

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

US Fish & Wildlife Publications

US Fish & Wildlife Service

2008

Priority Information Needs for Mourning and White-winged Doves

Dave Case

D.J. Case & Associates, dave@djcase.com

Follow this and additional works at: <https://digitalcommons.unl.edu/usfwspubs>

Case, Dave, "Priority Information Needs for Mourning and White-winged Doves" (2008). *US Fish & Wildlife Publications*. 327.

<https://digitalcommons.unl.edu/usfwspubs/327>

This Article is brought to you for free and open access by the US Fish & Wildlife Service at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in US Fish & Wildlife Publications by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.



Priority Information Needs for Mourning and White-winged Doves

A FUNDING STRATEGY

Developed by the Association
of Fish and Wildlife Agencies'
Migratory Shore and Upland
Game Bird Support Task Force.

June 30, 2008



Priority Information Needs for Mourning and White-winged Doves

A Funding Strategy

Developed by the Association of Fish and Wildlife Agencies'
Migratory Shore and Upland Game Bird Support Task Force

Compiled and Edited by
Dave Case, D.J. Case & Associates

June 30, 2008

Photo credits

Bruce Taubert: cover, white-winged dove (first photo), mourning dove (third photo),
white-winged dove (fourth photo)

Alfred Yan: cover, mourning dove (second photo)

Table of Contents

Executive Summary	i
Introduction	1
Status of Doves.....	2
Priority Information Needs	4
Priority 1. A National Banding Program for Doves	4
Priority 2. A National Dove Parts Collection Survey.....	5
Priority 3. Independent Measures of Abundance and/or Trends for Doves.....	6
Priority 4. A Database of Predictors of Dove Vital Rates	7
Measuring Success.....	9
Literature Cited.....	10
Appendix A: February 12-14, 2008 Workshop Participants.....	11

<i>Table 1. Preliminary Nationwide Estimates of Migratory Shore and Upland Game Bird Harvest and Hunter Activity (2005 and 2006)</i>	2
--	---

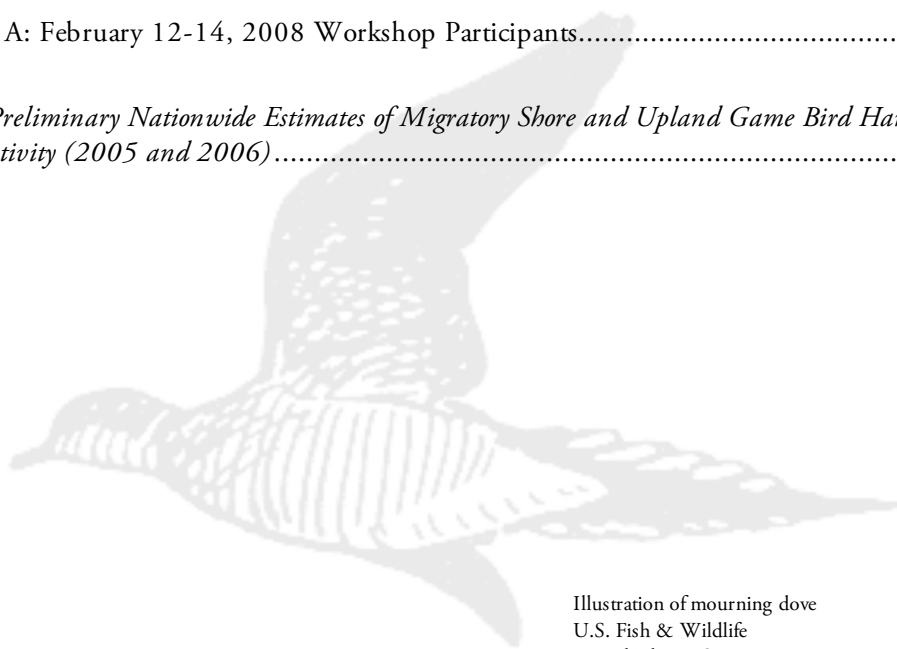


Illustration of mourning dove
U.S. Fish & Wildlife
Digital Library System

Executive Summary

This Strategy contains recommendations for obtaining priority information needed to reduce the uncertainties underlying management decisions for two of the most important game birds in North America, mourning and white-winged doves. This strategy is intended to increase the financial support for management over the next five to 10 years with thoughtful and deliberate planning built on basic scientific principles.

