

Performance Report

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Job 1: Breeding Bird Survey
Job 2: Winter Waterbird Survey
Job 3: Kingman-Heritage Island Survey

Job 1: Breeding Bird Survey

Abstract

The extensive National Park system, riparian corridors, city parks, athletic fields, and private lands of the District provide a variety of habitats suitable for use by breeding bird species. Sixty-two species were identified as possibly breeding in the District. Eleven of those species are designated as Species of Greatest Conservation Need (SGCN) by the District's Wildlife Action Plan (WAP). Catholic University of America, Rock Creek National Park, Kenilworth Aquatic Gardens, Anacostia Park, the Fort Circle Parks, Chesapeake & Ohio Canal National Historic Park and Glover-Archbold Park were identified as areas of importance due to high species richness and value as breeding habitat.

Introduction

Urban environments are not commonly thought of as suitable habitat for breeding wildlife. Fragmentation, habitat loss, and invasive species are just a few factors in a complex dynamic which can impact breeding status and success of avian species. Over-browsing (Horsley, 2003), degradation of

understory (Newell, 2007) and even competition with the sounds of the city (Slabblekoorn, 2007) can stress bird populations and increase reproductive failure.

Despite multiple negative factors, a 2008 woodland and shrubland breeding bird survey conducted by the District Department of the Environment, Fisheries and Wildlife Division (DDOE) identified 40 species as possible breeding birds in the District (State Wildlife Grant Report 2008). A more comprehensive survey was needed to identify key habitats to focus future monitoring and research efforts.

Objectives

The objective of this survey is to document the presence, abundance, and breeding status of bird species that utilize various habitats within the District during the summer breeding season. Collected data will be used to focus future breeding bird research efforts.

Location

The study area is comprised of various habitat types within the boundaries of the District of Columbia. Four hundred possible study sites were selected randomly from the District GIS Wildlife Habitat map. Points were given 50 meter buffers from roads, buildings, or other paved surfaces. Overlapping points were combined into single sites. Other criterion for survey sites included available permits, time restrictions, and accessibility. Ninety locations were confirmed as survey sites. They include Rock Creek National Park, Glover-Archbold Park, Chesapeake & Ohio Canal National Historic Park, Fort Dupont Park, Kingman and Heritage Islands, River Terrace, Theodore Roosevelt Island, Anacostia Park, Kenilworth Park and Aquatic Gardens, National Arboretum, Fort Circle Parks, Shepherd Parkway, Oxon Run Parkway, Oxon Cove Park, Catholic University of America, Bald Eagle Hill, Langston Golf Course, Pope Branch, Battery-Kimble Park and Pinehurst Parkway.

Methods

Bird Survey Procedures

Bird counts were conducted at 90 points during the summer breeding season between May 10 and July 23, 2010. The survey points were located in various habitats, including deciduous forest, mixed forest, marsh, managed meadows, scrub, forest edge, riparian corridors, wooded wetlands, and disturbed fields. Each point was visited three times and ten-minute point counts were conducted to record all birds seen or heard during this interval within a 50 meter radius plot. All counts were conducted within four hours of sunrise.

Data Analyses

Total Species Richness

The total number of species recorded within the survey plot was used to evaluate individual and total species richness. In addition, the numbers of SGCN were computed for each site as well.

Site Avian Abundance

The number of species recorded at each site was used to calculate the avian abundance by comparing the number of species detected per visit by the number of visits to each site.

Breeding Activity

The number and type of breeding species were determined by observing and recording possible indicative behaviors such as territorial song, reproductive display, copulation, nest building, food carry, fledgling feeding, sighted pairs, nest initiation, and the presence of juveniles. Additionally, the same was done for SGCN to assess the suitability of available habitat for species of concern.

Species Relative Abundance and Detection Frequencies

The relative abundance for possible breeding species was determined by comparing the total number of a species detected against the total number of birds recorded during the survey. Species detection frequencies were determined by comparing the number of sites at which a species was detected against the total number of sites visited during the survey.

Results

Total Species Richness

A total of 93 species were observed during the course of this survey. Fourteen species recorded were SGCN (Table 1.1).

