

Proposal for a Pilot Reward Banding Study of Mourning Doves

REVISION

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Dave Otis

Iowa Cooperative Fish and Wildlife Research Unit

Iowa State University

INTRODUCTION

Informed harvest management strategies for migratory game bird populations depend upon estimates of current demographic parameters and harvest rates. Population models that relate these estimates to population status can guide harvest management decisions, given a set of alternative harvest regulations and quantitative management objectives. These components can be synthesized into a protocol for development of a harvest management process, which may be very structured, as in the current Adaptive Harvest Management process currently in place for waterfowl species (Johnson et al. 1997), or a less formal approach, as is currently used for American woodcock (*Scolopax minor*).

The mourning dove (*Zenaida macroura*) is currently a game species in 36 of the lower 48 states, and more individuals are harvested annually than all other migratory game bird species combined (Baskett and Sayre 1993). The Call Count Survey (CCS), which is annually conducted nationwide, has indicated declining population trends in all management units (Eastern (EMU), Central (CMU), Western (WMU)) during the last 15 years (Dolton 2001). However, this survey represents the only source of contemporary information available on a large scale that is relevant to dove population demographics. No coordinated or informed harvest management strategies are currently in place for this species. In recognition of this situation, several state and federal committees and councils involved in management of migratory game birds have passed resolutions in the past 2 years that acknowledge the need for establishment of large scale surveys that will generate information that, when combined with appropriate population models, can begin to establish a more rigorous basis for dove harvest management. This proposal suggests the first step toward such a goal.

BACKGROUND

Efforts are underway to use the best available data to construct first generation population

models that depend on models that relate annual survival rate and reproductive rate to harvest rate (Otis and White 2002; Otis, unpublished manuscript). Estimates of survival and harvest rates have been derived from band recovery data collected from 1965-1975, because no large scale banding programs have been in place since that era. Models that assume additive, compensatory, and partially compensatory relationships between harvest and survival rate on a regional (subunit) scale have been developed, but new data will be required to begin to assess the relative weights of empirical support for the different models. Models that relate harvest rate, environmental parameters, and reproductive rates have not been developed, due to an almost complete lack of adequate data and questions about the mechanism of density dependent reproduction in dove populations. Currently, population models assume density independent reproduction.

Given the current evaluation of available data, the structure of population models, and the impetus to begin implementation of NFC recommendations, we propose that the best first step is to conduct a pilot reward banding study. The objectives of such a study are to: 1) estimate harvest rates in a representative sample of regions, 2) estimate current band reporting rates, which can be used to convert direct recovery rate estimates to harvest rates from other regions and presumably for all regions in the foreseeable future, 3) serve as a pilot study for a future coordinated nationwide banding program designed to produce comprehensive estimates of harvest and survival rates, 4) provide information on geographical distribution of harvest, and initial estimates of annual survival and breeding site fidelity from a sample of breeding populations. Estimates generated from this study will be used to update and improve population models developed to support harvest management strategies.

STUDY DESIGN

The critical design parameters are the length and timing of the study, the identification of participating states, the quotas of reward and standard bands, and the geographical sampling design for banding sites. We propose a 3 year study in which the first and third years involve only standard bands, and the second year involves use of both reward and standard bands. The rationale is that the first year will provide the opportunity for participating states to establish banding locations, train personnel in trapping techniques, age and sex assignment, and cost evaluation. The second year provides the essential data for estimation of reporting rates, and the third year provides an additional estimate of harvest rate, and initial estimates of survival and site fidelity rates (using recapture as well as dead recovery data). Banding would generally occur in July and August.

Personnel and fiscal resources will be constrained by available federal grant funds (e.g., Webless Migratory Game Bird Research Program) and state agency resources. Also, current population models have been based on stratification of the 3 dove management units into subregions, based on past analyses of movement data from banding studies (Figure 1). These economic and biological considerations led to a decision to develop banding quotas and sampling designs on a subregion scale. Thus, groups of states within subregions will cooperate to achieve banding quota objectives. Ideally, participating subregions in this pilot study will have expected harvest rates that range from relatively low to high, and represent a north-south latitudinal gradient.

Several decisions are required to determine banding quotas for each subregion. First, the ratio of reward bands to standard bands must be specified. Given the objective of an expected 1) standard error of 5% for the reporting rate in each subregion, 2) reporting rate of 30%, and 3) harvest rate of 10%, the best ratio of reward bands to standard bands is approximately 1:2. All reward bands would be placed on young of the year (HY), to insure that they were products of the subregion's breeding population. In the first and third years of standard bands only, the quota for the subregion would be 1000 juveniles and 1000 adults (AHY) birds of each age class. In the second year of reward banding, standard bands would be placed on 1000 adults and 1400 juveniles, and an additional 700 juveniles would be reward banded. The subregion quota would be divided among individual participating states within the subregion in proportion to the area of the state and its average Call Count Survey population index.

