2004

Surveys of Breeding Birds Within Bear Swamp, Wicomico and Worchester Counties, Maryland

B. J. Paxton
The Center for Conservation Biology, bjpaxt@wm.edu

F M. Smith
The Center for Conservation Biology, fmsmit@wm.edu

November 2004

Surveys of Breeding Birds Within Bear Swamp, Wicomico and Worchester Counties, Maryland

2004
Interim Report

Barton J. Paxton
Fletcher M. Smith
Center for Conservation Biology
College of William and Mary
Williamsburg, VA 23187-8795

The Nature Conservancy
SAVING THE LAST GREAT PLACES ON EARTH

This paper is funded by grants from the Maryland/DC Chapter of The Nature Conservancy. The views expressed herein are those of the authors and do not necessarily reflect the views of the Maryland/DC Chapter of The Nature Conservancy.

Surveys of Breeding Birds Within Bear Swamp, Wicomico and Worchester Counties, Maryland

2004
Interim Report

Barton J. Paxton
Fletcher M. Smith
Center for Conservation Biology
College of William and Mary
Williamsburg, VA 23187-8795

Recommended Citation:

Paxton, B. J. and F. M. Smith. 2004. Surveys of Breeding Birds Within Bear Swamp, Wicomico and Worchester Counties, Maryland. Center for Conservation Biology Technical Report Series, CCBTR-04-11. College of William and Mary, Williamsburg, VA. 35 pp.

Project Funded By:

The Maryland/DC Chapter of
The Nature Conservancy

The Center for Conservation Biology is an organization dedicated to discovering innovative solutions to environmental problems that are both scientifically sound and practical within today's social context. Our philosophy has been to use a general systems approach to locate critical information needs and to plot a deliberate course of action to reach what we believe are essential information endpoints.

TABLE OF CONTENTS

Executive Summary..... iii

BACKGROUND..... 1
Context 1
Objectives..... 2

METHODS..... 2
Study Area..... 2
Bird Surveys..... 2
Data Summary and Analysis 4

RESULTS..... 4

DISCUSSION..... 6

ACKNOWLEDGMENTS..... 6

LITERATURE CITED..... 7

APPENDIX I..... 8

APPENDIX II..... 10

APPENDIX III..... 33

EXECUTIVE SUMMARY

Birds are essential components of natural ecosystems, effective indicators of environmental health, and the focus of an emerging ecotourism industry that represents a growing portion of the world's economy. An increased concern for the status of many North American bird populations has resulted in an escalation of monitoring and management efforts. Much of this concern has been focused upon the many species of forest-dwelling neotropical migrants (species that migrate between forested breeding grounds in the temperate latitudes of North America and wintering grounds in Central and South America and the Caribbean) that have exhibited substantial population declines in recent decades. The mid-Atlantic Coastal Plain plays a significant role in the life cycle of many of the most vulnerable bird species in North America. The diversity of habitats available to birds during the breeding and winter periods, along with the strategic geographic position of the region for migrants, combine to make this one of the most diverse regions in eastern North America.

The Maryland/DC chapter of The Nature Conservancy is in the process of acquiring nearly 3,470 hectares (ha) of land from the E.S. Adkins Timber Company. Tracts of this property are located within or near the Pocomoke Swamp, which is a disjunct fragment of the larger, humid swamp forests of the deep south and represents the northern range limit for some neotropical migrant bird species. Monitoring populations of these species should be a local conservation priority.

A total of 69 survey points, consisting of a combination of fixed-radius and unlimited-radius point count techniques, were used to measure bird density and frequency of occurrence within Bear Swamp, a portion of the land to be acquired. A total of 2,754 detections of 76 bird species were made during the initial survey year. These detections were comprised of 38 neotropical migrant species, 16 temperate migrant species, and 22 non-migratory (resident) species.

The results of the first of two years of surveys provide an account of the abundance and distribution of bird species that occupy the varied habitat types of Bear Swamp. The majority of species observed during the first year of surveys are typical of those normally found within deciduous forest, pine plantations, and early successional habitats of the mid-Atlantic region. A complete comparison of densities and diversities between habitat types will be presented in the final report submitted after the second year of the study.

BACKGROUND

Context

Birds are essential components of natural ecosystems, effective indicators of environmental health, and the focus of an emerging ecotourism industry that represents a growing portion of the world's economy. During the course of the twentieth century, the living space and infrastructure required by an expanding human population has had a pervasive impact on the natural landscape, resulting in a direct change in the availability and distribution of the habitats required by many bird species. Restoring and maintaining healthy bird populations within these altered landscapes represents one of the most complex conservation challenges for the twenty-first century.

An increased concern for the status of many North American bird populations has resulted in an escalation of monitoring and management efforts. Much of this concern has been focused upon the many species of forest-dwelling neotropical migrants (species that migrate between forested breeding grounds in the temperate latitudes of North America and wintering grounds in Central and South America and the Caribbean) that have exhibited substantial population declines in recent decades. There is increasing evidence that habitat loss and fragmentation are two of the leading causes for the observed population declines (Faaborg et al. 1995, Robinson et al. 1995).

The mid-Atlantic Coastal Plain plays a significant role in the life cycle of many of the most vulnerable bird species in North America. The diversity of habitats available to birds during the breeding and winter periods, along with the strategic geographic position of the region for migrants, combine to make this one of the most diverse regions in eastern North America. The region was the site of the first successful European settlement in North America and has been altered by European culture for nearly four centuries. Currently, the urban crescent that runs from Baltimore, south to Richmond, and east to Norfolk is one of the fastest growing regions in North America. Growth is projected to continue for the foreseeable future, placing increasing demands on the region's natural resources. The landscape along the Delmarva Peninsula continues to be rural in character. However, immigration of residents from more urban areas will place increasing pressures on this landscape in the future (Watts 1999).

Vegetation within the mid-Atlantic Coastal Plain is most closely associated with that of the southeastern Coastal Plain. More than 100 plant species that are centered in the southeast reach their northern range limit in coastal New Jersey. Many more species reach their limit farther south within the region. Upland forests remain an important component of the regional landscape. Forests form a natural gradient in composition from pine-dominated forests on the outer Coastal Plain to hardwood-dominated forests on the inner Coastal Plain.

The Maryland/DC chapter of The Nature Conservancy is in the process of acquiring nearly 3,470 hectares (ha) of land from the E.S. Adkins Timber Company. Tracts of this property are located within or near the Pocomoke Swamp, which is a disjunct fragment of the larger, humid swamp forests of the deep south and represents the northern range limit for some neotropical migrant bird species. Monitoring populations of these species should be a local conservation priority.

Objectives

The overall objective of this project is to evaluate the breeding bird community within the Bear Swamp Unit of the Adkins Tract. The focal area is a mosaic of forest blocks within the Pocomoke drainage. Information provided through this project will provide resource staff with information important for making management decisions and establish a benchmark for future comparisons.

METHODS

Study Area

This study was conducted entirely within the Bear Swamp portion of the Adkins Tract, located within Wicomico and Worchester Counties on the coastal plain of Maryland (Figure 1). The Bear Swamp portion of the Adkins Tract consists primarily of a matrix of mature forested wetland and pine plantation and is associated with Nassawango Creek and the Pocomoke River. The composition of the forested wetland habitat is primarily Red Maple (*Acer rubrum*), Mockernut Hickory (*Carya tomentosa*) , Black Gum (*Nyssa sylvatica*), and Bald Cypress (*Taxodium distichum*) with a well developed understory of Red Maple (*A. rubrum*), American Holly (*Ilex opaca*), and Sweet Bay (*Magnolia virginiana*). The composition of the pine plantation habitat is primarily densely stocked Loblolly Pine (*Pinus taeda*) in stands of generally uniformily aged trees. Ages of pine stands ranged from recently cut to more than 30 years old.

Bird Surveys

A combination of fixed-radius and unlimited-radius point count techniques were used to measure bird density and frequency of occurrence. A survey plot (point count) consisted of a 50-m radius circle (used to determine density) flagged at its center. Surveys were conducted along roadways, trails, and within forest patches. Points situated along roads and trails had the plot centers positioned at the road or trail edge.

