

## SUCCESSFUL CAPTURE AND RELOCATION OF MOURNING DOVES: A MULTI-AGENCY ENDEAVOR

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**Abstract:** Capture and relocation has been successfully used for decades as a means of wildlife damage control. USDA, APHIS, Wildlife Services (WS), Missouri Department of Conservation (MDC) and the University of Missouri Department of Fisheries and Wildlife Sciences (MU) were involved in a collaborative project which produced benefits for the cooperator, and all agencies involved. At an industrial site located in northern Kansas City, mourning dove (*Zenaida macroura*) droppings accumulated under the roosting area. In addition to being unsanitary, the droppings also ran the risk of causing equipment to malfunction in a secondary chemical containment system. Benefits of our interagency capture and relocation program included a non-lethal solution to resolve the wildlife problem, positive public relations opportunities for the cooperator and provided data to a long-term mourning dove banding study. Mourning doves were trapped, banded, and relocated from an industrial area in eastern Kansas City, Missouri. The banded doves were released 31.4 km to the southeast (153°) at the James A. Reed Memorial Wildlife Area (JARMWA), near Lee's Summit, Missouri. We captured and relocated 566 (499 hatching year, 36 after hatching year and 31 unknown age) doves from July 12 to August 11. During that period there were no recaptures at the problem roost site, however birds were recaptured at the JARMWA at a rate similar to that of birds captured at the release site (3% JARMWA; 4% industrial site). During the opening 2 days of mourning dove hunting season birds released on the JARMWA from the industrial area were harvested at a slightly lower rate than birds caught and released on JARMWA (18% industrial site and 23% JARMWA). Results from our study indicate that capture and relocation of "problem" mourning doves can be successfully completed.

**Key words:** capture, industrial, interagency, mourning dove, non-lethal, relocation, wildlife damage, *Zenaida macroura*.

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### INTRODUCTION

Capture and relocation has been successfully used for decades as a means of wildlife damage control in the United States. Methods for trapping mourning doves

(*Zenaida macroura*) are well documented, but no relocation studies could be found in the literature.

USDA, APHIS, Wildlife Services (WS), the Missouri Department of

Conservation (MDC) and the University of Missouri Department of Fisheries and Wildlife Sciences (MU) were involved in a mourning dove capture and relocation project which produced benefits for the cooperator experiencing the damage and the agencies involved. Using an interagency approach resulted in a non-lethal solution to resolve the problem and an opportunity for agencies to share expertise.

Damage caused by mourning doves most frequently occurs at airports, where from 1996-2005 mourning doves caused \$3,696,340 in economic losses to civil aviation in the United States (Cleary et al. 2006). Other than this project, WS in Missouri did not receive any non-airport reports of mourning dove damage from 2004-2006 (USDA MIS 2000 unpublished data).

The damage in this study occurred at a chemical production plant in northeast Kansas City. A mourning dove roost formed in an area of the plant where liquid is pumped out of tanker trucks and into holding tanks. The area consists of overhead pipe racks holding liquid transfer pipes and steam lines. Mourning dove droppings accumulated under the roosting area and caused several problems. In addition to the unsanitary and slippery conditions where the droppings had built up, the droppings also caused equipment to malfunction in a secondary chemical containment system. The droppings plugged up drains in the containment area and several pumps were damaged when plant personnel attempted to pump out rainwater. Because the pumps need to stay fully operational in the event of an emergency, the plant contacted WS for assistance.

Our objective was to decrease the amount of dove droppings in the containment area by reducing the number of doves at the roost site. We attempted to meet our objective through 3 methods,

nightly harassment, Mylar tape, and capture and removal.

## STUDY SITES

The capture site was a chemical production plant in northeast Kansas City, Missouri. The area was approximately 70 hectares and consists of buildings, road systems, and power lines. Ground cover was mostly gravel. The area was bordered by the Missouri River to the north and the Big Blue River to the east. Levees separate the plant from both rivers. A 4 hectare crop field that rotates between corn and soybeans lies to the north between the levee and the Missouri River. There is an industrial site to the west and an interstate highway to the south.

