



SONGBIRD DIVERSITY IN WIND- THROW AREAS OF SCHMEECKLE RESERVE

Kimberly Emerson
Katherine Moratz
Andy Richardson

INTRODUCTION

- Opportunity to study natural disturbances that may lead to better timber harvest methods
- Wind damaged areas may increase species richness in forest ecosystem



HYPOTHESES

- H1: A greater number of bird species will be observed in the plots with wind-throw damage compared to control plots with no wind-throw damage in Schmeckle Reserve.
- H2: A greater number of bird species will be observed in the ten-minute point counts compared to the five-minute point counts in Schmeckle Reserve.



SCHMEECKLE RESERVE

- 113 hectares natural area in Stevens Point, WI
- Field station for UW-Stevens Point
- Multiple stands affected by July 19, 2011 storm
- Different cover types



METHODS

- Locate areas large enough to fit 25m radius plots
 - Randomly select 4 to use in the study
- Point counts conducted in center of each plot
 - Center of plots will be found by pacing the perimeter
- Control plot location
 - Random number generator
- Conducted on October 5-6 and November 22-23
- Identify species by sight and call
 - We will not count fly overs



METHODS

- Record birds within 25 m radius
- Record number of species within 5 and 10 minute intervals
- Other data recorded
 - Date, time, weather conditions, observers present



PLOT 1

- Northwest corner of Schmeeckle Reserve
- 0.31 hectares
- Composition
 - Old growth oaks (*Quercus* spp)
 - Maples (*Acer* spp.)



PLOT 2

- Northwest corner of Schmeckle Reserve
- 1.05 hectares
- Composition
 - White pines (*Pinus strobus*)
 - Red maples (*Acer rubrum*)
- Many downed trees, overgrown understory, snags present



PLOT 3

- Chilla Woodlot
- 0.36 hectares
- Composition
 - Mixed oaks
 - White pines
 - Red maples
- Minimal understory



PLOT 4

- North of Lake Joanis
- 3.6 hectares
- Composition
 - Red maples
 - Jack pine (*Pinus banksiana*)
 - White pine
 - Aspen (*Populus* spp.)



WILDLIFE

- White-tailed deer (*Odocoileus virginianus*)
- Gray squirrels (*Sciurus carolinensis*)
- Blue jays (*Cyanocitta cristata*)
- Black-capped chickadees (*Poecile atricapillus*)
- White-breasted nuthatches (*Sitta carolinensis*)
- Some species of woodpeckers



WEATHER CONDITIONS

○ Early October

- Temperatures ranged from 2.8°C to 13.9°C
- 6.5 cm precipitation
- Leaves present

○ November

- Temperatures ranged from 3.9°C to 5.5°C
- 5.4 cm precipitation
- Leaves absent



SPECIES OBSERVED

- White-breasted nuthatch (*Sitta carolinensis*)
- Black-capped chickadee (*Poecile atricapillus*)
- Red-breasted nuthatch (*Sitta canadensis*)
- American goldfinch (*Carduelis tristis*)
- White-throated sparrow (*Zonotrichia albicollis*)
- Downy woodpecker (*Picoides pubescens*)
- Brown creeper (*Certhia americana*)
- Blue jay (*Cyanocitta cristata*)
- Mourning dove (*Zenaidura macroura*)
- Pileated woodpecker (*Dryocopus pileatus*)
- Hairy woodpecker (*Picoides villosus*)
- American Crow (*Corvus brachyrhynchos*)



SPECIES OBSERVED

Site	October	November
1a	1 (1)	1 (1)
1b	2 (3)	2 (2)
2a	5 (6)	1 (1)
2b	1 (1)	0 (0)
3a	0 (1)	2 (2)
3b	1 (2)	1 (3)
4a	4 (4)	1 (3)
4b	1 (1)	3 (3)

