



U.S. Fish & Wildlife Service

# Mourning Dove

*Population Status, 2021*



# MOURNING DOVE POPULATION STATUS, 2021

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**Abstract:** This report summarizes information collected annually in the U.S. on survival, recruitment, abundance and harvest of mourning doves. Absolute abundance estimates based on band recovery and harvest data are reported, and harvest and hunter activity are estimated from the Migratory Bird Harvest Information Program (HIP). Estimates of absolute abundance are available since 2003 and indicate that there were approximately 194 million doves in the U.S. as of 1 September 2020. Abundance (in millions of birds) varied among management units in 2020: EMU 52.9 (SE=2.7); CMU 107.5 (SE=7.0); and WMU 33.7 (SE=2.8). HIP estimates for mourning dove total harvest, active hunters, and total days afield in the U.S. in 2020 were 11,727,200 (SE= 378,100) birds, 748,900 hunters, and 2,195,600 (SE=86,800) days afield. In 2020 harvest and hunter activity at the management unit level were: EMU, 4,648,300 (SE=196,225) birds, 293,800 hunters, and 792,700 (SE=31,500) days afield; CMU, 5,885,700 (SE=318,100) birds, 368,200 hunters, and 1,171,000 (SE=79,800) days afield; and WMU, 1,193,100 (SE=57,100) birds, 86,800 hunters, and 231,800 (SE=13,200) days afield.

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The mourning dove (*Zenaida macroura*) is one of the most abundant bird species in North America, and is familiar to millions of people. Authority and responsibility for management of this species in the U.S. is vested in the Secretary of the Interior. This responsibility is conferred by the Migratory Bird Treaty Act of 1918 which, as amended, implements migratory bird treaties between the U.S. and other countries. Mourning doves are included in the treaties with Great Britain (for Canada) and Mexico (U.S. Department of the Interior 2013). These treaties recognize sport hunting as a legitimate use of a renewable migratory bird resource.

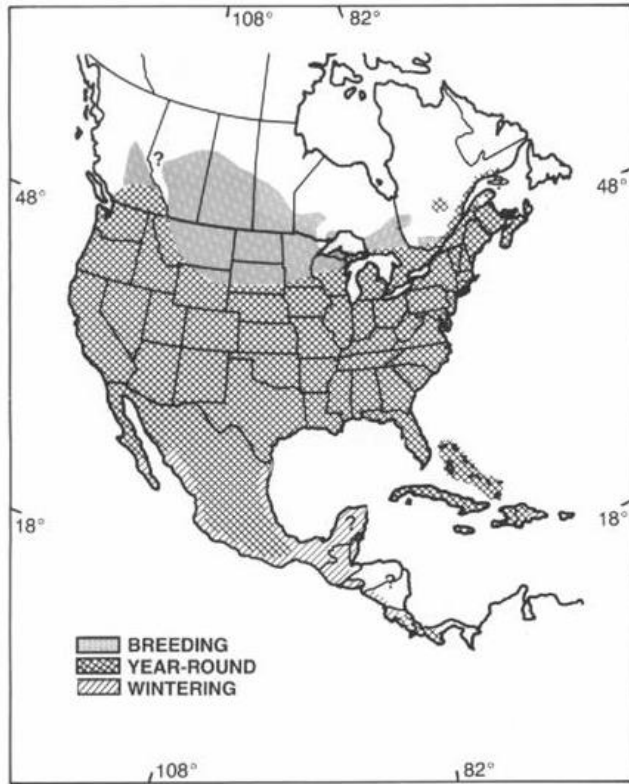
Maintenance of dove populations in a healthy, productive state is a primary management goal. Management activities include population assessment, harvest regulation, and habitat management. Each year, tens of thousands of doves are banded and thousands of wings from harvested doves are analyzed to estimate annual survival, harvest rates, recruitment, and abundance. The resulting information is used by wildlife managers in setting annual hunting regulations (USFWS 2017). Past federal frameworks for hunting mourning doves in the U.S. are in Appendix A.

## DISTRIBUTION

Mourning doves breed from southern Canada throughout the U.S. into Mexico, Bermuda, the Bahamas and Greater Antilles, and in scattered locations in Central America (Peterjohn et al. 1994, Fig. 1). Although mourning doves winter throughout much of their breeding range, the majority winter in the southern U.S., Mexico, and south through Central America to western Panama (Aldrich 1993, Mirarchi and Baskett 1994).

## POPULATION MONITORING

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



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

divided into two groups of states for some analyses: states permitting dove hunting were combined into one group (hunt) and those prohibiting dove hunting into another (non-hunt). Additionally, some states were grouped to increase sample sizes. Maryland and Delaware were combined; Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, and Rhode Island, and Vermont were combined to form a North Atlantic group. Even though Rhode Island is a hunt state, due to its small size and geographic location its data was included in this non-hunt group of states for analysis.

## Breeding Bird Survey

The North American Breeding Bird Survey (BBS; Robbins et al. 1986) was not completed in 2020 due to COVID-19 restriction. BBS results for mourning doves from previous years can be found in the 2020 status report (Seamans 2020).

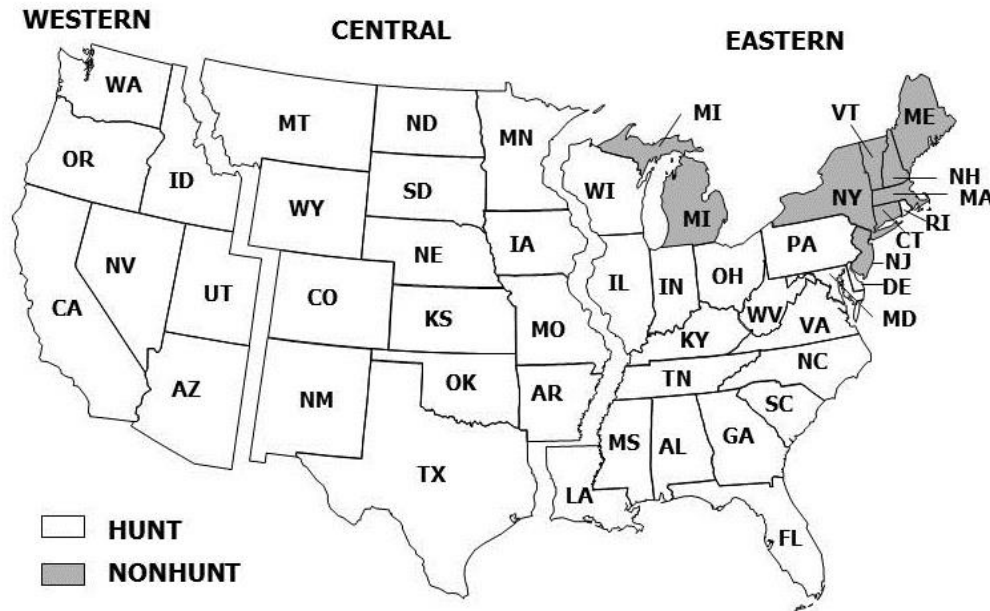
## Banding Program

A national banding program was initiated in 2003 to improve our understanding of mourning dove population biology and to help estimate the effect of harvest on mourning dove populations. Doves are banded in July and August in most of the lower 48 states. Band recoveries occur almost exclusively during the U.S. hunting seasons which occur between 1 September and 31 January (Appendix A).

Banding goals for each state (specified by Bird Conservation Region [BCR]) are based on a power analysis that estimated sample sizes necessary to achieve a desired precision in estimates of population growth rate at the management unit level (Otis 2009). A weighting factor based on the median BBS index during 1966–2008 was used to determine banding goals for each state within the management units. Within states, the amount of area in each BCR and associated median BBS indices were used to determine sample size allocation. Placement of banding stations is left to the judgment of each state's dove banding coordinator.

## Harvest Survey

The Harvest Information Program (HIP) was cooperatively developed by the U.S. Fish and Wildlife Service (USFWS) and state wildlife agencies to provide reliable annual estimates of hunter activity and harvest for all migratory game birds (Elden et al. 2002). The HIP sampling frame consists of all migratory game bird hunters. Under this program, state wildlife agencies collect the name, address, and additional information from each migratory bird hunter in their state, and send that information to the USFWS. The USFWS then selects stratified random samples of those hunters and asks them to voluntarily provide detailed information about their hunting activity. For example, hunters selected for the mourning dove harvest survey are asked to complete a daily diary about their mourning dove hunting and harvest during the current year's hunting season. Their responses are then used to develop nationwide mourning dove harvest estimates. HIP survey estimates of mourning dove harvest have been available since 1999. Although estimates from 1999–2002 have been finalized, the estimates from 2003–20 should be considered preliminary as refinements are still being made in the sampling frame and estimation techniques.



**Figure 2.** Mourning dove management units with 2019–21 hunt and non-hunt states.

## Parts Collection Survey

Age of individual doves can be determined by examination of their wings (Ruos and Tomlinson 1967, Braun 2014). Mourning dove wings are obtained during the hunting season and provide estimates of recruitment (number of young per adult in the population), which can be used to inform harvest management. From 2005–2009 some states collected wings for use in estimating age ratios in the fall populations. In 2007, the USFWS initiated the national Mourning Dove Parts Collection Survey, which expanded the geographical scope of the earlier state-based surveys.

The survey design for mourning dove wing collection follows that of waterfowl (Raftovich et al. 2020). The sampling frame is defined by hunters who identify themselves as dove hunters when purchasing a state hunting license and who were active dove hunters the previous year.