Birds were released at the James A Reed Memorial Wildlife Area (JARMWA) located 31.4 km southeast (153°) of the capture site.

## METHODS

### Dove aversion

Dove harassment started in December 2005 after the initial request for help from the chemical plant. Nightly harassment at the roost consisted of walking in the area and striking pipes and metal structures with PVC pipes and slapping wooden boards together. These crude methods were used because no pyrotechnics or any other harassment device could be used that made a spark. These methods had little successes, as doves would stay out of the roost until dark, but would eventually come into the roost, regardless of the harassment.

When nightly harassment was deemed unsuccessful, Mylar tape was strung around the roosting area in early January 2006. Evening observations revealed the doves initially had a strong aversion to the Mylar tape, and only 5 of the original 250 to

300 birds continued to roost in the liquid formulation area. This method remained effective through March 2006 at which time few doves were observed around the plant. Doves returned to the plant and started causing problems again in June 2006, but the Mylar tape was not effective in keeping them out of the liquid formulation area.

### **Dove relocation**

Doves were prebaited to trap sites for two weeks prior to trapping efforts using white proso millet (Schulz et al. 2005). Doves were trapped during July and August of 2006 using modified Kniffin traps during the morning (0700-1000) and evening hours (1800- 2000; Reeves et al. 1968). All doves were outfitted with a United States Fish and Wildlife Service (USFWS) metal band and age and gender was assigned based on methods described in Schulz et al. (2005.)

After the doves were assigned an age and gender, and banded they were placed into a carrier and transported to JARMWA in the covered bed of a pickup truck. When the temperature was over 30° C, birds were banded and transported in the cab of the truck where they could be kept cool with the air conditioner. Throughout the entire trapping season, we did not have any birds expire during transplantation. Drive time from the capture site to JARMWA was approximately 30 minutes with a driving distance of 38.6 km. Cost per round trip was ~\$50.00 based on a cost of \$25.00 per hour for biologist time and \$0.50 per 1.6 km.

All trapping activities ceased 2 weeks prior to hunting season to avoid any conflict with baiting.

### **Dove recapture/recovery**

Prior to this study, capture and banding of mourning doves had been taking place on the JARMWA since 1999. Seven trap sites had been established during the

spring of 2006 and were continually run through the dates of our project. Doves relocated from the chemical plant to the JARMWA were susceptible to recapture at these sites. The same information recorded for newly banded birds was collected for all recaptured birds on the JARMWA despite original capture site. All trapping activities ceased 2 weeks prior to hunting season (September 1) to avoid any conflict with hunting over baited sites.

The hunting regulations on the JARMWA are conducive to collecting recovery information for all doves harvested. All hunters are required to check in all birds shot and recovered during the first two days of the mourning dove hunt. The JARMWA, MU, and WS staff examined each dove for a metal USFWS band and recorded the band number of each banded bird.

## **RESULTS**

Five-hundred and sixty-six mourning doves were trapped and relocated from the chemical plant to JARMWA during 11 trapping attempts. A majority of birds captured were hatching year doves (HY; total capture: HY, 498; after hatching year, AHY, 30; unknown age = 38). Of the HY birds captured a large number of those had a molt score of less than 6 (326, total n = 498; Figure 1) indicating most birds were less than 2 months in age (Baskett et al. 1993).

There were no mourning doves recaptured on the chemical plant site however, recapture of relocated doves and doves captured on the JARMWA at the JARMWA trapping sites were similar (3% JARMWA; 4% chemical plant). Doves banded and released on the JARMWA were harvested at a slightly higher rate than those banded and relocated from the chemical plant (23% JARMWA, 18% chemical plant). However, the pattern of doves harvested based on the week prior to hunting

season was similar between both sites except for a slight variation between 3 and 4 weeks

prior to hunting season (Figure 2).