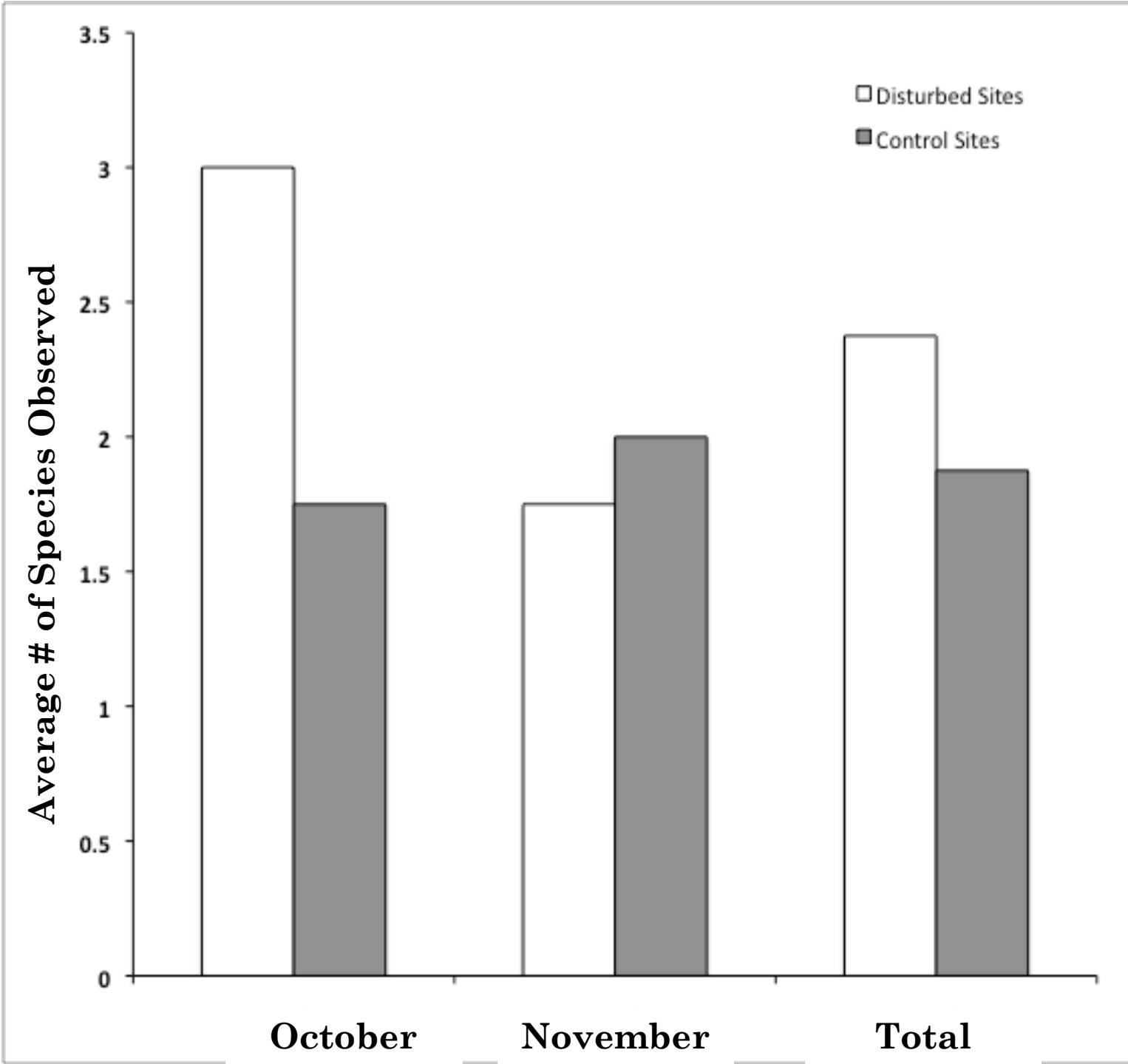
N=5-minute total **(N)= 10-minute total**

