Mourning Dove

Population Status, 2022

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Abstract: This report summarizes information collected annually in the U.S. on survival, recruitment, abundance and harvest of mourning doves. Information is provided for three management units: the Eastern (EMU), Central (CMU) and Western (WMU). 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 165 million doves in the U.S. as of 1 September 2021. Abundance (in millions of birds) varied among management units in 2021: EMU 39.5 (SE=2.0); CMU 82.1 (SE=5.8); and WMU 45.8 (SE=4.3). In 2021 HIP estimates for mourning dove total harvest, active hunters, and total days afield in the U.S. were 9,202,100 (SE= 291,200) birds, 642,800 hunters, and 1,710,000 (SE=59,200) days afield. In 2021 harvest and hunter activity at the management unit level were: EMU, 3,822,100 (SE=156,700) birds, 256,800 hunters, and 624,300 (SE=28,500) days afield; CMU, 4,236,600 (SE=234,500) birds, 303,500 hunters, and 874,700 (SE=50,300) days afield; and WMU, 1,143,300 (SE=72,600) birds, 82,500 hunters, and 211,000 (SE=12,900) days afield.

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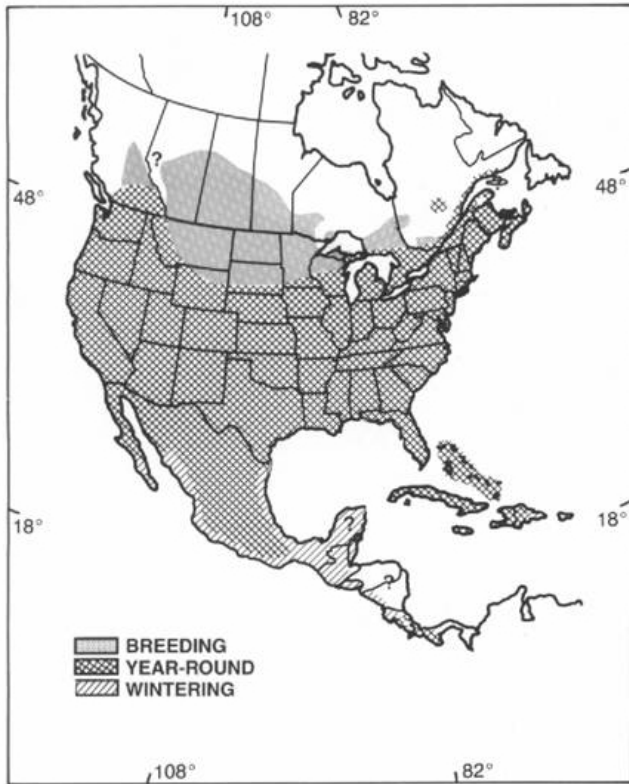
Figure 1. Breeding and wintering ranges of the mourning dove (adapted from Mirarchi and Baskett 1994).

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, 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) is completed in June and is based on routes that are 24.5 miles long. Each route consists of 50 stops or point count locations at 0.5-mile intervals. At each stop, a 3-minute count is conducted whereby every bird seen or heard within a 0.25-mile (400 m) radius is recorded. Surveys start one-half hour before local sunrise and take about 5 hours to complete. Data for birds heard and seen at stops are combined for BBS analyses (Link et al. 2020, Sauer et al. 2020).

Although the BBS is not used to inform annual mourning dove harvest management decisions, it is still of interest because it provides independent estimates of trends in abundance. Consequently, the 1966–2021 BBS trend information is included in this report. Current-year BBS data could not be analyzed in time for this report.

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
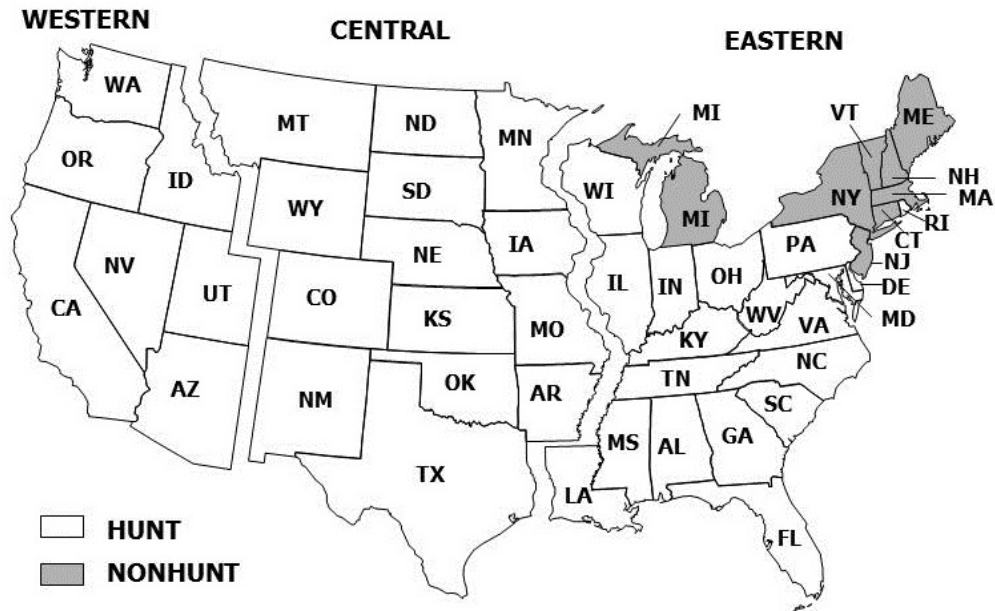
Figure 2. Mourning dove management units with 2021–22 hunt and non-hunt states.