Site Avian Abundance

Catholic University of America's fenced west campus woods had the highest avian abundance and number of species detected for all surveyed sites, with 12.33 species detected per visit and 24 species recorded during the survey. Site number 29, the northern most survey location in Rock Creek Park, had the second highest avian abundance with 11 species per visit and 20 species detected. Site number 1, at the end of Kenilworth Aquatic Garden's pier into the marsh had the third highest avian abundance, with 10 species per visit and 16 species detected. Poplar Point, Rock Creek Park's golf course, and Ft. Mahan's

athletic field area had avian abundances of 9.67 species per visit with 18, 18, and 19 species detected respectively. Other sites with high levels of avian abundance included the C&O Canal near Fletcher's Boathouse, Ft. Dupont Park, the police station meadows in Anacostia Park, another site on the C&O Canal near the Maryland/District border, and one site inside Glover-Archbold Park. (Tables 1.2 and 1.3)

Breeding Activity

Based on behavioral data, it was determined that 62 species are possible breeding birds in the District. Of those, eleven were designated SGCN. (Table 1.1)

Species Relative Abundance and Detection Frequencies

Relative abundance for possible breeding birds was calculated for each species by comparing the number of that species detected during all surveys by the total number of individual birds recorded (2,960). Three SGCN were among the 25 species with the highest relative abundance. (Table 1.4)

Detection frequencies for all species were also determined by comparing the number of sites at which a species was recorded by the total number of sites surveyed. Three SGCN were among the 20 species with the highest detection frequencies (Table 1.5).

Discussion

Urbanization dominates the District of Columbia and as such continuous pressure is placed on existing forests, fields, and various other open spaces. Land-use change and land cover alterations have been linked to declining bird populations in both temperate and tropical zones (Ludwig, 2009). Urban expansion is one of the key types of such change, and has resulted in the loss of meadows, forests, and wetlands on a massive scale. Urban development also contributes to the replacement of native species by non-native flora and fauna, and opens new territory to competitive species. Avian species are responding to habitat changes, and negative breeding trends may serve as an early warning sign for declining environmental conditions (Rich, 2004). Habitat loss, fragmentation, and degradation have led to regional and local declines in populations of some forest nesting species as well as other avifauna. Quantifying the District's breeding bird populations and distributions is a critical component to determining the effects of climate change, land-use planning, and the development of conservation measures in accordance with the District's Wildlife Action Plan (WAP).

Based on avian diversity and possible breeding species, the wooded section west of Catholic University of America and sections of Rock Creek Park, Kenilworth Aquatic Gardens, Anacostia Park, the C&O Canal, and Glover-Archbold Parks are important properties for breeding birds in the District.

Further investigation is needed to determine the possibility of Swainson's thrushes (*Catharus ustulatus*) breeding in the District. Swainson's thrushes were singing at three sites in Glover-Archbold Park on June 16, 2010, several weeks after the bulk of Swainson's thrushes had migrated through the region. The thrush is listed as a former breeding species in the District and the last breeding records for Maryland are around 1908 and 1917 in Garrett County (Behr 1914, Stewart and Robbins, 1958).

Brown-headed cowbirds (*Molothrus ater*) are brood parasites and were detected at 25% of survey locations. Urbanization, trail creation, and other disturbance activities may be creating new brown-headed cowbird habitat and contributing to the decline or absence of woodland species such as the summer tanager and hooded warbler.

Future studies on breeding birds in the District of Columbia will focus the key properties identified in the 2010 breeding bird survey. These studies will be more intensive and include nest searching, territory mapping, nesting success rates, and breeding densities, with emphasis on species of conservation priority.

Table 1.1 **Possible Breeding Birds from 2010 Survey**

Common Name	* = SGCN	Possible Breeder	Breeding Behavior Observed
Cormorants			
Double-crested Cormorant			
Herons and Egrets			
Black-crowned Night-Heron*			
Great Egret			
Great Blue Heron			
Ducks and Geese			
Canada Goose		Y	Fledged young
Wood Duck*		Y	Fledged young
Mallard		Y	Fledged young, vocal young
Vultures			
Turkey Vulture			
Hawks and Eagles			
Osprey		Y	Territorial song, food carry
Bald Eagle*			
Sharp-shinned Hawk			
Cooper's Hawk			
Red-shouldered Hawk*		Y	Complete nest with adults near
Red-tailed Hawk		Y	Fledged young
American Kestrel			
Pheasants and Turkeys			
Wild Turkey		Y	Territorial song
Plovers			
Killdeer			
Gulls and Terns			
Ring-billed Gull			
Doves			
Rock Dove		Y	
Mourning Dove		Y	
Cuckoos			
Yellow-billed Cuckoo		Y	
Owls			
Barred Owl			
Swifts			
Chimney Swift*		Y	
Hummingbirds			
Ruby-throated Hummingbird			