An in-person wingbee could not be held in 2020 due to COVID-19 restrictions. Wings were mailed to a subset of state and federal biologists that have annually attended the wingbee prior to 2020. Wings of harvested mourning doves are classified as juveniles (hatch-year birds [HY]) or adults (after-hatch-year birds [AHY]). A significant portion of wings are classified as unknown age where molt has progressed to a late stage. These

harvest age ratios (HY/AHY) are used to estimate recruitment (population age ratio) after accounting for uncertainty related to unknown-age wings and age-specific vulnerability to harvest (Miller and Otis 2010).

## Call-count Survey

The Mourning Dove Call Count Survey (CCS) was conducted from 1966 to 2013. The CCS was developed to provide an annual index of abundance specifically for mourning doves (Dolton 1993). The CCS was discontinued because the harvest strategy adopted for mourning doves in 2013 does not make use of data from the CCS, but rather relies on estimates of absolute abundance. However, state and federal biologists conducted a national study from 2015 to 2017 using a subset of the historical CCS routes to determine if point count surveys that use distance sampling methods (Buckland et al. 2001) can produce absolute abundance estimates. Those interested in historic CCS information can access the 2013 status report for mourning doves (available online at: <https://www.fws.gov/migratorybirds/pdf/surveys-and-data/Population-status/MourningDove/MourningDovePopulationStatus13.pdf>).

## METHODS

### Estimating Survival, Harvest, Recruitment Rates, and Absolute Abundance

Band recovery models were used to estimate annual survival. A Seber parameterization (Seber 1970) with both direct and indirect dead recoveries was used to estimate survival rates. To estimate harvest rates only direct recoveries (bands recovered during the hunting season immediately following banding) were used and data were adjusted for band-reporting rate (Sanders and Otis 2012) prior to analysis.

Age-specific harvest and survival rates were estimated by state and management unit. Many states lacked sufficient sample sizes of banded birds to estimate annual survival rates; therefore, data were pooled over years to obtain mean annual estimates. Harvest rate for a year in a given state was only estimated when the number of banded birds in an age-class was  $>75$ . Annual harvest rates for management units were based on state-weighted harvest rate estimates. Each state's weight was the product of its habitat area (area within state presumed to be dove habitat) and average dove abundance estimated by the CCS index of doves heard during 2009–2013 (the CCS was discontinued after 2013). It should be possible to update the CCS portion of the weighting factor once analysis of the 2015–2017 CCS-distance sampling study is complete (*see* “Call-Count Survey” above).

For estimating survival rates, a model was formulated that allowed recovery rate to vary by state with an additive age effect (HY vs. AHY), and allowed survival to vary by state and age. This model was used for inference regarding age and state-specific survival rates.

The approach of Miller and Otis (2010) was used to estimate annual recruitment rates. Samples were limited to wings collected during the first two weeks of September to minimize the proportion of unknown age wings and maximize the proportion of local birds in samples. Unknown age wings were assigned to an age-class based on previously estimated probabilities that adults will be in late stages of molt (Miller and Otis 2010). Band recovery data was used to adjust age-ratio estimates for differential vulnerability to harvest.

A simple Lincoln-type estimator was used to estimate abundance from annual harvest and harvest rates (Otis 2006). Abundance for each year was estimated at the management unit level separately for juvenile and adult doves by dividing age-specific total harvest (from the USFWS Harvest Information Program [Table 2] and Parts Collection Survey [Table 5]) by age-specific harvest rates estimated from direct (first hunting season after banding) recoveries of banded birds.

## RESULTS

### Harvest Survey

Preliminary results of mourning dove harvest and hunter activity from HIP for the 2019–20 and 2020–21 hunting seasons are presented in Tables 1 and 2, respectively. Current (2020–21) HIP estimates indicate that in the U.S. about 12 million mourning doves were harvested by about 750 thousand hunters who spent about 2.2 million days afield. The EMU and CMU total harvest represented 40% and 50%, respectively, of the national harvest of doves while the WMU represented 10% (Table 2). In all management units mourning dove harvest and hunter activity (days afield) increased in 2020–21 from the previous year (Fig. 3; Tables 1 and 2).

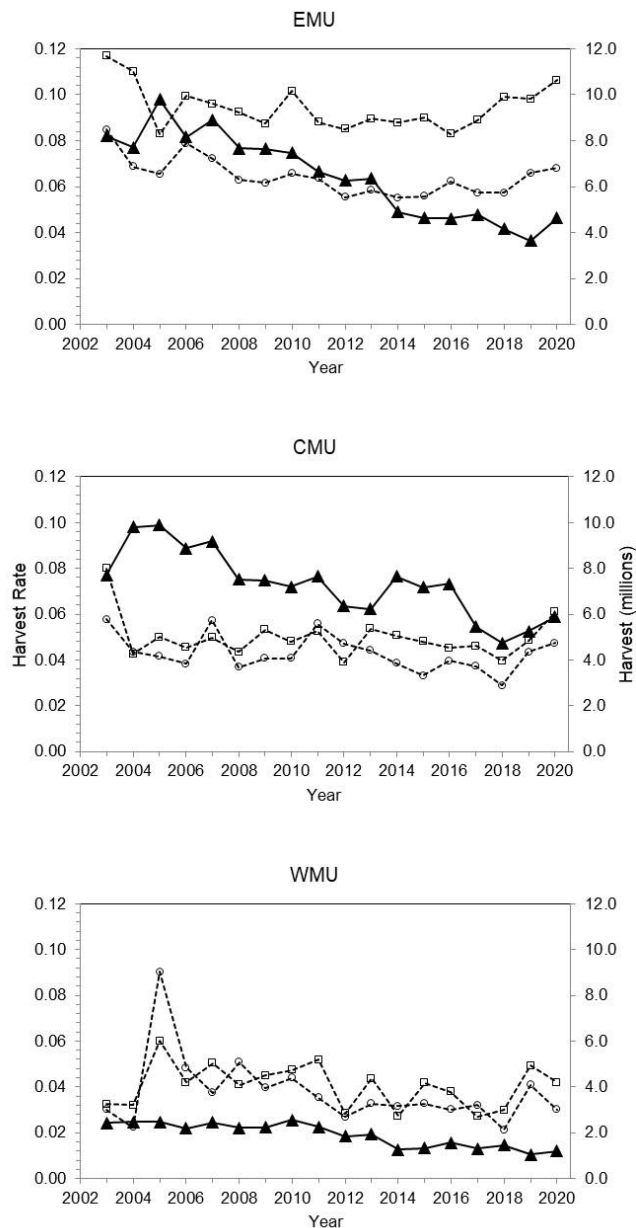
Additional information about HIP, survey methodology, and results can be found in annual reports located at: <https://www.fws.gov/birds/surveys-and-data/reports-and-publications/hunting-activity-and-harvest.php>.

### Survival and Harvest Rates

During July and August over the past 18 years 336,736 known age doves were banded in the EMU, 291,937 in the CMU, and 138,745 in the WMU (Table 3). There have been 19,759, 14,253, and 4,991 recoveries of known-age banded birds in the EMU, CMU, and WMU, respectively.

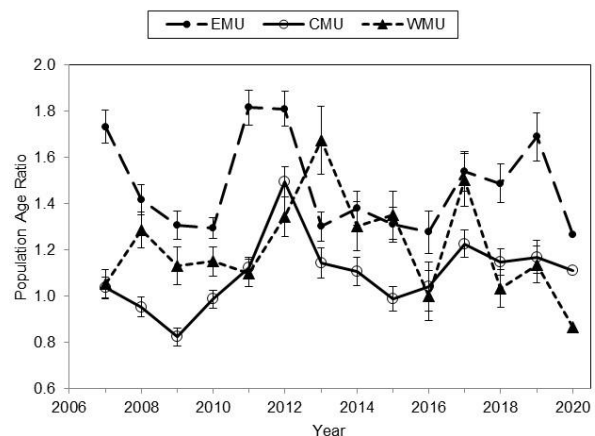
Mean annual HY survival was similar between the CMU and EMU but higher in the WMU (Table 4). AHY survival was higher in CMU compared to the EMU, and survival in the WMU was intermediate.

Mean annual harvest rate was higher for HY individuals compared to AHY individuals in all the management



**Figure 3.** Estimated mourning dove harvest (▲) and harvest rates (hatch-year=□ and after-hatch-year=○) by dove management unit, 2003–2020.

units (Fig. 3, Table 4). This relationship was more pronounced in the EMU (HY harvest rate 50% greater than AHY harvest rate) than the CMU (29% greater) and WMU (17% greater). Mean annual harvest rates by age-class (HY and AHY) were greater in the EMU than in the other management units (Table 4). Within the EMU, the harvest rate of birds banded in the North Atlantic states (predominantly non-hunt states) was much lower than that of most hunt states (Table 4).



**Figure 4.** Estimated mourning dove fall population age ratios for each management unit, 2007–2020. Error bars represent 95% confidence intervals.