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 2003–21 should be considered preliminary as refinements are still being made in the sampling frame and estimation techniques.

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. 2021). 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 2021 due to COVID-19 restrictions. Wings were mailed to a subset of state and federal biologists that have annually attended the wingbee prior to 2021. 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/MourningDovePopulationStatus 13.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 were 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 3] and Parts Collection Survey [Table 6]) by age-specific harvest rates estimated from direct (first hunting season after banding) recoveries of banded birds.

RESULTS

Breeding Bird Survey

The BBS provided evidence that dove abundance increased in the EMU hunt and non-hunt states during the last 56 years (Table 1). Over the last 10 years abundance remained unchanged in the EMU non-hunt states, declined in the hunt states, and declined in the entire EMU. The BBS suggested that doves decreased in abundance over the last 56 years, and the most recent 10 years in the CMU (Table 1). The BBS suggested that dove abundance decreased in the WMU over the last 56 years, and the most recent 10 years (Table 1).

Harvest Survey

Preliminary results of mourning dove harvest and hunter activity from HIP for the 2020–21 and 2021–22 hunting seasons are presented in Tables 2 and 3, respectively. Current (2021–22) HIP estimates indicate that in the U.S. about 9 million mourning doves were harvested by about 650 thousand hunters who spent about 1.7 million days afield. The EMU and CMU total harvest represented 42% and 46%, respectively, of the national harvest of doves while the WMU represented 12% (Table 3). In all management units mourning dove harvest and hunter activity (days afield) decreased in 2021–22 from the previous year (Fig. 3; Tables 2 and 3). Additional information about HIP, survey methodology, and results can be found in annual reports

located at: https://www.fws.gov/media/mourning-dove-population-status-report-2013.

Survival and Harvest Rates

During July and August over the past 19 years 350,129 known age doves were banded in the EMU, 304,854 in the CMU, and 146,596 in the WMU (Table 4). There have been 22,118, 15,401, and 5,482 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 5). 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 units (Fig. 3, Table 5). This relationship was more pronounced in the EMU (HY harvest rate 49% greater than AHY harvest rate) than the CMU (27% 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 5). 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 5).

Recruitment

A total of 234,443 wings were obtained from 2007 to 2021 from birds harvested prior to September 15th. Overall recruitment rates were highest in the east and northwest and lowest in the Great Plains states and the southwest (Table 6). At the management unit scale, the EMU typically had higher average annual recruitment compared to the CMU and WMU (Fig. 4). In 2021, age ratio in the EMU was lower-than-average, whereas in the CMU and WMU it was near the long-term average (Table 6).
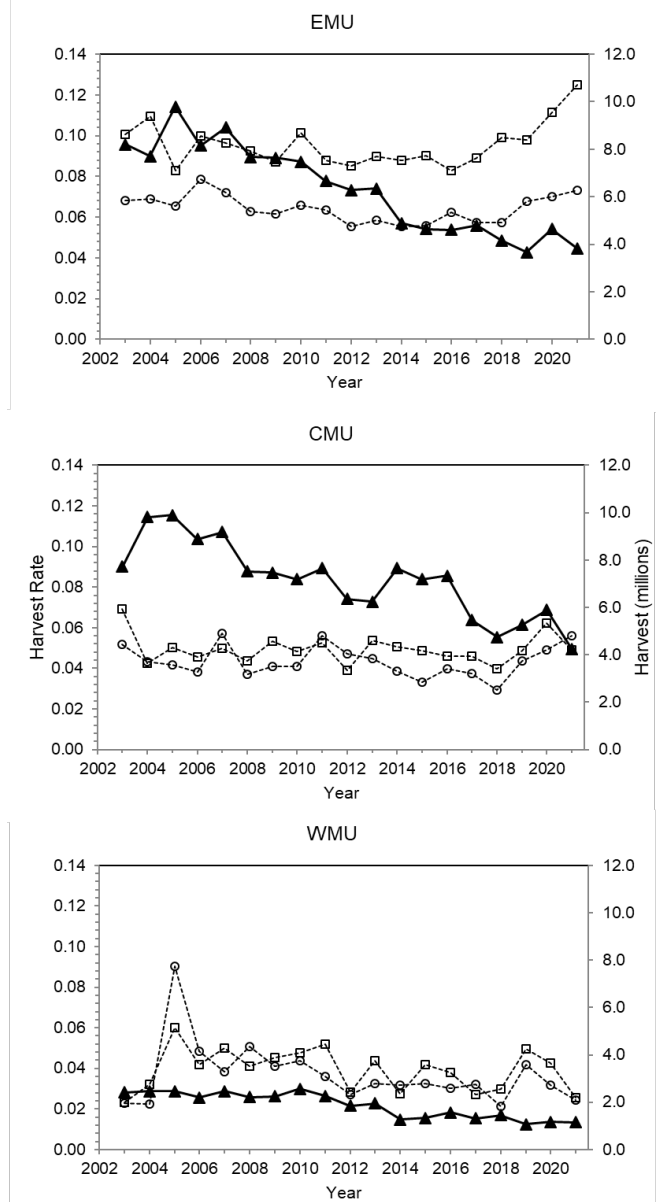
Figure 3. Estimated mourning dove total annual harvest (▲), hatch-year harvest rates (□) and after-hatch-year harvest rates (○) in the Eastern (EMU), Cental (CMU), and Western (WMU) Management Units, 2003–2021.
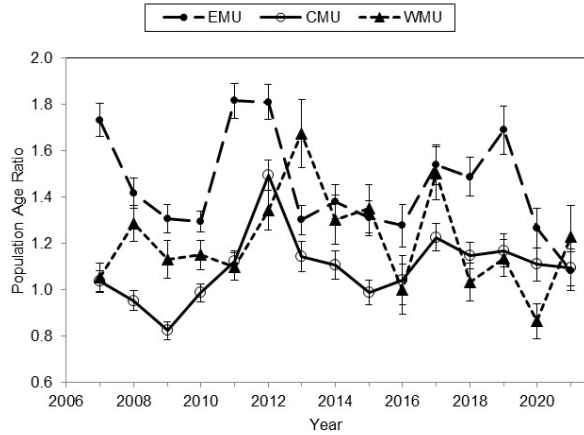
Figure 4. Estimated mourning dove fall population age ratios for each management unit, 2007–2021. Error bars represent 95% confidence intervals.