Kingfishers

Belted Kingfisher

Woodpeckers

Red-bellied Woodpecker	Y	Territorial song, fledged young, feeding fledged young
Northern Flicker	Y	Territorial song
Downy Woodpecker	Y	Territorial song, feeding fledged young
Hairy Woodpecker	Y	Territorial song, vocal young in nest cavity, fledged young
Pileated Woodpecker	Y	Territorial song

Flycatchers

Eastern Wood-pewee	Y	Territorial song
Acadian		
Flycatcher*	Y	Territorial song
Alder Flycatcher	Y	Territorial song
Willow Flycatcher		
Least Flycatcher		
Eastern Phoebe	Y	Territorial song
Great Crested Flycatcher	Y	Territorial song
Eastern Kingbird	Y	Territorial song

Vireos

White-eyed Vireo*		
Red-eyed Vireo	Y	Territorial song
Warbling Vireo	Y	Territorial song

Jays and Crows

Blue Jay	Y	Territorial song
American Crow	Y	Fledged young
Fish Crow	Y	

Swallows

Tree Swallow	Y	
Barn Swallow	Y	

Chickadees and Titmice

Tufted Titmouse	Y	Territorial song, adults feeding fledged young
Carolina Chickadee	Y	Territorial song, adults feeding fledged young

Nuthatches

White-breasted Nuthatch	Y	Territorial song
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Wrens

House Wren	Y	Territorial song
Carolina Wren	Y	Territorial song, fledged young, adults feeding three young

Gnatcatchers

Blue-gray Gnatcatcher	Y	Territorial song, fledged young
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Thrushes

Eastern Bluebird		
Wood Thrush*	Y	Territorial song, fledged young

Swainson's Thrush		
Hermit Thrush		
American Robin	Y	Complete nest, fledged young, adults feeding fledged young
Mockingbirds and Thrashers		
Gray Catbird	Y	Territorial song, nest building, complete nest, fledged young
Northern Mockingbird	Y	Territorial song
Brown Thrasher*	Y	Territorial song
Starlings		
European Starling	Y	Copulation, fledged young
Waxwings		
Cedar Waxwing		
Warblers		
Prothonotary Warbler*	Y	Territorial song
Northern Parula	Y	Territorial song
Magnolia Warbler		
Yellow-rumped Warbler		
Black-and-white Warbler		
Black-throated Blue Warbler		
Yellow-throated Warbler		
Blackpoll Warbler		
Yellow Warbler	Y	Territorial song, juvenile
Canada Warbler		
Ovenbird*	Y	Territorial song
Louisiana Waterthrush*	Y	Territorial song
Northern Waterthrush		
Common Yellowthroat	Y	Territorial song
American Redstart		
Tanagers		
Summer Tanager	Y	Territorial song
Scarlet Tanager*	Y	Territorial song
Towhees		
Eastern Towhee*	Y	Territorial song, fledged young
Sparrows		
Chipping Sparrow		
Song Sparrow	Y	Territorial song, fledged young
Cardinals, Grosbeaks and Buntings		
Northern Cardinal	Y	Territorial song, fledged young
Blue Grosbeak	Y	Territorial song
Indigo Bunting	Y	Territorial song
Blackbirds and Orioles		
Red-winged Blackbird	Y	Territorial song, fledged young, courtship display
Common Grackle	Y	Territorial song
Brown-headed Cowbird	Y	Territorial song, fledged young

Orchard Oriole	Y	Territorial song
Baltimore Oriole	Y	Territorial song
Finches		
House Finch	Y	Territorial song
American Goldfinch	Y	Territorial song
Old World Sparrows		
House Sparrow	Y	Adults feeding young, vocal young, pair carrying food, fledged young

Table 1.2 11 Sites with Highest Avian Abundance				
	Site No.	Location	Avian Abundance	Number of Species Detected
1	87	Catholic University of America	12.33	24
2	29	Rock Creek Park	11	20
3	1	Kenilworth Aquatic Gardens	10	16
4	10	Poplar Point	9.67	18
5	113	Rock Creek Park	9.67	18
6	118	Fort Mahan	9.67	19
7	42	C&O Canal	9.33	22
8	97	Fort Dupont	9.33	21
9	104	Anacostia Park	9.33	18
10	24	C&O Canal	9	21
11	35	Glover-Archbold Park	9	17

