A Rapid Assessment of a Bird Community Within 90 Acres of Land Along the Shore of Deer Lake, Polk County, Wisconsin

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Introduction and Activity Report

A single series of point counts was conducted on July 8, 2014 in order to develop a rapid assessment of the bird community within a 90-acre property along Deer Lake. The Northwestern boundary of the counts was at 42.41047 N latitude and -92.53759 W longitude. The Northeastern boundary of the counts was at 45.41006 N latitude and -92.52547 W longitude. The Southeastern boundary of the counts was at 45.40852 N latitude and -92.52673 W longitude. The Southwestern boundary of the counts was at 45.40855 N latitude and -92.53496 W longitude. Ten point counts, each following a standardized ten-minute protocol, were conducted between the hours of 5:15 AM and 8:30 AM. The late initiation date (July 8) of surveys was due to the proximity and availability of bird surveyors. The ten point counts were fit together as closely as protocol would reasonably allow. While the northern row of points was within 200 meters of a road, the total of points allowed the entire property to be surveyed.

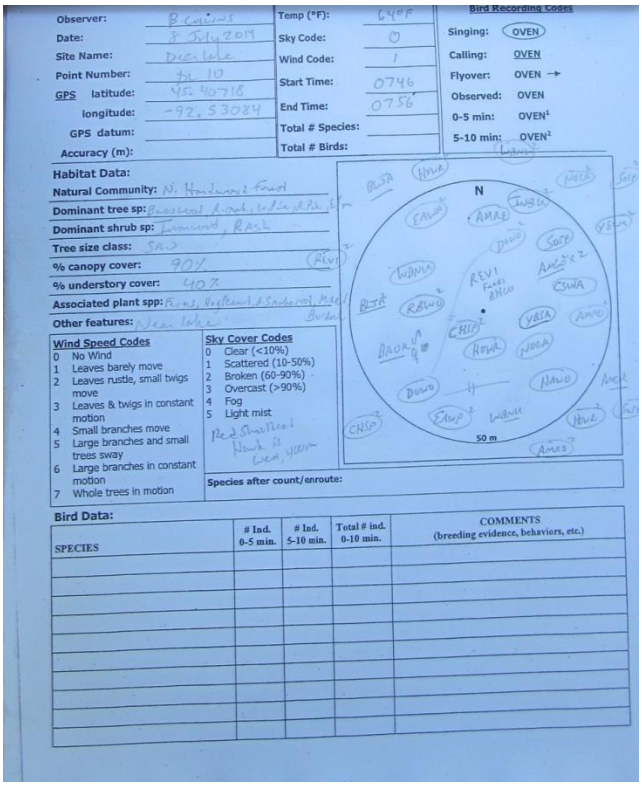
Bird Survey Points, 8 July 2014

A total of 234 birds of 36 species were detected. Among these, a single Threatened Species, the Red-shouldered Hawk, was detected by territorial calls. Many Neotropical migrant species were detected defending breeding territories as well. Almost all birds were detected by territorial song, fledgling feeding calls, or contact calls. Counts averaged 23.4 birds per survey, a number similar to other mixed hardwood forests around the state of Wisconsin, implying that the survey conducted in early July was fairly consistent with similar surveys conducted during the protocol window of June 1 to July 4.

Some bird species, such as Ovenbird and Rose-breasted Grosbeak, were surprisingly low in detection, but this was for a variety of reasons. Ovenbirds usually initiate second attempt nests or, possibly,

second broods in early July. The relative absence of Ovenbird detections is likely related to a true absence and may reflect the conditions of duff and leaf litter, slope, or understory characteristics. Rose-breasted Grosbeaks were likely under-surveyed as they tend to sing less as their nesting season wanes in mid to late June. The presence of American Basswood tends to correlate well with Rose-breasted Grosbeaks, and the fact that two individuals were detected by infrequent calls and no song indicates that the species is likely more abundant than surveys indicate. Yellow-bellied Sapsucker habitat was also abundant, and I suspect this species was under-surveyed. While the oldfield habitats were not very well suited to Golden-winged Warblers, I was fully expecting to find Blue-winged Warblers as well as increased abundance of Rose-breasted Grosbeaks. Both species eluded detection.

Due to the late survey date, I recommend that the property is resurveyed in early June of 2015. Further, a more comprehensive approach to understanding the property's value to birds could include two autumn migration surveys, two or more breeding bird surveys, and two or more spring migration surveys. I am available to conduct all of these surveys if enough advance notice is given. It is possible that alternate points could be chosen for each survey, creating an overlap in surveyed area that can be analyzed with averages. Multiple surveys tend to reveal species that are not as abundant on the property.