Mean population age ratios for all states and years are provided in Table 6. 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 7). 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 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 167 million mourning doves in the U.S. immediately prior to the 2021–22 hunting season. Abundance estimates were higher in WMU in 2021 compared to 2020, and were lower in the EMU and CMU.
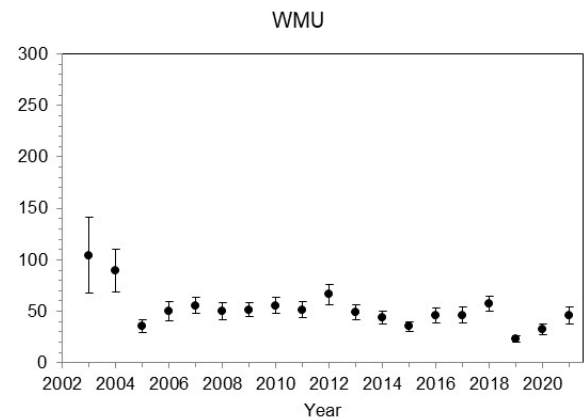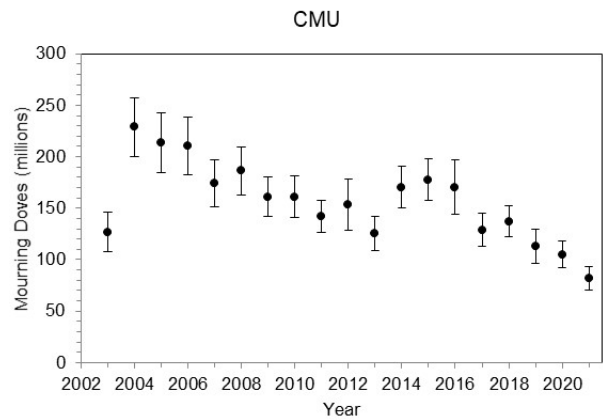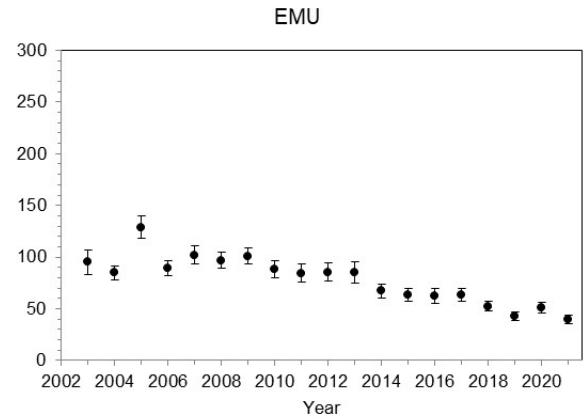
Figure 5. Estimates and 95% confidence intervals of mourning dove absolute abundance by management unit and year, 2003–2021. Estimates based on band recovery and harvest data.

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ACKNOWLEDGMENTS

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Table 1. Estimated trend[a] (percent change per year and lower and upper 95% credible intervals or CI) in mourning dove abundance based on Breeding Bird Survey data for management units and states during 56-year (1966–2021) and 10-year (2012–2021) periods. 'N' is the number of routes with >1 mourning dove detection in at least one year.