Table 1.3 Breeding Bird Site*

Site	Location	SSR	#SGCN	ABUN	#PBS	#PBSGCN	Primary Habitat Type	Secondary Hab Type
1	Kenilworth Aquatic Gardens	16	2	10	12	2	Tidal mudflats	Forested wetlands
3	Heritage Island	9	1	3.67	5	0	Tidal mudflats	Forested wetlands
4	River Terrace	15	2	8	11	0	Emergent tidal wetlands	Riparian Woodlands
5	Langston Golf Course	20	2	7.33	5	0	Urban Landscape	Early-successional/Edge
6	Kenilworth South	8	1	2.67	3	0	Early-successional/Edge	Grassland/Managed meadow
8	Kingman Island	7	1	3.67	6	0	Forested wetlands	Early-successional/Edge
9	RFK Parking lot edge	11	2	4.33	6	0	Early-successional/Edge	Urban Landscape
10	Poplar Point	18	0	9.67	7	0	Forested wetlands	Early-successional/Edge
11	Fort Lincoln	14	2	5.33	3	1	Hardwood forest	Pools and Ponds
12	Kenilworth Aquatic Gardens	9	0	3.67	5	0	Forested wetlands	Urban Landscape
13	Kenilworth Athletic Fields	16	3	7.33	8	2	Riparian woodlands	Hardwood forest
14	Theodore Roosevelt Island	8	1	3.67	4	0	Forested wetlands	Tidal mudflats
15	Theodore Roosevelt Island	10	1	5.67	7	1	Emergent tidal wetlands	Forested wetlands
16	Oxon Run	13	3	6.67	7	2	Hardwood forest	
17	Oxon Run	12	4	4.67	10	3	Forested wetlands	Hardwood forest
18	Bald Eagle Hill	10	1	5.67	4	1	Hardwood forest	Riparian Woodlands
19	Bald Eagle Hill	14	2	6.33	5	2	Hardwood forest	Forested wetlands
20	Oxon Cove	11	1	4.33	4	0	Hardwood forest	Early-successional/Edge
21	Rock Creek Park	12	2	5.67	7	2	Riparian woodlands	Hardwood forest
24	C&O Canal	21	4	9	8	2	Riparian woodlands	Forested wetlands
25	Division Road, NE	15	0	7.33	9	0	Riparian woodlands	Urban Landscape
27	Fort Dupont Park	13	3	6	8	3	Forested wetlands	Hardwood forest
28	Pope Branch	12	2	6.67	4	2	Riparian woodlands	Hardwood forest
29	Rock Creek Park	20	3	11	9	2	Forested wetlands	Hardwood forest
30	Rock Creek Park	14	2	8.67	10	2	Hardwood forest	Riparian Woodlands
33	Rock Creek Park	12	1	6.33	6	1	Riparian woodlands	Forested wetlands
34	Glover-Archbold Park	9	2	4	5	2	Hardwood forest	Forested wetlands
35	Glover -Archbold Park	17	4	9	8	4	Hardwood forest	Riparian Woodlands
36	Battery-Kimble Park	15	1	6.67	5	1	Riparian woodlands	Hardwood forest

