

FINAL REPORT

Species richness and abundances in nest predator communities in urban woodlands and residential habitat.

Grant Agreement #10-013W

Grantee and report author:

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Time-frame: August 25, 2009 to June 30, 2010

Objective: Create a predator inventory for Cook County Forest Preserves (total), each individual Cook County Forest Preserve used in the study, and residential areas.

Summary

Introduction

Urban areas often have fewer native breeding bird species than the natural areas they have replaced. While loss of habitat explains why birds that have narrow habitat requirements are absent from cities, it does not fully explain why many generalist species are absent or present only in low numbers. Nest predation, which is the leading cause of nest failure, may drive declines in populations, ultimately causing local extirpation and reduced diversity.

Research we conducted in the Chicago metropolitan area revealed that experimental open-cup nests located in forest preserves were significantly more vulnerable to predation than nests in residential areas. Ground nests in forest preserves were particularly vulnerable; 91% of ground nests were depredated in forest preserves compared to 30% of ground nests in residential areas. These results point to a striking difference in the predator communities of these two habitat types.

The goal of this project was to determine why open-cup nest species are more vulnerable to nest predation in forest preserves than in residential areas. The objective was to identify the predators within each habitat and create an index of their relative abundances.

Methods

Camera sites. Cameras were deployed in 20 forest preserve sites and 15 residential sites from May through June 2010. All sites were located a minimum of 700 m apart. Sites within forest preserve were a minimum of 50 m from recreational areas or major roads. Locations within residential habitat were selected on a volunteer basis. Volunteers were recruited via email and online announcements to the University of Illinois and University of Chicago communities and via word-of-mouth. Residential sites included 10 single family homes and 2 2-unit homes.

Camera Trapping. Camera traps were in place at each site from 5 to 14 nights. During that time, cameras were baited on 5 nights to ensure that any predators that were present were caught by the camera. Bait included 1 half-sardine, 5 peanuts, 1 tbsp. sunflower seeds, and 1 tbsp. dried cat food.

Results

Results were analyzed for the three predator types—raccoons, opossums, and squirrels—that occurred in both habitat types (Fig. 1). While deer were common at forest preserve sites, they were present at only one residential site. Similarly, coyotes were seen at only two forest preserve sites and one residential site, and skunks were seen at one forest preserve site and 2 residential sites.

In total, raccoons were the predator seen most widely (74% of sites), followed by squirrels (48% of sites) and then opossums (23% of sites). Raccoons were present in significantly more forest preserve sites--86% of forest preserve sites vs. 60% of residential sites ($\chi^2=4.5$, d.f.=1, $P<0.05$), while opossums were present in significantly fewer forest preserve sites--11% of forest preserve sites vs. 35% of residential sites ($\chi^2=5.2$, d.f.=1, $P<0.05$). No significant difference was found for squirrels, which were present in 39% of forest preserve sites and 58% of residential sites ($\chi^2=1.9$, d.f.=1, $P<0.05$). There was also no significant difference in the total number of predators between habitat types ($\chi^2=0.7$, d.f.=1, $P<0.05$).