The procedure for choosing band locations within a given subregion can be envisioned as a 3-step process. First, the subregion is divided into 1 degree latitude by 1 degree longitude blocks. These blocks average about 60 miles x 60 miles = 3600 square miles. Each subregion has at least 30 degree blocks. Next a representative sample of 20 blocks is chosen. Within each of these blocks, biologists are responsible for choosing specific banding sites, with the objective of obtaining a representative estimate of overall harvest rate within the block. The banding quota for that block is then 5% of the subregion quota.

CURRENT STATUS

Initial discussions about state participation occurred at meetings of the EMU Dove Technical Committee (January), Central Flyway Technical Committee (March), and Pacific Flyway Study Committee (March). Each of these groups formally endorsed the proposed project. Based on these and subsequent discussions, the 23 states (Figure 1) have indicated interest in participation, subject to final administrative approval:

Eastern Management Unit		Central Management Unit		Western Management Unit	
<u>Subregion</u>	<u>States</u>	<u>Subregion</u>	<u>States</u>	<u>Subregion</u>	<u>States</u>
North West	Ohio Wisconsin	Mid-North	North Dakota South Dakota Nebraska	North Coast	Washington Oregon
East Central	Pennsylvania West Virginia	Mid-South	Kansas Oklahoma Texas	Arizona	Arizona
South Atlantic	South Carolina	East-South	Missouri Arkansas		
South	Georgia Alabama	East-North	Iowa		
Gulf Coast	Florida Mississippi Louisiana				
Mid Central	Tennessee				

In 3 subregions, only one state has indicated interest in participation: South Carolina, Tennessee, and Iowa. Because it is unreasonable to assign banding quotas to a single state in a subregion, I arbitrarily assigned 50% of a subregion quota to each of these states. Banding quotas for the EMU, CMU, and WMU are given in Tables 1-3.

LITERATURE CITED

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- Otis, D. L. and G. C. White. 2002. Re-analysis of a banding study to test effects of an experimental increase in bag limits of mourning doves. *Journal of Applied Statistics* 29:479-495.
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SCHEDULE AND DELIVERABLES

February, 2002	Initiate planning of banding program with states
April, 2002	Finalize state participation
July-August, 2002	Develop specific banding and data management protocols with state participants
November, 2002	Submit WMGBR proposal
February-April, 2003	Workshops for state participants to discuss banding protocol and database
July-August, 2003	Banding
March, 2004	Progress report on 1st year results
July-August, 2004	Banding
March, 2005	Progress report on 2 nd year results
July-August, 2006	Banding
March, 2006	Progress report on 3 rd year results
December, 2006	Final report

BUDGET

The intention is to apply to the U.S. Fish and Wildlife Service Webless Migratory Game Bird Research Program for federal funds to cover administrative costs and band rewards (see following detailed budget). Participating state agencies will be responsible for the costs of trapping and banding activities. These costs are difficult to estimate because travel costs will vary by state, as will personnel costs, since the study could be handles by a variety of combination of permanent, temporary and volunteer workers. Thus, the in-kind budget contributions from the states given below should be considered as very approximate estimates at this stage of the process.

WMGBR Budget

Band rewards

$\$100 * 700 \text{ per subregion} * 11.5 \text{ participating subregions} * 10\% \text{ expected harvest rate} =$
 $\$80,500$

Administrative support/database management

$.20 \text{ FTE} * 3 \text{ years} * \$25,000 \text{ per year} = \$15,000$

Total direct cost

$\$95,500$

10% Indirect cost (Iowa State University)

$\$9,550$

Total cost

$\$105,050$

In-Kind State Agency Contributions

Estimated number of participating states: 23

Estimated average cost per state: 3000 banded birds @ \$10 per bird = \$30,000

Total estimated contribution: \$690,000

Table 1. Banding quotas for EMU states participating in the 2003-2005 reward banding study of mourning doves.

State		<u>2003</u>		<u>2004</u>		<u>2005</u>	
		AHY	HY	AHY	HY	AHY	HY
Alabama	Standard Reward	400	400	400	560 280	400	400
Georgia	Standard Reward	600	600	600	840 420	600	600
Mississippi	Standard Reward	580	580	580	810 405	580	580
Florida	Standard Reward	230	230	230	320 160	230	230
Louisiana	Standard Reward	190	190	190	270 135	190	190
Wisconsin	Standard Reward	400	400	400	560 280	400	400
Ohio	Standard Reward	600	600	600	840 420	600	600
Pennsylvania	Standard Reward	750	750	750	1050 525	750	750
West Virginia	Standard Reward	250	250	250	350 175	250	250
South Carolina	Standard Reward	500	500	500	700 350	500	500
Tennessee	Standard Reward	500	500	500	700 350	500	500
Total	Standard	5000	5000	5000	10,500	5000	5000

Table 2. Banding quotas for CMU states participating in the 2003-2005 reward banding study of mourning doves.