37	Glover-Archbold Park	17	2	8.67	6	1	Riparian woodlands	Hardwood forest
38	Circle Parks	17	3	8.67	9	2	Grasslands/Managed meadow	Riparian Woodlands
41	Fort Lincoln	7	0	3	6	0	Forested wetlands	Vernal pools
42	C&O Canal	22	5	9.33	7	4	Forested wetlands	Riparian Woodlands
44	Rock Creek Park	10	3	5.67	7	3	Hardwood forest	
46	Rock Creek Park	14	1	7.67	8	1	Hardwood forest	Early-successional/Edge
47	Rock Creek Park	19	3	8	7	3	Hardwood forest	Riparian Woodlands
48	Rock Creek Park	14	1	7	6	1	Hardwood forest	Urban Landscape
49	Rock Creek Park	15	2	7	6	2	Riparian woodlands	Hardwood forest
50	Battery-Kimble Park	13	1	5.33	6	1	Riparian woodlands	Hardwood forest
51	Glover-Archbold Park	14	1	5	6	0	Hardwood forest	
53	Whitehaven Parkway	9	0	6.33	7	0	Hardwood forest	Urban Landscape
56	Whitehaven Parkway	13	3	7.67	6	3	Hardwood forest	
57	Glover-Archbold Park	8	1	5	5	1	Forested wetlands	Hardwood forest
58	Kenilworth South	10	2	3.33	6	2	Early-successional/Edge	Grassland/Managed meadow
60	National Arboretum	12	2	6	8	2	Hardwood forest	
61	Fort Stanton	16	4	7.33	7	2	Hardwood forest	Urban Landscape
62	Fort Stanton	11	1	5.67	5	0	Hardwood forest	Early-successional/Edge
63	Shepherd Parkway	9	2	4	5	2	Hardwood forest	
65	Shepherd Parkway	17	2	8	7	1	Hardwood forest	Early-successional/Edge
66	Pinehurst Parkway	12	1	6.67	9	1	Hardwood forest	Riparian Woodlands
67	Pinehurst Parkway	13	1	8	8	2	Hardwood forest	Riparian Woodlands
68	Rock Creek Park	9	2	4.33	7	2	Riparian woodlands	Hardwood forest
69	Rock Creek Park	16	1	8.33	9	1	Hardwood forest	Grassland/Managed meadow
70	Glover-Archbold Park	12	2	5.67	6	2	Riparian woodlands	Hardwood forest
72	Glover-Archbold Park	15	4	8.33	9	4	Hardwood forest	Riparian Woodlands
73	National Arboretum	10	3	5	6	2	Hardwood forest	Early-successional/Edge
75	Theodore Roosevelt Island	11	0	6	8	0	Hardwood forest	Early-successional/Edge
76	Theodore Roosevelt Island	9	2	5.33	5	0	Riparian woodlands	Forested wetlands
78	National Arboretum	12	2	6	8	2	Hardwood forest	
79	Fort Mahan	11	3	5.33	5	2	Hardwood forest	Early-successional/Edge

80	Fort Dupont	13	2	5.33	1	2	Hardwood forest	Early-successional/Edge
81	Fort Dupont	14	4	5.67	5	2	Hardwood forest	Early-successional/Edge
82	Pope Branch	12	2	6.67	5	2	Hardwood forest	
83	Circle Fort Park	13	5	6.33	5	4	Hardwood forest	Riparian Woodlands
84	Stanton Park	16	5	7.67	8	5	Hardwood forest	
85	Bald Eagle Hill	12	2	6	4	2	Hardwood forest	Riparian Woodlands
86	Fort Totten	11	1	6	5	0	Grasslands/Managed meadow	Early-successional/Edge
87	Catholic University	24	4	12.33	12	5	Early-successional/Edge	Grassland/Managed meadow
92	Poplar Point	13	1	8	7	0	Early-successional/Edge	Grassland/Managed meadow
94	C&O Canal	17	2	7.33	5	2	Forested wetlands	Riparian Woodlands
95	Kenilworth Aquatic Gardens	15	2	6	9	2	Tidal mudflats	Riparian Woodlands
96	Fort Dupont	14	4	5.33	3	2	Hardwood forest	Riparian Woodlands
97	Fort Dupont	21	5	9.33	7	2	Hardwood forest	Riparian Woodlands
99	Oxon Cove	9	1	4	3	0	Grasslands/Managed meadow	Early-successional/Edge
100	Fort Lincoln	5	0	2.33	5	0	Grasslands/Managed meadow	Early-successional/Edge
104	Anacostia Park	18	1	9.33	9	0	Riparian woodlands	Grassland/Managed meadow
105	East Potomac Park	10	1	5.33	5	1	Urban Landscape	Early-successional/Edge
108	Rock Creek Park	14	1	8	6	0	Urban Landscape	Riparian Woodlands
109	Fort Stanton	12	2	6.67	6	1	Early-successional/Edge	Hardwood forest
113	Rock Creek Park	18	3	9.67	11	2	Urban Landscape	Early-successional/Edge
115	Rock Creek Park	10	1	5.67	6	1	Riparian woodlands	Early-successional/Edge
117	Oak Hill Cemetary	10	0	5.33	6	0	Urban Landscape	Early-successional/Edge
118	Fort Mahan	19	3	9.67	8	2	Grasslands/Managed meadow	Early-successional/Edge
119	Anacostia Park - AREC	10	0	4.67	3	0	Urban Landscape	Early-successional/Edge
122	Barnard Hill Park	13	2	7.67	7	2	Urban Landscape	Early-successional/Edge
124	Fort Lincoln	12	2	6	8	2	Early-successional/Edge	Hardwood forest
125	National Arboretum	12	1	5.67	8	1	Grasslands/Managed meadow	Early-successional/Edge
126	National Arboretum	16	1	7	3	1	Hardwood forest	Early-successional/Edge
128	Kenilworth Aquatic Gardens	12	1	5.33	5	1	Riparian woodlands	Hardwood forest