Initially, 63 points were established within the Bear Swamp study area. After completion of surveys on round 1, it became evident that survey time constraints would allow an additional 6 points, resulting in a total of 69 points. Points were established along

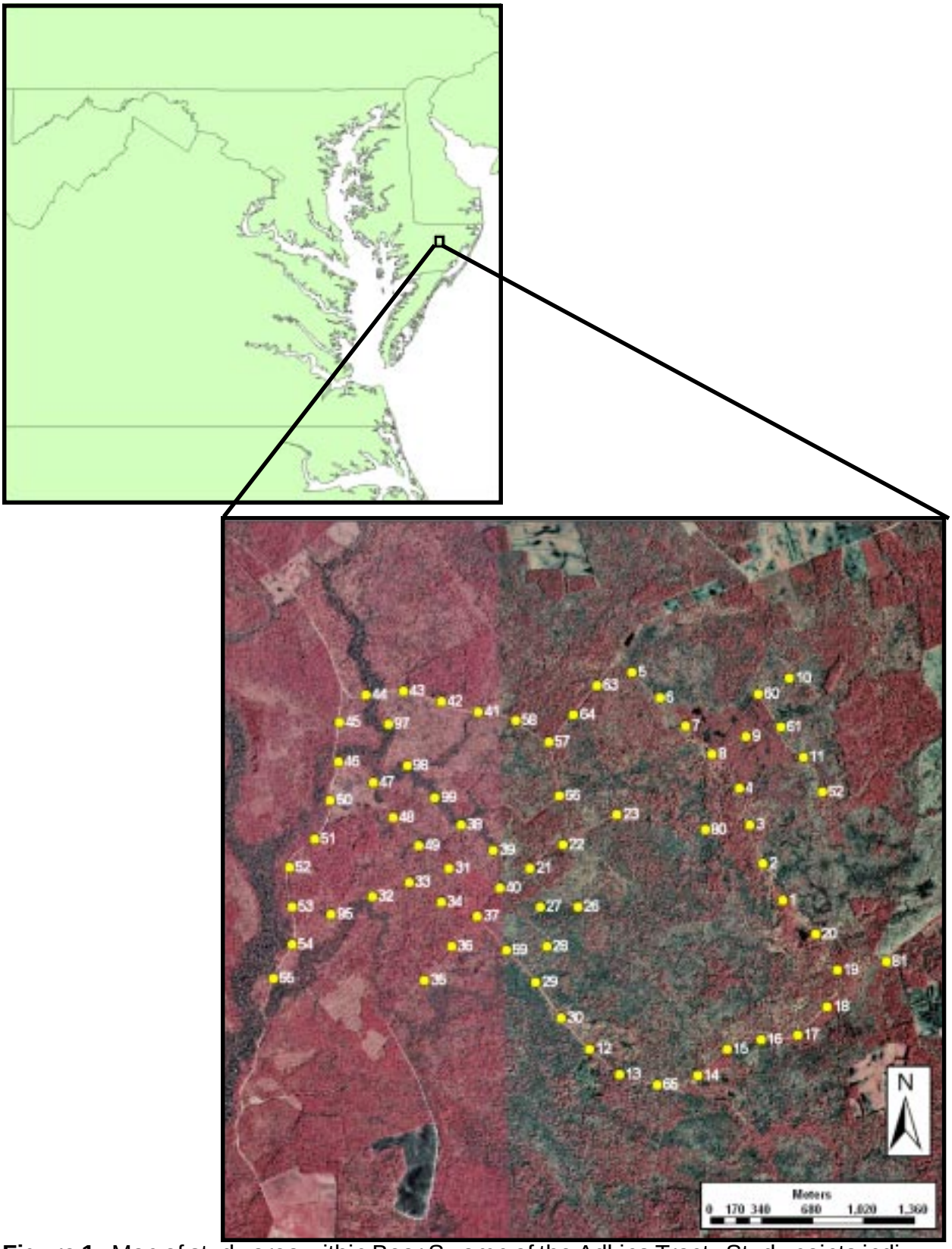

Figure 1. Map of study area within Bear Swamp of the Adkins Tract. Study points indicated by yellow dots.

the gradient of habitat types available, with a minimum of 250 m between each point (see Appendix I for list of points, coordinates, and associated habitat types). While an effort was made to associate each 50-m fixed-radius point count to a single habitat type, space and habitat limitations resulted in some points occurring along the edge of 2 habitat types.

Bird surveys were conducted by a single observer standing at the point center and counting all birds seen or heard within a 5-minute period. Birds detected were stratified according to time period and location. The count period was subdivided into an initial 3-min period and a subsequent 2-min period. Birds were recorded as either within or beyond the 50-m radius. Each point was surveyed 3 times between 10 June 2004 and 8 July 2004, with a minimum of 7 days between survey rounds. The order in which points were surveyed was changed each round to reduce the impact of time-of-day effects. All surveys were conducted between 0.5 and 4.5 hrs after sunrise on days with no precipitation and wind speeds of less than 24 km/h (15 mph).

Data Summary and Analysis

Bird survey data were summarized to determine overall bird abundance and species richness for individual habitat types as well as the entire study area. Bird densities were calculated from the number of birds detected within the 50-m radius point count. For each bird species, the survey visit with the greatest number of individuals detected was used for analysis. Species richness values were calculated using the accumulated number of species detected within or beyond the 50-m radius point count.

RESULTS

A total of 2,754 detections of 76 bird species were made during the 2004 surveys. These were comprised of 38 neotropical migrant species, 16 temperate migrant species, and 22 non-migratory (resident) species (see Appendix II for summary of detections by point and survey round and Appendix III for list of birds detected with migration status). Common Yellowthoat, Ovenbird, Eastern Towhee, Prairie Warbler, Pine Warbler, White-eyed Vireo, and Yellow-breasted Chat were the most commonly detected species, accounting for nearly 40% of all detections.

The overall number of species detected within each habitat type (only points associated with a single habitat type were included in analysis) ranged from 26, within the mature pine habitat, to 60, within the young pine habitat (Figure 2). Bird densities, for points associated with a single habitat type, were highest within the clearcut habitat (7.80 birds/ha + 6.59 SD) and lowest within the mature pine habitat (5.56 birds/ha + 2.75 SD) (Figure 3). Differences in densities among the different habitat types were not significant (one-way ANOVA $p>0.05$).

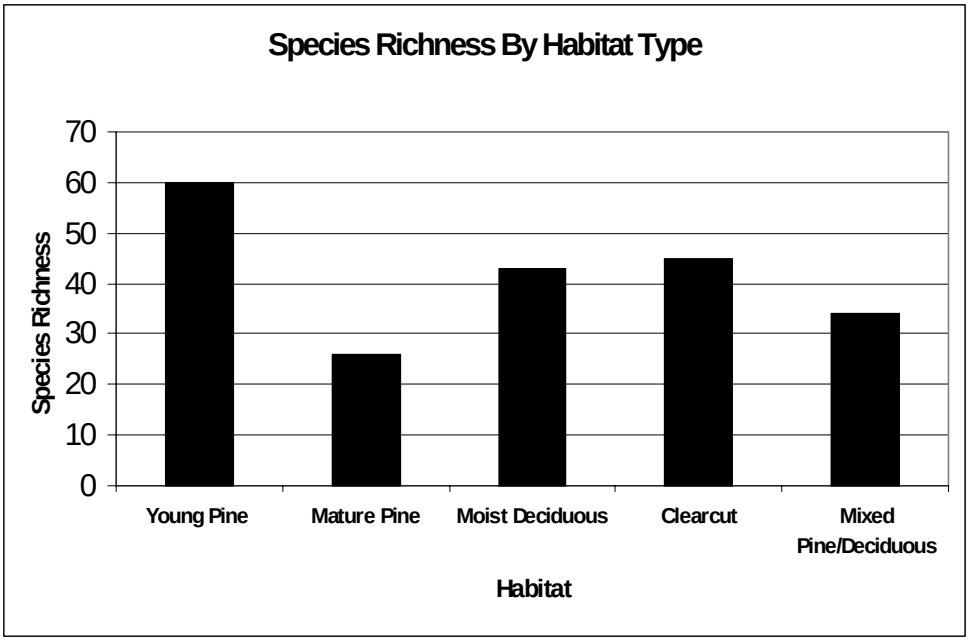

Figure 2. Species richness values for habitat types within Bear Swamp. Values are based on the accumulated number of species detected at points associated with a single habitat type over three survey visits.

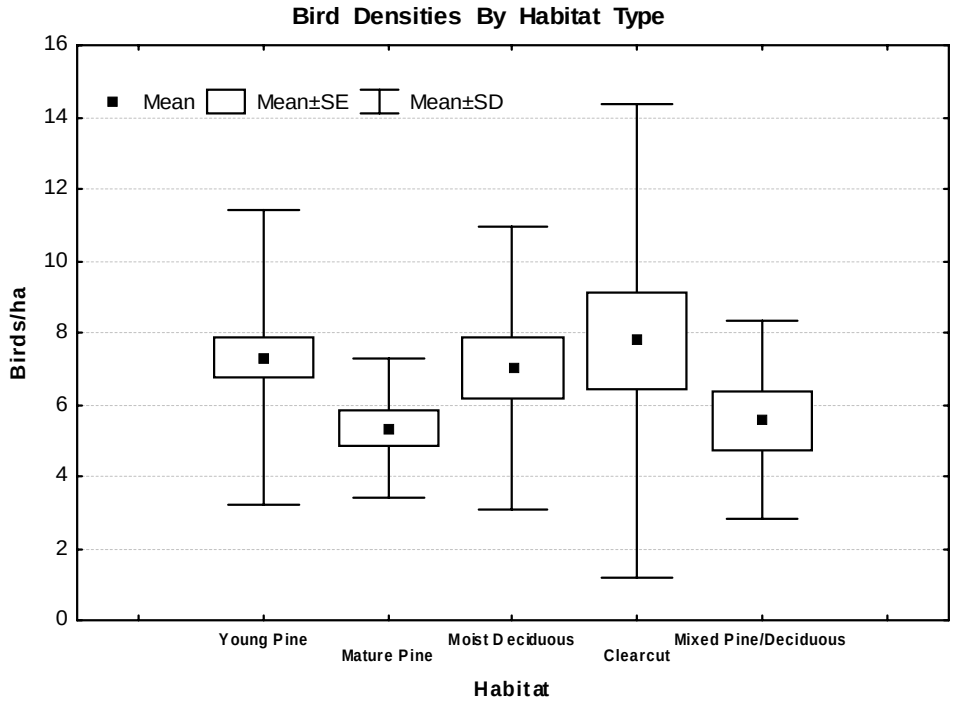

Figure 3. Bird density values for habitat types within Bear Swamp. Values are based on the mean densities for all birds detected with the 50-m radius plots of points associated with a single habitat type over three survey visits.