A completed point count survey field data sheet

Major Findings

A total of 36 species of birds were detected on the property, most of which are likely using the property to breed. Only one species, the Osprey, was detected as a transient bird, though it could very well be breeding along the shores of Deer Lake. A total of 234 individual birds were detected along the ten-survey point count route. Of the 36 species, 16 were Neotropical Migrant species, represented by 134 individuals (57% of all individuals). The Red-eyed Vireo, a late migrant Neotropical species, dominated the community at just under 20% of the total community (46 individuals). A Simpson's Diversity Index of .066 gave a fairly excellent score of diversity, describing the probability of encountering the same species twice in a row as being just under 7%.

Species of highest conservation priority were present in the mature forest habitats and included Red-shouldered Hawk, a threatened species, and Wood Thrush, a Neotropical migrant passerine of high conservation priority.

The overall forested area and proximity to other high-quality habitats makes this property a valuable component of the landscape level ecology. The forest diversity at the stand level is fairly strong in most places, and the natural course of forest succession will continue to improve the value to birds in the coming decades. Some care may be taken to ensure that the areas of sugar maple monoculture do not limit overall biological potential. Younger areas of succession to the east of the property hold potential in growing to a diverse mixed conifer / hardwood forest.

Neotropical Migrant Bird Species

Species	Number Detected	% of Community
Red-eyed Vireo	46	19.658
Eastern Wood Pewee	15	6.410
American Redstart	12	5.128
Indigo Bunting	12	5.128
Common Yellowthroat	9	3.846
Baltimore Oriole	6	2.564
Gray Catbird	5	2.137
Great Crested Flycatcher	5	2.137
House Wren	5	2.137
Scarlet Tanager	5	2.137
Ovenbird	4	1.709
Wood Thrush	4	1.709
Rose-breasted Grosbeak	2	0.855
Yellow Warbler	2	0.855
Chestnut-sided Warbler	1	0.427
Yellow-throated Vireo	1	0.427
Percent Individuals Neotropical	0.57	

Total Bird Community Overview

Species	Number Detected	% of Community
Red-eyed Vireo	46	19.658
American Crow	18	7.692
Eastern Wood Pewee	15	6.410
White-breasted Nuthatch	13	5.556
American Redstart	12	5.128
Indigo Bunting	12	5.128
Black-capped Chickadee	10	4.274
Common Yellowthroat	9	3.846
Downy Woodpecker	9	3.846
Song Sparrow	9	3.846
American Goldfinch	7	2.991
Baltimore Oriole	6	2.564
Blue Jay	6	2.564
Gray Catbird	5	2.137
Great Crested Flycatcher	5	2.137
House Wren	5	2.137
Red-breasted Nuthatch	5	2.137
Scarlet Tanager	5	2.137
Brown-headed Cowbird	4	1.709
Chipping Sparrow	4	1.709
Ovenbird	4	1.709
Wood Thrush	4	1.709
American Robin	3	1.282
Hairy Woodpecker	2	0.855
Northern Cardinal	2	0.855
Red-bellied Woodpecker	2	0.855
Rose-breasted Grosbeak	2	0.855
Yellow Warbler	2	0.855
Chestnut-sided Warbler	1	0.427
Cooper's Hawk	1	0.427
Eastern Phoebe	1	0.427
House Finch	1	0.427
Osprey	1	0.427
Red-shouldered Hawk	1	0.427
Yellow-bellied Sapsucker	1	0.427
Yellow-throated Vireo	1	0.427
Total Birds	234	
Total Surveys	10	
Birds per Survey	23.4	
Total Species	36	
Simpson's D	0.066	

Mature Forest Surveys

Approximately 80% (by bird survey coverage) of the property falls within a "mature forest" or "mixed Northern hardwood forest" habitat classification. Overall, 32 species of birds were detected in the mature forest portion of the property. Whereas 23.4 birds were detected per survey overall, the detection rate for Northern hardwood forest was 22.25 birds per survey, a number similar to mature hardwood forests throughout Wisconsin.