ANALYSIS

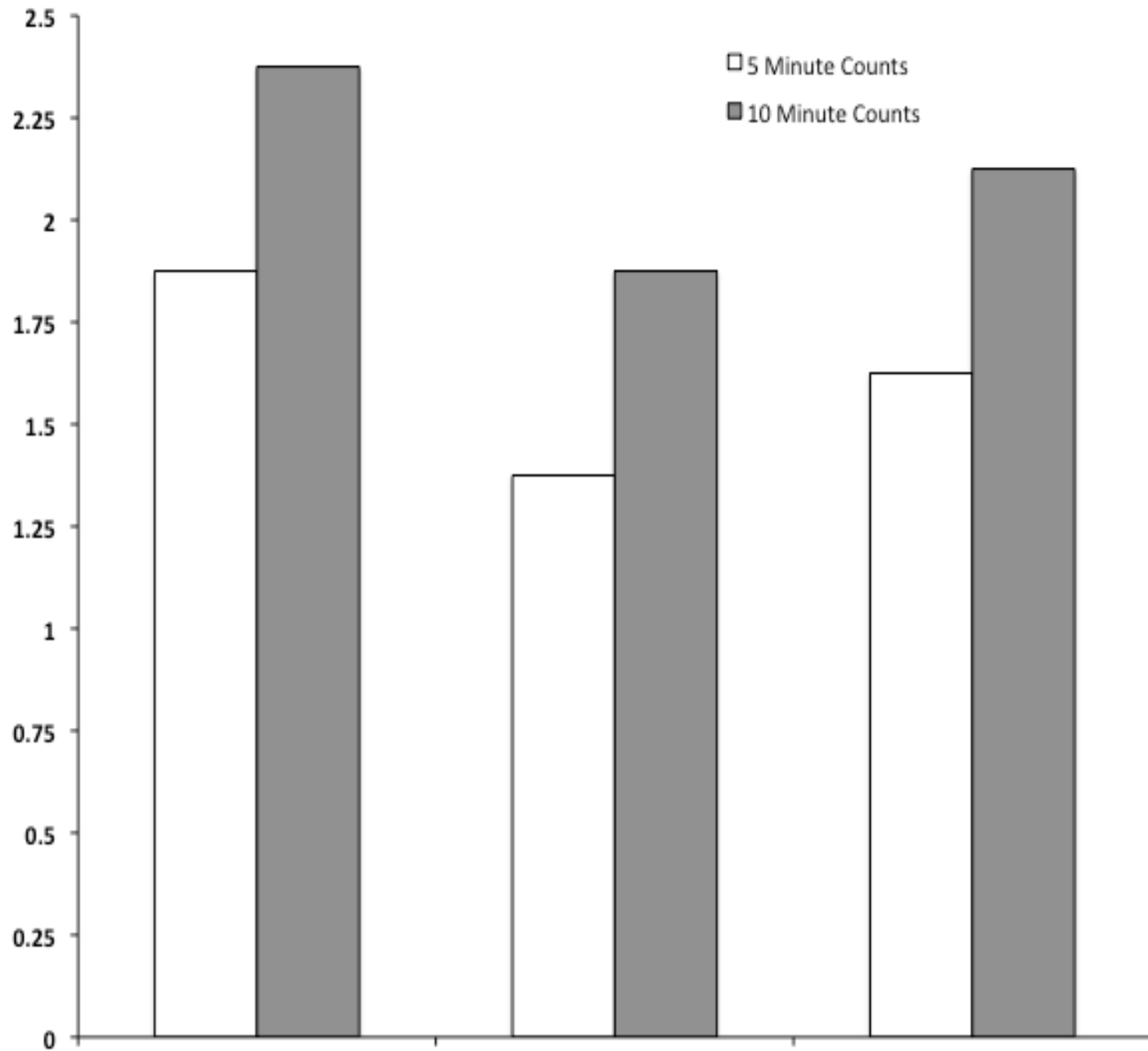
- H1: Not Significant
 - October: $p = 0.51$
 - November: $p = 0.64$
 - Total: $p = 0.57$

- H2: Significant
 - October: $p = 0.03$
 - November: $p = 0.17$
 - Total: $p = 0.015$





Average # of Species Observed



October

November

Total



DISCUSSION

- Few number of disturbed sites lead to low sample size
- Disturbed areas not large enough to affect the number of species
- Some difficulties identifying individual birds
- Noise disturbances
- Predator fly over
- Possible double counts



MANAGEMENT IMPLICATIONS

- Selective harvest has no significant impact on song bird species
- 10 minute point counts for detecting more species



CITATIONS

- Becker, D. A., P. B. Wood, P.D. Keyser, T. B. Wigley, R. Dellinger, and C. A. Weakland. 2011. Threshold responses of songbirds to long-term timber management on an active industrial forest. *Forest Ecology and Management* 262:499-460.
- Braun, C. E., editor. 2005. *Techniques for Wildlife Investigations and Management*. Sixth edition. The Wildlife Society, Bethesda, Maryland, USA.
- Buckland, Stephen T., Anderson, David R., Burham, Kenneth P., and J.L. Laake. 2005. *Distance Sampling*. Encyclopedia of Biostatistics. Second Edition. John Wiley & Sons, Ltd.
- Dytham, Calvin. 2003. *Choosing & Using Statistics: A Biologists Guide*. 2nd ed. Blackwell Publishing, Hoboken, New Jersey, USA.
- Fuller, Richard A., Warren, Phillip H., and K.J. Gaston. 2007. Daytime noise predicts nocturnal singing in urban robins. *Biology Letters* 3:368-370
- Lancia, Richard A., Kendall, William L., Pollock, Kenneth H., and J.D. Nichols. 2005. Estimating the number of animals in wildlife populations. Pages 118-119 *in* C.E. Braun, editor. *Techniques for wildlife investigations and management*. Sixth edition. The Wildlife Society, Bethesda, Maryland, USA.
- Neuschulz, E. L., A. Botzat, and N. Farwig. 2011. Effects of forest modification on bird community composition and seed removal in a heterogeneous landscape in South Africa. *Oikos* 120:1371-1379.
- Reidy, J. L., F. R. Thompson III, and J. W. Bailey. 2011. Comparison of methods for estimating density of forest songbirds from point counts. *Journal of Wildlife Management* 75:558-568.
- Schmeckle Reserve. University of Wisconsin – Stevens Point. 2010. Schmeckle Reserve Home Page. <<http://www4.uwsp.edu/cnr/schmeckle/>>. Accessed 29 September 2011.
- The Weather Channel. 2011. Monthly Averages for Stevens Point. <<http://www.weather.com/outlook/health/fitness/wxclimatology/monthly/graph/54481>>. Accessed 29 September 2011.