



WILDLIFE RESTORATION GRANT—INDIANA

Movement and Harvest of Local Mallards from Urban Environments of Indiana



Drake mallard wearing a USGS leg band deployed through the collaborative work of the Indiana DNR and Franklin College, which are investigating the ecology of urban ducks. (Photo by Ryan Askren)

CURRENT STATUS

Second year of a four-year project

FUNDING SOURCES AND PARTNERS

Wildlife Restoration Grant Program (W49R1)
Franklin College
Branigin Foundation

PROJECT PERSONNEL

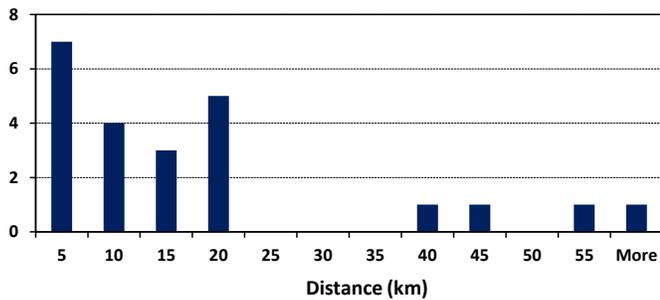
Dr. Benjamin O’Neal, Franklin College
Seth Eckert, Wanda Gaines, Andrew Kammerer, Hannah McIntosh; Franklin College undergraduates (2016)
Alex Bird, Katelyn Pierce, Ricky Smith; Franklin College undergraduates (2017)

BACKGROUND AND OBJECTIVES

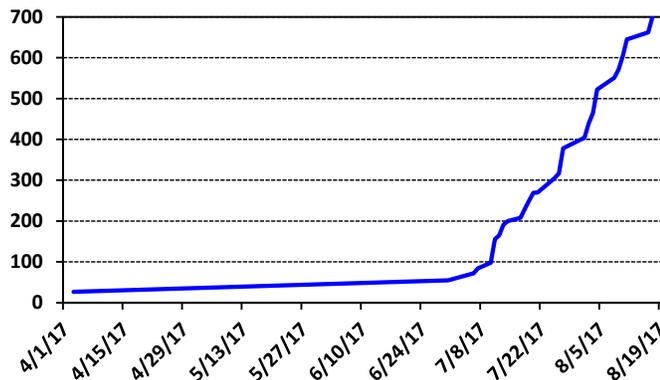
Land cover analyses show that the area of water bodies in the developed regions of the Midwest has increased in recent decades. Collectively, these water

bodies provide a meaningful amount of habitat for generalist species such as mallards (*Anas platyrhynchos*). While aquatic habitats have been increasing in states like Indiana, the acreage of grass cover in the primary region for duck reproduction (i.e., the Prairie Pothole region of the northern plains) has decreased, particularly in recent years, as acreage enrolled in U.S. Department of Agriculture farm bill conservation programs has plummeted. As such, the mallards produced in developed areas (hereafter “urban mallards”) may play an increasingly significant role, both ecologically and recreationally.

To begin to understand the ecological impact of this population segment, we have to determine the extent of its members’ seasonal movements outside their natal areas. At present, there is little information on whether urban mallards migrate and, if so, how far. The extent of these seasonal movements and the type of habitat occupied (e.g., urban vs. rural) can



Distance between banding location and estimated recovery location for 23 mallards banded in urban areas in central Indiana in 2016 and harvested during the 2016–2017 hunting season.



Cumulative number of mallards banded in urban areas in central Indiana from April 3 to August 17, 2017.

have significant effects on: 1) the extent to which they consume resources in other regions; 2) their capacity to spread disease; and 3) their vulnerability to harvest. Regardless of whether mallards that hatch in developed areas migrate, they may still spend time in areas outside city limits. As such, they may at times be available for hunter harvest. If developed areas do produce meaningful numbers of mallards, and if these birds spend substantial amounts of time outside city limits, they may contribute a considerable amount to the overall harvest in a state like Indiana.

This project will provide data on the extent to which urban mallards are harvested within Indiana. More broadly, it could help inform population models used by the Upper Mississippi River Great Lakes Region Joint Venture, as well as harvest objectives set at various regulatory levels. Results from this study will be combined with those from a similar urban study in Illinois to increase sample size and corresponding scope of inference. This project will also support educational development of undergraduate researchers at Franklin College.