The Task Force determined that convening a workshop of national dove experts to develop the strategy would be the most efficient and effective process. By invitation of the Migratory Shore and Upland Game Bird Working Group chairman, experts from state and federal agencies, flyways and universities were invited to the workshop. Experts from Canada and Mexico were also invited, but were unable to attend. The workshop was held February 12-14, 2008, at the U.S. Fish and Wildlife Service (FWS) Region 6 Office in Denver, Colorado.

By almost every measure, mourning and white-winged doves are critically important game birds in North America. The mourning dove is the most harvested migratory game bird species in the U.S. — nearly 20.7 million mourning doves were harvested by nearly 1.1 million hunters each year in 2005 and 2006.

In addition, mourning doves (and white-winged doves in the Southwest) are valued by the public in rural, suburban, and urban locales because they occur widely, nest readily around yards and farmsteads, and are frequent visitors to bird feeders (Schwertner et al., 2002).

The economic impact of dove hunting is considerable. The 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation estimated that average annual expenditures for migratory bird hunters are \$588 each.

Four priority information needs for mourning and white-winged doves have been determined:

- 1) A national banding program for doves.
- 2) A national dove parts collection survey.
- 3) Independent measures of abundance and/or trends for doves.
- 4) A database of predictors of dove vital rates.

Workshop participants identified four overarching guidelines that should be considered in further development of each of the priority information needs:

- 1) Consider the involvement of Canada and Mexico.
- 2) Account for differences in urban and rural doves.
- 3) Gather human dimensions information.
- 4) Consider the effects of climate or system change and its impacts on dove vital rates.

Priority information needs outlined in this Strategy will increase management population performance significantly by:

- Reducing uncertainty surrounding vital rates and management decisions;
- Enabling management actions to be more responsive to changes in vital rates; and
- Providing information to enable a more formal decision-making process.

Ultimately, these priorities help build on the foundation of current efforts in a way that ensures the long-term conservation and informed harvest management of these critically important birds in the face of a changing environment.



Photo by Bruce Taubert

Introduction

The Migratory Shore and Upland Game Bird Working Group (Working Group) met during the March 2006 meeting of the Association of Fish and Wildlife Agencies. The Working Group established a Migratory Shore and Upland Game Bird Support Task Force (Task Force) to assist it. The Task Force is composed of nine representatives of state, federal and non-governmental organizations. The Task Force was directed to update the research and management needs of the 16 species of migratory shore and upland game birds (MSUGB), and to develop a strategy for funding priority research and management needs for these species.

With the approval of the Working Group, the Task Force completed the update of the list of research and management needs, but did not establish priorities for the needed work. The Task Force also placed the 16 species into five groups because it was determined that separate strategies for each species were not possible. Finally, the Task Force developed criteria to determine which of the species groups should be the subject of the first strategy, and the mourning dove and white-winged dove species group was chosen.

Strategy Purpose

This Strategy contains recommendations for obtaining *priority* information needed to reduce the uncertainties underlying management decisions for mourning and white-winged doves. The Strategy focuses on identifying priority information needs as they influence vital rates during the annual cycle of these birds.

The Strategy is intended to increase the financial support for management and research activities over the next five to 10 years with thoughtful and deliberate planning built on basic scientific principles. It can be used to guide the acquisition and expenditure of funds, as well as provide the means to attract additional funds from partners interested in migratory shore and upland game birds.

Separate from the Strategy, an action plan will be developed to encourage partners to collaborate and support these information needs, to use or redirect current funding, and/or to secure new funding. It will describe a budget process or other means of securing funds. Finally, this action plan will ensure that everyone presents a consistent message when pursuing funding.

Strategy Development Process

The Task Force determined that convening a workshop of national dove experts to develop the strategy would be the most efficient and effective process.

By invitation of the Working Group Chairman, experts from flyways, universities, and from state and federal agencies in the United States, Canada and Mexico were invited to the workshop. The workshop was held February 12-14, 2008, at the U.S. Fish and Wildlife Service (FWS) Region 6 Office in Denver, Colorado.