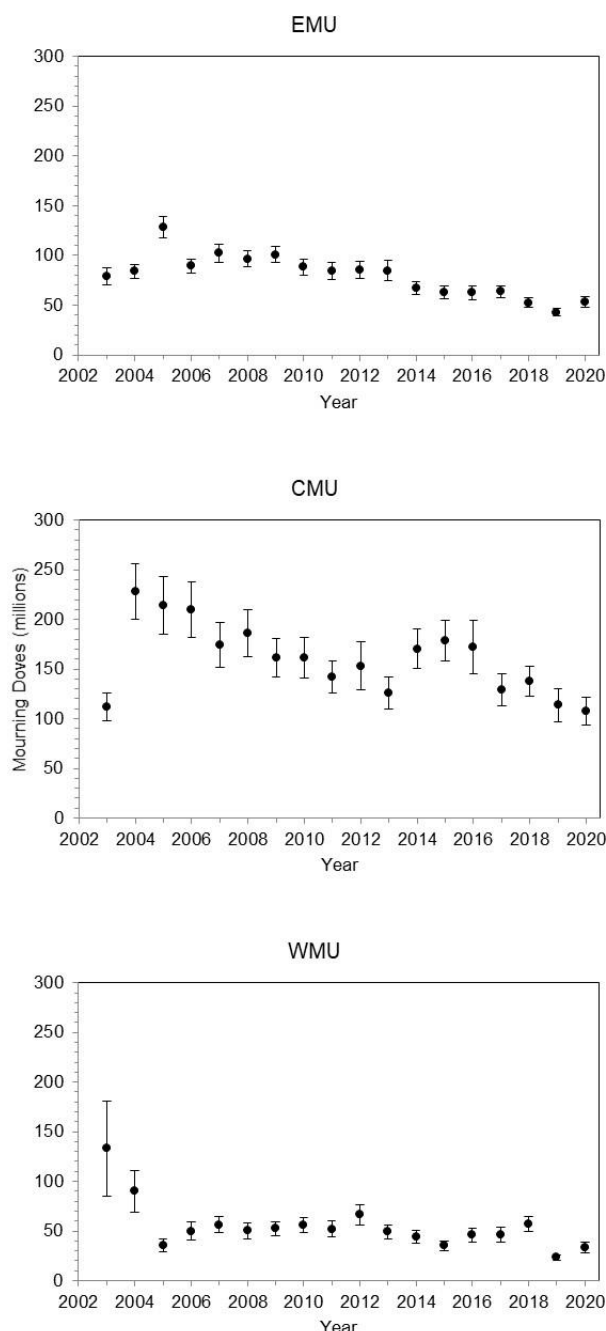
## Recruitment

A total of 227,693 wings were obtained from 2007 to 2020 from birds harvested prior to September 15<sup>th</sup>. Overall recruitment rates were highest in the east and northwest and lowest in the Great Plains states and the southwest (Table 5). At the management unit scale, the EMU typically had higher average annual recruitment compared to the CMU and WMU (Fig. 4). In 2020, age ratio in the EMU was lower-than-average, in the CMU near the long-term average, and in the WMU below the long-term average (Table 5).

Mean population age ratios for all states and years are provided in Table 5. There was great variation in the sample sizes for individual states. However, sample sizes were sufficient to calculate precise estimates of recruitment for all states. Age ratios for Florida are not estimated because hunting seasons there do not start until late September each year. At this late date most wings cannot be aged due to molt progression, precluding accurate estimates of age ratio.

## Absolute Abundance

Estimates of absolute abundance are available since 2003 (Fig. 5, Table 6). Estimates during the first 1 or 2 years may be biased in association with startup of the national mourning dove banding program when coordinators were gaining experience and some states were not yet participants. In addition, age ratio



**Figure 5.** Estimates and 95% confidence intervals of mourning dove absolute abundance by management unit and year, 2003–2020. Estimates based on band recovery and harvest data.

information was not available for the first 4 years (the annual averages from later years were used for estimating abundance during this period). The most recent estimates indicate that there were 194 million mourning doves in the U.S. immediately prior to the

2020–21 hunting season. Abundance estimates were higher in EMU and WMU in 2020 compared to 2019, and were lower in the CMU.

## ACKNOWLEDGMENTS

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**Table 1.** Preliminary estimates and their standard errors (SE) of mourning dove harvest and hunter activity during the 2019–20 hunting season<sup>a</sup>. Data rounded to nearest 100.

Management Unit	Harvest		Active hunters		Hunter days afield		Harvest per hunter <sup>b</sup>	
State	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Eastern	3,656,800	136,700	242,200 <sup>a</sup>	† <sup>c</sup>	643,500	42,800	† <sup>c</sup>	† <sup>c</sup>
AL	512,800	59,000	28,600	2,000	61,700	5,900	17.9	2.4
DE	20,700	3,700	1,200	200	4,000	600	17.3	3.9
FL	113,000	24,900	7,400	1,600	24,200	4,800	15.2	4.7
GA	713,600	58,600	33,400	2,200	93,300	7,100	21.3	2.2
IL	148,800	21,700	11,300	1,300	25,900	3,400	13.2	2.4
IN	112,600	16,200	8,600	1,200	21,100	2,800	13.1	2.6
KY	223,300	14,500	11,200	1,000	32,800	3,100	19.9	2.2
LA	63,800	17,200	6,100	1,400	11,200	2,500	10.5	3.8
MD	66,200	9,100	6,200	900	18,400	5,200	10.7	2.1
MS	193,400	20,900	12,700	1,200	28,400	3,500	15.2	2.2
NC	336,600	35,100	33,300	3,700	61,000	6,300	10.1	1.5
OH	93,000	17,100	10,200	1,300	25,000	3,400	9.1	2.0
PA	98,500	18,100	12,200	1,800	75,400	37,600	8.1	1.9
RI	300	100	100	<100	300	100	2.8	1.3
SC	493,200	80,500	22,400	2,500	60,900	8,000	22.0	4.4
TN	228,700	26,700	17,100	2,000	46,300	9,400	13.4	2.2
VA	186,000	15,400	13,600	1,100	33,600	3,000	13.7	1.6
WI	41,400	9,800	5,300	1,000	17,200	4,500	7.8	2.4
WV	10,900	1,700	1,100	100	2,700	400	9.5	1.9
Central	5,266,400	335,500	337,700 <sup>a</sup>	† <sup>c</sup>	986,800	50,800	† <sup>c</sup>	† <sup>c</sup>
AR	328,100	74,800	14,200	2,200	37,500	7,100	23.0	6.3
CO	106,300	9,500	10,700	800	22,800	2,000	10.0	1.2
IA	29,900	4,700	3,600	400	11,000	1,800	8.2	1.5
KS	389,800	64,200	22,300	1,900	64,800	8,500	17.5	3.3
MN	40,200	11,800	3,900	1,400	9,400	2,300	10.4	4.8
MO	268,000	28,400	21,100	1,500	47,100	3,800	12.7	1.6
MT	16,600	4,600	1,600	400	3,600	800	10.1	3.6
NE	137,700	14,100	10,700	1,000	24,500	2,500	12.8	1.8
NM	125,400	22,000	8,300	700	28,800	4,100	15.0	2.9
ND	75,000	19,500	4,100	500	11,900	2,000	18.5	5.4
OK	247,900	26,700	14,800	1,200	38,000	4,200	16.7	2.2
SD	103,300	19,100	4,700	600	15,500	2,700	22.0	4.9
TX	3,385,000	315,600	216,300	13,100	669,000	48,800	15.7	1.7
WY	13,200	2,200	1,300	200	2,800	500	10.5	2.4
Western	1,060,200	45,800	83,000 <sup>a</sup>	† <sup>c</sup>	207,200	8,700	† <sup>c</sup>	† <sup>c</sup>
AZ	235,400	15,300	13,100	500	36,500	2,000	17.9	1.3
CA	641,600	37,400	44,500	2,200	112,000	6,800	14.4	1.1
ID	48,600	15,700	6,700	1,500	13,400	3,300	7.2	2.8
NV	25,300	8,400	3,000	500	6,200	1,200	8.5	3.1
OR	24,200	7,800	3,300	600	8,400	1,800	7.3	2.7
UT	38,700	6,300	7,600	800	17,600	2,500	5.1	1.0
WA	46,400	7,000	4,800	500	13,100	2,100	9.7	1.8
United States	9,983,500	365,100	662,900 <sup>a</sup>	† <sup>c</sup>	1,837,400	67,000	† <sup>c</sup>	† <sup>c</sup>

<sup>a</sup>Hunter number estimates at the management unit and national levels may be biased high, because the HIP sample frames are state specific; therefore hunters are counted more than once if they hunt in >1 state. Variance is inestimable.

<sup>b</sup>Seasonal harvest per hunter.

<sup>c</sup>No estimate available.

**Table 2.** Preliminary estimates and their standard errors (SE) of mourning dove harvest and hunter activity during the 2020–21 hunting season<sup>a</sup>. Data rounded to nearest 100.