State		2003		2004		2005	
		AHY	HY	AHY	HY	AHY	HY
Missouri	Standard Reward	700	700	700	980 490	700	700
Arkansas	Standard Reward	300	300	300	420 210	300	300
North Dakota	Standard Reward	270	270	270	380 190	270	270
South Dakota	Standard Reward	360	360	360	500 250	360	360
Nebraska	Standard Reward	370	370	370	520 260	370	370
Kansas	Standard Reward	330	330	330	460 230	330	330
Oklahoma	Standard Reward	170	170	170	240 120	170	170
Texas	Standard Reward	500	500	500	700 350	500	500
Total		3000	3000	3000	6300	3000	3000

Table 3. Banding quotas for WMU states participating in the 2003-2005 reward banding study of mourning doves.

State		2003		2004		2005	
		AHY	HY	AHY	HY	AHY	HY
Arizona	Standard Reward	1000	1000	1000	1400 700	1000	1000
Washington	Standard Reward	430	430	430	600 300	430	430
Oregon	Standard Reward	570	570	570	800 400	570	570
Total		2000	2000	2000	4200	2000	2000

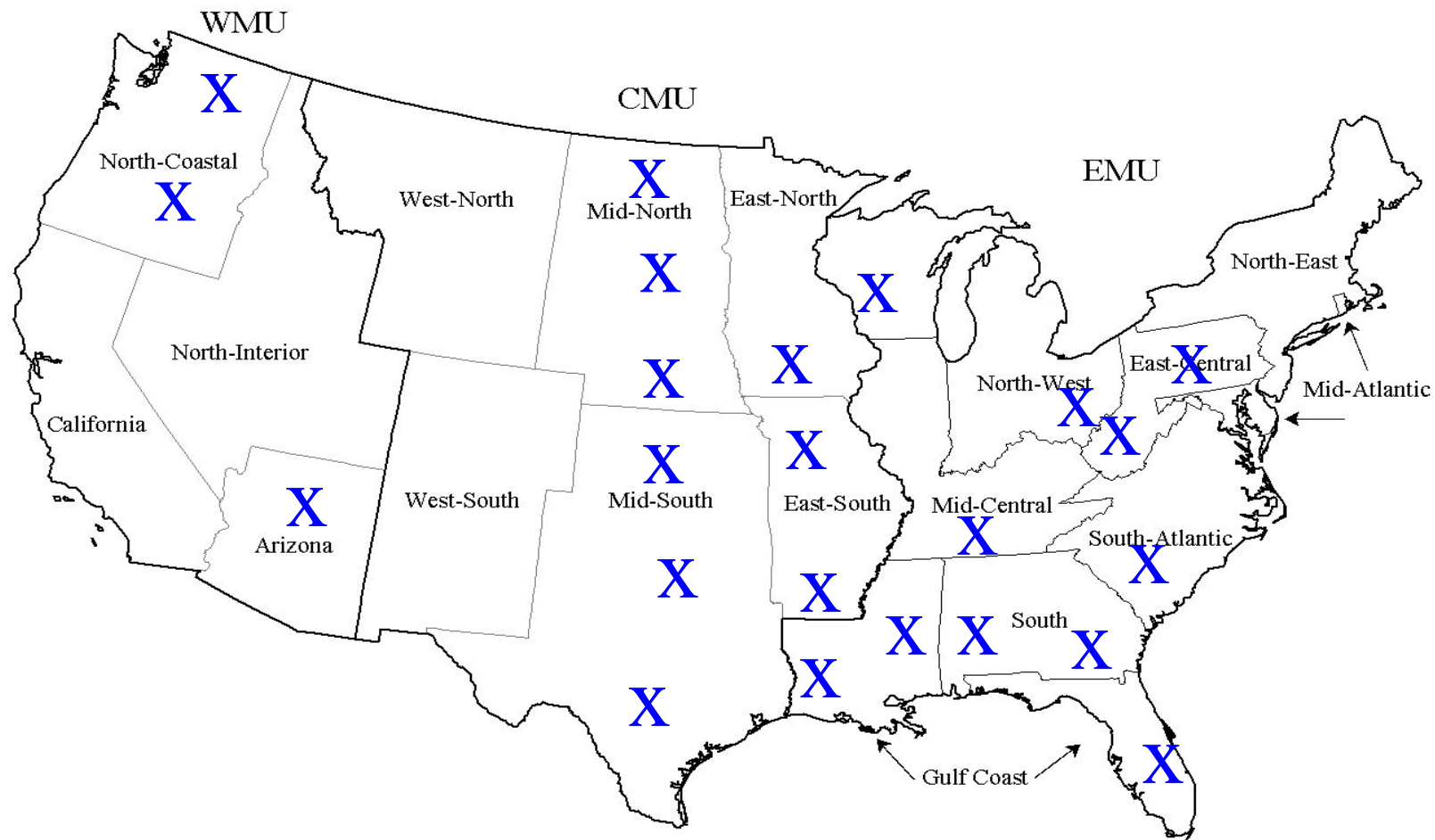


Figure 1. States interested in participation in 2003-2005 mourning dove reward banding study