CURRENT STATUS AND MORTALITY RATES OF MASSACHUSETTS MOURNING DOVES

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INTRODUCTION

The Mourning Dove (*Zenaida macroura*) has been protected in Massachusetts since 1908. Forbush (1927) considered it a rare or uncommon to common summer resident that had been formerly abundant in southern New England. Its numbers declined in the early part of the 20th century due to market gunning, spring shooting, and habitat destruction, but it began to increase slowly after protection. Griscom and Snyder (1955) reported a marked increase in dove populations since 1920 with the increase becoming especially rapid after 1930.

The purpose of this paper is to report on the current status of the Mourning Dove in Massachusetts and the results of an analysis of dove banding data collected from recent banding programs.

METHODS

Over 34,000 doves have been banded in Massachusetts since 1920. Most of the early efforts were restricted to outer Cape Cod which is not representative of the Commonwealth as a whole. Substantial statewide banding did not begin until the early 1960's, and the bulk of banding occurred under the Accelerated Research Program for Migratory Webless Game Birds commencing in 1968 and under subsequent Federal Aid project W-35-R.

Banding data and recovery data as compiled on computer printouts for all doves banded in Massachusetts since 1920 were received from the U.S. Fish and Wildlife Service Bird Banding Laboratory. These data, as updated with 1976 Division banding data and an extensive literature review, form the base used in this evaluation.

RESULTS AND DISCUSSION

Population Estimates

Doves have been confirmed as breeding in nearly all regions of the state except for a central area (R. Forster, pers. comm.). They are especially abundant in the eastern half of Massachusetts.

The U.S. Fish and Wildlife Service has conducted Mourning Dove "coo counts" in Massachusetts for over two decades. Table 1 lists adjusted figures for doves heard calling per route since 1954. A comparison of five-year averages (5.2 for 1954–1958, 7.8 for 1959–1963, 9.0 for 1964–1968, 4.8 for 1969–1973, and 15.6 for 1974–1978) indicates dove populations are three times higher now than in the mid-1950's. Due to the small number (3) of routes run in recent years, however, the increases are not statistically significant.

Dove population estimates for Massachusetts were obtained from the U.S. Fish and Wildlife Service and were based upon 1977 "coo count"

TABLE 1
Doves heard calling per route in Massachusetts (adjusted).

Year	Number	Year	Number	Year	Number
1954	6.0	1963	5.2	1971	4.7
1955	2.0	1964	6.7	1972	6.3
1956	1.0	1965	7.7	1973	6.3
1957	11.6	1966	11.0	1974	5.0
1958	5.2	1967	14.6	1975	9.9
1959	7.4	1968	5.0	1976	16.8
1960	10.6	1969	1.4	1977	19.0
1961	6.9	1970	5.5	1978	27.2
1962	9.0				

data. Such estimates are only theoretical since the call count survey was not designed to estimate population numbers. The Service came up with a minimum population estimate of 220,847 doves, assuming doves could be heard from 0.6 km away, but some researchers reported doves could not be heard cooing over 0.4 km away. If the data are recalculated using that figure, the population estimate would indicate 494,914 doves. The 1977 calling index (19 doves per route) was the second highest in 25 years. In order to reduce bias that may be due to exceptionally high counts, I recalculated the Fish and Wildlife Service's data using the most recent five-year average. The Service also used a figure of 2.4 young fledged per adult based on a southeastern study. Since the southern states have a longer breeding season than does Massachusetts, this figure is probably too high. Richards (1966) reported 3.3 young fledged per pair in his Connecticut Valley study in Massachusetts, whereas Austin (1951), working on Cape Cod with its milder weather, used a figure of 4.6 young per pair. I averaged Richards' and Austin's data and came up with 3.95 young fledged per pair or 1.97 young per adult. By recalculating Service data, using a coo call rate of 15.6 and a reproduction rate of 1.97 for the 20,348 km^2 of land area in Massachusetts, I derived an estimated premigratory population of 154,000 to 346,000 doves. This estimate does not account for summer mortality. Although expansion factors appear reasonable, they may not be accurate due to insufficient data or unknown biases.

Increasing numbers of doves also appear to be overwintering in Massachusetts. Table 2 presents Audubon Christmas counts for doves for the period 1957–1977. The count includes only those stations with a 21-year history. Whereas part of the 30-fold magnitude increase may be due to increased observer activity, there is no question that wintering populations are increasing.

Austin (1951) reported Cape Cod summer residents began leaving the last of August with the last pronounced wave leaving the first week of October. Tomlinson et al. (1960), in Missouri, reported immature doves left the area within two weeks after banding but that adults were

TABLE 2

Audubon Christmas Counts for Mourning Doves in Massachusetts, 1957–1977 (based on 9 statewide stations).