Management Unit	Harvest		Active hunters		Hunter days afield		Harvest per hunter <sup>b</sup>	
State	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Eastern	4,648,300	196,200	293,800 <sup>a</sup>	† <sup>c</sup>	792,700	31,500	† <sup>c</sup>	† <sup>c</sup>
AL	617,800	88,100	36,200	2,200	97,700	11,700	17.1	2.7
DE	8,700	2,300	1,700	300	4,800	1,600	5.2	1.7
FL	149,300	57,000	8,700	1,900	31,900	10,400	17.1	7.5
GA	856,500	79,600	39,300	2,800	112,400	11,100	21.8	2.6
IL	171,500	33,500	14,200	2,300	30,900	4,800	12.0	3.0
IN	177,300	30,800	11,400	1,400	30,700	4,600	15.6	3.3
KY	282,200	32,200	13,300	1,700	37,900	4,300	21.2	3.7
LA	183,700	33,000	10,000	1,700	23,500	3,700	18.4	4.5
MD	77,800	10,800	5,700	700	15,900	3,300	13.6	2.5
MS	214,600	24,000	15,300	1,400	28,400	2,700	14.0	2.0
NC	573,800	74,400	42,400	4,600	106,400	14,200	13.5	2.3
OH	132,200	23,400	10,500	1,400	41,200	7,400	12.6	2.8
PA	110,400	18,700	14,000	2,200	44,800	8,200	7.9	1.8
RI	400	100	100	<100	400	100	3.0	1.4
SC	353,200	53,700	21,500	2,800	48,400	6,400	16.5	3.3
TN	467,200	79,500	26,000	2,900	69,400	10,100	17.9	3.6
VA	213,500	22,900	16,200	1,500	42,500	5,800	13.2	1.8
WI	50,400	10,600	6,300	1,300	22,900	5,000	8.0	2.3
WV	7,900	1,300	1,000	100	2,600	500	8.0	1.7
Central	5,885,700	318,100	368,200 <sup>a</sup>	† <sup>c</sup>	1,171,000	79,800	† <sup>c</sup>	† <sup>c</sup>
AR	320,300	44,600	20,000	2,300	47,600	7,300	16.1	2.9
CO	124,600	11,800	12,700	1,000	27,200	2,500	9.8	1.2
IA	104,600	9,000	9,700	700	25,000	2,400	10.8	1.2
KS	366,000	60,100	22,800	2,500	62,800	9,000	16.0	3.2
MN	63,100	28,400	7,000	2,200	23,800	7,700	9.0	5.0
MO	318,400	39,900	24,300	1,700	63,600	6,900	13.1	1.9
MT	32,900	13,100	2,200	500	6,600	1,900	14.9	6.8
NE	159,900	15,900	12,400	1,200	33,600	4,300	12.9	1.8
NM	147,400	16,600	10,600	700	37,000	3,400	13.9	1.8
ND	75,400	11,400	4,500	600	13,900	2,800	16.8	3.3
OK	339,600	39,300	19,000	1,800	58,200	8,800	17.9	2.7
SD	92,800	14,800	6,000	700	14,500	1,600	15.5	3.1
TX	3,729,300	300,600	216,100	14,000	754,800	77,400	17.3	1.8
WY	11,300	2,300	1,000	200	2,300	500	10.8	3.1
Western	1,170,100	56,400	83,600 <sup>a</sup>	† <sup>c</sup>	226,100	13,100	† <sup>c</sup>	† <sup>c</sup>
AZ	355,900	19,600	17,400	600	54,100	2,600	20.4	1.3
CA	684,500	51,600	47,800	2,400	117,900	7,700	14.3	1.3
ID	32,700	7,500	800	100	1,900	500	10.0	3.2
NV	7,600	2,100	4,000	900	7,700	1,900	7.6	2.9
OR	19,500	4,000	3,100	600	17,200	9,500	6.2	1.7
UT	26,400	4,100	6,300	800	13,300	2,200	4.2	0.9
WA	43,500	6,400	4,400	500	11,700	1,600	10.0	1.8
United States	11,704,100	378,000	745,600 <sup>a</sup>	† <sup>c</sup>	2,189,800	86,700	† <sup>c</sup>	† <sup>c</sup>

<sup>a</sup>Hunter number estimates at the management unit and national levels may be biased high, because the HIP sample frames are state specific; therefore hunters are counted more than once if they hunt in >1 state. Variance is inestimable.

<sup>b</sup>Seasonal harvest per hunter.

<sup>c</sup>No estimate available.

**Table 3.** Number of mourning doves banded in each management unit, state, and year, 2003–2020. Only known-age birds banded in July or August are included in the table and used in analysis of survival and harvest rates.

Mgmt Unit State	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Eastern	15,652	17,454	20,142	20,862	21,717	19,461	21,309	20,475	18,946	19,525	19,411
AL	1,130	1,112	991	961	889	117	1,147	1,026	942	1,010	1,097
DE	0	0	0	0	0	68	111	133	103	205	107
FL	830	960	916	858	773	1,027	799	865	736	968	805
GA	1,424	1,161	1,396	1,136	1,234	1,332	1,450	1,670	1,244	1,498	1,258
IL	6	6	47	1,163	1,267	1,378	1,877	1,833	2,034	1,501	1,276
IN	6	1,175	1,211	1,253	1,261	963	1,008	1,312	1,162	1,418	1,136
KY	1,444	1,566	1,454	1,637	1,608	1,867	2,391	2,232	1,786	1,299	1,553
LA	1,205	655	2,412	2,581	3,516	2,347	1,955	1,826	1,738	1,362	1,729
MD	472	482	719	571	708	322	334	312	377	346	366
MI	39	26	0	2	6	2	4	0	2	10	0
MS	1,071	994	1,008	656	690	822	928	448	462	605	666
North Atl. <sup>a</sup>	20	4	19	34	12	12	460	1,176	1,286	967	974
NC	1,283	1,539	1,662	1,299	1,307	1,736	1,685	1,198	795	1,847	1,734
OH	1,984	2,712	2,020	1,976	1,993	1,958	2,007	955	1,264	1,393	1,300
PA	1,564	1,590	1,658	1,838	1,748	942	903	899	827	899	1,007
RI	0	2	0	0	0	0	14	22	0	0	13
SC	1,041	863	1,484	1,461	1,761	1,720	1,875	1,953	1,911	1,795	1,902
TN	938	1,277	1,154	1,275	866	1,199	653	854	635	651	785
VA	474	546	804	585	642	603	599	554	496	522	420
WI	7	18	561	973	836	725	761	838	807	926	895
WV	714	768	626	603	600	321	348	369	339	303	388
Central	10,491	12,562	10,960	11,355	10,499	16,230	19,595	17,380	18,710	18,219	18,868
AR	782	975	1,085	914	822	711	514	0	424	222	297
CO	7	12	11	20	467	753	670	953	984	940	1,254
IA	1,940	2,191	2,458	1,099	987	1,694	1,238	1,078	2,216	2,089	1,649
KS	1,230	1,426	1,412	1,457	1,099	2,377	3,388	2,445	3,211	3,385	3,739
MN	0	4	0	0	363	529	700	1,164	853	1,026	1,390
MO	1,983	2,063	1,739	2,219	1,729	2,512	2,861	2,903	2,296	2,168	2,453
MT	0	0	0	0	0	0	0	322	270	296	223
NE	926	1,237	721	753	799	1,057	1,014	997	1,316	1,454	1,345
NM	3	11	14	4	0	463	1,059	625	114	717	829
ND	745	1,293	1,072	976	703	782	1,135	1,666	1,741	1,433	1,344
OK	391	447	528	715	826	1,513	2,746	1,520	1,661	1,488	1,182
SD	1,506	1,303	851	1,768	1,456	1,713	1,693	1,771	1,356	1,430	1,370
TX	978	1,600	1,069	1,430	1,237	2,078	2,575	1,936	2,268	1,502	1,702
WY	0	0	0	0	11	48	2	0	0	69	91
Western	3,261	3,658	4,494	4,559	6,495	6,253	9,059	9,348	7,552	8,634	8,961
AZ	1,653	1,574	1,582	2,436	2,562	2,544	3,831	3,599	3,818	3,362	3,718
CA	252	157	819	1,160	1,870	1,706	2,693	3,468	1,422	2,458	2,269
ID	440	854	837	730	615	594	466	453	355	677	511
NV	0	0	0	0	0	120	431	488	642	729	200
OR	0	0	0	0	0	173	245	219	243	319	734
UT	0	0	0	233	722	398	685	553	323	319	770
WA	916	1,073	1,256	0	726	718	708	568	749	770	759
United States	29,404	33,674	35,596	36,776	38,711	41,944	49,963	47,203	45,208	46,378	47,240

<sup>a</sup>Combined total for North Atlantic non-hunt states: CT, NH, ME, MA, NJ, NY, and VT.

**Table 3** (continued).

Mgmt Unit State	2014	2015	2016	2017	2018	2019	2020
Eastern	17,993	18,448	16,772	16,069	16,876	16,221	17,500
AL	1,149	987	1,133	942	1,010	1,323	1,347
DE	202	38	94	92	30	169	109
FL	906	772	759	642	716	689	759
GA	954	1,336	1,152	1,132	1,466	1,650	1,810
IL	1,988	2,048	1,810	2,211	2,039	1,538	2,338
IN	1,237	977	653	1,171	982	689	764
KY	1,430	1,759	1,324	1,516	1,321	1,100	1,158
LA	1,066	1,769	1,596	1,232	1,759	1,346	1,761
MD	279	306	221	283	361	348	336
MI	0	0	0	0	0	0	0
MS	791	675	448	666	546	564	591
North Atl. <sup>a</sup>	141	118	159	191	10	3	6
NC	1,326	1,163	1,199	1,004	1,023	1,367	1,421
OH	1,336	1,312	1,316	1,314	1,072	1,300	921
PA	993	795	737	824	808	784	812
RI	0	55	0	0	0	15	29
SC	1,831	1,990	1,918	1,566	1,484	967	1,115
TN	677	611	540	609	530	730	769
VA	525	580	442	492	555	540	446
WI	789	800	887	746	798	873	773
WV	373	357	384	378	366	228	235
Central	21,545	19,516	19,982	18,357	15,417	16,379	15,552
AR	342	300	359	413	233	280	521
CO	1,335	1,011	1,419	923	1,017	1,125	1,329
IA	1,960	2,027	1,906	2,201	1,878	2,058	1,970
KS	3,233	3,332	2,868	3,403	2,451	2,457	2,478
MN	782	388	357	490	327	604	24
MO	2,997	1,966	1,983	1,465	1,635	1,242	1,294
MT	417	439	283	330	330	549	431
NE	1,505	1,357	1,718	1,458	1,101	1,094	1,207
NM	661	701	682	855	1,131	866	765
ND	1,675	1,620	1,647	1,685	614	1,356	1,312
OK	1,561	1,604	1,402	1,154	740	971	688
SD	1,872	2,052	2,329	1,278	1,197	916	1,038
TX	2,770	2,391	2,645	2,115	2,022	2,123	1,999
WY	435	328	384	587	741	739	496
Western	10,139	10,951	9,110	9,098	10,195	8,529	7,733
AZ	3,319	2,983	3,032	3,388	3,532	3,445	2,987
CA	3,510	4,535	3,293	3,265	3,877	2,384	1,811
ID	756	770	685	657	646	657	652
NV	600	401	498	415	458	636	444
OR	1,122	1,057	737	697	886	860	961
UT	349	282	59	73	13	52	306
WA	483	923	806	603	783	495	572
United States	49,677	48,915	45,864	43,524	42,488	41,133	40,785