A list of workshop participants is included in Appendix A. The Task Force retained Dave Case, D.J. Case & Associates, to facilitate the workshop. A draft of the Strategy was compiled and edited by Dave Case and distributed to workshop participants on April 21, 2008. Comments were incorporated, and a second draft was distributed for review on May 23, 2008.

Status of Doves

Important Resource

By almost every measure, mourning and white-winged doves are critically important game birds in North America.

The mourning dove is the most harvested migratory game bird species in the U.S. — Nearly 20.7 million mourning doves were harvested by nearly 1.1 million hunters each year in 2005 and 2006 (Table 1).

Preliminary Nationwide Estimates of Migratory Shore and Upland Game Bird Harvest and Hunter Activity

Average for 2005 and 2006 Hunting Seasons¹

Species	Harvest	Active Hunters ²	Days Afield
Mourning dove	20,697,600	~1,098,100	3,623,200
White-winged dove	1,305,450	~152,500	592,400
American woodcock	304,500	~120,600	505,450
American coot	190,200	~34,150	114,350
Common snipe	98,700	~24,000	56,750
Sora	30,300	Unavailable	Unavailable
Common moorhen ³	22,150	~6800	17,350
Sandhill crane ⁴	19,524	>10,800	Unavailable
Band-tailed pigeon	16,400	~7,500	16,200
Clapper rail	9,600	Unavailable	Unavailable
White-tipped dove ⁵	2,300	~28,300	52,600
King rail	200	Unavailable	Unavailable
Puerto Rico⁶		2,900⁷	Unavailable
White-winged dove	34,750		
Scaly-naped pigeon	23,650		
Zenaida dove	11,200		
Mourning dove	5,600		

¹ Data from Harvest Information Program unless noted otherwise.

² This total is slightly biased high because people are counted more than once if they hunted in more than one state.

³ Includes a small number of purple gallinules.

⁴ Estimates only for Mid-continent and Rocky Mountain Populations in the U.S.

⁵ Data from state survey in Texas; results from first two weekends of hunting.

⁶ Data from survey in Puerto Rico.

⁷ Average number of Columbidae hunters in Puerto Rico.

According to the 2006 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, 1.2 million hunters spent 5.9 million days hunting doves in 2006. By contrast, the survey found that 1.1 million hunters spent 12.2 million days hunting ducks in 2006.

The economic impact of dove hunting is considerable. The 2006 Survey estimated average annual expenditures for migratory bird hunters at \$588 each.

In addition, mourning doves (and white-winged doves in the Southwest) are valued by the public in rural, suburban, and urban locales because they occur widely, nest readily around yards and farmsteads, and are frequent visitors to bird feeders (Schwertner et al., 2002).

Population Status and Trends

The mourning dove is ranked eleventh among 251 species in relative abundance throughout its distribution (Droege and Sauer, 1990), and population abundance in the U.S. has been estimated to be approximately 350 million (Otis, unpublished data).

White-winged doves occur in huntable numbers in at least 13 states and are increasing their range in the southeastern and south-central United States (George et al., 2000). They are the second most important MSUGB species in the U.S. in terms of harvest, number of hunters and days of hunting (Table 1). In some states, like Texas, white-winged doves now comprise a quarter of the total annual dove harvest.

In spite of the widespread distribution and large population sizes of both mourning and white-winged doves, there has been concern among managers for some time about potentially declining populations in some portions of their ranges based on nationwide mourning dove call count survey (Dolton et al., 2007) and the North American Breeding Bird Survey (Sauer et al., 2007). In 1998, the FWS notified the Central Management Unit Technical Committee and the Southeastern Dove Technical Committee that "if downward trends [in the Call Count Survey indices] continue, it may be prudent to consider some type of harvest restriction...and place a priority on ...a harvest management strategy for mourning doves...". "The strategy needs to include decision criteria that explicitly state when regulatory changes will be made and should clearly define what the changes will be...provide estimates...of the effect of various regulatory options." A dynamic modeling approach to harvest management for both species provides the opportunity to learn how hunting regulations and habitat change affect breeding populations.