Year	Total	Year	Total	Year	Total
1957	132	1964	1,350	1971	4,010
1958	236	1965	1,287	1972	3,090
1959	481	1966	1,337	1973	2,894
1960	652	1967	2,248	1974	4,341
1961	917	1968	2,737	1975	5,195
1962	1,073	1969	3,004	1976	3,924
1963	1,251	1970	2,914	1977	3,489

sedentary over the summer. Richards (1966), working in the Connecticut Valley, found 33% of the adult doves he trapped between 1961–1963 had frostbite injuries attributed to overwintering in Massachusetts. Howard (1968) reported a 25% incidence of frostbite injury for eastern Massachusetts areas. Since not all doves that overwinter in Massachusetts sustain frostbite injuries (Richards, 1966), the percent of doves that overwinter can be assumed to be higher than these figures indicate.

Rice and Lovrien (1974) reported that doves banded as locals winter farther north after they become adults. Hennessey and VanCamp (1963) felt that local recruitment of winter flocks comes mainly from young hatched late in the season.

Table 3 presents data on recovery sites for Massachusetts banded doves. The doves are divided into those recovered as adults and those reported as direct immature recoveries. I consider doves found in Massachusetts between 1 November and 15 March to be overwintering. Several southern states have hunting seasons during this period, so hunting season recoveries should create a bias in favor of areas south of Massachusetts. The percent of doves that winter in Massachusetts as reflected in band recovery rates should be considered minimal. According to these data, 48% of the adult and 22% of the immature doves overwinter in Massachusetts. Some doves begin migrating south during September and October (or earlier) as evidenced by the migration period data in Table 3. Apparently, most juvenile doves tend to migrate south their first year, then, after returning to Massachusetts to nest, a majority of adults overwinter in southern New England.

If 22% of Massachusetts' juvenile doves overwinter and 48% of the adults do, the overwintering population would range from 47,000 to 106,000 birds, depending on which of the summer population figures is used.

Wintering populations may be heavily associated with artificial feeding in Massachusetts. A 1974 bird feeding survey, conducted by the Massachusetts Audubon Society, indicated that nearly half of the Commonwealth's 1.8 million households fed something to the birds and approximately 600,000 households bought bird seed. They also estimated that

TABLE 3

Recoveries of Massachusetts Mourning Doves during fall migration and winter periods (1968–1975).

	Migration Period 1 Sept.–31 Oct.			Winter Period 1 Nov.–15 Mar.			Combined Periods 1 Sept.–15 Mar.		
	Ad.	Im.	Both	Ad.	Im.	Both	Ad.	Im.	Both
Massachusetts	26	16	42	35	18	53	61	34	95
R.I. and Conn.	7	18	25	4	8	12	11	26	37
Northern Areas[1]	2	1	3	2	0	2	4	1	5
Southern Areas[2]	37	32	69	32	55	87	69	87	156
Totals	72	67	139	73	81	154	145	148	293
Percentage of Massachusetts recovered doves	36	24	30	48	22	34	42	23	32

[1] New York and areas north of Mass.
[2] Pennsylvania and states south of Conn. and R.I.

nearly 18,000 tons of seed were fed each year. Observations by biologists of both the Massachusetts Division of Fisheries and Wildlife and the Massachusetts Audubon Society indicate that a large number of doves are commonly seen at bird feeders during winter months.

Mortality Data

Band recoveries for Mourning Doves are low. Newson et al. (1957) reported the nationwide band recovery rate for doves to be only 3.7%. Hayne (1975) reported the recovery rates for doves in the Eastern Management Unit to be 4.9% for immatures and 3.4% for adults. The recovery rates for nonhunting states in the Eastern Management Unit was only 1.5 and 0.8%, respectively.

Between 1965 and 1975, 28,122 doves were banded in Massachusetts; 456 (1.6%) had been recovered as of 1 July 1977. The recovery rate for 13,828 bandings during 1965–1971 (all birds are presumed dead) was 2.4%. Half the bands reported (51%) came from within the state; 33% of the direct recoveries and 67% of the indirect recoveries were from Massachusetts. Newson et al. (1957) reported that among hunting states, 75% of the recoveries occur within the state. In Massachusetts, 26% of doves banded as immatures were recovered before the following breeding season (1 April), whereas 64% of the doves recovered as adults were in-state birds.

Hunting is not a major mortality factor for Massachusetts banded doves. Only 185 were reported shot in other states during 1965–1975. Since not all banded doves shot are reported, I used Hayne and Geissler's (1977) band reporting rates for eastern groups of states (40.5%) to determine that 455 doves were actually harvested. Nelson (1957) reported that the crippling loss for doves during Georgia's Sep-

TABLE 4
Causes of Mourning Dove mortality in Massachusetts based on band recoveries, 1966–1975.