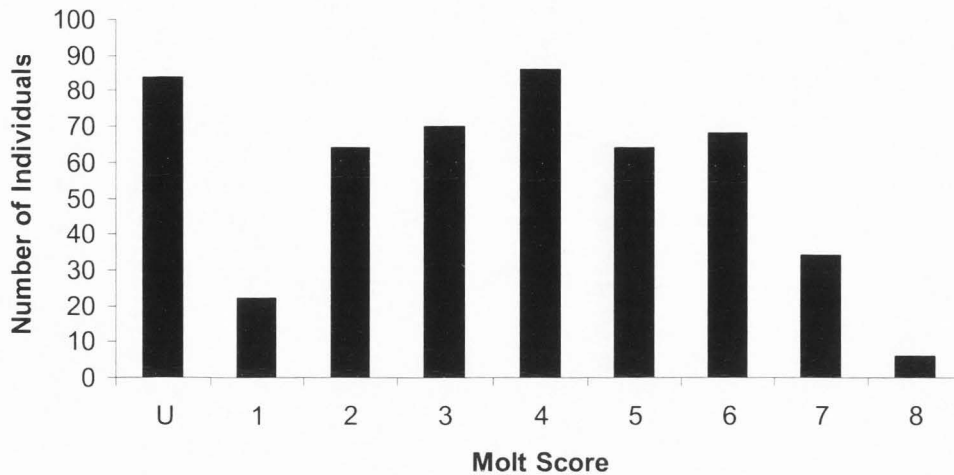


Figure 1. The primary molt scores for HY (hatching year) mourning doves captured at the chemical site. A score of U (unknown) indicates that an individual has not molted any feathers and is  $\leq 4$  weeks old. A molt score of  $\leq 6$  indicates a dove that is approximately  $< 2$  months in age. This figure indicates that a majority of the doves captured at the chemical plant site were  $\leq 2$  months in age.

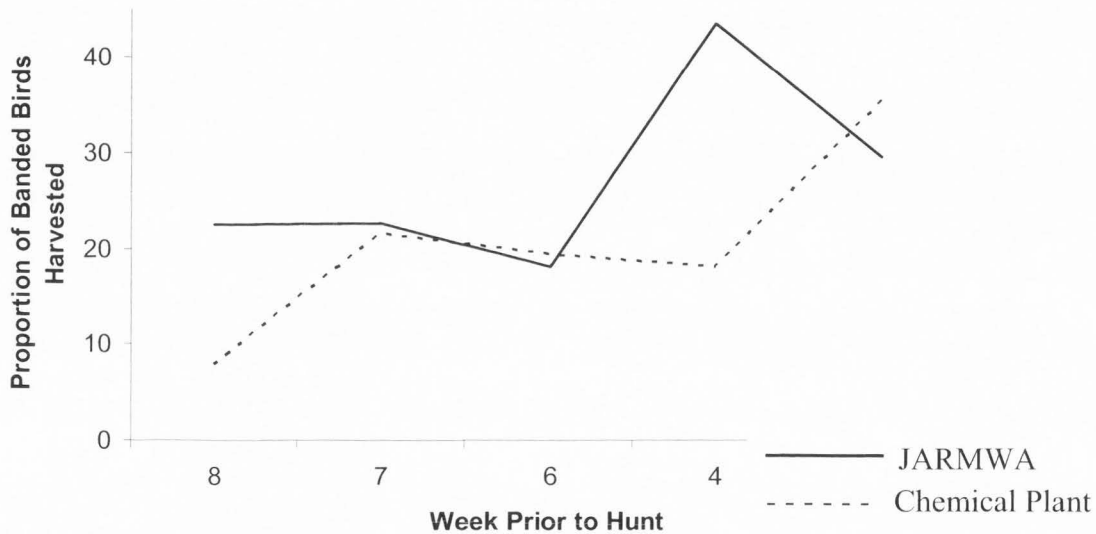


Figure 2. The proportion of mourning doves harvested on the James A. Reed Memorial Wildlife Area (JARMWA) based on the week prior to the hunting season that the dove was banded. Doves banded on the JARMWA are indicated by the solid line and doves that were banded on the chemical plant site then relocated to JARMWA are indicated by the dashed line. Trends are similar with the proportion of doves harvested increasing as the hunting season approached but differed during the 3<sup>rd</sup> and 4<sup>th</sup> weeks prior to hunting season.