Management Unit & State	56-year N	56-year Trend	56-year Lower CI	56-year Upper CI	10-year N	10-year Trend	10-year Lower CI	10-year Upper CI
Eastern	1,794	0.3	0.2	0.4	1,445	-1.0	-1.3	-0.6
Hunt states	1,458	0.3	0.2	0.4	1,195	-1.1	-1.5	-0.7
AL	102	-0.6	-0.9	-0.2	89	-1.0	-2.3	0.2
DE-MD	90	0.4	0.1	0.7	73	1.0	-0.1	2.2
FL	102	1.8	1.3	2.3	73	-4.1	-5.6	-2.5
GA	107	-0.2	-0.5	0.2	96	0.1	-1.0	1.1
IL	104	0.4	0.0	0.8	102	-0.6	-1.7	0.6
IN	65	-0.3	-0.7	0.2	58	-0.2	-1.7	1.2
KY	56	0.7	0.4	1.1	38	-0.8	-2.3	0.7
LA	96	1.4	0.8	1.9	66	-2.9	-4.7	-1.0
MS	54	-0.6	-1.3	0.0	39	-3.5	-6.4	-1.0
NC	95	0.2	-0.2	0.6	80	-1.8	-2.8	-0.7
OH	78	0.8	0.4	1.2	58	0.7	-0.8	2.3
PA	127	1.2	0.8	1.5	98	-0.6	-1.7	0.5
SC	47	-0.3	-0.7	0.2	39	-1.0	-2.8	0.7
TN	32	-0.3	-0.7	0.2	26	-0.6	-2.4	1.3
VA	60	-0.2	-0.6	0.3	51	-0.2	-1.6	1.3
WI	96	1.4	1.0	1.8	91	-0.6	-1.9	0.7
WV	57	3.4	2.8	4.0	50	-0.1	-2.1	2.0
Non-hunt states	426	1.2	1.0	1.4	323	0.3	-0.4	1.1
MI	90	0.5	0.1	1.0	68	-1.8	-3.3	-0.3
New England[b]	168	1.9	1.5	2.3	128	0.0	-1.2	1.3
NJ	42	0.0	-0.5	0.5	29	0.9	-0.9	2.8
NY	126	1.5	1.1	1.9	93	0.2	-1.2	1.6
Central	1,256	-0.6	-0.8	-0.4	1,084	-0.6	-1.1	-0.1
AR	55	-0.6	-1.1	-0.1	47	-5.7	-8.0	-3.5
CO	148	-0.7	-1.2	-0.2	130	-2.1	-3.6	-0.6
IA	38	0.1	-0.4	0.5	32	-1.5	-3.5	0.4
KS	65	-0.2	-0.6	0.2	61	0.0	-1.5	1.6
MN	79	-0.8	-1.3	-0.4	72	-1.8	-3.3	-0.3
MO	94	-0.8	-1.2	-0.4	80	0.9	-0.5	2.2
MT	94	-0.2	-0.7	0.4	88	3.6	1.5	5.9
NE	69	-0.3	-0.7	0.1	64	-0.8	-2.4	0.9
NM	83	-0.8	-3.2	0.0	65	-0.8	-2.8	1.2
ND	51	0.4	-0.1	0.8	47	1.7	0.0	3.5
OK	60	-1.2	-1.6	-0.8	49	-1.6	-3.3	0.2
SD	58	0.2	-0.3	0.7	47	0.7	-1.1	2.6
TX	235	-1.1	-1.4	-0.8	198	-1.8	-2.8	-0.8
WY	127	-0.8	-1.4	-0.2	104	1.1	-0.7	3.1
Western	717	-1.3	-1.7	-1.0	522	-1.3	-2.3	-0.2
AZ	88	-1.4	-2.2	-0.7	64	-1.7	-4.1	0.7
CA	253	-0.8	-1.2	-0.3	167	-0.2	-1.8	1.4
ID	49	-1.7	-2.6	-0.7	42	-1.7	-4.5	1.2
NV	45	-2.4	-3.5	-1.4	32	-5.1	-9.8	-0.3
OR	115	-1.3	-2.1	-0.6	85	2.2	-0.1	4.6
UT	101	-2.2	-3.1	-1.3	80	-4.0	-6.2	-1.7
WA	78	0.0	-0.7	0.6	62	0.4	-1.3	2.4

[a] There is evidence of a positive trend if the lower CI > 0 and there is evidence of negative trend if the upper CI < 0. If the CI contains 0, then there is inconclusive evidence about trend in abundance.

[b] New England consists of CT, ME, MA, NH, RI, and VT; RI is a hunt state but was included in this group for purposes of analysis.

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

Management Unit & State	Harvest	Harvest SE	Active hunters	Active Hunters SE	Hunter days afield	Hunter days afield SE	Harvest per hunter[b]	Harvest per hunter SE
Eastern	4,648,300	196,200	293,800[a]	†[c]	792,700	31,500	†[c]	†[c]
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[a]	†[c]	1,171,000	79,800	†[c]	†[c]
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[a]	†[c]	226,100	13,100	†[c]	†[c]
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	3,800	800	9,900	2,500	8.6	2.7
NV	7,600	2,100	800	100	1,900	500	10.0	3.2
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[a]	†[c]	2,189,800	86,700	†[c]	†[c]

[a]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.
[b]Seasonal harvest per hunter.
[c] No estimate available.

Table 3. Preliminary estimates and their standard errors (SE) of mourning dove harvest and hunter activity during the 2021–22 hunting season[a]. Data rounded to nearest 100.