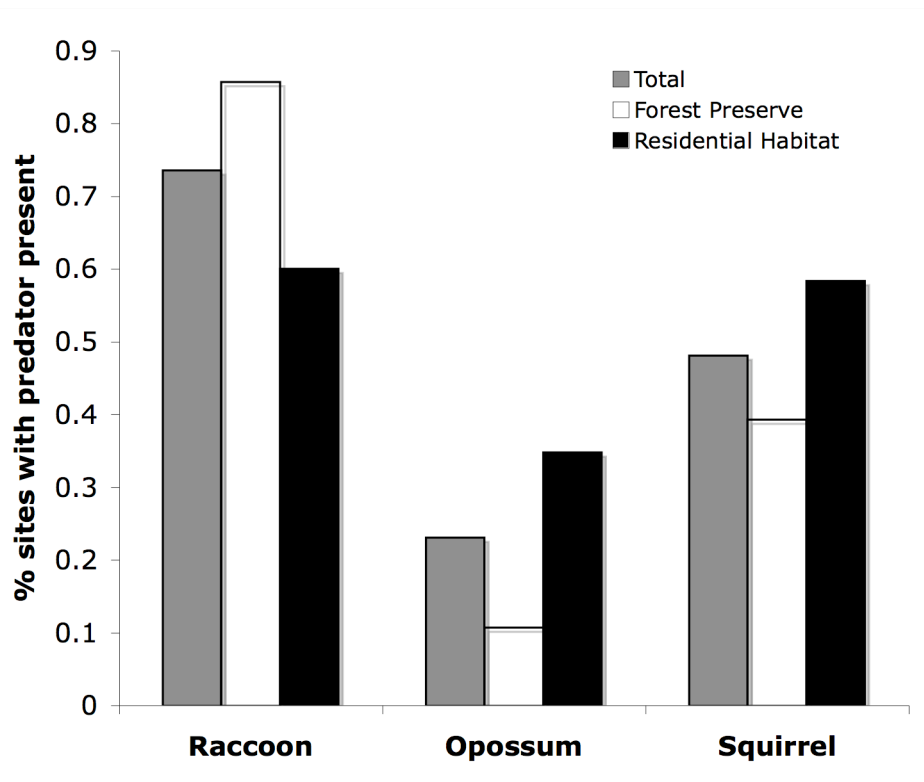


Fig. 1. Prevalence of predator by type in all sites, forest preserve sites, and residential sites.

Discussion

While total predator occurrence does not differ between forest preserve and residential habitats, raccoon occurrence is significantly higher in forest preserve habitat than it is in residential habitat. This is consistent with our previous research that showed that the highest rate of nest predation in forest preserves was on ground nests. This relatively higher prevalence of raccoons may have contributed to the decline of ground-nesting species such as the ovenbird within Cook County Forest Preserves.

The results of this work provide much-needed insight into how urban bird communities are structured and how metropolitan areas can best be managed to promote avian biodiversity.

Species that benefit from this project

Native songbird communities benefit from this project because it provides insight into how and why breeding birds are vulnerable to nest predation. Some of the species that benefit are Red-eyed Vireo, Blue-winged warbler, Yellow warbler, Common Yellowthroat, Common Grackle, Eastern Wood Pewee, Veery, American Robin, Northern Cardinal and Grey Catbird.

Total Project Expenditures

Expenditures for which reimbursement is requested

Item	Quantity Purchased	Total Cost	Date Purchased	Vendor	Vendor Address
Chain (for securing camera)	15 feet	9.59	24-May	Home Depot	1300 S Clinton Street, Chicago, IL
Snack bags (for packaging bait)	2	4.86	22-May	Walmart	1300 Des Plaines Ave, Forest Park, IL
Batteries 4 pack	3	18.07	18-May	Kmart	7600 W Roosevelt Road, Forest Park, IL
	2	14.21	11-Feb	Kmart	7600 W Roosevelt Road, Forest Park, IL
	2	13.07	22-May	Walmart	1300 Des Plaines Ave, Forest Park, IL
	4	21.91	23-May	Menards	8311 W North Ave, Melrose Park, IL
	3	18.95	19-May	Target	8560 S Cottage Grove Ave, Chicago IL
Batteries 8 pack	2	23	28-May	Walmart	1300 Des Plaines Ave, Forest Park, IL
Trophy Trail Camera	3	563.18	21-Apr	Apex Suppliers	Apexsuppliers.com
Eneloop rechargeable batteries 8 pack	2	42.9	19-May	National Brand Distributors Inc	1548 59th St, Brooklyn, NY
Sardines	1 case	36.62	2-Nov-09	BuytheCase	BuytheCase.net
Travel	598 mi	58.8	May through June	Citgo/Shell	4601 S Harlem, Forest View, IL and 1209 S 1st Ave, Maywood, IL
TOTAL REQUESTED		815.57			

Expenditures paid for by other funds

Item	Quantity Purchased	Total Cost
Chain (for securing camera)	30 feet	9.59
Snack bags, box of 50 (for packaging bait)	2	4.86
Batteries, rechargeable	90	393
Plastic trays (for holding bait at site)	35	35
Battery Charger	1	50
Stealthcam	14	1120
Wildview trail cameras	3	370
Bait, catfood	8 lbs	6
Bait, peanuts	15 lbs	12
Bait, sunflower seeds	10 lbs	6.99
TOTAL		2007.44



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WILDVIEW 05-22-2010 21:31:47







Stealth Cam 06-19-2010 22:34:13 069F



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