Red-eyed vireos dominated the mature forest on the property, comprising nearly 20% of the overall bird community and 22.5 % of the mature forest bird community. Wood Thrush, a species of conservation priority, occurred in the northwestern portions of the property and in the adjacent preserve. This species tends to occur in mature forest with a more pristine herbaceous community and some well-developed understory and subcanopy structure, and microhabitat study may be very useful in developing a long-standing habitat management plan. Red-shouldered Hawk, a threatened species detected on the property, requires very large tracts of contiguous mature forest with a high tree species diversity, often near water. The presence of this species on the acreage provides strong evidence that this property is an important conservation link in the landscape level habitat. Scarlet Tanager, Eastern Wood Pewee, Great Crested Flycatcher, Cooper's Hawk, Yellow-bellied Sapsucker, and Yellow-throated Vireo were all present on the property, and all have been identified by Cornell Labs or IUCN as birds of conservation priority. Of these, Wood Thrush, Scarlet Tanager, Eastern Wood Pewee, Great Crested Flycatcher, and Yellow-throated Vireo are also Neotropical Migrant birds, and the Yellow-bellied Sapsucker is a long-distance migrant bird. Other Neotropical migrant species breeding in the mature forest habitats included Red-eyed Vireo, Ovenbird, Indigo Bunting, American Redstart, Baltimore Oriole, and Rose-breasted Grosbeak.

Birds dependent upon standing deadwood and cavity nesting substrate were abundant and diverse. A total of 9 cavity-nesting species were present with a total representation of 22% of all individuals. Great Crested Flycatchers were common (5 individuals detected) and point to high quality forested habitat with large snags.

Some areas of the mature forest are approaching a sugar maple monoculture and, as a result, are becoming more sterile in overall biological (including bird) community. Two surveys within the mature forested areas (Points 2 and 9, occurring at similar West longitude) had only six bird species each, whereas other forested surveys had many more species (11, 11, 12, 12, 14 and 21 species). A greater diversity in tree canopy species and understory/shrub layer species within larger, contiguous tracts of forest tends to result in more structural diversity and greater bird diversity.

Many areas of mature forest have a minimum of shrub layer structural development and may be somewhat limited in providing for forest bird diversity.

Other areas are rich in plant diversity, structural diversity, and lend to greater bird diversity.

Open pools of water throughout the property enhance bird diversity as well as amphibian diversity. Green frogs were heard during bird surveys, and frog surveys would certainly reveal other species to include Wood Frog, Chorus Frog, and Gray Treefrog. Open pools serve as feeding areas for aerial insectivore birds such as American Redstart, Great Crested Flycatcher, Eastern Phoebe, and Eastern Wood Pewee.

Indigo Buntings thrive on the property due to abundant intersections of habitat types, especially mature forest edges intersecting pools, roads, and early succession habitats.

Bird Community Overview, Mature Forested Habitats (8 Bird Surveys)

Species	**Number Detected**	**% of Community**
Red-eyed Vireo	40	22.47
American Crow	15	8.43
Eastern Wood Pewee	13	7.30
White-breasted Nuthatch	12	6.74
American Redstart	10	5.62
Indigo Bunting	8	4.49
Downy Woodpecker	7	3.93
Black-capped Chickadee	6	3.37
Blue Jay	6	3.37
Song Sparrow	6	3.37
Common Yellowthroat	5	2.81
Great Crested Flycatcher	5	2.81
American Goldfinch	4	2.25
Baltimore Oriole	4	2.25
House Wren	4	2.25
Ovenbird	4	2.25
Scarlet Tanager	4	2.25
Wood Thrush	4	2.25
American Robin	3	1.69
Brown-headed Cowbird	3	1.69
Chipping Sparrow	2	1.12
Northern Cardinal	2	1.12
Rose-breasted Grosbeak	2	1.12
Chestnut-sided Warbler	1	0.56
Cooper's Hawk	1	0.56
Eastern Phoebe	1	0.56
Gray Catbird	1	0.56
Hairy Woodpecker	1	0.56
Red-bellied Woodpecker	1	0.56
Red-shouldered Hawk	1	0.56
Yellow Warbler	1	0.56
Yellow-bellied Sapsucker	1	0.56
Total Birds	178	
Total Surveys	8	
Birds per Survey	22.25	
Species	32	
Simpson's D	0.078	

Oldfield Habitat Surveys

Consistent with similar habitats throughout Wisconsin, the early succession, edge portions of the property had increased bird abundance (28 birds per survey) and bird diversity (Simpson D = 0.04). As is usual, however, the majority of the species present were edge species common to disturbed areas. These species are native, beneficial, and often Neotropical migrants. Due to the abundance of younger habitats throughout the Great Lakes states, many of these species are not considered to be conservation priorities.