Management Unit & State	Harvest	Harvest SE	Active hunters	Active Hunters SE	Hunter days afield	Hunter days afield SE	Harvest per hunter[b]	Harvest per hunter SE
Eastern	3,822,100	156,700	256,800	†[c]	624,300	28,500	†[c]	†[c]
AL	456,200	61,100	32,500	3,200	65,800	7,000	14.0	2.3
DE	21,500	4,600	1,600	200	4,500	1,000	13.2	3.4
FL	110,200	27,800	7,200	1,600	21,200	4,400	15.2	5.1
GA	620,300	59,000	37,000	3,000	84,600	7,000	16.8	2.1
IL	150,600	25,300	11,800	1,700	23,800	3,300	12.8	2.8
IN	176,000	30,100	9,000	1,400	29,100	5,000	19.7	4.6
KY	376,100	42,700	12,100	500	41,800	4,000	31.0	3.7
LA	110,300	19,200	7,500	900	19,200	2,900	14.7	3.1
MD	89,200	15,800	6,000	1,000	13,000	2,300	14.9	3.7
MS	130,400	23,000	10,900	1,400	19,900	3,000	12.0	2.6
NC	549,300	60,600	37,100	4,000	81,400	8,400	14.8	2.3
OH	154,500	27,800	12,800	2,000	32,400	5,900	12.0	2.9
PA	54,500	12,900	9,200	2,800	38,100	18,200	5.9	2.3
RI	1,000	500	300	100	1,400	500	3.4	2.3
SC	347,600	62,900	20,900	3,400	50,100	9,100	16.6	4.0
TN	204,400	54,700	18,400	3,700	36,700	7,900	11.1	3.7
VA	208,000	19,400	15,900	1,700	37,000	4,000	13.1	1.9
WI	51,500	10,200	5,800	1,300	21,500	4,500	8.9	2.6
WV	10,400	1,700	1,000	100	2,700	400	10.6	2.2
Central	4,236,600	234,500	303,500	†[c]	874,700	50,300	†[c]	†[c]
AR	181,300	29,400	15,500	2,100	31,200	4,700	11.7	2.5
CO	122,900	13,900	9,800	800	25,700	3,000	12.6	1.7
IA	61,400	10,000	7,500	1,000	20,900	4,000	8.2	1.7
KS	400,200	44,000	25,500	2,500	64,600	6,900	15.7	2.3
MN	22,600	6,500	4,200	2,000	9,700	2,800	5.4	3.0
MO	259,700	39,700	19,800	2,000	51,300	6,300	13.1	2.4
MT	18,400	4,400	2,100	400	4,700	1,200	8.8	2.8
NE	148,000	15,800	10,400	1,100	27,000	3,000	14.3	2.2
NM	151,800	26,600	11,500	1,400	33,700	5,000	13.2	2.8
ND	91,500	15,800	5,500	900	20,100	3,400	16.5	3.9
OK	212,900	35,500	14,800	2,100	38,100	4,800	14.4	3.1
SD	88,200	16,900	5,400	900	12,300	1,800	16.2	4.1
TX	2,467,700	218,000	170,300	13,100	532,500	48,100	14.5	1.7
WY	10,000	2,600	1,200	300	2,900	800	8.1	2.7
Western	1,143,300	72,600	82,500	†[c]	211,000	12,900	†[c]	†[c]
AZ	308,600	24,400	17,900	800	50,500	3,200	17.2	1.6
CA	660,400	64,100	42,400	3,400	108,500	11,400	15.6	1.9
ID	83,000	21,200	8,600	1,600	17,600	3,600	9.7	3.0
NV	19,600	5,100	1,900	400	4,300	800	10.3	3.4
OR	20,300	6,800	3,400	700	11,200	2,600	6.0	2.3
UT	20,300	4,800	4,900	800	9,300	1,800	4.2	1.2
WA	31,100	5,000	3,400	500	9,700	1,800	9.1	1.9
United States	9,202,100	291,200	642,800	†[c]	1,710,000	59,200	†[c]	†[c]

[a]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.

[b]Seasonal harvest per hunter.

[c] No estimate available.

Table 4. Number of mourning doves banded in each management unit, state, and year, 2003–2021. Only known-age birds banded in July or August are included in the table and used in analysis of survival and harvest rates.

Management 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.[a]	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

[a]Combined total for North Atlantic non-hunt states: CT, NH, ME, MA, NJ, NY, and VT.

Table 4 (continued).

Management Unit & State	2014	2015	2016	2017	2018	2019	2020	2021
Eastern	17,993	18,448	16,772	16,069	16,876	16,221	17,500	15,296
AL	1,149	987	1,133	942	1,010	1,323	1,347	1,125
DE	202	38	94	92	30	169	109	135
FL	906	772	759	642	716	689	759	705
GA	954	1,336	1,152	1,132	1,466	1,650	1,810	1,310
IL	1,988	2,048	1,810	2,211	2,039	1,538	2,338	2,395
IN	1,237	977	653	1,171	982	689	764	0
KY	1,430	1,759	1,324	1,516	1,321	1,100	1,158	1,030
LA	1,066	1,769	1,596	1,232	1,759	1,346	1,761	771
MD	279	306	221	283	361	348	336	369
MI	0	0	0	0	0	0	0	0
MS	791	675	448	666	546	564	591	724
North Atl.[a]	141	118	159	191	10	3	6	24
NC	1,326	1,163	1,199	1,004	1,023	1,367	1,421	1,407
OH	1,336	1,312	1,316	1,314	1,072	1,300	921	1,138
PA	993	795	737	824	808	784	812	881
RI	0	55	0	0	0	15	29	39
SC	1,831	1,990	1,918	1,566	1,484	967	1,115	1,243
TN	677	611	540	609	530	730	769	755
VA	525	580	442	492	555	540	446	235
WI	789	800	887	746	798	873	773	769
WV	373	357	384	378	366	228	235	241
Central	21,545	19,516	19,982	18,357	15,417	16,379	15,552	13,237
AR	342	300	359	413	233	280	521	273
CO	1,335	1,011	1,419	923	1,017	1,125	1,329	1,221
IA	1,960	2,027	1,906	2,201	1,878	2,058	1,970	1,907
KS	3,233	3,332	2,868	3,403	2,451	2,457	2,478	2,218
MN	782	388	357	490	327	604	24	43
MO	2,997	1,966	1,983	1,465	1,635	1,242	1,294	984
MT	417	439	283	330	330	549	431	393
NE	1,505	1,357	1,718	1,458	1,101	1,094	1,207	1,007
NM	661	701	682	855	1,131	866	765	645
ND	1,675	1,620	1,647	1,685	614	1,356	1,312	1,116
OK	1,561	1,604	1,402	1,154	740	971	688	401
SD	1,872	2,052	2,329	1,278	1,197	916	1,038	828
TX	2,770	2,391	2,645	2,115	2,022	2,123	1,999	1,614
WY	435	328	384	587	741	739	496	587
Western	10,139	10,951	9,110	9,098	10,195	8,529	7,733	8,567
AZ	3,319	2,983	3,032	3,388	3,532	3,445	2,987	2,368
CA	3,510	4,535	3,293	3,265	3,877	2,384	1,811	2,775
ID	756	770	685	657	646	657	652	733
NV	600	401	498	415	458	636	444	549
OR	1,122	1,057	737	697	886	860	961	722
UT	349	282	59	73	13	52	306	226
WA	483	923	806	603	783	495	572	1,194
United States	49,677	48,915	45,864	43,524	42,488	41,133	40,785	37,100

[a]Combined total for North Atlantic non-hunt states: CT, NH, ME, MA, NJ, NY, and VT.