Managers have long recognized that "an informed harvest management strategy for mourning doves requires a long-term coordinated commitment to demographic data collection and assessment, quantitative population models, and adaptive resource management" (2003 Mourning Dove National Strategic Harvest Management Plan).

Fulfilling the priority information needs identified in this Strategy will have a high probability of yielding a meaningful, coherent and informative harvest management strategy. The priority information in this strategy will also ensure better understanding of variation in dove vital rates. Better understanding of this variation is critical to understanding effects of various regulatory changes as articulated in the National Plan.

Priority Information Needs

Workshop participants determined that, in spite of some differences between mourning and white-winged doves, the information needed to improve harvest management decisions for both species was similar and thus, for purposes of this strategy, the priorities for both species are the same.

Four priority information needs (in priority order) have been determined:

- Priority 1. A national banding program for doves
- Priority 2. A national dove parts collection survey
- Priority 3. Independent measures of abundance and/or trends for doves
- Priority 4. A database of predictors of dove vital rates

Following for each of the priorities are the rationale, description, and timetable and cost.

Priority 1. A National Banding Program for Doves

Rationale

An operational national banding program for mourning and white-winged doves will provide necessary data for estimating a variety of vital rates and harvest rates with adequate statistical precision. An experimental national banding program has been underway since 2003, but the primary obstacle in initiating such a program is the lack of securing a reliable, long-term funding mechanism that involves all collaborators. Consistent involvement by cooperators in a banding program is imperative for attaining reliable estimates of vital rates, harvest rates, and their associated variances. Since the initiation of modern mourning dove banding in 2003, current annual banding costs being born by state wildlife agencies have been estimated at over \$1.5 million annually. Many states have indicated that current inputs by their agencies are not sustainable, thus jeopardizing the operational banding program.

Description

Initially, banding would occur in the 39 conterminous states that permit dove hunting. Proportional allocation of funds should be based in part on state land area and relative Call Count Survey information within a management unit. Total banding quotas will be specified in a FWS Banding Needs Assessment document to be developed in 2008, and will be driven by statistical criteria related to precision of vital rate estimates.

Also, the FWS's National Wildlife Refuge System has the potential to play a significant role in meeting mourning and white-winged dove banding goals. The relative importance of the Refuge

Workshop participants identified four overarching guidelines that should be considered in further development of each of the priority information needs.

- Consider the involvement of Canada and Mexico. It is important to evaluate the potential importance of breeding, migration, wintering habitats, and harvest levels that occur in Canada and Mexico into management decisions. New or expanded information-gathering activities should be rangewide in scope.
- Account for differences in urban and rural doves in estimating vital rates and understanding basic population dynamics. Current information-gathering techniques are not responsive in these two distinctively different habitats.
- Gather human dimensions information. Very little information on hunters is available to inform changes in the management of doves and dove hunting at a national or management unit scale. Yet, much of this management is directed at achieving implicit or explicit objectives regarding hunter satisfaction, participation, recruitment and retention. Opportunities exist within each of the four priority information needs to acquire more and better human dimensions information.
- Consider the effects of climate or system change and its impacts on dove vital rates. There are several reasons why doves could serve as "sentinels" for the effects of global climate change. This is discussed in more detail under Priority 4.

System in meeting goals will vary by state, depending upon the distribution of refuges. Consequently, both states and the federal refuges will require funding support to ensure banding quotas are met.

Timetable and Cost

Current estimates indicate that \$600,000 will help defray the annual costs of labor and supplies for participating states. This amount does not include funding needed by the National Wildlife Refuge System for dove banding. The banding program should be evaluated approximately every 10 years.

Priority 2. A National Dove Parts Collection Survey

Rationale

Over the last three years, about 20 states that have dove hunting seasons have been collecting dove wings in the field from hunters. These wings are subsequently examined to estimate the age composition of the dove harvest. While these state wing collections are a means of obtaining an annual sample of dove wings, the hunters that provide these dove wings are not randomly selected, and these hunters may not be representative of the entire dove hunter population. Thus, there are concerns that the resulting age composition estimates of the harvest may not be a true reflection of the age composition of the U.S. dove harvest as a whole.