DISCUSSION

The results of the first of two years of surveys provide an account of the abundance and distribution of bird species that occupy the varied habitat types of Bear Swamp. The majority of species observed during the first year of surveys are typical of those normally found within deciduous forest, pine plantations, and early successional habitats of the mid-Atlantic region.

While the density and diversity of birds within the early successional habitats were higher than those found in the mature forest, the forested wetland and mature pine habitats provide critical nesting habitat for numerous species. Many of the species that rely on this mature habitat for breeding have been found to nest at low densities within the Coastal Plain of Maryland (Robbins and Blom 1996). The higher diversity and density of birds within the early successional habitats can be attributed to the fact than many species of neotropical migrants will utilize the early successional habitat along with the temperate migrant and resident species that are tolerant of disturbed habitat (Johnson and Landers 1982). A more complete comparison of densities and diversities between habitat types will be presented in the final report submitted after the second year of the study.

ACKNOWLEDGMENTS

This project would not have been possible without the efforts of many people. Deborah Landau provided the opportunity to conduct the study and administrative support. Bill Turner was helpful in providing access to study sites. Lydia Whitaker, Carlton Adams, Renee Peace, Anne Womack, Gloria Sciole, Mark Roberts, and Cheryl Pope provided important administrative support from the College of William and Mary. This study was funded through a cooperative agreement between the Maryland/DC Chapter of The Nature Conservancy and the Center for Conservation Biology at the College of William and Mary.

LITERATURE CITED

Faaborg, J., M. Brittingham, T. Donovan, and J. Blake. 1995. Habitat fragmentation in the temperate zone. ppg 357-380 in T.E. Martin and D.M. Finch, eds., Ecology and Management of Neotropical Migratory Birds. Oxford University Press, Oxford, United Kingdom.

Johnson, A.S., and J.L. Landers. 1982. Habitat relationships of summer resident birds in slash pine flatwoods. Journal of Wildlife Management 46:416-428.

Robbins, C. S. and E. A. T. Blom. 1996. Atlas of the breeding birds of Maryland and the District of Columbia. University of Pittsburgh Press, Pittsburgh, PA.

Robinson, S.K., F.R. Thompson III, T.M. Donovan, D.R. Whitehead, and J. Faaborg. 1995. Regional forest fragmentation and the nesting success of migratory birds. Science 267:1987-1990

Watts, B.D. 1999. Partners in Flight bird conservation plan for the mid-Atlantic Coastal Plain. Partners in Flight Document

Appendix I. Bird point count coordinates and habitat association.

Point Number	Latitude	Longitude	Habitat
1	38.28155709	-75.41428199	Young Pine
2	38.28377034	-75.41573298	Young Pine
3	38.28612733	-75.41664066	Mixed Pine/Deciduous
4	38.28836345	-75.41745027	Young Pine
5	38.29547592	-75.42546697	Young Pine, Mixed Pine/Deciduous
6	38.29387606	-75.42338591	Young Pine, Mixed Pine/Deciduous
7	38.29215584	-75.42143770	Clearcut, Mixed Pine/Deciduous
8	38.29041325	-75.41947098	Mature Pine
9	38.29146383	-75.41683671	Mature Pine
10	38.29494442	-75.41342578	Mature Pine
11	38.29016648	-75.41247192	Mature Pine
12	38.27276414	-75.42920530	Mature Pine, Clearcut
13	38.27121751	-75.42698166	Young Pine, Clearcut
14	38.27106857	-75.42099170	Young Pine
15	38.27265769	-75.41872524	Young Pine
16	38.27318676	-75.41609743	Young Pine
17	38.27339522	-75.41331061	Young Pine
18	38.27508300	-75.41097072	Young Pine
19	38.27728140	-75.41017964	Young Pine, Mature Pine
20	38.27945299	-75.41179340	Young Pine
21	38.28376531	-75.43349507	Clearcut, Mixed Pine/Deciduous
22	38.28511261	-75.43099584	Clearcut, Mixed Pine/Deciduous
23	38.28692193	-75.42680481	Young Pine, Mixed Pine/Deciduous
26	38.28139214	-75.42992564	Moist Deciduous
27	38.28143111	-75.43280323	Moist Deciduous
28	38.27903238	-75.43232580	Moist Deciduous
29	38.27684722	-75.43322610	Young Pine, Moist Deciduous
30	38.27467974	-75.43131930	Young Pine, Mixed Pine/Deciduous
31	38.28385307	-75.43970975	Clearcut
32	38.28222463	-75.44560835	Young Pine
33	38.28300280	-75.44278876	Young Pine
34	38.28181149	-75.44034476	Young Pine
35	38.27708920	-75.44172476	Clearcut
36	38.27909885	-75.43961579	Clearcut
37	38.28089107	-75.43761251	Young Pine, Clearcut

Appendix I (continued). Bird point count coordinates and habitat association.

Point Number	Latitude	Longitude	Habitat
38	38.28642732	-75.43873971	Clearcut
39	38.28488152	-75.43627845	Clearcut
40	38.28260676	-75.43584812	Young Pine, Clearcut
41	38.29323367	-75.43727028	Young Pine, Clearcut
42	38.29390624	-75.44008258	Young Pine
43	38.29454376	-75.44297383	Young Pine
44	38.29436850	-75.44587456	Mixed Pine/Deciduous
45	38.29275238	-75.44791111	Young Pine, Clearcut
46	38.29036170	-75.44802317	Young Pine, Mixed Pine/Deciduous
47	38.28910827	-75.44540928	Moist Deciduous, Clearcut
48	38.28695068	-75.44391009	Clearcut
49	38.28524144	-75.44201779	Clearcut
50	38.28806581	-75.44870412	Young Pine, Mixed Pine/Deciduous
51	38.28575400	-75.44995076	Young Pine, Mixed Pine/Deciduous
52	38.28406060	-75.45190643	Young Pine, Mixed Pine/Deciduous
53	38.28168592	-75.45175052	Young Pine, Moist Deciduous
54	38.27937352	-75.45178019	Young Pine, Mixed Pine/Deciduous
55	38.27738341	-75.45328743	Moist Deciduous
57	38.29132268	-75.43194719	Young Pine, Clearcut
58	38.29266320	-75.43440853	Young Pine, Clearcut
59	38.27880934	-75.43545744	Young Pine, Mixed Pine/Deciduous
60	38.29402819	-75.41588612	Mature Pine
61	38.29200271	-75.41420043	Mature Pine
62	38.28806430	-75.41108781	Mixed Pine/Deciduous
63	38.29470629	-75.42816284	Young Pine
64	38.29295338	-75.42999169	Young Pine
65	38.27054822	-75.42410390	Young Pine
66	38.28808031	-75.43121461	Clearcut
80	38.28588610	-75.42009224	Mixed Pine/Deciduous
81	38.27776319	-75.40639646	Young Pine
95	38.28115133	-75.44877914	Moist Deciduous
97	38.29258483	-75.44414042	Moist Deciduous
98	38.29006724	-75.44278038	Moist Deciduous
99	38.28808601	-75.44069219	Moist Deciduous

Appendix II. Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
ACFL	1	2	0	0	2
ACFL	2	2	0	0	2
ACFL	3	1	0	0	1
ACFL	4	0	1	1	2
ACFL	7	1	2	2	5
ACFL	8	1	0	0	1
ACFL	9	2	1	2	5
ACFL	20	2	0	0	2
ACFL	22	1	0	0	1
ACFL	26	1	1	1	3
ACFL	27	3	1	2	6
ACFL	40	2	1	0	3
ACFL	42	0	0	1	1
ACFL	44	0	2	0	2
ACFL	46	1	1	1	3
ACFL	50	1	1	0	2
ACFL	51	1	1	0	2
ACFL	52	2	0	2	4
ACFL	53	0	0	2	2
ACFL	54	1	0	0	1
ACFL	55	1	1	0	2
ACFL	61	1	2	2	5
ACFL	62	0	0	1	1
ACFL	81	1	0	0	1
ACFL	95	0	1	2	3
ACFL	98	1	1	1	3
ACFL	99	2	0	1	3
Total		30	17	21	68
EATO	1	2	1	2	5
EATO	2	1	0	0	1
EATO	6	1	2	1	4
EATO	7	2	0	1	3
EATO	12	2	1	0	3
EATO	13	2	0	2	4
EATO	14	2	3	4	9
EATO	15	1	3	2	6
EATO	16	3	2	1	6
EATO	17	3	4	3	10
EATO	18	2	1	1	4
EATO	19	2	1	1	4
EATO	20	2	2	3	7
EATO	21	0	1	1	2
EATO	22	1	0	2	3
EATO	23	2	1	1	4
EATO	27	0	0	1	1
EATO	29	0	2	1	3
EATO	30	0	1	1	2
EATO	31	0	2	3	5
EATO	34	0	1	1	2
EATO	35	1	0	0	1
EATO	36	0	1	2	3
EATO	37	2	1	1	4