Table 5. Estimates of mean annual survival and harvest rate of mourning doves by management unit and state that banded doves, 2003–2021. Estimates by age-class: hatch-year (HY) and after-hatch-year (AHY).

Management Unit & State	HY Survival	HY Survival SE	AHY Survival	AHY Survival SE	HY Harvest Rate	HY Harvest Rate SE	AHY Harvest Rate	AHY Harvest Rate SE
Eastern	0.273	0.006	0.420	0.004	0.091	0.001	0.061	0.001
AL	0.272	0.019	0.430	0.016	0.107	0.008	0.068	0.005
DE-MD[a]	0.287	0.024	0.390	0.020	0.129	0.009	0.092	0.007
FL	0.293	0.032	0.446	0.023	0.040	0.005	0.033	0.005
GA	0.277	0.016	0.420	0.013	0.135	0.005	0.083	0.006
IL	0.287	0.016	0.397	0.016	0.073	0.003	0.049	0.004
IN	0.255	0.022	0.399	0.013	0.086	0.007	0.078	0.005
KY	0.326	0.019	0.419	0.012	0.067	0.004	0.054	0.003
LA	0.312	0.011	0.460	0.013	0.110	0.005	0.057	0.005
MS	0.224	0.017	0.417	0.018	0.150	0.008	0.090	0.005
North Atlantic[b]	0.302	0.086	0.572	0.064	0.005	0.008	0.004	0.003
NC	0.209	0.013	0.403	0.013	0.104	0.007	0.066	0.004
OH	0.268	0.021	0.399	0.015	0.056	0.003	0.041	0.004
PA	0.225	0.023	0.411	0.025	0.045	0.005	0.021	0.003
SC	0.282	0.014	0.424	0.011	0.099	0.006	0.062	0.003
TN	0.206	0.016	0.386	0.017	0.119	0.005	0.078	0.004
VA	0.355	0.038	0.441	0.023	0.031	0.005	0.041	0.004
WI	0.321	0.027	0.480	0.023	0.052	0.005	0.031	0.004
WV	0.401	0.048	0.472	0.041	0.026	0.005	0.022	0.003
Central	0.271	0.007	0.457	0.004	0.066	0.001	0.052	0.001
AR	0.223	0.023	0.422	0.020	0.090	0.011	0.064	0.006
CO	0.532	0.046	0.490	0.023	0.014	0.002	0.030	0.004
IA	0.250	0.015	0.473	0.013	0.045	0.008	0.032	0.007
KS	0.312	0.016	0.466	0.010	0.064	0.004	0.062	0.004
MN	0.374	0.035	0.555	0.024	0.025	0.003	0.014	0.003
MO	0.158	0.008	0.379	0.009	0.155	0.009	0.130	0.007
MT	0.255	0.062	0.548	0.055	0.022	0.005	0.013	0.003
ND	0.436	0.032	0.583	0.018	0.011	0.001	0.008	0.001
NE	0.344	0.030	0.464	0.016	0.022	0.002	0.028	0.002
NM	0.487	0.074	0.556	0.048	0.014	0.003	0.009	0.002
OK	0.262	0.017	0.422	0.017	0.078	0.006	0.065	0.007
SD	0.420	0.018	0.483	0.013	0.029	0.003	0.024	0.002
TX	0.333	0.020	0.473	0.014	0.058	0.004	0.042	0.004
WY	0.373	0.116	0.525	0.061	0.012	0.002	0.010	0.001
Western	0.301	0.012	0.446	0.007	0.042	0.001	0.035	0.001
AZ	0.310	0.022	0.419	0.015	0.021	0.003	0.016	0.001
CA	0.303	0.017	0.442	0.010	0.059	0.005	0.060	0.006
ID	0.316	0.043	0.544	0.025	0.025	0.003	0.021	0.002
NV	0.270	0.040	0.483	0.032	0.041	0.007	0.035	0.004
OR	0.327	0.039	0.408	0.029	0.032	0.006	0.036	0.004
UT	0.260	0.048	0.521	0.051	0.024	0.005	0.017	0.003
WA	0.289	0.022	0.422	0.024	0.054	0.005	0.038	0.006

[a]Data combined for Delaware and Maryland.
[b]Data combined for North Atlantic states: CT, NH, ME, MA, NJ, NY, RI, and VT.

Table 6. Estimated age ratios (juveniles per adult) by management unit and state based on the Parts Collection Survey, 2007–2021. Age ratios are corrected for unknown age wings and differential vulnerability. Sample size is the number of wings examined.

Management Unit & State	Age Ratio 2007[a]	Age Ratio SE 2007	Age Ratio 2008	Age Ratio SE 2008	Age Ratio 2009	Age Ratio SE 2009	Age Ratio 2010	Age Ratio SE 2010	Age Ratio 2011	Age Ratio SE 2011	Age Ratio 2012	Age Ratio SE 2012
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[b]	----	----	----	----	----	----	----	----	----	----	----	----
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	†[c]	†	†	†	†	†	†	†	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

[a] 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.
[b] Insufficient data to estimate age ratio for RI in most years.
[c] Iowa did not have a hunting season until 2011.

Table 6 (continued).

Management Unit & State	Age Ratio 2013[a]	Age Ratio SE 2013	Age Ratio 2014	Age Ratio SE 2014	Age Ratio 2015	Age Ratio SE 2015	Age Ratio 2016	Age Ratio SE 2016	Age Ratio 2017	Age Ratio SE 2017	Age Ratio 2018	Age Ratio SE 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[b]	----	----	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

[a] 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.

[b] Insufficient data to estimate age ratio for RI in most years.