How obtained	Number	Percent
Struck by vehicle or found along highway	31	27.2
Caught by cat	25	21.9
Striking stationary object	13	11.4
Caught by hand	11	9.7
Shot (illegally)	11	9.7
Disease	6	5.3
Killed by raptor	3	2.6
Killed by dog	3	2.6
Dove trapping mortality	3	2.6
Entangled	2	1.7
Found dead in enclosure	2	1.7
Killed by weather	2	1.7
Killed by miscellaneous animals	1	0.9
Caught in non-dove trap	1	0.9
	114	

tember season was 30% and that it increased to 36% during the December–January season. Hoffman et al. (1974) reported a crippling loss of 27.4% for September hunting in Pennsylvania. Reeves (1969) assumed a nationwide crippling loss of 25%. Assuming a 30% crippling loss for Massachusetts doves, an additional 137 doves were killed by hunters for a total of 592 out of 28,122, or 2.1%.

Since half the band recoveries for Massachusetts doves were from within the state, despite the fact Massachusetts does not have a dove hunting season, the causes of nonhunting mortality should be examined. In some instances, the bird is simply reported as "found dead." Table 4 lists known causes of death in order of importance. The three most important causes (cars, cats, and structures) are indicative of people coming into contact with banded birds. Birds killed by diseases, wild predators, and weather are much less likely to come to the attention of interested individuals. In an Ohio study, Hennessey and VanCamp (1963) reported the Cooper's Hawk (*Accipiter cooperii*) to be the main winter predator of Mourning Doves. Harris et al. (1963) reported high levels of nest and egg loss during mid-May to mid-July due to severe weather, and Fichter (1959) reported a 61% mortality before fledging in Idaho.

Since there was no evidence to the contrary, Austin (1951) assumed that all doves handled between 25 March and 31 October were still alive on 1 November of the same year. The data presented in Figure 1, however, indicate that Mourning Dove mortality is a year-round occurrence. Band recoveries from out-of-state occurred primarily (91%) during the September through January hunting period. Hunting accounted for 83% of out-of-state recoveries. This figure agrees closely with

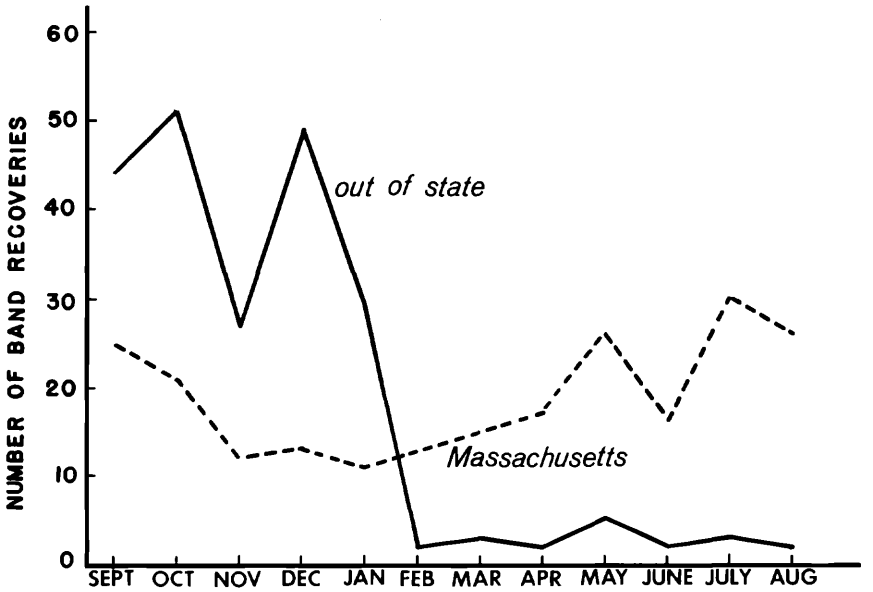

FIGURE 1. Month of recovery for Mourning Doves banded in Massachusetts, 1968–1977.

findings of Newson et al. (1957) that 84% of dove band recoveries are by hunters.

The mortality rate in Massachusetts is spread unevenly throughout the year. Only 36% of the band recoveries occurred during the September–January period. However, 51% of the recoveries occurred during the April–August breeding period. The low recovery rate in Massachusetts for the November–February period reflects, in part, reduced numbers of doves that overwinter whereas the low out-of-state recovery rate for spring and summer indicates most doves return to Massachusetts during this period.

SUMMARY

The Mourning Dove has greatly increased in numbers in Massachusetts during recent years. Current summer populations probably exceed 150,000 birds whereas winter residents number nearly 50,000. Hunting mortality is minimal, with slightly more than 2% of Massachusetts doves succumbing to hunters in southern states. Mortality is a year-round occurrence with 51% of Massachusetts band recoveries occurring during the April–August breeding period.

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