*SSR = Site Species Richness

#SGCN = Number of SGCN recorded at site

ABUN= Site Avian Abundance

#PBS = Number of possible breeding species

#PBSGCN= Number of possible breeding SGCN

Table 1.4 *SGCN**25 Species with Highest Relative Abundance of Possible Breeding Species Over All Surveyed Sites**

	Common Name	Scientific Name	No. Detected	Relative Abundance
1	American Robin	<i>Turdus migratorius</i>	400	13.514
2	Northern Cardinal	<i>Cardinalis cardinalis</i>	205	6.926
3	Gray Catbird	<i>Dumetella carolinensis</i>	181	6.115
4	European Starling	<i>Sturnus vulgaris</i>	158	5.338
5	Carolina Wren	<i>Thryothorus ludovicianus</i>	150	5.068
6	Carolina Chickadee	<i>Poecile carolinensis</i>	105	3.547
7	Eastern Towhee*	<i>Pipilo erythrophthalmus</i>	103	3.480
8	Acadian Flycatcher*	<i>Empidonax virens</i>	87	2.939
9	Tufted Titmouse	<i>Baeolophus bicolor</i>	79	2.669
10	Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	75	2.534
11	American Goldfinch	<i>Carduelis tristis</i>	74	2.500
12	Red-eyed Vireo	<i>Vireo olivaceus</i>	70	2.365
13	Wood Thrush*	<i>Hylocichla mustelina</i>	68	2.297
14	Common Grackle	<i>Quiscalus quiscula</i>	65	2.196
15	Eastern Wood-pewee	<i>Contopus virens</i>	62	2.095
16	Red-winged Blackbird	<i>Agelaius phoeniceus</i>	62	2.095
17	Mallard	<i>Anas platyrhynchos</i>	54	1.824
18	Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>	45	1.520
19	Tree Swallow	<i>Tachycineta bicolor</i>	42	1.419
20	Song Sparrow	<i>Melospiza melodia</i>	42	1.419
21	White-breasted Nuthatch	<i>Sitta carolinensis</i>	41	1.385
22	Brown-headed Cowbird	<i>Molothrus ater</i>	35	1.182
23	Indigo Bunting	<i>Passerina cyanea</i>	35	1.182
24	Downy Woodpecker	<i>Picoides pubescens</i>	34	1.149
25	Canada Goose	<i>Branta canadensis</i>	32	1.081

Table 1.5		*= SGCN		
20 Species with Highest Detection Frequencies of Possible Breeding Species Over All Surveyed Sites				
	Common Name	Scientific Name	No. of Sites Detected	Detection Frequency
1	American Robin	<i>Turdus migratorius</i>	74	82.22
2	Northern Cardinal	<i>Cardinalis cardinalis</i>	72	80.00
3	Carolina Wren	<i>Thryothorus ludovicianus</i>	61	67.78
4	Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	45	50.00
5	Red-eyed Vireo	<i>Vireo olivaceus</i>	44	48.89
6	Carolina Chickadee	<i>Poecile carolinensis</i>	43	47.78
7	Tufted Titmouse	<i>Baeolophus bicolor</i>	40	44.44
8	Acadian Flycatcher*	<i>Empidonax virescens</i>	39	43.33
9	Gray Catbird	<i>Dumetella carolinensis</i>	38	42.22
10	Eastern Wood-pewee	<i>Contopus virens</i>	36	40.00
11	Eastern Towhee*	<i>Pipilo erythrophthalmus</i>	34	37.78
12	American Goldfinch	<i>Carduelis tristis</i>	33	36.67
13	Downy Woodpecker	<i>Picoides pubescens</i>	30	33.33
14	Wood Thrush*	<i>Hylocichla mustelina</i>	27	30.00
15	White-breasted Nuthatch	<i>Sitta carolinensis</i>	24	26.67
16	European Starling	<i>Sturnus vulgaris</i>	24	26.67
17	Common Grackle	<i>Quiscalus quiscula</i>	23	25.56
18	Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>	22	24.44
19	Brown-headed Cowbird	<i>Molothrus ater</i>	22	24.44
20	Indigo Bunting	<i>Passerina cyanea</i>	19	21.11