<sup>a</sup>Combined total for North Atlantic non-hunt states: CT, NH, ME, MA, NJ, NY, and VT.

**Table 4.** Estimates of mean annual survival and harvest rate of mourning doves by management unit and state that banded doves, 2003–2020. Estimates by age-class: hatch-year (HY) and after-hatch-year (AHY). Standard errors are in parentheses.

Management Unit State	Annual Survival				Annual Harvest Rate			
	HY (SE)		AHY (SE)		HY (SE)		AHY (SE)	
Eastern	0.269	(0.006)	0.409	(0.004)	0.090	(0.001)	0.061	(0.001)
AL	0.274	(0.019)	0.399	(0.017)	0.103	(0.007)	0.067	(0.005)
DE-MD <sup>a</sup>	0.283	(0.024)	0.370	(0.020)	0.127	(0.009)	0.091	(0.007)
FL	0.275	(0.032)	0.442	(0.023)	0.040	(0.006)	0.034	(0.005)
GA	0.276	(0.016)	0.409	(0.013)	0.132	(0.004)	0.083	(0.005)
IL	0.277	(0.017)	0.374	(0.017)	0.073	(0.003)	0.050	(0.004)
IN	0.251	(0.023)	0.397	(0.014)	0.086	(0.007)	0.078	(0.005)
KY	0.323	(0.019)	0.413	(0.012)	0.067	(0.004)	0.054	(0.004)
LA	0.306	(0.011)	0.443	(0.014)	0.112	(0.005)	0.059	(0.007)
MS	0.207	(0.016)	0.407	(0.018)	0.155	(0.008)	0.090	(0.005)
North Atl <sup>b</sup>	0.316	(0.089)	0.570	(0.067)	0.005	(0.008)	0.004	(0.003)
NC	0.204	(0.014)	0.378	(0.013)	0.101	(0.007)	0.065	(0.004)
OH	0.265	(0.020)	0.385	(0.015)	0.056	(0.003)	0.041	(0.004)
PA	0.219	(0.022)	0.417	(0.025)	0.046	(0.006)	0.021	(0.004)
SC	0.279	(0.014)	0.422	(0.011)	0.098	(0.005)	0.061	(0.003)
TN	0.203	(0.016)	0.398	(0.017)	0.118	(0.005)	0.080	(0.005)
VA	0.353	(0.038)	0.445	(0.023)	0.031	(0.005)	0.041	(0.004)
WI	0.321	(0.028)	0.475	(0.025)	0.052	(0.005)	0.030	(0.004)
WV	0.419	(0.049)	0.447	(0.043)	0.025	(0.004)	0.021	(0.002)
Central	0.270	(0.007)	0.451	(0.004)	0.066	(0.001)	0.051	(0.001)
AR	0.220	(0.023)	0.411	(0.021)	0.092	(0.012)	0.064	(0.006)
CO	0.528	(0.048)	0.474	(0.026)	0.014	(0.002)	0.029	(0.004)
IA	0.253	(0.016)	0.475	(0.014)	0.043	(0.008)	0.030	(0.007)
KS	0.313	(0.017)	0.468	(0.011)	0.066	(0.005)	0.059	(0.003)
MN	0.363	(0.036)	0.549	(0.025)	0.025	(0.003)	0.014	(0.003)
MO	0.157	(0.008)	0.373	(0.009)	0.155	(0.009)	0.129	(0.007)
MT	0.292	(0.069)	0.523	(0.061)	0.020	(0.005)	0.014	(0.003)
ND	0.440	(0.032)	0.575	(0.019)	0.012	(0.001)	0.008	(0.001)
NE	0.341	(0.031)	0.449	(0.016)	0.023	(0.002)	0.029	(0.002)
NM	0.496	(0.077)	0.582	(0.051)	0.014	(0.003)	0.009	(0.002)
OK	0.256	(0.017)	0.414	(0.018)	0.082	(0.008)	0.064	(0.007)
SD	0.421	(0.019)	0.475	(0.014)	0.029	(0.003)	0.024	(0.003)
TX	0.337	(0.021)	0.473	(0.014)	0.058	(0.004)	0.042	(0.004)
WY	0.311	(0.122)	0.525	(0.071)	0.013	(0.002)	0.009	(0.001)
Western	0.304	(0.013)	0.439	(0.007)	0.042	(0.001)	0.036	(0.001)
AZ	0.304	(0.022)	0.422	(0.016)	0.022	(0.003)	0.016	(0.001)
CA	0.303	(0.018)	0.437	(0.011)	0.061	(0.005)	0.062	(0.006)
ID	0.348	(0.045)	0.491	(0.026)	0.026	(0.003)	0.021	(0.003)
NV	0.276	(0.041)	0.488	(0.034)	0.043	(0.007)	0.036	(0.004)
OR	0.351	(0.042)	0.418	(0.032)	0.031	(0.007)	0.035	(0.004)
UT	0.254	(0.049)	0.452	(0.056)	0.024	(0.005)	0.016	(0.003)
WA	0.297	(0.023)	0.432	(0.024)	0.053	(0.005)	0.038	(0.007)

<sup>a</sup>Data combined for Delaware and Maryland.

<sup>b</sup>Data combined for North Atlantic states: CT, NH, ME, MA, NJ, NY, RI, and VT.

**Table 5.** Estimated age ratios (juveniles per adult) by management unit and state based on the Parts Collection Survey, 2007–2020. Age ratios are corrected for unknown age wings and differential vulnerability. Sample size is the number of wings examined. Standard errors are in parentheses.