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
EATO	38	0	1	0	1
EATO	39	2	0	0	2
EATO	40	1	1	1	3
EATO	41	0	1	0	1
EATO	46	1	0	0	1
EATO	47	1	1	0	2
EATO	48	1	1	3	5
EATO	49	3	1	5	9
EATO	50	2	0	3	5
EATO	51	0	4	0	4
EATO	52	1	0	2	3
EATO	53	1	0	0	1
EATO	54	0	0	1	1
EATO	57	3	1	1	5
EATO	58	1	1	0	2
EATO	59	1	0	0	1
EATO	63	2	2	1	5
EATO	64	2	0	1	3
EATO	65	3	4	3	10
EATO	66	2	0	0	2
EATO	81	0	1	0	1
EATO	97	0	3	0	3
EATO	99	1	0	0	1
Total		59	52	56	167
BHCO	1	1	0	0	1
BHCO	8	2	1	0	3
BHCO	9	2	0	0	2
BHCO	12	2	2	0	4
BHCO	14	1	0	0	1
BHCO	15	0	2	0	2
BHCO	16	0	3	0	3
BHCO	17	0	4	0	4
BHCO	18	1	3	0	4
BHCO	19	1	0	0	1
BHCO	20	2	0	0	2
BHCO	23	0	3	2	5
BHCO	26	0	1	0	1
BHCO	34	0	2	1	3
BHCO	36	0	2	0	2
BHCO	41	1	0	0	1
BHCO	42	0	0	1	1
BHCO	43	2	0	0	2
BHCO	45	0	3	0	3
BHCO	50	3	0	0	3
BHCO	51	1	6	2	9
BHCO	52	1	2	3	6
BHCO	53	1	1	2	4
BHCO	54	3	0	3	6
BHCO	58	0	0	1	1
BHCO	59	1	0	0	1
BHCO	63	1	0	0	1
BHCO	80	0	1	3	4

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
Total		26	36	18	80
OVEN	1	2	0	0	2
OVEN	2	2	1	1	4
OVEN	3	2	1	1	4
OVEN	4	0	1	1	2
OVEN	5	2	2	0	4
OVEN	6	2	0	0	2
OVEN	7	1	0	0	1
OVEN	8	2	1	2	5
OVEN	9	1	3	2	6
OVEN	10	0	2	1	3
OVEN	11	0	3	2	5
OVEN	12	1	0	0	1
OVEN	13	1	0	0	1
OVEN	14	1	0	0	1
OVEN	19	2	1	0	3
OVEN	20	1	1	1	3
OVEN	21	1	2	0	3
OVEN	22	1	0	0	1
OVEN	23	1	1	0	2
OVEN	26	1	3	1	5
OVEN	27	2	1	3	6
OVEN	28	2	1	2	5
OVEN	29	1	1	0	2
OVEN	30	2	0	0	2
OVEN	32	0	1	0	1
OVEN	33	1	1	1	3
OVEN	34	1	0	0	1
OVEN	36	1	0	0	1
OVEN	37	1	0	0	1
OVEN	39	0	1	1	2
OVEN	40	1	1	2	4
OVEN	41	1	1	1	3
OVEN	42	2	3	0	5
OVEN	43	2	2	1	5
OVEN	44	1	2	0	3
OVEN	45	1	0	0	1
OVEN	47	1	1	2	4
OVEN	48	2	0	1	3
OVEN	50	0	1	1	2
OVEN	51	0	1	2	3
OVEN	52	2	0	0	2
OVEN	53	2	1	0	3
OVEN	54	1	1	1	3
OVEN	55	2	2	2	6
OVEN	59	1	0	0	1
OVEN	60	0	1	2	3
OVEN	61	1	2	0	3
OVEN	62	0	1	1	2
OVEN	63	2	0	0	2
OVEN	65	2	0	0	2
OVEN	80	2	2	1	5

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
OVEN	81	3	1	1	5
OVEN	95	0	2	1	3
OVEN	97	0	3	2	5
OVEN	98	2	2	2	6
OVEN	99	0	1	1	2
Total		66	59	43	168
EAWP	1	1	0	0	1
EAWP	3	1	0	0	1
EAWP	4	1	0	0	1
EAWP	8	1	0	0	1
EAWP	15	0	0	1	1
EAWP	19	0	1	0	1
EAWP	23	1	0	0	1
EAWP	26	0	1	0	1
EAWP	27	1	0	1	2
EAWP	30	1	0	0	1
EAWP	34	2	0	0	2
EAWP	45	1	1	0	2
EAWP	46	0	1	0	1
EAWP	47	1	0	1	2
EAWP	48	1	0	1	2
EAWP	49	0	1	0	1
EAWP	51	1	0	0	1
EAWP	52	1	2	0	3
EAWP	53	0	2	1	3
EAWP	54	1	0	1	2
EAWP	58	0	0	1	1
EAWP	63	0	0	1	1
EAWP	66	0	0	1	1
EAWP	99	1	0	0	1
Total		16	9	9	34
COYE	1	1	0	0	1
COYE	2	0	3	4	7
COYE	4	1	1	1	3
COYE	5	3	2	1	6
COYE	7	1	1	1	3
COYE	8	2	0	0	2
COYE	12	2	2	2	6
COYE	13	1	1	2	4
COYE	14	1	1	1	3
COYE	15	2	2	4	8
COYE	16	1	2	2	5
COYE	17	1	3	1	5
COYE	18	1	0	0	1
COYE	19	0	1	1	2
COYE	20	2	0	0	2
COYE	21	0	0	1	1
COYE	22	0	3	2	5
COYE	23	2	2	0	4
COYE	29	2	4	1	7
COYE	30	1	0	3	4
COYE	31	3	2	3	8

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
COYE	32	0	1	0	1
COYE	33	2	2	0	4
COYE	34	1	2	2	5
COYE	35	2	3	3	8
COYE	36	1	0	1	2
COYE	37	0	2	2	4
COYE	38	4	2	2	8
COYE	39	1	2	2	5
COYE	40	2	0	2	4
COYE	41	1	0	2	3
COYE	42	0	3	2	5
COYE	44	0	3	2	5
COYE	45	1	1	2	4
COYE	46	0	2	2	4
COYE	47	2	1	2	5
COYE	48	4	3	3	10
COYE	49	0	1	3	4
COYE	50	1	1	0	2
COYE	51	1	0	0	1
COYE	53	1	0	0	1
COYE	54	1	0	0	1
COYE	57	1	2	2	5
COYE	58	2	3	3	8
COYE	59	1	3	2	6
COYE	63	2	3	2	7
COYE	64	4	2	3	9
COYE	65	2	2	0	4
COYE	66	1	1	2	4
COYE	80	3	1	2	6
COYE	81	2	1	2	5
COYE	99	0	1	0	1
Total		70	78	80	228
WEVI	1	1	2	2	5
WEVI	2	1	0	0	1
WEVI	4	2	1	1	4
WEVI	5	1	0	0	1
WEVI	6	1	1	0	2
WEVI	7	0	1	2	3
WEVI	11	0	1	2	3
WEVI	12	1	0	0	1
WEVI	14	2	1	0	3
WEVI	15	1	1	1	3
WEVI	16	0	2	1	3
WEVI	17	1	0	0	1
WEVI	18	1	1	1	3
WEVI	21	1	1	1	3
WEVI	22	1	2	1	4
WEVI	23	1	0	0	1
WEVI	30	2	2	0	4
WEVI	31	1	0	1	2
WEVI	32	1	2	3	6
WEVI	33	0	2	2	4

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
WEVI	34	1	0	0	1
WEVI	36	1	0	1	2
WEVI	37	0	1	2	3
WEVI	38	2	0	0	2
WEVI	39	1	1	1	3
WEVI	40	2	1	0	3
WEVI	41	1	2	2	5
WEVI	42	1	1	1	3
WEVI	43	1	1	1	3
WEVI	44	1	0	0	1
WEVI	45	0	1	2	3
WEVI	47	0	2	1	3
WEVI	48	0	0	1	1
WEVI	49	1	2	0	3
WEVI	50	2	1	1	4
WEVI	51	2	0	2	4
WEVI	52	0	0	2	2
WEVI	53	0	1	0	1
WEVI	54	0	1	0	1
WEVI	55	0	0	1	1
WEVI	58	1	1	0	2
WEVI	59	0	1	0	1
WEVI	63	1	1	1	3
WEVI	64	2	0	0	2
WEVI	65	1	1	1	3
WEVI	66	2	0	1	3
WEVI	97	0	3	4	7
WEVI	98	1	1	2	4
WEVI	99	0	1	1	2
Total		43	44	46	133
HOWA	1	1	0	0	1
HOWA	11	0	1	1	2
HOWA	43	1	0	0	1
HOWA	99	0	0	1	1
Total		2	1	2	5
TUTI	1	2	0	0	2
TUTI	2	2	0	0	2
TUTI	3	1	0	0	1
TUTI	4	3	0	0	3
TUTI	5	0	2	0	2
TUTI	7	1	2	1	4
TUTI	8	0	2	1	3
TUTI	10	0	1	3	4
TUTI	11	0	1	0	1
TUTI	12	1	1	0	2
TUTI	14	1	0	0	1
TUTI	20	1	0	0	1
TUTI	22	0	2	0	2
TUTI	27	0	0	3	3
TUTI	28	0	1	0	1
TUTI	29	2	0	0	2
TUTI	30	0	1	0	1