Table 6 (continued).

Management Unit & State	Age Ratio 2019[a]	Age Ratio SE 2019	Age Ratio 2020	Age Ratio SE 2020	Age Ratio 2021	Age Ratio SE 2021	All Years Sample Size	All Years Mean	All Years SE
Eastern	1.69	0.05	1.27	0.04	1.08	0.04	98,115	1.47	0.01
AL	2.06	0.35	1.12	0.30	1.42	0.19	4,598	1.64	0.05
DE	3.71	1.89	1.32	0.25	1.30	0.38	2,134	1.49	0.07
GA	2.01	0.18	0.90	0.10	1.25	0.15	6,835	1.68	0.04
IL	1.72	0.19	1.21	0.18	0.73	0.14	8,599	1.45	0.03
IN	1.47	0.15	1.66	0.18	1.06	0.17	10,812	1.50	0.03
KY	2.45	0.23	1.60	0.14	1.34	0.13	7,741	1.54	0.04
LA	1.29	0.26	0.71	0.18	2.06	0.74	2,069	1.64	0.07
MD	2.60	0.48	1.79	0.29	1.30	0.19	4,482	1.64	0.05
MS	1.46	0.22	1.37	0.20	1.14	0.35	5,112	1.33	0.04
NC	1.89	0.22	1.00	0.12	0.91	0.11	9,493	1.30	0.03
OH	0.95	0.29	1.26	0.21	0.49	0.12	4,696	1.45	0.04
PA	0.85	0.18	1.56	0.22	1.03	0.24	3,478	1.18	0.04
RI[b]	----	----	----	----	----	----	35	4.29	1.85
SC	1.89	0.19	1.22	0.17	1.09	0.17	9,393	1.62	0.03
TN	1.36	0.23	1.12	0.26	0.91	0.14	3,938	1.58	0.05
VA	1.15	0.11	1.14	0.12	0.97	0.15	10,213	1.27	0.03
WI	2.07	0.36	2.35	0.56	1.46	0.46	2,635	1.63	0.07
WV	1.29	0.23	0.85	0.18	1.58	0.36	1,887	1.43	0.07
Central	1.17	0.04	1.11	0.04	1.10	0.04	89,877	1.09	0.01
AR	1.85	0.47	1.38	0.25	1.29	0.25	4,694	1.36	0.04
CO	1.12	0.10	1.05	0.11	1.20	0.12	9,611	1.14	0.02
IA	1.10	0.11	1.05	0.10	1.31	0.15	3,583	1.16	0.04
KS	1.05	0.14	0.91	0.12	0.97	0.13	9,157	1.15	0.02
MN	0.90	0.20	1.57	0.26	1.12	0.27	2,079	1.30	0.06
MO	1.46	0.13	1.09	0.12	0.80	0.10	8,475	1.39	0.03
MT	1.72	0.27	1.44	0.26	1.61	0.47	2,894	1.20	0.04
ND	1.43	0.14	1.14	0.14	0.97	0.16	4,925	1.23	0.04
NE	0.94	0.09	1.13	0.10	0.92	0.10	8,339	0.89	0.02
NM	0.59	0.10	0.53	0.10	1.07	0.33	4,513	0.56	0.02
OK	0.94	0.12	0.77	0.08	1.33	0.18	7,008	1.29	0.03
SD	1.73	0.17	1.17	0.13	1.41	0.17	6,709	1.14	0.03
TX	1.25	0.12	1.09	0.11	1.01	0.11	14,315	1.09	0.02
WY	2.40	0.61	1.58	0.30	2.90	0.63	3,575	1.17	0.04
Western	1.14	0.04	0.87	0.04	1.23	0.07	46,451	1.20	0.01
AZ	0.75	0.04	0.52	0.04	0.60	0.06	15,716	0.69	0.01
CA	1.38	0.08	1.03	0.08	1.90	0.16	13,148	1.33	0.02
ID	0.81	0.16	2.27	0.82	1.58	0.50	3,861	1.37	0.04
NV	1.40	0.27	----[c]	----	----	----	3,181	1.10	0.04
OR	2.19	0.48	1.36	0.28	1.52	0.54	1,988	1.48	0.07
UT	0.88	0.14	1.26	0.25	1.70	0.61	2,721	1.07	0.04
WA	2.26	0.37	1.74	0.28	1.35	0.24	5,836	1.61	0.04

[a] 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.
[b] Insufficient data to estimate age ratio for RI in most years.
[c] Insufficient data to estimate age ratio for NV in 2020–21.

Table 7. Estimates of absolute abundance and their standard error (SE) of mourning doves on 1 September each year based on band recovery and harvest data by year and management unit (Eastern=EMU, Central=CMU, and Western=WMU) in the U.S., 2003–2021.