Management Unit		2007 <sup>a</sup>		2008		2009		2010		2011		2012	
State													
Eastern		1.73	(0.04)	1.42	(0.03)	1.35	(0.03)	1.30	(0.02)	1.83	(0.04)	1.81	(0.04)
AL		3.79	(2.69)	1.25	(0.17)	1.95	(0.29)	1.35	(0.10)	2.14	(0.19)	2.74	(0.27)
DE		1.15	(0.16)	1.88	(0.23)	0.89	(0.18)	1.60	(0.24)	3.21	(0.45)	1.47	(0.17)
GA		3.13	(0.40)	1.70	(0.24)	1.43	(0.18)	1.77	(0.20)	3.51	(0.48)	2.09	(0.18)
IL		1.85	(0.11)	1.21	(0.08)	1.47	(0.11)	1.29	(0.08)	1.51	(0.12)	2.50	(0.21)
IN		1.62	(0.07)	1.80	(0.15)	1.54	(0.11)	1.15	(0.06)	2.00	(0.12)	1.60	(0.12)
KY		1.68	(0.14)	1.18	(0.17)	1.58	(0.17)	1.77	(0.14)	1.65	(0.12)	1.69	(0.14)
LA		1.09	(0.13)	1.61	(0.25)	2.26	(0.31)	2.30	(0.26)	2.94	(0.58)	1.60	(0.25)
MD		2.07	(0.21)	1.52	(0.19)	1.24	(0.13)	1.39	(0.12)	1.45	(0.14)	1.93	(0.15)
MS		1.42	(0.14)	1.57	(0.16)	1.81	(0.17)	1.07	(0.07)	1.38	(0.13)	1.70	(0.24)
NC		1.80	(0.14)	1.67	(0.14)	1.40	(0.09)	1.04	(0.05)	1.73	(0.13)	1.45	(0.09)
OH		2.06	(0.19)	2.26	(0.29)	1.42	(0.16)	0.87	(0.07)	1.75	(0.15)	2.36	(0.29)
PA		1.35	(0.14)	1.03	(0.11)	0.93	(0.10)	1.03	(0.11)	1.91	(0.24)	1.62	(0.18)
RI <sup>b</sup>		----	----	----	----	----	----	----	----	----	----	----	----
SC		1.91	(0.12)	1.39	(0.09)	1.17	(0.08)	1.55	(0.09)	2.37	(0.16)	1.50	(0.10)
TN		1.82	(0.28)	1.34	(0.20)	1.13	(0.11)	1.51	(0.14)	2.13	(0.21)	3.25	(0.36)
VA		1.79	(0.11)	1.23	(0.07)	0.88	(0.07)	1.19	(0.06)	1.38	(0.08)	1.58	(0.08)
WI		1.00	(0.18)	1.58	(0.17)	1.24	(0.18)	2.04	(0.23)	1.27	(0.19)	2.04	(0.27)
WV		1.93	(0.24)	2.56	(0.58)	1.16	(0.19)	1.62	(0.25)	2.09	(0.32)	1.39	(0.22)
Central		1.04	(0.02)	0.95	(0.02)	0.84	(0.02)	0.99	(0.02)	1.13	(0.02)	1.50	(0.03)
AR		1.09	(0.10)	2.77	(0.35)	1.27	(0.11)	1.19	(0.10)	1.52	(0.14)	2.54	(0.27)
CO		1.12	(0.06)	1.09	(0.07)	0.83	(0.06)	1.43	(0.09)	1.37	(0.10)	1.12	(0.11)
IA	† <sup>c</sup>	†		†		†		†		2.07	(0.59)	1.54	(0.16)
KS		1.32	(0.07)	0.99	(0.07)	0.89	(0.07)	1.11	(0.07)	1.10	(0.07)	1.46	(0.11)
MN		1.26	(0.90)	0.54	(0.33)	2.51	(0.72)	6.41	(3.83)	0.98	(0.10)	2.06	(0.18)
MO		1.62	(0.12)	0.93	(0.07)	0.94	(0.06)	1.21	(0.10)	1.58	(0.11)	1.96	(0.13)
MT		1.30	(0.16)	0.68	(0.09)	1.45	(0.23)	1.49	(0.17)	1.85	(0.26)	1.27	(0.16)
ND		1.07	(0.15)	0.92	(0.11)	1.39	(0.26)	0.65	(0.09)	0.99	(0.10)	1.56	(0.16)
NE		0.68	(0.04)	0.83	(0.06)	0.80	(0.09)	1.02	(0.07)	0.82	(0.05)	1.49	(0.11)
NM		0.55	(0.08)	0.35	(0.04)	0.48	(0.04)	0.59	(0.04)	0.71	(0.07)	0.68	(0.06)
OK		1.41	(0.17)	1.35	(0.10)	1.15	(0.07)	1.05	(0.06)	1.76	(0.14)	1.72	(0.16)
SD		1.07	(0.09)	0.89	(0.07)	1.08	(0.11)	1.05	(0.10)	1.18	(0.11)	1.73	(0.15)
TX		0.78	(0.05)	1.24	(0.07)	0.67	(0.04)	0.86	(0.04)	1.21	(0.05)	1.47	(0.07)
WY		1.32	(0.16)	0.90	(0.10)	0.75	(0.10)	1.68	(0.16)	1.51	(0.14)	1.05	(0.13)
Western		1.05	(0.03)	1.29	(0.04)	1.17	(0.04)	1.15	(0.03)	1.11	(0.03)	1.34	(0.04)
AZ		0.52	(0.03)	0.85	(0.04)	0.72	(0.04)	0.74	(0.04)	0.74	(0.04)	0.72	(0.05)
CA		1.22	(0.08)	1.45	(0.08)	1.23	(0.10)	1.15	(0.06)	1.15	(0.06)	1.35	(0.07)
ID		1.12	(0.10)	0.88	(0.17)	1.52	(0.16)	1.56	(0.18)	1.45	(0.25)	1.56	(0.15)
NV		1.13	(0.11)	1.09	(0.21)	0.97	(0.13)	0.96	(0.08)	1.14	(0.11)	1.28	(0.13)
OR		1.75	(0.29)	1.42	(0.60)	1.10	(0.18)	2.24	(0.28)	0.98	(0.16)	0.98	(0.13)
UT		1.19	(0.16)	0.73	(0.09)	0.69	(0.14)	0.79	(0.09)	1.17	(0.11)	1.36	(0.19)
WA		1.50	(0.10)	1.62	(0.12)	1.55	(0.15)	1.41	(0.12)	1.53	(0.13)	1.66	(0.15)

<sup>a</sup> Standard errors for estimates only incorporate sampling error for the proportion of young in the sample and do not incorporate additional uncertainty from correction factors for unknown age wings and differential vulnerability.

<sup>b</sup> Insufficient data to estimate age ratio for RI in most years.

<sup>c</sup> Iowa did not have a hunting season until 2011.

**Table 5** (continued).

Management Unit												
State	2013 <sup>a</sup>		2014		2015		2016		2017		2018	
Eastern	1.33	(0.03)	1.42	(0.04)	1.31	(0.04)	1.31	(0.05)	1.54	(0.04)	1.49	(0.04)
AL	1.67	(0.18)	1.10	(0.10)	1.56	(0.17)	1.86	(0.26)	1.57	(0.23)	1.62	(0.23)
DE	1.97	(0.37)	1.30	(0.21)	0.42	(0.11)	0.96	(0.26)	29.34	(18.61)	1.28	(0.44)
GA	1.45	(0.11)	1.70	(0.16)	1.30	(0.12)	1.69	(0.16)	1.63	(0.12)	1.70	(0.13)
IL	1.36	(0.11)	1.48	(0.12)	1.15	(0.12)	0.93	(0.12)	1.28	(0.13)	1.70	(0.16)
IN	1.49	(0.12)	1.28	(0.12)	1.05	(0.09)	0.93	(0.13)	1.41	(0.14)	2.21	(0.21)
KY	1.23	(0.10)	1.41	(0.12)	1.18	(0.15)	1.29	(0.18)	1.49	(0.12)	1.46	(0.13)
LA	1.82	(0.29)	1.01	(0.76)	5.29	(2.89)	0.86	(0.26)	1.28	(0.28)	1.47	(0.23)
MD	1.64	(0.18)	1.78	(0.25)	1.69	(0.29)	2.76	(0.58)	2.50	(0.40)	1.82	(0.29)
MS	1.19	(0.12)	1.38	(0.15)	1.50	(0.18)	0.96	(0.18)	1.96	(0.23)	0.79	(0.11)
NC	1.12	(0.08)	1.01	(0.09)	0.97	(0.08)	0.83	(0.10)	1.81	(0.16)	1.58	(0.16)
OH	1.35	(0.15)	2.14	(0.22)	0.95	(0.10)	1.59	(0.26)	1.40	(0.18)	1.92	(0.31)
PA	1.27	(0.17)	1.30	(0.23)	1.57	(0.26)	1.04	(0.19)	0.93	(0.14)	1.28	(0.18)
RI <sup>b</sup>	----	----	0.76	(0.76)	----	----	0.67	(0.61)	----	----	----	----
SC	1.28	(0.12)	1.88	(0.18)	1.94	(0.23)	2.85	(0.35)	1.80	(0.19)	1.23	(0.12)
TN	1.38	(0.16)	2.01	(0.25)	1.36	(0.16)	1.19	(0.31)	1.44	(0.20)	1.82	(0.25)
VA	0.98	(0.09)	1.16	(0.15)	2.35	(0.31)	0.92	(0.11)	1.55	(0.19)	1.11	(0.12)
WI	1.64	(0.20)	1.39	(0.19)	2.78	(0.55)	3.14	(0.84)	1.34	(0.28)	2.35	(0.45)
WV	0.95	(0.32)	3.98	(1.19)	2.74	(0.71)	0.94	(0.23)	1.13	(0.17)	0.89	(0.17)
Central	1.16	(0.03)	1.12	(0.03)	0.99	(0.03)	1.07	(0.05)	1.23	(0.03)	1.15	(0.03)
AR	1.51	(0.15)	0.82	(0.10)	1.27	(0.15)	1.15	(0.17)	1.21	(0.16)	0.99	(0.15)
CO	1.62	(0.15)	1.48	(0.14)	0.92	(0.07)	1.09	(0.17)	1.35	(0.12)	0.84	(0.06)
IA	1.26	(0.21)	1.16	(0.13)	0.78	(0.09)	0.88	(0.19)	1.38	(0.10)	1.37	(0.15)
KS	1.37	(0.20)	1.50	(0.13)	1.00	(0.08)	1.00	(0.17)	1.32	(0.09)	1.25	(0.11)
MN	1.24	(0.16)	1.45	(0.25)	1.05	(0.21)	1.15	(0.41)	1.57	(0.36)	2.11	(0.53)
MO	1.07	(0.12)	1.93	(0.26)	2.41	(0.31)	1.17	(0.23)	1.42	(0.11)	2.19	(0.15)
MT	1.40	(0.26)	1.42	(0.26)	0.98	(0.12)	0.53	(0.14)	1.62	(0.22)	0.78	(0.10)
ND	1.23	(0.13)	1.24	(0.13)	1.32	(0.11)	1.00	(0.23)	2.12	(0.22)	1.28	(0.10)
NE	0.82	(0.08)	0.77	(0.10)	0.81	(0.09)	1.21	(0.23)	1.17	(0.11)	0.73	(0.06)
NM	0.52	(0.07)	0.41	(0.06)	0.77	(0.14)	0.84	(0.21)	0.46	(0.06)	0.61	(0.10)
OK	1.75	(0.19)	0.89	(0.10)	1.32	(0.15)	1.78	(0.29)	1.81	(0.20)	1.84	(0.30)
SD	1.07	(0.10)	0.93	(0.08)	0.91	(0.09)	0.97	(0.20)	1.15	(0.13)	1.29	(0.10)
TX	1.40	(0.11)	1.56	(0.10)	1.14	(0.10)	1.22	(0.16)	0.99	(0.06)	1.32	(0.09)
WY	2.06	(0.33)	0.89	(0.10)	0.81	(0.08)	2.27	(1.74)	1.03	(0.15)	0.71	(0.12)
Western	1.72	(0.08)	1.33	(0.06)	1.35	(0.05)	1.03	(0.06)	1.50	(0.06)	1.03	(0.04)
AZ	1.38	(0.13)	0.75	(0.05)	0.97	(0.06)	0.79	(0.06)	1.03	(0.06)	0.65	(0.05)
CA	1.62	(0.16)	1.54	(0.12)	1.41	(0.12)	1.44	(0.20)	1.71	(0.14)	1.30	(0.10)
ID	1.64	(0.17)	1.58	(0.17)	1.68	(0.21)	1.06	(0.15)	1.61	(0.18)	0.91	(0.12)
NV	1.30	(0.23)	0.93	(0.15)	1.57	(0.23)	0.58	(0.26)	1.17	(0.18)	0.85	(0.11)
OR	1.52	(0.18)	1.77	(0.39)	1.43	(0.26)	1.35	(0.34)	1.07	(0.27)	2.06	(0.42)
UT	1.27	(0.21)	1.70	(0.25)	0.85	(0.12)	0.76	(0.20)	1.85	(0.33)	1.71	(0.30)
WA	2.20	(0.26)	2.30	(0.48)	1.87	(0.25)	0.68	(0.16)	2.37	(0.27)	1.12	(0.15)