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
TUTI	32	0	3	0	3
TUTI	40	2	2	1	5
TUTI	41	0	1	2	3
TUTI	42	1	0	0	1
TUTI	44	2	0	0	2
TUTI	47	1	0	1	2
TUTI	48	2	0	0	2
TUTI	50	0	1	0	1
TUTI	51	1	0	0	1
TUTI	53	0	1	0	1
TUTI	54	0	0	2	2
TUTI	55	0	2	0	2
TUTI	60	0	3	1	4
TUTI	61	0	1	1	2
TUTI	62	0	1	0	1
TUTI	66	1	0	0	1
TUTI	95	0	3	1	4
TUTI	97	0	2	0	2
TUTI	98	1	0	2	3
TUTI	99	0	0	1	1
Total		25	33	20	78
PIWA	1	1	3	2	6
PIWA	2	3	1	1	5
PIWA	3	2	3	1	6
PIWA	4	1	0	0	1
PIWA	5	1	2	0	3
PIWA	7	0	1	1	2
PIWA	9	1	0	1	2
PIWA	13	0	0	1	1
PIWA	14	1	0	1	2
PIWA	18	1	0	0	1
PIWA	19	2	2	2	6
PIWA	20	0	1	1	2
PIWA	21	2	0	1	3
PIWA	27	2	1	0	3
PIWA	29	1	0	0	1
PIWA	30	3	0	0	3
PIWA	31	0	0	1	1
PIWA	32	1	1	2	4
PIWA	33	2	2	2	6
PIWA	37	2	0	0	2
PIWA	38	0	1	2	3
PIWA	39	0	1	0	1
PIWA	40	1	0	0	1
PIWA	41	1	3	0	4
PIWA	42	3	2	1	6
PIWA	43	2	0	0	2
PIWA	44	0	1	0	1
PIWA	47	2	1	1	4
PIWA	48	2	1	0	3
PIWA	49	1	2	0	3
PIWA	50	1	1	1	3

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
PIWA	51	1	1	1	3
PIWA	52	1	2	1	4
PIWA	53	1	2	1	4
PIWA	54	4	0	1	5
PIWA	55	2	0	0	2
PIWA	59	2	0	0	2
PIWA	61	1	2	3	6
PIWA	63	1	4	1	6
PIWA	64	0	2	0	2
PIWA	65	1	0	2	3
PIWA	66	1	0	0	1
PIWA	80	0	1	0	1
PIWA	81	2	0	2	4
PIWA	99	0	1	0	1
Total		56	45	34	135
RBWO	1	1	0	0	1
RBWO	14	1	0	0	1
RBWO	15	0	0	1	1
RBWO	16	0	0	1	1
RBWO	18	1	0	0	1
RBWO	35	0	0	1	1
RBWO	40	0	0	1	1
RBWO	41	1	0	0	1
RBWO	42	0	2	1	3
RBWO	45	0	0	1	1
RBWO	46	1	0	1	2
RBWO	48	1	0	1	2
RBWO	52	0	1	0	1
RBWO	53	0	0	1	1
RBWO	54	0	1	0	1
RBWO	57	0	0	1	1
RBWO	66	0	0	1	1
RBWO	97	0	0	1	1
RBWO	98	0	0	1	1
Total		6	4	13	23
GCFL	1	1	0	0	1
GCFL	4	1	0	0	1
GCFL	8	1	0	0	1
GCFL	12	0	2	0	2
GCFL	13	0	1	0	1
GCFL	20	0	2	0	2
GCFL	26	2	0	0	2
GCFL	27	2	0	0	2
GCFL	28	2	2	2	6
GCFL	29	0	2	1	3
GCFL	35	0	0	1	1
GCFL	42	0	1	0	1
GCFL	43	0	1	0	1
GCFL	44	1	1	0	2
GCFL	46	0	0	1	1
GCFL	47	0	1	0	1
GCFL	48	0	1	0	1

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
NOCA	10	0	1	1	2
NOCA	11	0	1	0	1
NOCA	13	0	0	1	1
NOCA	15	0	0	1	1
NOCA	16	1	0	0	1
NOCA	22	2	0	0	2
NOCA	27	0	0	1	1
NOCA	29	1	0	0	1
NOCA	41	2	0	0	2
NOCA	42	0	1	0	1
NOCA	44	0	0	1	1
NOCA	45	0	0	2	2
NOCA	47	1	1	1	3
NOCA	48	0	0	2	2
NOCA	50	0	1	0	1
NOCA	51	0	2	0	2
NOCA	53	0	1	1	2
NOCA	57	1	0	0	1
NOCA	58	2	0	0	2
NOCA	62	0	0	1	1
NOCA	63	2	0	0	2
NOCA	80	0	0	2	2
NOCA	81	0	0	1	1
NOCA	97	0	0	1	1
NOCA	98	0	1	0	1
Total		13	11	20	44
BLJA	1	0	1	0	1
BLJA	43	0	1	0	1
BLJA	50	0	1	1	2
Total		0	3	1	4
WEWA	2	1	1	1	3
WEWA	3	1	1	1	3
WEWA	7	2	0	0	2
WEWA	9	3	1	2	6
WEWA	10	0	3	3	6
WEWA	11	0	0	2	2
WEWA	19	1	1	1	3
WEWA	26	1	0	0	1
WEWA	28	3	3	2	8
WEWA	37	1	0	0	1
WEWA	40	0	2	0	2
WEWA	41	0	1	0	1
WEWA	43	0	1	1	2
WEWA	48	0	0	1	1
WEWA	50	0	1	0	1
WEWA	51	2	2	2	6
WEWA	53	0	2	1	3
WEWA	54	0	1	0	1
WEWA	60	0	3	3	6
WEWA	61	3	1	1	5
WEWA	62	0	2	3	5
WEWA	80	0	1	2	3

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
WEWA	81	0	2	0	2
WEWA	95	0	1	2	3
Total		18	30	28	76
MODO	2	1	0	0	1
MODO	13	1	1	0	2
MODO	15	0	1	0	1
MODO	17	1	1	0	2
MODO	18	0	1	0	1
MODO	45	0	1	0	1
MODO	48	0	0	2	2
MODO	57	2	0	0	2
MODO	63	2	0	0	2
Total		7	5	2	14
WOTH	2	1	0	0	1
WOTH	7	1	0	0	1
WOTH	8	0	1	2	3
WOTH	9	1	1	0	2
WOTH	10	0	1	0	1
WOTH	11	0	1	2	3
WOTH	21	0	0	1	1
WOTH	22	0	0	1	1
WOTH	23	1	0	1	2
WOTH	26	0	1	1	2
WOTH	27	0	1	2	3
WOTH	28	0	1	0	1
WOTH	32	0	0	1	1
WOTH	35	0	1	0	1
WOTH	44	0	0	1	1
WOTH	45	1	0	1	2
WOTH	46	1	0	2	3
WOTH	50	0	1	0	1
WOTH	51	0	1	0	1
WOTH	52	0	1	0	1
WOTH	61	1	2	0	3
WOTH	62	0	1	1	2
WOTH	95	0	0	1	1
WOTH	97	0	1	0	1
WOTH	98	1	1	1	3
WOTH	99	0	0	1	1
Total		8	16	19	43
REVI	2	1	0	0	1
REVI	14	0	1	0	1
REVI	19	1	0	0	1
REVI	22	0	1	0	1
REVI	26	0	0	2	2
REVI	27	0	1	0	1
REVI	29	1	0	0	1
REVI	40	0	0	1	1
REVI	44	0	1	1	2
REVI	46	0	2	0	2
REVI	48	0	0	1	1
REVI	50	1	0	0	1

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
REVI	51	1	1	0	2
REVI	52	1	0	0	1
REVI	53	1	0	0	1
REVI	55	0	1	1	2
REVI	95	0	0	1	1
REVI	99	1	0	1	2
Total		8	8	8	24
YTWA	2	1	1	2	4
YTWA	3	0	2	1	3
YTWA	4	0	2	2	4
YTWA	21	2	0	0	2
YTWA	27	2	1	0	3
YTWA	28	0	1	1	2
YTWA	30	1	1	0	2
YTWA	33	0	0	1	1
YTWA	38	1	0	0	1
YTWA	41	0	2	0	2
YTWA	42	0	0	1	1
YTWA	46	1	1	1	3
YTWA	48	0	1	2	3
YTWA	49	1	0	1	2
YTWA	50	1	2	1	4
YTWA	52	1	3	0	4
YTWA	53	1	1	0	2
YTWA	54	1	1	0	2
YTWA	55	0	3	0	3
YTWA	59	2	0	0	2
YTWA	80	1	0	0	1
YTWA	98	0	1	1	2
Total		16	23	14	53
BHNU	2	0	2	2	4
Total		0	2	2	4
AMGO	2	0	1	0	1
AMGO	10	0	1	0	1
AMGO	13	5	0	2	7
AMGO	17	0	2	3	5
AMGO	19	0	1	0	1
AMGO	20	1	0	0	1
AMGO	26	1	0	0	1
AMGO	29	1	0	3	4
AMGO	30	2	0	0	2
AMGO	36	1	0	0	1
AMGO	41	0	1	1	2
AMGO	42	2	0	0	2
AMGO	43	1	0	0	1
AMGO	46	0	2	0	2
AMGO	47	1	0	0	1
AMGO	50	1	0	0	1
AMGO	52	1	0	0	1
AMGO	53	0	0	1	1
AMGO	57	0	0	1	1
AMGO	59	0	0	1	1

