICES BY PHYSIOGRAPHIC REGION, 1966-76--CONT.

WESTERN MANAGEMENT UNIT

REGION	LAND AREA WEIGHT	ADJUSTED AVERAGE Doves HEARD CALLING PER ROUTE A.B./										LINEAR REGRESSION, 1966-76				
		1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	TOTAL ANNUAL	PERCENT CHANGE C/	STAT. SIGN. D/	
180	8.00	21.4	24.9	33.3	8.3	13.1	10.3	8.8	3.8	3.8	2.9	4.8	-100.0	-71.1	P .01	
190	32.19	13.4	9.5	8.2	9.6	11.1	12.0	16.5	12.5	12.3	10.7	15.8	34.5	3.0	N.S.	
201	27.15	9.7	8.8	10.9	8.9	8.2	9.7	9.0	11.4	13.6	20.6	21.0	160.8	10.1	P .01	
202 E/	5.05	6.7	5.4	7.8	5.5	7.0	7.0	5.8	5.3	5.8	N.E.	N.E.	N.E.	N.E.	N.E.	
203	19.43	10.6	14.0	10.9	11.5	12.4	15.1	14.8	14.1	19.9	12.3	15.8	43.2	3.7	P .05	
204	11.00	15.7	15.0	14.1	9.7	15.3	12.2	21.5	23.4	15.6	9.8	18.6	20.6	1.9	N.S.	
205	6.17	267.5	61.8	48.0	68.9	44.6	24.3	21.4	10.7	7.4	3.0	2.5	-100.0	-75.6	P .05	
211	8.20	10.1	9.4	5.0	0.0	2.3	4.9	9.5	0.0	0.0	0.0	1.5	-100.0	-67.6	P .05	
212	5.96	20.5	55.3	9.8	10.7	4.0	18.3	2.6	12.0	14.8	12.0	20.8	-60.2	-8.8	N.S.	
213	12.24	1.6	3.4	3.6	5.4	7.1	11.5	7.1	8.7	9.6	8.9	8.0	220.4	12.3	P .01	
214	12.54	39.8	14.8	20.6	19.9	14.9	8.2	34.8	37.2	24.3	47.0	52.3	138.5	9.1	P .10	
215	13.78	16.8	19.5	14.3	45.5	22.4	19.6	27.2	9.9	15.4	18.6	13.4	-31.6	-3.7	N.S.	
216	1.46	1.8	3.5	1.5	0.0	3.2	6.9	4.1	3.8	0.5	0.8	0.7	-33.4	-4.0	N.S.	
221	115.89	12.0	14.7	14.2	10.7	9.1	9.1	9.0	6.8	11.8	9.4	11.3	-28.9	-3.4	N.S.	
222	35.86	91.2	67.8	57.4	51.5	34.9	26.9	32.6	51.2	59.5	36.2	47.0	-47.3	-6.2	P .10	
223	4.20	19.7	20.1	16.6	17.6	23.5	25.1	25.1	23.9	36.1	21.3	22.7	45.0	3.8	P .10	
224	24.20	52.4	61.0	48.4	47.2	46.1	21.3	28.4	42.91	9.31	21.01	34.2	325.0	15.6	P .05	
231	7.99	16.4	16.1	16.5	20.6	15.2	12.9	13.5	13.4	14.3	18.2	23.6	12.8	1.2	N.S.	
232	14.07	5.2	3.5	3.1	1.9	1.3	2.8	2.8	1.4	4.3	1.6	2.0	-55.7	-7.8	N.S.	
233 E/	4.42	10.8	10.3	N.E.	N.E.	N.E.	20.3	25.9	31.8	32.7	27.7	37.6	58.4	9.6	P .05	
234	16.87	12.2	11.9	10.9	9.2	10.5	8.8	9.4	8.4	10.7	8.4	9.3	-25.2	-2.9	P .05	
241	8.84	0.0	1.5	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	N.S.	
242	2.95	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	N.S.	
243	8.29	4.0	1.6	10.7	0.7	2.3	1.6	6.2	0.0	6.0	6.0	6.0	43.1	3.7	N.S.	
244	10.48	2.4	2.2	3.0	3.2	3.1	4.0	2.5	6.0	6.0	12.1	9.8	1017.0	27.3	P .01	
245	13.01	15.8	13.0	13.7	13.9	11.5	14.5	14.9	9.2	11.3	15.6	17.4	3.6	0.4	N.S.	
246	19.64	27.0	23.5	24.2	21.9	21.0	21.1	24.9	18.5	25.1	38.6	46.7	74.3	5.7	P .10	
247	8.10	10.2	8.4	3.6	11.7	11.7	6.3	3.5	17.9	19.1	11.0	20.3	164.4	10.2	P .10	
250 E/	1.50	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.	N.E.
TOTAL/AVERAGE	459.48	19.3	18.4	16.7	16.6	14.1	12.5	14.6	17.0	20.5	19.9	26.2	31.4	2.8	N.S.	

TABLE 4.—TRENDS IN MOURNING DOVE BREEDING DENSITY INDICES BY PHYSIOGRAPHIC REGION, 1966-76.