<sup>a</sup> Standard errors for estimates only incorporate sampling error for the proportion of young in the sample and do not incorporate additional uncertainty from correction factors for unknown age wings and differential vulnerability.

<sup>b</sup> Insufficient data to estimate age ratio for RI in most years.

**Table 5** (continued).

Management Unit State	2007–2020					
	2019 <sup>a</sup>		2020		Sample Size	Mean SE
Eastern	1.69	(0.05)	1.27	(0.04)	95,537	1.48 (0.01)
AL	2.06	(0.35)	1.12	(0.30)	4,373	1.65 (0.05)
DE	3.71	(1.89)	1.32	(0.25)	2,086	1.50 (0.07)
GA	2.01	(0.18)	0.90	(0.10)	6,538	1.70 (0.04)
IL	1.72	(0.19)	1.21	(0.18)	8,491	1.46 (0.03)
IN	1.47	(0.15)	1.66	(0.18)	10,655	1.51 (0.03)
KY	2.45	(0.23)	1.60	(0.14)	7,284	1.55 (0.04)
LA	1.29	(0.26)	0.71	(0.18)	2,034	1.63 (0.07)
MD	2.60	(0.48)	1.79	(0.29)	4,295	1.69 (0.05)
MS	1.46	(0.22)	1.37	(0.20)	5,070	1.33 (0.04)
NC	1.89	(0.22)	1.00	(0.12)	9,238	1.31 (0.03)
OH	0.95	(0.29)	1.26	(0.21)	4,625	1.48 (0.04)
PA	0.85	(0.18)	1.56	(0.22)	3,405	1.18 (0.04)
RI <sup>b</sup>	----	----	----	----	35	4.29 (1.85)
SC	1.89	(0.19)	1.22	(0.17)	9,220	1.63 (0.04)
TN	1.36	(0.23)	1.12	(0.26)	3,776	1.62 (0.05)
VA	1.15	(0.11)	1.14	(0.12)	10,049	1.28 (0.03)
WI	2.07	(0.36)	2.35	(0.56)	2,594	1.63 (0.07)
WV	1.29	(0.23)	0.85	(0.18)	1,804	1.42 (0.07)
Central	1.17	(0.04)	1.11	(0.04)	86,977	1.09 (0.01)
AR	1.85	(0.47)	1.38	(0.25)	4,581	1.36 (0.04)
CO	1.12	(0.10)	1.05	(0.11)	9,219	1.14 (0.02)
IA	1.10	(0.11)	1.05	(0.10)	3,286	1.16 (0.04)
KS	1.05	(0.14)	0.91	(0.12)	8,922	1.15 (0.02)
MN	0.90	(0.20)	1.57	(0.26)	2,012	1.31 (0.06)
MO	1.46	(0.13)	1.09	(0.12)	8,208	1.43 (0.03)
MT	1.72	(0.27)	1.44	(0.26)	2,844	1.20 (0.05)
ND	1.43	(0.14)	1.14	(0.14)	4,782	1.24 (0.04)
NE	0.94	(0.09)	1.13	(0.10)	7,996	0.89 (0.02)
NM	0.59	(0.10)	0.53	(0.10)	4,472	0.55 (0.02)
OK	0.94	(0.12)	0.77	(0.08)	6,785	1.29 (0.03)
SD	1.73	(0.17)	1.17	(0.13)	6,440	1.13 (0.03)
TX	1.25	(0.12)	1.09	(0.11)	13,966	1.09 (0.02)
WY	2.40	(0.61)	1.58	(0.30)	3,464	1.14 (0.04)
Western	1.14	(0.04)	0.87	(0.04)	45,179	1.20 (0.01)
AZ	0.75	(0.04)	0.52	(0.04)	15,298	0.70 (0.01)
CA	1.38	(0.08)	1.03	(0.08)	12,527	1.31 (0.02)
ID	0.81	(0.16)	2.27	(0.82)	3,819	1.37 (0.04)
NV	1.40	(0.27)	---- <sup>c</sup>	----	3,181	1.10 (0.04)
OR	2.19	(0.48)	1.36	(0.28)	1,955	1.48 (0.07)
UT	0.88	(0.14)	1.26	(0.25)	2,688	1.07 (0.04)
WA	2.26	(0.37)	1.74	(0.28)	5,711	1.62 (0.04)

<sup>a</sup> Standard errors for estimates only incorporate sampling error for the proportion of young in the sample and do not incorporate additional uncertainty from correction factors for unknown age wings and differential vulnerability.

<sup>b</sup> Insufficient data to estimate age ratio for RI in most years.

<sup>c</sup> Insufficient data to estimate age ratio for NV in 2020.



**Table 6.** Estimates of absolute abundance of mourning doves on 1 September each year based on band recovery and harvest data by year and management unit in the U.S., 2003–2020.

Year	Management Unit						Total (United States)	
	Eastern		Central		Western			
	N	SE	N	SE	N	SE	N	SE
2003	79,154,321	4,211,498	111,609,299	7,008,965	133,009,176	24,632,880	323,772,795	25,954,597
2004	84,356,096	3,544,909	228,169,691	14,444,029	89,904,924	10,890,758	402,430,711	18,433,799
2005	128,683,065	5,408,749	213,977,992	14,768,189	35,704,697	3,144,598	378,365,754	16,038,780
2006	89,319,596	3,610,640	210,108,740	14,289,538	49,884,911	4,707,174	349,313,247	15,472,075
2007	102,135,753	4,593,250	174,153,485	11,633,609	56,002,423	4,141,996	332,291,660	13,175,543
2008	96,646,892	3,980,309	186,193,535	12,070,199	50,214,812	4,222,236	333,055,240	13,392,529
2009	100,752,349	4,139,379	161,096,503	9,848,875	52,489,867	3,673,152	314,338,719	11,297,205
2010	88,459,897	4,095,716	161,028,300	10,378,064	55,760,146	3,947,119	305,248,344	11,834,646
2011	84,263,204	4,378,879	142,122,321	8,085,318	51,789,619	4,120,782	278,175,143	10,076,100
2012	85,521,639	4,356,184	153,308,876	12,614,214	66,538,068	5,238,038	305,368,583	14,336,379
2013	84,801,646	5,359,551	126,037,083	8,402,230	49,178,051	3,703,235	260,016,780	10,631,849
2014	67,357,105	3,430,438	170,391,830	10,186,979	43,886,035	3,235,750	281,634,970	11,225,530
2015	63,209,108	3,284,388	178,422,372	10,376,261	35,115,690	2,408,306	276,747,170	11,146,925
2016	62,451,100	3,525,377	171,715,772	13,739,721	45,857,068	3,491,498	280,023,939	14,608,175
2017	63,543,969	3,246,544	129,128,203	8,270,852	46,075,465	3,893,183	238,747,638	9,700,717
2018	52,476,017	2,547,076	137,763,546	7,738,722	57,176,994	3,805,201	247,416,558	8,991,940
2019	42,920,053	2,032,488	113,561,181	8,550,527	23,282,277	1,560,732	179,763,511	8,926,276
2020	52,929,476	2,681,780	107,536,524	7,009,523	33,664,084	2,788,402	194,130,084	8,006,281

**Appendix A.** Federal framework dates, season length, and daily bag limit for mourning dove hunting in the U.S. by management unit, 1918–2021.