The objectives of this project are to:

1. Examine the movements of mallards that breed or hatch in developed areas in central Indiana,

2. Assess the extent to which urban mallards contribute to overall mallard harvest in Indiana, and
3. Examine the spatial and environmental characteristics of the areas in which urban mallards are harvested relative to the area in which they were banded.

METHODS

We are using a leg-banding approach to gain information regarding the movement and harvest rates of mallards from developed settings. We seek to capture and band at least 2,000 mallards over a three-year period. We are focusing our trapping and banding in central Indiana. To find locations with concentrations of mallards, we employ extensive scouting throughout spring and summer. We then deploy bait and surveillance cameras to further concentrate birds and habituate them to future trapping sites. If adequate birds gather over time, we deploy Y-confusion traps, which are walk-in live traps that encourage ducks to approach bait piles through one-way funnels that prevent their escape. A short time later, we retrieve birds and determine their sex and age class based on diagnostic plumage patterns.

Birds are aged as local (unflighted), hatch year



Dr. Ben O'Neal bands a mallard at a suburban trapping site during the 2017 field season. (Photo by Jared Hodge)



High school students and Franklin College students participate in a banding effort with Dr. Ben O'Neal at a suburban trapping site in Bargersville during the 2017 field season. (Photo by JoEllen Lengacher)

(hatched in that year), or after hatch year (at least 1 year old). We then record key measurements from each bird that serve as an index of general size and condition (head/culmen length, tarsus length, wing chord and mass). These variables allow us to compare urban mallards with other groups of mallards. After birds are fitted with a band, they are released. A portion of these birds (about 10%) will later be harvested by hunters, who are asked to report the unique band number of the bird they harvested, the time and date, and location harvested. That information is archived by the U.S. Geological Survey's Bird Banding Lab, which will send us ongoing reports regarding band-return data. We can then analyze the locations of any band returns to determine the extent to which mallards reared in developed contexts move outside of the habitats in which they were hatched. We will look for evidence of northward molt migration and/or southward fall/winter migration. We will also examine the spatial and environmental characteristics of the areas in which individual mallards are harvested to see if any patterns exist between the characteristics of their summer habitat (i.e., urban) and their fall/winter habitat.

This project actively involves undergraduate students in the development of methodologies, execution of the project, data collection and analysis, and interpretation and communication of results. This type of experience is intended to help train future biologists for effective service in the field.

PROGRESS TO DATE

In summer 2016, we banded 600 mallards (223 females, 377 males) consisting of the following age distribution: 36 local, 140 hatch year (HY), 412 after hatch year (AHY), and 12 unknown. We successfully trapped mallards at 30 different locations in seven counties (Hamilton, Hancock, Hendricks, Johnson, Madison, Marion, and Morgan).

In summer 2017, we banded 700 mallards (336 females; 343 males; 21 unknown) at 36 locations in five counties (Hamilton, Johnson, Madison, Marion, and Shelby). We recaptured 48 individuals that were banded in 2016. The 2017 sample included 39 local, 261 HY, 399 AHY, and one un-aged mallard. Across both years, we have banded at 45 distinct locations in eight different counties with most captures occurring in July and August.

Having numerous field sites enabled us to interact extensively with the public and communicate the importance of our work and of urban wildlife in general. We have engaged seven different undergraduate students through this project and more than 30 local high school science students. All undergraduate students are proceeding with studies and careers in wildlife biology.

We had returns from 26 mallards from the 2016 banding effort that were reported between August 1, 2016 and March 3, 2017. Those returns included one live observation, two incidental mortality reports, and 23 harvested birds (4% return rate on 600 bands in first year) that were reported by 21 different hunters. The age and sex distribution for harvested mallards included, respectively, four local, nine HY, 10 AHY; and six females, 13 males, and four unknown. The reported birds were banded at 14 sites in Hendricks, Johnson, Madison, Marion and Morgan counties, all within municipal boundaries. Harvest sites were distributed among eight Indiana counties (Bartholomew, Hamilton, Henry, Johnson, Madison, Marion, Morgan, and Hancock) and included both water and field hunting locations distributed across both public and private land. The average distance traveled for 22 mallards harvested in Indiana was 8.4 miles. There was also one mallard harvested near Dickeyville, Wisconsin, 318 miles from its banding site.

COST: \$195,162 FOR THE COMPLETE FOUR-YEAR PROJECT