FOOTNOTES

A/ THE AVERAGE NUMBER OF DOVES HEARD PER ROUTE ADJUSTED ANNUALLY TO A BASE YEAR ACCORDING TO THE PERCENT CHANGE FROM PRECEDING YEAR ON COMPARABLE ROUTES. FOR EACH PHYSIOGRAPHIC REGION, 1971 SELECTED AS THE BASE YEAR REPRESENTING THE MEAN BDI FOR THE 6-YEAR PERIOD 1968 to 1973. BASE YEAR DATA FROM COMPARABLE ROUTES ACCEPTED IN EACH OF THE 2-YEAR COMPARISONS, THUS INCLUDE THE MEAN OF 12 DATA POINTS. SEE TEXT FOR ADDITIONAL INFORMATION. N.E. = NO ESTIMATE AVAILABLE.

B/ THE MANAGEMENT UNIT BREEDING INDICES ARE OBTAINED FROM TABLE 3.

C/ REGRESSION ANALYSIS: (1) 0.0 CALCULATED AS 0.0001.

(2) ANNUAL PERCENT CHANGE GREATER THAN 999 EQUALS NO ESTIMATE (N.E.).

D/ STATISTICAL SIGNIFICANCE OF TREND: N.S. = NOT SIGNIFICANT ($P > .10$); N.E. = NO ESTIMATE AVAILABLE.

E/ LINEAR REGRESSION ANALYSIS FROM MOST RECENT AVAILABLE DATA, RESULTS NOT COMPARABLE TO OTHER ANALYSES.

Changes greater than 10% in the breeding index are illustrated by State (Fig. 5) and physiographic region (Fig. 6). An increase in the index was prevalent throughout the Unit, with the exception of the Pacific Northwest and the Colorado Plateau where the population remained the same or decreased.

Analyses of several factors associated with the 1975 and 1976 surveys showed no important differences between years in the temperature at the beginning of the survey, or in the extent of high disturbance along routes (Table 2). The mean survey date in 1976 was 2 days earlier than in 1975.

1966 to 1976 Long-term Population Trends

The population index for the Western Unit in 1976 was 54.1% above its preceding 10-year mean of 17.0 doves heard per route (Fig. 7). Linear regression analysis of data from 1966 to 1976 shows a stable population trend. From 1971 to 1976, however, a similar analysis revealed the population to be increasing at 15.2% per year (Table 3). Long-term trends by State and physiographic region are shown in Figs. 10 and 11. Since 1966, three States (37% of the Unit's land area) have had significant upward population trends, compared with one State, Utah (12% of the area), showing a downward trend. Increasing trends were primarily limited to the Columbia Plateaus (Regions 201, 203) and Mexican Highlands (Region 224). Decreasing trends were found in portions of Utah (Regions 180, 211) and the Sierra Nevada (Region 234).

Statistical Significance of Data

1975 to 1976 Population Changes

A significant ($P < 0.05$) increase occurred between 1975 and 1976 in the BDI of the Western Management Unit (Table 1). None of the indices for the other units or their combined hunting States or combined nonhunting States differed significantly ($P < 0.05$) between these years. Although not designed to detect population changes within States, the survey showed significant ($P < 0.05$) increases in North Dakota, California, Idaho and Washington. Significant ($P < 0.05$) decreases did not occur in any State between 1975 and 1976.

A study of physiographic region data within Management Units revealed a significant ($P < 0.05$) increase from 1975 to 1976 in the BDI of the Northern Rocky Mountain Province (Region 190) in the Western Unit (Fig. 1). No other significant increases or decreases occurred throughout the Nation.

The analyses of several factors associated with the call-count survey showed that the survey was run in cooler weather in 1976 than in 1975 in the Eastern

Unit, the combined hunting and combined nonhunting States of this Unit, and in the combined hunting States of the Central Unit. The survey was run in warmer weather in the combined nonhunting States of the Central Unit. It is not known whether the relatively large change in the Eastern Unit and subunits affected the survey. In the Central Unit, the difference is not believed to be of biological significance although the change in temperature is statistically significant. The 1976 survey was conducted earlier in the Central Unit and its subunits and in the Western Unit. No other statistically significant ($P < 0.05$) differences occurred between years for any Unit or subunit in the analysis of the ancillary data.

1966 to 1976 Long-term Population Trends

Linear regression analyses of the 1966-76 data revealed significant ($P < 0.05$) downward trends in BDI's for the Eastern Unit as well as for the combined hunting States of the Unit (Table 3). Although no significant 11-year trend was determined for the Western Unit, the data from 1966 to 1971 were represented by a significant ($P < 0.05$) downward trend, and data from 1971 to 1976 by a significant upward trend.

Analyses of long-term data by State (Table 3) revealed that eight States representing 16% of the Nation's land area had significant ($P < 0.05$) upward population trends between 1966 and 1976. Ten States, totaling 21% of the land area, had significant long-term downward population trends (Table 3, Fig. 10). From 1966 to 1976, 13 of 79 physiographic regions, constituting 13% of the total land area, had significant ($P < 0.05$) upward trends, and 14 regions (16% of the land area) had significant downward trends (Table 4, Fig. 11).

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