In 2007, the FWS initiated a mail parts collection survey for doves to obtain productivity estimates (harvest age ratios) at the state and management unit levels. Randomly selected successful hunters who responded to the Migratory Bird Hunter Dove Survey the previous year were asked to complete and return a postcard if they were willing to participate in the Dove Parts Collection Survey. Those who answered “Yes” were sent two postage-paid envelopes before the hunting season, and asked to send in one wing from each dove that they harvested during their first two hunts at the beginning (first week) of the dove season.

This experimental mail survey will be conducted concurrently with the state surveys for a period of three years. The FWS will compare the results and the cost of its experimental mail survey with the results and costs of other mourning dove collection methods employed by most states. Given the available information, it appears that the long-term method for estimating recruitment will be through a mail survey of dove hunters.

Description

Given that the three-year experimental survey is successful, it will then become an operational dove parts collection survey in the United States.

This survey will be conducted annually in all states that have dove seasons, and in any other states that would like to participate. A mail survey is expected to provide the most cost-effective opportunity to achieve a random sample of approximately 50,000 dove wings, which should be representative of the harvest. Harvest age ratios obtained from this survey will provide annual productivity estimates, to be used as input data in the National Mourning Dove Strategic Harvest Management Strategy.

In addition, this parts collection survey could be used to provide species composition estimates of the dove harvest. Presently, there is some concern about hunters’ abilities to identify doves to species (i.e., mourning doves, white-winged doves, Eurasian collared doves) which could lead to a potential

bias in harvest estimates. Species composition estimates obtained from this mail survey can help examine the magnitude and direction of any potential bias and to evaluate any changes over time.

Timetable and Cost

The annual cost of this survey is estimated to be \$75,000/year, with a one-time cost of approximately \$20,000 for the purchase and installation of a walk-in freezer to store dove wings until they can be examined. A proposed location of the freezer and annual wing bee is the James Reed Wildlife Management Area in Lee's Summit, MO.

Priority 3. Independent Measures of Abundance and/or Trends for Doves

Rationale

The importance of estimating population change is reflected in the management goal and objective of the 2003 Mourning Dove National Strategic Harvest Management Plan. That goal is to “...*develop and continuously improve an objective framework for making informed harvest management decisions based on demographic models that predict the effects of harvest management actions and environmental conditions on **population abundance**.*” The specific objective is to “...*promulgate regulations that will maximize expected harvest rate while maintaining the desired **population abundance**.*”

In combination with population models based on information from banding and parts-collection surveys, independent estimates of abundance are necessary to evaluate the veracity of models and the resulting effects of harvest regulation changes on dove populations.



Description

If a comprehensive banding program is implemented (Priority 1 in this Strategy), two derived estimates of abundance could be calculated using banding data with relatively little extra cost:

1. Capture-recapture estimators are calculated from the ratios of marked to unmarked doves.
2. An alternative abundance estimate derived from banding data uses harvest and harvest rate.

A completely independent, robust abundance estimate or annual change in density may be derived that accounts for observer and environmental differences and corresponding differences in detection. These methods might include double-sampling, double-observer and distance sampling. Compared to the current CCS, or the Breeding Bird Survey (BBS), distance sampling may provide much more robust, unbiased and precise estimates of abundance. Only one more variable (distance) needs to be collected on existing CCS roadside routes and within existing survey protocols; however, it would be expensive to test DS at a large scale.

Non-representative sampling only along roadsides is a fundamental concern of those analyzing and interpreting both CCS and BBS data. Non-representative sampling is not addressed by DS procedures. It must be addressed by separate studies. The tendency for doves to be either attracted to or repelled from secondary roads is not well understood. It may be that most dove habitat is now sufficiently close to some secondary roads that roadside bias is minimal. It may be that the variance of dove density estimates derived from points along such roads may not vary across similar landscapes and over time. This should be tested even if traditional CCS or BBS techniques are continued.

Timetable and Cost

DERIVED ESTIMATES The estimated costs to derive periodic estimates of dove population size from capture/recapture techniques and ratio estimators may initially be \$25,000/year. Such estimates could periodically (e.g., every five years) be used to validate or verify the trends in dove abundance determined by banding and HIP sampling data.

DISTANCE SAMPLING The estimated cost and timeline for completion of a regional replicated comparison of changes in distance sampling density estimates with other estimates using existing CCS routes would likely be \$100,000/year for four years.