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
AMGO	60	0	1	0	1
AMGO	62	0	1	0	1
AMGO	64	0	1	0	1
AMGO	65	0	1	0	1
Total		17	12	12	41
NOPA	2	0	1	0	1
NOPA	4	0	1	2	3
NOPA	5	0	1	0	1
NOPA	6	0	1	1	2
NOPA	8	0	2	2	4
NOPA	11	0	1	1	2
NOPA	44	0	0	1	1
NOPA	46	1	1	0	2
NOPA	53	0	1	0	1
NOPA	55	1	0	1	2
NOPA	95	0	0	1	1
Total		2	9	9	20
RSHA	4	1	1	0	2
RSHA	6	1	1	0	2
RSHA	48	0	1	0	1
RSHA	52	0	0	1	1
RSHA	53	0	2	0	2
RSHA	54	0	0	1	1
Total		2	5	2	9
PRAW	4	0	1	0	1
PRAW	5	4	0	0	4
PRAW	6	4	1	1	6
PRAW	7	0	1	2	3
PRAW	8	2	1	0	3
PRAW	12	1	1	0	2
PRAW	13	1	1	0	2
PRAW	14	3	2	2	7
PRAW	15	2	2	0	4
PRAW	16	3	1	0	4
PRAW	17	2	1	0	3
PRAW	18	5	3	1	9
PRAW	19	2	0	0	2
PRAW	20	0	2	2	4
PRAW	21	1	1	0	2
PRAW	22	2	1	0	3
PRAW	23	1	1	1	3
PRAW	29	1	2	0	3
PRAW	30	2	2	0	4
PRAW	31	2	1	0	3
PRAW	32	1	1	1	3
PRAW	33	2	2	0	4
PRAW	34	0	2	2	4
PRAW	35	3	5	0	8
PRAW	36	1	0	0	1
PRAW	37	3	0	0	3
PRAW	38	2	0	1	3
PRAW	39	2	1	1	4

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
PRAW	40	1	1	0	2
PRAW	44	1	0	0	1
PRAW	45	3	1	0	4
PRAW	47	1	1	0	2
PRAW	48	1	0	0	1
PRAW	49	1	0	0	1
PRAW	50	1	1	1	3
PRAW	57	2	0	1	3
PRAW	58	3	2	1	6
PRAW	59	2	2	0	4
PRAW	63	2	1	0	3
PRAW	64	1	0	0	1
PRAW	65	2	2	2	6
PRAW	66	2	1	0	3
PRAW	99	1	0	0	1
Total		76	48	19	143
YBCH	4	0	0	1	1
YBCH	7	2	0	0	2
YBCH	12	1	2	0	3
YBCH	13	1	1	0	2
YBCH	14	1	2	1	4
YBCH	15	2	2	0	4
YBCH	16	2	3	1	6
YBCH	17	2	3	0	5
YBCH	18	0	3	1	4
YBCH	19	0	1	1	2
YBCH	21	0	2	0	2
YBCH	22	1	1	0	2
YBCH	29	0	2	0	2
YBCH	30	1	1	0	2
YBCH	31	3	1	5	9
YBCH	34	0	2	2	4
YBCH	35	3	3	1	7
YBCH	36	1	0	2	3
YBCH	37	1	4	0	5
YBCH	38	2	2	2	6
YBCH	39	1	1	1	3
YBCH	40	0	2	1	3
YBCH	44	1	0	0	1
YBCH	45	3	0	1	4
YBCH	48	0	0	2	2
YBCH	49	0	3	2	5
YBCH	57	3	3	0	6
YBCH	58	2	1	2	5
YBCH	59	0	3	1	4
YBCH	63	2	3	0	5
YBCH	64	3	3	2	8
YBCH	65	1	0	0	1
YBCH	66	1	2	0	3
Total		40	56	29	125
GRCA	12	0	1	0	1
GRCA	13	2	2	0	4

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
GRCA	14	2	0	0	2
GRCA	15	2	0	2	4
GRCA	16	3	2	1	6
GRCA	17	4	1	0	5
GRCA	18	1	0	0	1
GRCA	22	1	0	0	1
GRCA	31	2	0	0	2
GRCA	33	0	0	2	2
GRCA	34	0	2	3	5
GRCA	36	5	3	1	9
GRCA	37	1	2	1	4
GRCA	38	3	0	0	3
GRCA	39	3	5	3	11
GRCA	40	1	1	0	2
GRCA	45	1	2	2	5
GRCA	49	1	0	0	1
GRCA	51	1	0	0	1
GRCA	57	0	1	0	1
GRCA	58	0	0	1	1
GRCA	59	0	1	1	2
GRCA	63	0	1	0	1
GRCA	65	1	1	0	2
Total		34	25	17	76
FISP	7	0	1	0	1
FISP	13	0	1	1	2
FISP	14	1	0	0	1
FISP	15	1	1	1	3
FISP	16	3	1	3	7
FISP	17	3	3	2	8
FISP	18	1	1	0	2
FISP	29	0	2	0	2
FISP	30	0	0	1	1
FISP	31	2	2	2	6
FISP	34	0	0	1	1
FISP	35	1	1	2	4
FISP	36	1	1	1	3
FISP	37	0	4	1	5
FISP	39	0	0	2	2
FISP	40	0	0	1	1
FISP	44	1	0	0	1
FISP	45	0	0	1	1
FISP	49	0	0	1	1
FISP	57	0	0	1	1
FISP	59	1	0	2	3
FISP	65	0	2	1	3
FISP	66	1	0	0	1
Total		16	20	24	60
BAWW	14	1	0	0	1
BAWW	18	1	0	0	1
BAWW	28	1	0	0	1
BAWW	42	0	1	0	1
BAWW	44	1	0	0	1

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
BAWW	46	1	0	0	1
BAWW	50	0	1	0	1
BAWW	51	1	0	0	1
BAWW	53	0	1	0	1
BAWW	54	1	0	0	1
BAWW	61	0	1	1	2
BAWW	97	0	0	1	1
BAWW	98	2	0	0	2
Total		9	4	2	15
YBCU	3	0	1	0	1
YBCU	5	1	0	0	1
YBCU	6	0	1	1	2
YBCU	7	1	0	0	1
YBCU	13	0	1	0	1
YBCU	14	1	0	0	1
YBCU	15	1	0	0	1
YBCU	17	0	1	0	1
YBCU	18	1	0	0	1
YBCU	23	1	0	0	1
YBCU	26	0	1	0	1
YBCU	27	1	0	2	3
YBCU	28	1	0	0	1
YBCU	30	0	1	0	1
YBCU	31	0	0	1	1
YBCU	35	1	0	0	1
YBCU	37	1	0	0	1
YBCU	38	0	1	0	1
YBCU	41	1	1	0	2
YBCU	42	0	2	0	2
YBCU	44	0	1	0	1
YBCU	45	0	1	0	1
YBCU	47	0	0	1	1
YBCU	48	0	1	0	1
YBCU	49	0	0	1	1
YBCU	50	2	0	0	2
YBCU	53	1	0	0	1
YBCU	54	0	1	0	1
YBCU	55	1	0	0	1
YBCU	59	1	0	0	1
YBCU	63	1	0	0	1
YBCU	66	1	0	0	1
YBCU	99	1	0	0	1
Total		19	14	6	39
NOFL	14	0	2	0	2
NOFL	19	1	0	0	1
NOFL	22	0	0	2	2
NOFL	29	1	0	0	1
NOFL	31	1	0	0	1
NOFL	35	2	0	0	2
NOFL	39	1	0	0	1
NOFL	41	1	0	0	1
NOFL	42	1	0	0	1

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
NOFL	43	0	1	0	1
NOFL	44	0	1	0	1
NOFL	46	0	1	0	1
NOFL	47	1	0	0	1
NOFL	49	1	0	0	1
NOFL	55	0	2	0	2
NOFL	81	1	0	0	1
Total		11	7	2	20
AMCR	3	0	0	2	2
AMCR	5	0	1	0	1
AMCR	6	0	3	0	3
AMCR	7	0	1	0	1
AMCR	9	0	1	3	4
AMCR	12	1	1	0	2
AMCR	13	0	3	0	3
AMCR	14	0	1	0	1
AMCR	15	0	1	0	1
AMCR	16	1	0	0	1
AMCR	17	2	2	0	4
AMCR	18	0	1	0	1
AMCR	19	1	1	0	2
AMCR	20	3	0	0	3
AMCR	31	1	0	0	1
AMCR	32	0	0	2	2
AMCR	35	1	0	0	1
AMCR	38	1	0	3	4
AMCR	39	1	0	0	1
AMCR	42	0	0	1	1
AMCR	44	1	0	0	1
AMCR	45	0	1	2	3
AMCR	46	0	0	1	1
AMCR	47	0	0	1	1
AMCR	54	0	0	1	1
AMCR	58	1	0	0	1
AMCR	65	0	1	0	1
Total		14	18	16	48
BGGN	12	0	2	0	2
BGGN	13	0	1	0	1
BGGN	14	0	0	1	1
BGGN	18	0	0	2	2
BGGN	19	0	1	0	1
BGGN	21	2	0	0	2
BGGN	23	0	2	0	2
BGGN	26	1	0	0	1
BGGN	35	3	0	0	3
BGGN	38	0	1	0	1
BGGN	40	0	2	1	3
BGGN	41	1	0	0	1
BGGN	42	2	1	1	4
BGGN	44	0	0	1	1
BGGN	46	0	1	2	3
BGGN	47	0	2	1	3

