

Calls, captures, and collisions:

Triangulating three census methods to better understand nightly passage of songbird migrants through the Chicago region during May

By Melissa Schramm 1,
Jacqueline Fiala 1, Terese Noe 1,
Paul Sweet, Annette Prince 2, Caleb Gordon 1

Introduction

Censusing migrant birds is a prime concern of birdwatchers and ornithologists alike, particularly in light of recent population declines reported for some species (National Audubon Society 2005, 2007). The large volume and diversity of birds that pass through the Chicago region each year during migration present a great opportunity for monitoring populations that breed and winter across a wide range of regions and habitats, yet censusing bird populations during migration presents significant technical challenges. Each technique for censusing migrating birds has its own advantages and biases. Some of these biases, such as those for mist netting, are well known. However, other techniques, such as nocturnal flight-call recordings or window-collision monitoring are somewhat newer, and their biases are less well understood. Understanding these biases, and the general correspondence between the data rendered by different migrant bird censusing techniques is an important frontier for improving our ability to monitor migrant bird populations while en route.

As a bird censusing technique, mist-netting has the advantage of a highly standardized sampling structure and effort, yet it also has well-known biases. For instance, mist-netting does not frequently capture larger birds or those that forage in flight; captures consist largely of understory birds found between 2

and 3 m off the ground (Remsen & Good, 1996, Wang & Finch 2002). Mist nets also typically capture only forest species, thus, birds that prefer open areas are under-represented (Derlindati & Caziani 2005).

Recording nocturnal flight calls of migrating birds has recently received a great deal of attention in the birding and ornithological communities because of its potential as an identification and censusing tool. However, this technique is also subject to significant methodological challenges. Migrants can only be reliably heard or recorded when they are flying low, and birds' migration altitude varies depending on weather conditions (Graber & Cochran 1959; Farnsworth 2005). Moreover, even with recent software advances, it is still impossible or extremely difficult to confidently identify many species on the basis of their nocturnal flight calls (Evans and O'Brien 2002, Farnsworth 2005). In addition, variation in calling behavior and frequency further complicate abundance inferences from nocturnal flight call data (Graber and Cochran 1960).

Window-collision bird rescue programs have saved the lives of many birds both directly, and through the attention they have drawn to bird mortality from window collisions, leading to various collision mitigation programs. Such programs also provide scientifically valuable museum specimens, yet bird collision and rescue programs have rarely been exploited as a

source of information for monitoring bird populations. Using window collision data in this way requires an understanding of the biases associated with window-collision bird samples. These biases are poorly known. Graber and Cochran (1959) suggested that some bird species are attracted to tower lights, which might increase the density of these birds in lighted areas. Another study by Graber (1968), along with anecdotal observations, suggest that bird species vary in their susceptibility to window collisions. Some species, such as the Northern (Yellow-shafted) Flicker, are more likely to be stunned or killed in window collisions than others, such as the Black-throated Green Warbler, who are presumably either less likely to suffer significant damage from collisions, better able to avoid collisions in the first place, or both.

The purpose of this study was to triangulate three different methods for measuring the daily flow of migrants through the Chicago region in springtime: Mist-net captures, nocturnal flight call recordings, and window collision rescues/collections. By seeing how these three methods complement, contradict and/or corroborate each other, we aimed to understand better the methodological advantages and limitations inherent in each censusing method, and gain a clearer picture of nightly songbird migrant flow through the Chicago region during the month of May.