Job 2: Winter Waterbird Survey

Abstract

The open water of the Anacostia and Potomac Rivers, municipal reservoirs, ponds and adjacent wetlands of the District provide year- round habitat for waterbirds. These water features are important breeding areas and migration corridors. Wintering waterbirds rely on these resources to survive the winter. The District surveyed the Anacostia and Potomac Rivers, reservoirs, tidal wetlands, mudflats, and ponds on a bi-monthly basis from November 15, 2009 to March 15, 2010. Four species of greatest conservation need were recorded; bald eagle, red-shouldered hawk, American black duck, and wood duck. Canada geese, ring-billed gulls, mallards, greater black-backed gulls, and lesser scaup were seen in large numbers on the Anacostia and Potomac River watersheds.

Introduction

The District contains approximately 3,120 hectares (7,745 acres) of suitable waterbird habitat, including but not exclusively, rivers, wetlands, and reservoirs. These habitats are essential and enable waterbirds to survive the winter months and prepare for spring migrations and breeding seasons. The habitats also provide resources such as loafing space and forage for gulls, terns, geese, dabbling ducks, diving ducks, wading birds and raptors. Waterbirds can act as barometers of these habitats in terms of water quality, submerged aquatic vegetation levels, and the general health of the ecosystems they are utilizing.

Waterbirds can be highly visible representatives of aquatic and wetland habitats. Their large congregations draw birdwatchers, hunters and other outdoor enthusiasts. Since waterbirds are also important indicators of environmental health and quality, their conservation and management contributes to the overall preservation of aquatic ecosystems. Waterbirds face numerous pressures throughout their breeding habitats, migration routes and wintering habitats, in both inland and coastal areas. The destruction of wetlands, adverse impacts of invasive plant and animal species, decreasing water quality, loss of sub-aquatic vegetation, and human disturbance are just a few of the waterbird conservation issues that wildlife managers address. Minimizing these pressures in waterbirds' wintering habitats may help to increase their survivability during migration and productivity during the breeding season.

A vast majority of research on urban avifauna has focused on passerine species in terrestrial habitats. Even when studies have focused on waterbirds, they have generally done so in non-urban settings

(Bolduc and Afton, 2004). Very little information exists on habitat needs outside of the breeding season for many bird species. Along with other types of non-breeding habitats, wintering areas are critical to the overall conservation needs of avian species. Since the use of such areas by waterbirds is relatively poorly understood, and given their importance for the long-term health of waterbird populations, there is need for long-term monitoring of such habitat.

Open water habitat is listed as a highly critical habitat in the DC Wildlife Action Plan (WAP). Sixty-two SGCN species use open water habitat, wetlands and mudflats along the Potomac and Anacostia Rivers. The District is also a part of the Atlantic migratory flyway and is far enough south that many birds that nest in the far north may overwinter here, depending on weather conditions. To establish diversity and abundance data of waterbirds that use these critical habitats, surveys were conducted on the Anacostia and Potomac rivers during the winter of 2010.

Like most urban water bodies in the nation, the Anacostia River faces ecological threats from myriad sources. Its watershed is one of the most densely populated areas within the Chesapeake Bay drainage region. As a result, urban and suburban development exerts constant and ever-increasing pressures on the ecosystem of this tidal river. Stormwater runoff, sedimentation, toxic pollution from a variety of non-point sources, and illegal dumping of trash are examples of major stressors. The DDOE of the District of Columbia began monitoring wintering waterbirds on the tidal sections of the Anacostia and Potomac rivers, as well as select large water bodies within the District limits in the winter of 2002. This remains an ongoing study, with the following specific objectives:

- 1) To compile an inventory of wintering waterbird species along the District's main water bodies.
- 2) To evaluate spatial patterns of utilization by wintering waterbirds of the District's rivers and reservoirs.
- 3) To assess the frequency and abundance of wintering waterbirds within the District and how these population parameters vary between years.

Results obtained from such analyses will be used to establish a database to implement best management practices (BMP) for priority waterbird species.

Methods

The Winter Waterbird Survey (WWS) study area includes the tidal sections of the Anacostia and Potomac Rivers within the boundary of the District of Columbia. Data were also collected on reservoirs

and ponds associated with the river systems. For the Potomac, this included the Georgetown Reservoir, Constitution Gardens, and the Tidal Basin on the National Mall.

Data were collected from fixed points offering high visibility along the rivers, nine on the Anacostia River and eleven on the Potomac River.