BIAS IN DOVE ROADSIDE COUNTS (NON-REPRESENTATIVE SAMPLING) Testing whether dove densities 'near' to roads (CCS routes) are representative of dove densities 'away' from roads would likely cost \$900,000 (i.e. \$100,000/yr for three years and replicated concurrently on at least three different sites or states). Note that this is for an initial pilot study, and will require additional ongoing operational funds for implementation.

Priority 4. A Database of Predictors of Dove Vital Rates

Rationale

In an informed process for dove harvest management, regulations are chosen based primarily on an understanding of how subsequent harvest might affect population status through changes in population vital rates, such as survival and productivity, and to a lesser extent by immigration and emigration. Thus, part of the decision process is to anticipate how these vital rates will vary under a particular regulatory option. However, variability in vital rates of doves is also likely influenced by

many environmental factors outside of hunting, such as weather/climate, disease, and habitat. By learning how key environmental factors affect vital rates, it will be much easier to isolate the effect of hunting regulations on these rates. In addition, where key factors can be measured in a timely fashion, this information could directly inform the choice of regulations at a particular point in time. Another benefit of learning more about how environmental factors, especially weather/climate, can affect dove vital rates is to better anticipate the potential impact of global climate change on dove population status. There are several reasons why doves could serve as “sentinels” for the effects of global climate change. First, taken together they are almost ubiquitous within North America, and especially within the conterminous United States. Thus, climatic changes anywhere in the “Lower 48” states could have resultant impact on dove populations. Secondly, the fact that doves are a game bird species significantly increases the probability that their vital rates will be monitored. A national banding program, combined with reports of band recoveries by hunters, will certainly provide the basis for estimating survival rates with reasonable precision. Furthermore, a national parts collection survey, in conjunction with band recoveries, will provide information on the annual productivity of young. Thus, doves could serve as a surrogate for estimating impacts on larger groups of migratory birds where, at various spatial scales, there is little information on vital rates, such as survival or productivity, for these birds. Consequently, if the vital rates of doves change during a period of climate change, and because mourning doves are considered habitat generalists, effects of climate change on mourning dove populations are likely to also affect species that are less abundant and/or are habitat specialists.

Description

Given the value of understanding the relationship between environmental factors and dove vital rates, and once these relationships are assessed, one option in predicting vital rates would be to simply treat all potential factors as background noise that causes process variance. However, some factors may have especially important effects on dove populations and their vital rates. If those factors can be measured in a timely manner, they may become pertinent to the regulatory process as predictors of vital rates, and thus, harvest management decisions. Therefore, a postdoctoral research project is proposed to:

- 1) Elicit specific, hypothesized limiting factors (e.g., seasonal precipitation, drought, severe weather events, temperature, disease events, landscape features) on vital rates at the management unit scale for each management unit;
- 2) Develop databases for these factors at the appropriate time and spatial scales; and
- 3) Relate these factors, and harvest levels, to the vital rates estimated to date.

For each of the potential factors, the sequence of questions would be:

- 1) How does this factor relate to variability in pertinent vital rates?
- 2) If it predicts vital rates well, can it be measured at the appropriate scale in a timely manner for the regulatory process?
 - a) If it cannot be measured in a timely manner, should it
 - i) Be absorbed into the background noise (i.e. the process variance) or
 - ii) Modeled as a periodic event that occurs with some probability?

Timetable and Cost

The study should be initiated after eight to 10 years of information has been obtained from the national banding and recruitment monitoring programs. Total cost for this study would be approximately \$150,000 per year for one to two years.

Measuring Success

The current system of harvest management decision making for mourning and white-winged doves is based on the best available data on population trends, but it does not represent an informed long-term strategy that will reduce uncertainty about the relative effects of harvest and ecological factors on population abundance. Given that doves are the most important migratory game bird in North America, priority information needs outlined in this Strategy will increase management population performance significantly by:

- Reducing uncertainty surrounding vital rates and management decisions;
- Enabling management actions to be more responsive to changes in vital rates; and
- Providing information to enable a more formal decision-making process.

Ultimately, these priorities help build on the foundation of current efforts in a way that ensures the long-term conservation and informed harvest management of these critically important birds in the face of a changing environment.