Year	EMU Abundance	EMU SE	CMU Abundance	CMU SE	WMU Abundance	WMU SE	U.S. Abundance	U.S. SE
2003	94,997,885	5,927,250	126,864,487	9,981,171	104,487,281	18,756,756	326,349,653	22,058,376
2004	84,676,886	3,567,091	228,689,538	14,483,776	89,438,971	10,792,698	402,805,395	18,411,579
2005	128,808,635	5,414,863	213,978,697	14,768,228	35,708,067	3,145,394	378,495,398	16,041,035
2006	89,221,856	3,606,235	210,109,377	14,289,605	49,886,659	4,708,026	349,217,892	15,471,369
2007	101,824,281	4,579,800	174,034,726	11,624,655	55,492,966	4,075,902	331,351,973	13,142,303
2008	96,519,463	3,974,326	186,193,535	12,070,199	49,891,942	4,175,607	332,604,940	13,376,122
2009	100,968,788	4,150,479	160,813,209	9,827,596	51,484,683	3,573,738	313,266,680	11,250,765
2010	88,453,847	4,095,377	161,028,300	10,378,064	55,760,146	3,947,119	305,242,293	11,834,529
2011	84,263,204	4,378,879	142,046,546	8,080,756	51,358,407	4,051,521	277,668,157	10,044,303
2012	85,521,639	4,356,184	153,308,876	12,614,214	66,160,816	5,208,051	304,991,331	14,325,450
2013	84,729,922	5,354,648	125,259,102	8,341,927	49,178,051	3,703,235	259,167,075	10,581,775
2014	67,174,157	3,418,470	170,391,830	10,186,979	43,657,356	3,210,150	281,223,343	11,214,524
2015	63,209,108	3,284,388	177,453,490	10,320,127	35,115,690	2,408,306	275,778,288	11,094,691
2016	62,430,702	3,523,932	170,271,410	13,611,495	45,857,068	3,491,498	278,559,179	14,487,286
2017	63,543,969	3,246,544	128,927,682	8,257,041	46,075,465	3,893,183	238,547,116	9,688,945
2018	52,476,017	2,547,076	136,991,762	7,673,507	57,176,994	3,805,201	246,644,774	8,935,875
2019	42,549,975	2,006,982	113,196,922	8,517,785	22,983,991	1,536,004	178,730,888	8,884,816
2020	50,929,425	2,567,299	105,086,379	6,828,914	31,960,889	2,650,841	187,976,694	7,762,220
2021	39,531,415	2,001,047	82,110,375	5,763,288	45,756,145	4,342,183	167,397,935	7,488,273

Appendix A. Federal framework dates, season length, and daily bag limit for mourning dove hunting in the U.S. by management unit (Eastern=EMU, Central=CMU, and Western=WMU), 1918–2022.

Year	EMU Dates[a]	EMU Days	EMU Bag	CMU Dates	CMU Days	CMU Bag	WMU Dates	WMU Days	WMU 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[b]	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[c]	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[d]	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[e]	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[f]	Sep 1–Jan 15	70[g]	12	Sep 1–Jan 15	60	15	Sep 1–Jan 15	50	10
1962	Sep 1–Jan 15	70[g]	12	Sep 1–Jan 15	60	12	Sep 1–Jan 15	50	10
1963	Sep 1–Jan 15	70[g]	10	Sep 1–Jan 15	60	10	Sep 1–Jan 15	50	10
1964–67	Sep 1–Jan 15	70[g]	12	Sep 1–Jan 15	60	12	Sep 1–Jan 15	50	12
1968	Sep 1–Jan 15	70[g]	12	Sep 1–Jan 15	60	12	Sep 1–Jan 15	50	10
1969–70	Sep 1–Jan 15	70[g]	18[h]	Sep 1–Jan 15	60	10	Sep 1–Jan 15	50	10
1971–79	Sep 1–Jan 15	70[g]	12	Sep 1–Jan 15	60	10	Sep 1–Jan 15	50	10
1980	Sep 1–Jan 15	70	12	Sep 1–Jan 15[i]	60	10	Sep 1–Jan 15	70[j]	10[k]
1981	Sep 1–Jan 15	70	12	Sep 1–Jan 15[i]	45[l]	15[l]	Sep 1–Jan 15	70[j]	10[k]
1982	Sep 1–Jan 15	45[m]	15[m]	Sep 1–Jan 15[i]	45[m]	15[m]	Sep 1–Jan 15	45[m]	15[m]
1983–86	Sep 1–Jan 15	60[m]	15[m]	Sep 1–Jan 15[i]	60[m]	15[m]	Sep 1–Jan 15	60[m]	15[m]
1987–07[n]	Sep 1–Jan 15	60[m]	15[m]	Sep 1–Jan 15[i]	60[m]	15[m]	Sep 1–Jan 15	60[o]	10
2008	Sep 1–Jan 15	70	15	Sep 1–Jan 15[i]	60[m]	15[m]	Sep 1–Jan 15	60[o]	10
2009–13	Sep 1–Jan 15	70	15	Sep 1–Jan 15[i]	70	15	Sep 1–Jan 15	60[o]	10
2014	Sep 1–Jan 15	90	15	Sep 1–Jan 15[i]	70	15	Sep 1–Jan 15	60[o]	15
2015	Sep 1–Jan 15	90	15	Sep 1–Jan 15[i]	70	15	Sep 1–Jan 15	60	15[p]
2016–17	Sep 1–Jan 15	90	15	Sep 1–Jan 15[i]	90	15	Sep 1–Jan 15	60	15[p]
2018–21	Sep 1–Jan 31	90	15	Sep 1–Jan 15[i]	90	15	Sep 1–Jan 15	60	15[p]

[a] 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.

[b] Beginning in 1937, the bag and possession limit included white-winged doves in selected states.

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

[d] In 1954–1955, states permitting dove hunting were listed separately. Only bag and possession limits, and season dates were specified.

Appendix A. Continued.

[e] 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.

[f] In 1960, states were grouped by management unit for the first time. Maximum season length was specified for the first time.

[g] Half days.

[h] More liberal limits allowed in conjunction with an Eastern Management Unit hunting regulations experiment.

[i] The framework extended to January 25 in Texas.

[j] 50–70 days depending on state and season timing.

[k] Arizona was allowed 12.

[l] States had the option of a 60-day season and daily bag limit of 12.

[m] States had the option of a 70-day season and daily bag limit of 12.

[n] 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.

[o] 30–60 days depending on state (30 in Idaho, Nevada, Oregon, Utah, Washington; 60 in Arizona and California).

[p] 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.