Niche Study of Winter Birds at Feeders in Menomonie, Wisconsin

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INTRODUCTION

When winter arrives, food resources become limited to birds, bringing competition at feeders, which causes bird species to adapt to different feeding niches to avoid competition. We conducted our study to determine if bird species at a feeder prefers different feeding niches and what local habitat structures effect bird species richness. We examined the abundance and species of birds at feeders and we assessed habitat structure at eight different sites in Menomonie, Wisconsin during winters of 2011-2012.

QUESTION

1.Do birds at a feeder exhibit different feeding niches?
2. What factors influence bird species richness at feeders?

HYPOTHESIS

1. Black-capped chickadees prefer sunflower seeds at the feeder over sunflower seeds on the ground.
2. Local habitat structure will have an effect on bird diversity.

METHODOLOGY

Niche assessment

- Observed between 7am and 9am
- Identified bird species and abundance every one-minute intervals for 30 minutes at each feeding station
- All observations were done at least 15 meters (50 feet) away from feeder
- Conduct a Chi-square contingency test

Local habitat assessment

- Record the number and types of feeders at the feeding station.
- Record the amount/types of food.
- Measure the distance to the nearest cover.
- Determine percentage within a 15 m radius of the feeding station
- Is there any water on-site?

RESULTS

Table 1. Pearson's correlation (r) of species richness and total bird abundance of local scale habitat variables.

Bird	Sunflower- at feeder	Sunflower- on ground	Sunflower- away from feeder	Suet- at feeder	Nyjer/thistle - at feeder	Mix - at feeder	Mix - on ground	Total
Black-capped chickadee	37(29.60)	10(10.17)	21(4.72)	1(5.08)	4(9.18)	0(6.17)	0(7.45)	73
Nuthatch	21(14.19)	6(4.88)	3(2.26)	5(2.44)	0(4.70)	0(2.96)	0(3.57)	35
Goldfinch	5(17.03)	0(5.85)	1 2.72)	0(2.93)	31(5.64)	5(3.55)	0(4.28)	42
Woodpecker	9(12.57)	0(4.32)	1(2.00)	21(2.16)	0 4.16)	0(2.62)	0(3.16)	31
Dark-eyed junco	6(30.82)	9(10.59)	0(4.92)	1(5.29)	14(10.21)	8(6.43)	38(7.75)	76
Northern cardinal	26(19.46)	11(6.69)	0(3.10)	0(3.34)	0(6.45)	11(4.06)	0(4.90)	48
House finch	45(28.38)	15(9.75)	0(4.53)	0(4.88)	5(9.40)	5(5.92)	0(7.14)	70
House sparrow	14(10.95)	5(3.76)	0(1.75)	0(1.88)	0(3.63)	5(2.28)	3(2.75)	27
Total	163	56	26	28	54	34	41	402

RESULTS CONTINUED

Table 2. Pearson's correlation (r) of species richness and total bird abundance of local scale habitat variables.

Community Attribute	Habitat variable	Correlation (r) with community attribute	*P*- value
Species richness	Water	0.013	0.809
	Number of feeders	0.680	0.022
	Nyjer	0.404	0.125
Total bird abundance	Distance cover	0.020	0.760
	Percent cover	0.024	0.741
	Suet	0.108	0.471

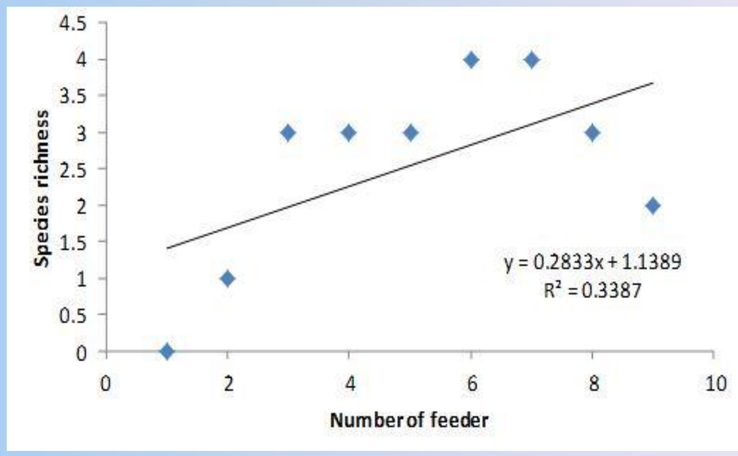

Figure 1. Number of feeder shows a relatively strong positive correlation relationship.

DISCUSSION

Our results indicated that black-capped chickadees (*Poecile atricapillus*) preferred sunflower seeds that they ate away from the feeder.
We also found that the number of feeders had a significant negative correlation with bird species richness. Our research suggests that local habitat structure can have complex relationships with bird communities with bird communities and different bird species have different niches at feeding stations.

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