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
BGGN	48	0	3	0	3
BGGN	50	0	1	0	1
BGGN	51	0	1	0	1
BGGN	52	0	1	0	1
BGGN	53	1	0	0	1
BGGN	54	1	2	0	3
BGGN	55	1	0	0	1
BGGN	58	0	0	2	2
BGGN	62	0	2	2	4
BGGN	98	2	0	0	2
BGGN	99	0	2	0	2
Total		14	25	13	52
CARW	3	0	0	1	1
CARW	5	0	2	0	2
CARW	7	0	1	1	2
CARW	15	1	0	0	1
CARW	16	1	0	0	1
CARW	27	1	0	0	1
CARW	28	0	0	1	1
CARW	32	1	1	2	4
CARW	34	1	0	0	1
CARW	37	0	1	0	1
CARW	43	0	1	0	1
CARW	44	1	0	1	2
CARW	46	0	0	2	2
CARW	48	1	0	1	2
CARW	51	0	0	2	2
CARW	53	2	0	1	3
CARW	57	0	0	2	2
CARW	58	2	0	0	2
CARW	59	1	0	0	1
CARW	60	0	0	1	1
CARW	63	0	1	1	2
CARW	64	0	0	1	1
CARW	66	2	0	0	2
CARW	80	1	0	0	1
CARW	81	1	0	0	1
CARW	97	0	1	0	1
CARW	99	0	1	0	1
Total		16	9	17	42
INBU	5	1	0	0	1
INBU	7	1	0	0	1
INBU	12	1	0	0	1
INBU	13	1	4	0	5
INBU	15	0	1	0	1
INBU	16	1	1	0	2
INBU	17	2	1	0	3
INBU	29	0	1	0	1
INBU	31	1	0	0	1
INBU	34	0	1	1	2
INBU	36	0	1	0	1
INBU	37	3	2	0	5

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
INBU	38	4	2	2	8
INBU	40	1	0	0	1
INBU	42	1	0	0	1
INBU	45	6	4	0	10
INBU	46	0	1	0	1
INBU	48	2	0	0	2
INBU	50	1	0	0	1
INBU	51	1	0	0	1
INBU	55	1	0	0	1
INBU	57	0	1	1	2
INBU	58	0	0	1	1
INBU	59	1	0	0	1
INBU	64	1	0	0	1
INBU	66	0	2	0	2
INBU	81	0	1	0	1
Total		30	23	5	58
SUTA	13	0	0	1	1
SUTA	15	0	1	0	1
SUTA	17	0	1	0	1
SUTA	26	0	0	1	1
SUTA	27	0	5	0	5
SUTA	42	0	0	1	1
SUTA	43	2	0	0	2
SUTA	51	0	1	1	2
SUTA	54	0	1	1	2
SUTA	55	0	0	1	1
SUTA	61	1	0	0	1
SUTA	65	0	0	1	1
SUTA	98	0	1	0	1
Total		3	10	7	20
BARS	15	0	1	0	1
BARS	18	1	0	0	1
BARS	57	0	0	1	1
Total		1	1	1	3
BLGR	12	0	0	1	1
BLGR	13	1	1	0	2
BLGR	15	0	0	1	1
BLGR	17	1	1	0	2
BLGR	22	0	0	1	1
BLGR	30	0	0	1	1
BLGR	33	0	0	2	2
BLGR	37	0	0	1	1
BLGR	38	0	1	2	3
BLGR	45	0	0	1	1
BLGR	57	0	0	2	2
BLGR	59	0	0	1	1
BLGR	64	0	1	0	1
BLGR	66	0	0	2	2
Total		2	4	15	21
BRTH	16	1	0	0	1
BRTH	36	0	1	0	1
BRTH	57	0	1	0	1

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
BRTH	64	0	2	0	2
BRTH	65	0	0	1	1
BRTH	66	0	1	0	1
Total		1	5	1	7
COGR	3	0	1	0	1
COGR	5	0	1	0	1
COGR	6	1	0	0	1
COGR	16	0	1	0	1
COGR	17	0	5	0	5
COGR	19	0	0	3	3
COGR	20	0	0	3	3
COGR	22	0	1	0	1
COGR	30	0	16	0	16
COGR	31	0	0	1	1
COGR	33	0	3	0	3
COGR	34	0	3	0	3
COGR	36	5	11	0	16
COGR	37	5	0	0	5
COGR	38	0	1	0	1
COGR	48	2	0	0	2
COGR	49	0	4	0	4
COGR	53	0	2	0	2
COGR	57	0	0	1	1
COGR	59	0	9	1	10
COGR	66	0	1	0	1
Total		13	59	9	81
TUVU	5	1	0	0	1
TUVU	8	3	0	0	3
TUVU	12	0	0	1	1
TUVU	17	1	0	3	4
TUVU	21	0	1	3	4
TUVU	22	2	3	0	5
TUVU	31	0	4	0	4
TUVU	35	0	1	1	2
TUVU	38	0	0	4	4
TUVU	39	0	6	4	10
TUVU	40	0	0	2	2
TUVU	44	1	0	0	1
TUVU	47	0	2	0	2
TUVU	48	1	3	0	4
TUVU	49	0	1	0	1
TUVU	50	0	0	1	1
TUVU	51	0	0	1	1
TUVU	57	0	1	1	2
TUVU	58	0	3	0	3
Total		9	25	21	55
RTHA	17	0	1	0	1
RTHA	28	0	0	1	1
RTHA	31	0	0	1	1
RTHA	65	1	0	0	1
Total		1	1	2	4
RBGU	18	1	0	0	1

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
Total		1	0	0	1
GBHE	18	0	1	0	1
Total		0	1	0	1
EAKI	18	0	0	1	1
EAKI	23	0	0	1	1
EAKI	34	0	1	0	1
EAKI	36	1	2	0	3
EAKI	59	0	0	1	1
Total		1	3	3	7
PROW	3	0	1	1	2
PROW	7	2	0	0	2
PROW	10	0	1	1	2
PROW	26	1	3	2	6
PROW	27	1	0	2	3
PROW	28	1	1	1	3
PROW	31	1	0	0	1
PROW	32	0	0	1	1
PROW	33	0	1	0	1
PROW	38	2	1	0	3
PROW	43	0	2	0	2
PROW	44	1	3	1	5
PROW	46	0	3	2	5
PROW	47	1	1	0	2
PROW	48	1	1	0	2
PROW	49	2	0	0	2
PROW	50	1	3	2	6
PROW	51	2	0	0	2
PROW	52	1	1	0	2
PROW	53	1	1	0	2
PROW	54	2	2	0	4
PROW	55	4	3	1	8
PROW	81	1	0	1	2
PROW	98	2	2	1	5
PROW	99	4	0	0	4
Total		31	30	16	77
OROR	30	0	3	0	3
OROR	31	0	1	1	2
OROR	33	2	2	2	6
OROR	34	1	3	3	7
OROR	36	0	0	1	1
OROR	37	0	0	1	1
OROR	38	0	0	2	2
OROR	43	0	1	1	2
OROR	45	0	0	1	1
OROR	49	0	2	0	2
OROR	66	0	1	0	1
Total		3	13	12	28
EUST	34	0	1	0	1
EUST	64	5	0	1	6
Total		5	1	1	7
DOWO	21	0	0	1	1
DOWO	34	0	0	1	1

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
DOWO	40	2	0	1	3
DOWO	44	1	0	0	1
DOWO	51	2	3	0	5
DOWO	52	0	1	0	1
DOWO	53	0	0	1	1
DOWO	55	0	1	1	2
DOWO	57	2	0	0	2
DOWO	66	1	0	0	1
DOWO	81	0	1	0	1
DOWO	95	0	1	0	1
DOWO	97	0	1	0	1
Total		8	8	5	21
CHSP	13	1	0	0	1
CHSP	31	0	0	1	1
CHSP	36	0	1	0	1
CHSP	37	1	0	0	1
CHSP	42	1	0	0	1
CHSP	45	1	1	0	2
CHSP	63	1	0	0	1
Total		5	2	1	8
YEWA	42	1	0	0	1
YEWA	43	0	0	1	1
YEWA	46	1	0	0	1
YEWA	51	1	0	0	1
YEWA	98	0	1	0	1
Total		3	1	1	5
RTHU	13	1	0	0	1
RTHU	27	2	0	0	2
RTHU	29	1	0	0	1
RTHU	30	0	0	1	1
RTHU	40	1	0	0	1
RTHU	41	1	0	0	1
RTHU	42	1	0	0	1
RTHU	43	1	0	0	1
RTHU	47	0	0	1	1
RTHU	58	1	0	1	2
RTHU	99	1	0	1	2
Total		10	0	4	14
PIWO	27	2	0	0	2
PIWO	28	2	0	0	2
PIWO	38	2	0	0	2
PIWO	42	0	1	0	1
PIWO	43	0	1	0	1
PIWO	46	1	0	0	1
PIWO	47	0	0	1	1
PIWO	48	1	0	0	1
PIWO	50	1	0	0	1
PIWO	54	0	0	1	1
PIWO	97	0	2	0	2
PIWO	98	1	0	0	1
Total		10	4	2	16
NOBO	21	0	0	1	1

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
NOBO	31	0	1	3	4
NOBO	42	0	1	0	1
NOBO	43	0	1	0	1
NOBO	44	0	1	0	1
NOBO	45	0	1	0	1
NOBO	57	0	0	1	1
NOBO	64	0	0	2	2
NOBO	66	0	0	1	1
Total		0	5	8	13
YTVI	26	0	1	2	3
YTVI	27	1	1	1	3
YTVI	42	0	1	0	1
YTVI	46	0	2	1	3
YTVI	47	1	0	0	1
YTVI	48	2	0	0	2
YTVI	51	1	0	0	1
YTVI	52	1	0	0	1
YTVI	54	0	0	1	1
YTVI	55	1	1	2	4
YTVI	98	0	0	1	1
Total		7	6	8	21
SCTA	11	0	1	0	1
SCTA	43	0	1	0	1
SCTA	55	0	2	0	2
Total		0	4	0	4
HAWO	6	0	1	0	1
HAWO	30	0	1	0	1
HAWO	43	0	3	0	3
HAWO	54	0	0	1	1
Total		0	5	1	6
RHWO	57	0	0	1	1
RHWO	64	2	2	0	4
Total		2	2	1	5
WITU	3	1	0	0	1
WITU	23	0	1	0	1
WITU	64	1	0	0	1
Total		2	1	0	3
PUMA	61	2	0	0	2
PUMA	64	0	0	3	3
Total		2	0	3	5
KILL	13	0	2	0	2
Total		0	2	0	2
EAPH	37	0	1	0	1
Total		0	1	0	1
CHSW	22	0	1	0	1
CHSW	29	0	1	0	1
CHSW	40	0	0	1	1
Total		0	2	1	3
KEWA	46	0	1	0	1
KEWA	48	0	1	0	1
KEWA	54	0	1	0	1
KEWA	98	0	1	0	1

Appendix II (continued). Bird species and numbers of detections by point and round.