Year	Management Unit								
	Eastern			Central			Western		
	Dates <sup>a</sup>	Days	Bag	Dates	Days	Bag	Dates	Days	Bag
1918	Sep 1–Dec 31	107	25	Sep 1–Dec 15	106	25	Sep 1–Dec 15	106	25
1919–22	Sep 1–Jan 31	108	25	Sep 1–Dec 15	106	25	Sep 1–Dec 15	106	25
1923–28	Sep 1–Jan 31	108	25	Sep 1–Dec 31	106	25	Sep 1–Dec 15	106	25
1929	Sep 1–Jan 31	106	25	Sep 1–Dec 31	106	25	Sep 1–Dec 15	106	25
1930	Sep 1–Jan 31	108	25	Sep 1–Dec 15	106	25	Sep 1–Dec 15	106	25
1931	Sep 1–Jan 31	106	25	Sep 1–Dec 15	106	25	Sep 1–Dec 15	106	25
1932–33	Sep 1–Jan 31	106	18	Sep 1–Dec 15	106	18	Sep 1–Dec 15	106	18
1934	Sep 1–Jan 31	106	18	Sep 1–Jan 15	106	18	Sep 1–Dec 15	106	18
1935	Sep 1–Jan 31	107	20	Sep 1–Jan 16	106	20	Sep 1–Jan 05	107	20
1936	Sep 1–Jan 31	77	20	Sep 1–Jan 16	76	20	Sep 1–Nov 15	76	20
1937 <sup>b</sup>	Sep 1–Jan 31	77	15	Sep 1–Nov 15	76	15	Sep 1–Nov 15	76	15
1938	Sep 1–Jan 31	78	15	Sep 1–Nov 15	76	15	Sep 1–Nov 15	76	15
1939	Sep 1–Jan 31	78	15	Sep 1–Jan 31	77	15	Sep 1–Nov 15	76	15
1940	Sep 1–Jan 31	77	12	Sep 1–Jan 31	76	12	Sep 1–Nov 15	76	12
1941	Sep 1–Jan 31	62	12	Sep 1–Oct 27	42	12	Sep 1–Oct 12	42	12
1942	Sep 1–Oct 15	30	10	Sep 1–Oct 27	42	10	Sep 1–Oct 12	42	10
1943	Sep 1–Dec 24	30	10	Sep 1–Dec 19	42	10	Sep 1–Oct 12	42	10
1944	Sep 1–Jan 20	58	10	Sep 1–Jan 20	57	10	Sep 1–Oct 25	55	10
1945	Sep 1–Jan 31	60	10	Sep 1–Jan 31	60	10	Sep 1–Oct 30	60	10
1946	Sep 1–Jan 31	61	10	Sep 1–Jan 31	60	10	Sep 1–Oct 30	60	10
1947–48 <sup>c</sup>	Sep 1–Jan 31	60	10	Sep 1–Dec 3	60	10	Sep 1–Oct 30	60	10
1949	Sep 1–Jan 15	30	10	Sep 1–Nov 14	45	10	Sep 1–Oct 15	45	10
1950	Sep 1–Jan 15	30	10	Sep 1–Dec 3	45	10	Sep 1–Oct 15	45	10
1951	Sep 1–Jan 15	30	8	Sep 1–Dec 24	42	10	Sep 1–Oct 15	45	10
1952	Sep 1–Jan 10	30	8	Sep 1–Nov 6	42	10	Sep 1–Oct 12	42	10
1953	Sep 1–Jan 10	30	8	Sep 1–Nov 9	42	10	Sep 1–Oct 12	42	10
1954 <sup>d</sup>	Sep 1–Jan 10	40	8	Sep 1–Nov 9	40	10	Sep 1–Oct 31	40	10
1955	Sep 1–Jan 10	45	8	Sep 1–Nov 28	45	10	Sep 1–Dec 31	45	10
1956 <sup>e</sup>	Sep 1–Jan 10	55	8	Sep 1–Jan 10	55	10	Sep 1–Jan 10	50	10
1957	Sep 1–Jan 10	60	10	Sep 1–Jan 10	60	10	Sep 1–Jan 10	50	10
1958–59	Sep 1–Jan 15	65	10	Sep 1–Jan 15	65	10	Sep 1–Jan 15	50	10
1960–61 <sup>f</sup>	Sep 1–Jan 15	70 <sup>g</sup>	12	Sep 1–Jan 15	60	15	Sep 1–Jan 15	50	10
1962	Sep 1–Jan 15	70 <sup>g</sup>	12	Sep 1–Jan 15	60	12	Sep 1–Jan 15	50	10
1963	Sep 1–Jan 15	70 <sup>g</sup>	10	Sep 1–Jan 15	60	10	Sep 1–Jan 15	50	10
1964–67	Sep 1–Jan 15	70 <sup>g</sup>	12	Sep 1–Jan 15	60	12	Sep 1–Jan 15	50	12
1968	Sep 1–Jan 15	70 <sup>g</sup>	12	Sep 1–Jan 15	60	12	Sep 1–Jan 15	50	10
1969–70	Sep 1–Jan 15	70 <sup>g</sup>	18 <sup>h</sup>	Sep 1–Jan 15	60	10	Sep 1–Jan 15	50	10
1971–79	Sep 1–Jan 15	70 <sup>g</sup>	12	Sep 1–Jan 15	60	10	Sep 1–Jan 15	50	10
1980	Sep 1–Jan 15	70	12	Sep 1–Jan 15 <sup>i</sup>	60	10	Sep 1–Jan 15	70 <sup>j</sup>	10 <sup>k</sup>
1981	Sep 1–Jan 15	70	12	Sep 1–Jan 15 <sup>i</sup>	45 <sup>l</sup>	15 <sup>l</sup>	Sep 1–Jan 15	70 <sup>j</sup>	10 <sup>k</sup>
1982	Sep 1–Jan 15	45 <sup>m</sup>	15 <sup>m</sup>	Sep 1–Jan 15 <sup>i</sup>	45 <sup>m</sup>	15 <sup>m</sup>	Sep 1–Jan 15	45 <sup>m</sup>	15 <sup>m</sup>
1983–86	Sep 1–Jan 15	60 <sup>m</sup>	15 <sup>m</sup>	Sep 1–Jan 15 <sup>i</sup>	60 <sup>m</sup>	15 <sup>m</sup>	Sep 1–Jan 15	60 <sup>m</sup>	15 <sup>m</sup>
1987–07 <sup>n</sup>	Sep 1–Jan 15	60 <sup>m</sup>	15 <sup>m</sup>	Sep 1–Jan 15 <sup>i</sup>	60 <sup>m</sup>	15 <sup>m</sup>	Sep 1–Jan 15	60 <sup>o</sup>	10
2008	Sep 1–Jan 15	70	15	Sep 1–Jan 15 <sup>i</sup>	60 <sup>m</sup>	15 <sup>m</sup>	Sep 1–Jan 15	60 <sup>o</sup>	10
2009–13	Sep 1–Jan 15	70	15	Sep 1–Jan 15 <sup>i</sup>	70	15	Sep 1–Jan 15	60 <sup>o</sup>	10
2014	Sep 1–Jan 15	90	15	Sep 1–Jan 15 <sup>i</sup>	70	15	Sep 1–Jan 15	60 <sup>o</sup>	15
2015	Sep 1–Jan 15	90	15	Sep 1–Jan 15 <sup>i</sup>	70	15	Sep 1–Jan 15	60	15 <sup>p</sup>
2016–17	Sep 1–Jan 15	90	15	Sep 1–Jan 15 <sup>i</sup>	90	15	Sep 1–Jan 15	60	15 <sup>p</sup>
2018–20	Sep 1–Jan 31	90	15	Sep 1–Jan 15 <sup>i</sup>	90	15	Sep 1–Jan 15	60	15 <sup>p</sup>

<sup>a</sup> From 1918–1947, seasons for doves and other “webless” species were selected independently and the dates were the earliest opening and latest closing dates chosen. Dates were inclusive. There were different season lengths in various states with some choosing many fewer days than others. Only bag and possession limits, and season dates were specified.

<sup>b</sup> Beginning in 1937, the bag and possession limit included white-winged doves in selected states.

<sup>c</sup> From 1948–1953, states permitting dove hunting were listed by waterfowl flyway. Only bag and possession limits, and season dates were specified.

<sup>d</sup> In 1954–1955, states permitting dove hunting were listed separately. Only bag and possession limits, and season dates were specified.

## **Appendix A. Continued.**

<sup>e</sup> From 1956–1959, states permitting dove hunting were listed separately. Framework opening and closing dates for seasons (but no maximum days for season length) were specified for the first time along with bag and possession limits.

<sup>f</sup> In 1960, states were grouped by management unit for the first time. Maximum season length was specified for the first time.

<sup>g</sup> Half days.

<sup>h</sup> More liberal limits allowed in conjunction with an Eastern Management Unit hunting regulations experiment.

<sup>i</sup> The framework extended to January 25 in Texas.

<sup>j</sup> 50–70 days depending on state and season timing.

<sup>k</sup> Arizona was allowed 12.

<sup>l</sup> States had the option of a 60-day season and daily bag limit of 12.

<sup>m</sup> States had the option of a 70-day season and daily bag limit of 12.

<sup>n</sup> Beginning in 2002, the limits included white-winged doves in all states in the Central Management Unit. Beginning in 2006, the limits included white-winged doves in all states in the Eastern Management Unit.

<sup>o</sup> 30–60 days depending on state (30 in Idaho, Nevada, Oregon, Utah, Washington; 60 in Arizona and California).

<sup>p</sup> In Idaho, Nevada, Oregon, and Utah daily limit is 15 mourning and white-winged doves in the aggregate. In Arizona and California daily limit is 15 mourning and white-winged doves in the aggregate, of which no more than 10 can be white-winged doves.

## **Mourning Dove Population Status, 2021**

U.S. Fish and Wildlife Service  
Division of Migratory Bird Management  
Branch of Assessment and Decision Support  
11510 American Holly Drive  
Laurel, MD 20708-4002

August 2021

**Cover photograph:** Adult mourning dove. Photo by John Brunjes.

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