No quantitative measures were used to determine number of doves using the roosting site. However, plant personnel reported fewer doves and fewer dove droppings at the chemical plant capture site.

## DISCUSSION

To our knowledge this is the first study to determine if a capture and relocation program can be used to resolve damage caused by mourning doves. We found 3 major results: 1) a high proportion of those birds captured at the chemical plant were HY birds with an age  $\leq 1$  month; 2) birds were not recaptured at the problem trapping site within the same year; and 3) that recapture and recovery rates indicated that relocated birds were establishing themselves on the JARMWA at a rate similar to birds captured at the JARMWA.

An unusually high proportion of HY birds were captured at the chemical plant site. This may indicate that the chemical plant is an especially attractive draw for young birds. This could be caused by a combination of 2 factors: 1) the plant is located at the confluence of two major rivers; 2) the large graveled area and easy roosting sites of the chemical plant. The river corridors that meet close to the chemical plant could prove to be an important migratory corridor for young mourning doves as they migrate south (Knopf et al. 1988). This coupled with the large expanses of graveled area and large number of roosting sites may draw young birds to the site that are inexperienced at searching for food and finding adequate roosting sites. Because mourning doves rely almost exclusively on food laying on bare ground migrating young mourning doves may see the large expanses of gravel as an easy feeding site (Baskett et al. 1993). Because our trapping and the majority of the dove complaints occurred late in the summer when many young doves are migrating the

mourning dove problem at the chemical site may be an on-going problem (Baskett et al. 1993).

We did not recapture any banded birds at the chemical plant site during our trapping efforts in July and August of 2006. This is an indication that the distance and direction doves were relocated was sufficient to keep birds from returning to the plant site during the late summer. The seasonal timing and proximity of the relocation site were important factors in the success of this study. Because late summer/early fall is time of the year when many mourning doves migrate, we were able to couple this life history trait with a relocation site to the south ( $153^\circ$ ) of the original trap site to produce a successful trap and relocation program for doves (Baskett et al. 1993). This same technique has been used for many raptor species caught and relocated from airports across the country (Wernaart and McIlveen 1989). Because our banding and relocating only took place during the migration season, other problem doves trapped during other times of the year and other regions of the United States may need to implement a different relocation strategy based on the timing of migration and their location.

The doves we banded and relocated showed a similar recapture rate to those birds captured at the JARMWA although relocated birds recovered from harvest were harvested at a slightly lower rate than those birds captured on the JARMWA. The recapture rates indicate that birds we relocated to the JARMWA were initially establishing themselves on the release site. Although relocated birds were harvested at a slightly lower rate, the trends shown in Figure 2 indicate that the number of birds harvested, based on the week prior to hunting season when they were captured and relocated, was steadily increasing from 8 weeks prior to 3 weeks prior. This trend is



different for those birds captured on the area with the proportion of birds harvested increasing until week 4 prior to season, after which we see a marked decrease in the proportion of birds harvested. This may be due to a certain acclimation period exhibited by relocated doves. Thus those birds relocated in weeks 4 and 3 prior to hunting season needed more time to reacclimate to the migration route they were on or had started. Whereas the birds captured on the JARMWA did not need the extra time to migrate off the area.

We found that trapping and relocating mourning doves is a viable method of dealing with doves that are causing problems or damage to an industrial site. Our results, however, may only be consistent with doves trapped during the same time period and with younger doves. We may have obtained different results if a higher proportion of adult birds were captured, or if birds had been captured earlier in the year. In order to fully understand the effects of trapping and relocating mourning doves, future studies must focus on trapping at different times of the year and for multiple years. Continued trapping at the capture site, and future band returns will show if doves eventually return to the capture site.

Interagency cooperation can sometimes be problematic with different protocols set for different agencies. Within this study the interagency approach allowed us to share equipment, knowledge, and staff time to obtain reliable data as it relates to mourning dove capture and relocation. Future wildlife damage control issues should be explored using an interagency approach to maximize the expertise and options for dealing with wildlife damage issues.

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