Literature Cited

- Dolton, David D., R.D. Rau, and K. Parker. 2007.
Mourning dove population status, 2007. U.S. Fish and Wildlife Service, Laurel, Maryland.
- Sauer, John R., David D. Dolton and Sam Droege. July 1994.
Mourning Dove Population Trend Estimates from Call-Count and North American Breeding Bird Surveys. The Journal of Wildlife Management, Vol. 58, No. 3, pp. 506-515.
- George, R. R., G. L. Waggenerman, D. M. McCarty, R. E. Tomlinson, D. Blankinship, and J. H. Dunks. 2000.
Migration, harvest and population dynamics of white-winged doves banded in Texas and Northeastern Mexico, 1950-78. Texas Parks and Wildlife Department, Austin, TX. 49pp.
- Otis, D. L., J. H. Schulz, D. A. Miller, R. Mirarchi, and T. Baskett. *In Press*.
Mourning dove (*Zenaida macroura*). The Birds of North America, No. 117 (A. Poole and F. Gill, Eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists Union, Washington, D.C.
- Sauer, J. R., J. E. Hines, and J. Fallon. 2007.
The North American Breeding Bird Survey, Results and Analysis 1966-2006. Version 10.13.2007.
- Schwertner, T. W., H. A. Mathewson, J. A. Roberson, M. Small, and G. L. Waggenerman. 2002.
White-winged dove (*Zenaida asiatica*). The Birds of North America, No. 710 (A. Poole and F. Gill, eds.). The Academy of Natural Sciences, Philadelphia and The American Ornithological Union, Washington, D. C.
- U.S. Fish and Wildlife Services, Pacific, Central, Mississippi and Atlantic Flyway Councils, 2003.
Mourning Dove National Strategic Harvest Management Plan.

Appendix A

February 12-14, 2008 Workshop Participants

Bob Blohm, U.S. Fish and Wildlife FWS, robert_blohm@fws.gov, 703-358-1966
Dave Case, DJ Case & Associates, dave@djcase.com, 574-258-0100
David Dolton, U.S. Fish and Wildlife FWS, David_Dolton@fws.gov, 301-497-5863
Bill Kendall, U.S. Geological Survey, William_Kendall@usgs.gov, 301-497-5868
Joe Kramer, Kansas Dept. of Wildlife and Parks, joek@wp.state.ks.us, 620-672-5911
Josh Millspaugh, University of Missouri, MillspaughJ@missouri.edu, 573-882-9432
Ralph Morgenweck, U.S. Fish and Wildlife FWS, Ralph_Morgenweck@fws.gov, 303-202-4217
Dave Otis, USGS, Iowa Cooperative Research Unit, Iowa State University, dotis@iastate.edu, 515-294-7639
Mike Rabe, Arizona Game and Fish Department, mrabe@gf.state.az.us, 602-789-3353
Jay Roberson, Texas Parks and Wildlife Department, jay.roberson@tpwd.state.tx.us, 512-389-8011
Pat Ruble, Wildlife Management Institute, pruble@wildlifemgt.org
Todd Sanders, U.S. Fish and Wildlife FWS, todd_sanders@fws.gov, 503-231-2384
Paul Schmidt, U.S. Fish and Wildlife FWS, paul_r_schmidt@fws.gov, 202-208-1050
John Schulz, Missouri Department of Conservation, john.h.schulz@mdc.mo.gov, 573-882-9909
T. Wayne Schwertner, Texas Parks and Wildlife Department, tpwd_whitewing@verizon.net, 800-792-1112
Dave Scott, Ohio Department of Natural Resources, dave.scott@dnr.state.oh.us, 614-265-6338
Dave Sharp, U.S. Fish and Wildlife FWS, dave_sharp@fws.gov, 303-275-2386
Nova Silvy, Texas A&M University, n-silvy@tamu.edu, 979-845-0598
Casey Stemler, U.S. Fish and Wildlife FWS, casey_stemler@fws.gov, 202-273-3288
Mike Szymanski, North Dakota Game and Fish Department, mszymanski@nd.gov, 701-328-6360



Illustration of mourning dove
U.S. Fish & Wildlife
Digital Library System