Species	Point	Round 1	Round 2	Round 3	Total
Total		0	4	0	4
LAGU	46	0	1	0	1
Total		0	1	0	1
LOWA	44	0	1	0	1
LOWA	46	0	1	0	1
LOWA	52	1	1	0	2
LOWA	53	1	0	0	1
LOWA	98	0	1	1	2
LOWA	99	0	0	1	1
Total		2	4	2	8
WBNU	50	2	0	0	2
WBNU	55	1	0	2	3
Total		3	0	2	5
AMRE	30	1	1	0	2
AMRE	44	0	1	0	1
AMRE	51	1	0	0	1
AMRE	55	0	1	1	2
AMRE	60	0	1	0	1
AMRE	98	0	1	1	2
Total		2	5	2	9
FICR	12	0	1	0	1
Total		0	1	0	1
TRES	12	0	1	0	1
TRES	35	0	0	1	1
Total		0	1	1	2
SWWA	55	1	0	0	1
Total		1	0	0	1
BAOW	55	1	0	0	1
Total		1	0	0	1
AMWO	98	0	1	0	1
Total		0	1	0	1
SOSP	48	1	0	0	1
Total		1	0	0	1
GRHE	45	0	2	0	2
Total		0	2	0	2
HOWR	45	0	2	0	2
Total		0	2	0	2
Column Total		953	1020	781	2754

Appendix III. List of species detected with scientific name, alpha code, and migration status.

Common Name	Genus	Species	AOU Alpha code	Migration Status
Great Blue Heron	*Ardea*	*herodias*	GBHE	Resident
Green Heron	*Butorides*	*virescens*	GRHE	Temperate Migrant
Turkey Vulture	*Cathartes*	*aura*	TUVU	Temperate Migrant
Red-shouldered Hawk	*Buteo*	*lineatus*	RSHA	Resident
Red-tailed Hawk	*Buteo*	*jamaicensis*	RTHA	Temperate Migrant
Wild Turkey	*Meleagris*	*gallopavo*	WITU	Resident
Northern Bobwhite	*Colinus*	*virginianus*	NOBO	Resident
Killdeer	*Charadrius*	*vociferous*	KILL	Temperate Migrant
American Woodcock	*Scolopax*	*minor*	AMWO	Temperate Migrant
Laughing Gull	*Larus*	*atricilla*	LAGU	Neotropical Migrant
Ring-billed Gull	*Larus*	*delawarensis*	RBGU	Temperate Migrant
Mourning Dove	*Zenaida*	*macroura*	MODO	Resident
Yellow-billed Cuckoo	*Coccyzus*	*americanus*	YBCU	Neotropical Migrant
Barred Owl	*Strix*	*varia*	BAOW	Resident
Chimney Swift	*Chaetura*	*pelagica*	CHSW	Neotropical Migrant
Ruby-throated Hummingbird	*Archilochus*	*colubris*	RTHU	Neotropical Migrant
Red-headed Woodpecker	*Melanerpes*	*erythrocephalus*	RHWO	Resident
Red-bellied Woodpecker	*Melanerpes*	*carolinus*	RBWO	Resident
Downy Woodpecker	*Picoides*	*pubescens*	DOWO	Resident
Hairy Woodpecker	*Picoides*	*villosus*	HAWO	Resident
Northern Flicker	*Colaptes*	*auratus*	NOFL	Temperate Migrant
Pileated Woodpecker	*Dryocopus*	*pileatus*	PIWO	Resident
Eastern Wood-Pewee	*Contopus*	*virens*	EAWP	Neotropical Migrant
Acadian Flycatcher	*Empidonax*	*virescens*	ACFL	Neotropical Migrant
Eastern Phoebe	*Sayornis*	*phoebe*	EAPH	Temperate Migrant
Great Crested Flycatcher	*Myiarchus*	*crinitus*	GCFL	Neotropical Migrant
Eastern Kingbird	*Tyrannus*	*tyrannus*	EAKI	Neotropical Migrant
White-eyed Vireo	*Vireo*	*griseus*	WEVI	Neotropical Migrant
Yellow-throated Vireo	*Vireo*	*flavifrons*	YTVI	Neotropical Migrant
Red-eyed Vireo	*Vireo*	*olivaceus*	REVI	Neotropical Migrant
Blue Jay	*Cyanocitta*	*cristata*	BLJA	Temperate Migrant
American Crow	*Corvus*	*brachyrhynchos*	AMCR	Resident
Fish Crow	*Corvus*	*ossifragus*	FICR	Resident
Purple Martin	*Progne*	*subis*	PUMA	Neotropical Migrant
Tree Swallow	*Tachycineta*	*bicolor*	TRES	Neotropical Migrant
Barn Swallow	*Hirundo*	*rustica*	BARS	Neotropical Migrant
Carolina Chickadee	*Poecile*	*carolinensis*	CACH	Resident
Eastern Tufted Titmouse	*Baeolophus*	*bicolor*	ETTI	Resident

Appendix III (continued). List of species detected with scientific name, alpha code, and migration status.

Common Name	Genus	Species	AOU Alpha code	Migration Status
White-breasted Nuthatch	*Sitta*	*carolinensis*	WBNU	Resident
Brown-headed Nuthatch	*Sitta*	*pusilla*	BHNU	Resident
Carolina Wren	*Thryothorus*	*ludovicianus*	CARW	Resident
House Wren	*Troglodytes*	*aedon*	HOWR	Neotropical Migrant
Blue-gray Gnatcatcher	*Polioptila*	*caerulea*	BGGN	Neotropical Migrant
Wood Thrush	*Hylocichla*	*mustelina*	WOTH	Neotropical Migrant
Gray Catbird	*Dumetella*	*carolinensis*	GRCA	Neotropical Migrant
Brown Thrasher	*Toxostoma*	*rufum*	BRTH	Temperate Migrant
European Starling	*Sturnus*	*vulgaris*	EUST	Resident
Northern Parula	*Parula*	*americana*	NOPA	Neotropical Migrant
Yellow Warbler	*Dendroica*	*petechia*	YWAR	Neotropical Migrant
Yellow-throated Warbler	*Dendroica*	*dominica*	YTWA	Neotropical Migrant
Pine Warbler	*Dendroica*	*pinus*	PIWA	Temperate Migrant
Prairie Warbler	*Dendroica*	*discolor*	PRAW	Neotropical Migrant
Black-and-white Warbler	*Mniotilta*	*varia*	BAWW	Neotropical Migrant
American Redstart	*Setophaga*	*ruticilla*	AMRE	Neotropical Migrant
Prothonotary Warbler	*Protonotaria*	*citrea*	PROW	Neotropical Migrant
Worm-eating Warbler	*Helmitheros*	*vermivorum*	WEWA	Neotropical Migrant
Ovenbird	*Seiurus*	*aurocapilla*	OVEN	Neotropical Migrant
Louisiana Waterthrush	*Seiurus*	*motacilla*	LOWA	Neotropical Migrant
Swainson's Warbler	*Limnothlypis*	*swainsonii*	SWWA	Neotropical Migrant
Kentucky Warbler	*Oporornis*	*formosus*	KEWA	Neotropical Migrant
Common Yellowthroat	*Geothlypis*	*trichas*	COYE	Neotropical Migrant
Hooded Warbler	*Wilsonia*	*citrina*	HOWA	Neotropical Migrant
Yellow-breasted Chat	*Icteria*	*virens*	YBCH	Neotropical Migrant
Summer Tanager	*Piranga*	*rubra*	SUTA	Neotropical Migrant
Scarlet Tanager	*Piranga*	*olivacea*	SCTA	Neotropical Migrant
Eastern Towhee	*Pipilo*	*erythrophthalmus*	EATO	Temperate Migrant
Chipping Sparrow	*Spizella*	*passerina*	CHSP	Temperate Migrant
Field Sparrow	*Spizella*	*pusilla*	FISP	Temperate Migrant
Song Sparrow	*Melospiza*	*melodia*	SOSP	Temperate Migrant
Northern Cardinal	*Cardinalis*	*cardinalis*	NOCA	Resident
Blue Grosbeak	*Passerina*	*caerulea*	BLGR	Neotropical Migrant
Indigo Bunting	*Passerina*	*cyanea*	INBU	Neotropical Migrant
Common Grackle	*Quiscalus*	*quiscula*	COGR	Resident
Brown-headed Cowbird	*Molothrus*	*ater*	BHCO	Resident
Orchard Oriole	*Icterus*	*spurius*	OROR	Neotropical Migrant
American Goldfinch	*Carduelis*	*tristis*	AMGO	Temperate Migrant