An abundance of conifers, especially spruce, resulted in strong community representation by Red-breasted Nuthatch. Other species, including Common Yellowthroat and Gray Catbird, each representing 7% of the oldfield community, were representative of an edge habitat in close proximity to contiguous forest. Indigo Bunting, Red-eyed Vireo, American Redstart, Baltimore Oriole, and Yellow-throated Vireo were present in transitional margins where mature trees and brushy openings intersected.

Invasive plant species, including European honeysuckle and Amur maple, contribute to a dense shrub layer throughout the younger succession. While used by many breeding bird species, these plants may also pose challenges to forest community development in the coming decades.

Oldfield succession, eastern portion of the property, is rich in conifer plantings.

Bird Community Overview, Oldfield Habitats (2 Bird Surveys)

Species	**Number Detected**	**% of Community**
Red-eyed Vireo	6	10.71
Red-breasted Nuthatch	5	8.93
Black-capped Chickadee	4	7.14
Common Yellowthroat	4	7.14
Gray Catbird	4	7.14
Indigo Bunting	4	7.14
American Crow	3	5.36
American Goldfinch	3	5.36
Song Sparrow	3	5.36
American Redstart	2	3.57
Baltimore Oriole	2	3.57
Chipping Sparrow	2	3.57
Downy Woodpecker	2	3.57
Eastern Wood Pewee	2	3.57
Brown-headed Cowbird	1	1.79
Hairy Woodpecker	1	1.79
House Finch	1	1.79
House Wren	1	1.79
Osprey	1	1.79
Red-bellied Woodpecker	1	1.79
Scarlet Tanager	1	1.79
White-breasted Nuthatch	1	1.79
Yellow Warbler	1	1.79
Yellow-throated Vireo	1	1.79
Total Individuals	56	
Total Surveys	2	
Individuals per Survey	28	
Total Species	24	
Simpson's D	0.04	

Conclusions and Considerations

This property will benefit greatly from continued natural succession, though very selective thinning (simulating windfall sunny openings) of monoculture sugar maples may result in richer bird diversity in the long run. Some consideration may be given to planting native white pine, yellow birch, white birch and white oak along sunny edges so that the area will eventually succeed into a more complete representation of this Wisconsin forest ecotype. Allowing at least some of the plantation pine to mature will also lend to future bird diversity as they will create a supercanopy favored by Scarlet Tanagers, Blue-headed Vireos, Pine Warblers, various species of forest raptors, Bald Eagles, and Ospreys.

Currently, the mature forest exists as a haven for the Red-eyed Vireo. This species demonstrates complex subcanopy component to the forest and marks this as a healthy and valuable second growth forest. The success of this species on the property is very encouraging, but the very high relative abundance of this species also suggests that the forest is less than suitable for a variety of other deep forest birds. Habitat improvements, including a couple of very small sunny openings within monocultures of sugar maple and the encouragement of white pine within the contiguous tract of forest may encourage other species of forest birds and improve bird diversity. In the next half century, mature white pines will encourage Pine Warbler, improve habitat for Scarlet Tanager, and may invite Blackburnian Warbler. Increasing understory cover in some areas, near flooded pools for example, could encourage Veery, Black-and-white Warbler, Mourning Warbler, Hooded Warbler and other Neotropical migrant birds that depend upon a developed shrub layer. Some understory candidates include red maple and winterberry holly.

The strength of the cavity-nesting bird community points to the importance of standing dead wood in every forest ecosystem. Long range planning for this forest should include practices sensitive to maintaining the presence of standing snags of large size.

Forest health through succession in this type of forest community may also be tracked by the presence or maintenance of various herbaceous understory plants such as Blue Cohosh. There is evidence that significant historical disturbance of a forest's soil may influence which types of herbaceous plants occur at the ground layer, and this may affect the larger biological community in turn. Further study may reveal correlation between high quality, diverse species of herbaceous cover and increased bird diversity. While the Simpson D score of 0.066 for this property is very strong, it is also reflective of strong dominance by one species of bird (Red-eyed Vireo). Successfully providing microhabitat for a greater diversity of birds in the forest would be reflected in indices around 0.04 or lower. As indicated earlier, a more intensive study of habitats favored by Wood Thrush may provide a key for habitat goals and future management of contiguous forest habitats in this region.

Overall, this forest provides an important landscape level link to the ecology of the north shore of Deer Lake. Allowing this forest to remain will be important to bird conservation efforts in Polk County. If acquired, a variety of small-scale habitat improvements will enhance its value to forest birds.