Field counts for the winter waterbird survey of 2010 were conducted from mid-November to mid-March. Waterbird counts were conducted on each river system on a bi-weekly basis.

Visible waterbirds were recorded from each survey point using binoculars and a spotting scope. Efforts were made to identify and count every waterbird along the visible section of water visible from points and exclude individuals previously counted at another point. Other species were recorded due to their ecology being associated with water ecosystems, wetland habitats, or use of water systems during winter. Additionally, weather and tide were recorded at the beginning of each survey.

Results

Summary

A total of thirty-seven species, nine hybrid ducks, and one hybrid goose were observed and recorded during the WWS of 2010. Four Species of Greatest Conservation Need (SGCN) were recorded during these surveys: American black duck, bald eagle, red-shouldered hawk, and wood duck. For the second year in a row, a black-crowned night heron was not sighted during the WWS. Five waterbird species were recorded only once on all surveys (Table 2.1).

Data Analysis

Data were summarized for each river system to provide estimates of species richness, relative abundance, and detection frequency. The total number of individuals of each species sighted during the course of the study was used to calculate a percentage for relative abundance. The total number of days a given species were observed was used to calculate the frequency of detection for that species. Data were analyzed in this manner for each river system.

Anacostia River System

A total of twenty-five species of waterbirds were observed on the Anacostia River, representing 68 percent of the total species diversity recorded. Twenty-three species were recorded in 2007, nineteen in 2008, and sixteen in 2009.

Four SGCN seen during these surveys were recorded on the Anacostia River.

The Anacostia River site with the highest overall diversity was the Kenilworth Aquatic Gardens, with twenty species. The next highest site for species diversity was Langston Golf Course – North, with eighteen species. The Pumphouse had the lowest species diversity with only seven. A summary of the Anacostia River system data appears in Table 2.2.

One type of grebe, cormorant, and heron were each recorded on the Anacostia River. The double-crested cormorant was the most frequently observed of these species with 2.21% relative abundance and 90% detection on field days.

Four species of dabbling ducks or geese were observed. The Canada goose was the most common with 45.23% relative abundance and 100% detection on field days. Mallards also had a 100% detection frequency, but had a lower relative abundance of 2.94%. American black duck and wood duck are both SGCN species and had relative abundances of less than 1%.

Three species of diving ducks were recorded in the Anacostia River system. Lesser scaup, common mergansers, and hooded mergansers were seen in low numbers, less than 1% relative abundance, with the hooded merganser being observed most often, on 50% of field days.

Six species of raptors were sighted during Anacostia surveys, with the red-shouldered hawk (SGCN) being the most common and seen on 80% of field days. Other raptors were seen on only 10% or 20% of field days.

The killdeer was the only plover sighted, with 25 individuals being recorded on two field days.

Four gull species were observed during surveys. Ring-billed gulls were the most common with 36.84% relative abundance and 100% detection on field days. Herring gulls and great black-backed gulls were also detected on 100% of field days, but with much lower relative abundances, 1.95% and 3.91% respectively. Laughing gulls were observed on 20% of field days with a 1.19% relative abundance.

The belted kingfisher was sighted on 50% of field days. Red-winged blackbirds were seen on 30% of field days, but with a low relative abundance of 0.17%.

Two corvid species were recorded on the Anacostia River system. American crows and fish crows were both seen on 90% of field days and with similar abundances, 2.35% and 1.61% respectively.

Potomac River System

A total of thirty-four waterbird species were observed and recorded on the Potomac River, representing 92% of the total species diversity recorded. Twenty-one species were recorded in 2007, twenty in 2008, and twenty-five in 2009. Five species were sighted exclusively during surveys of the Potomac River system: horned grebe, canvasback, Cooper's hawk, greater scaup, and American pipit.

Four SGCN seen during these surveys were recorded on the Potomac River.

The Potomac River sites with the highest overall diversity were Washington Channel and Daingerfield Island, both with seventeen species recorded. The sites with the next highest diversity were Chain Bridge and Alexandria Waterfront, both with eleven species. Ohio Drive/East Potomac Park had the lowest diversity with only five species recorded. A summary of the Potomac River system data appears in Table 2.3.

Two types of grebes were sighted during surveys on the Potomac River system. Pied-billed grebes were seen on 90% of field days, with a low relative abundance of 0.23%. The horned grebe was recorded once during surveys. Double-crested cormorants were recorded on 100% of field days, with 3.33% relative abundance. The great blue heron was the only heron species sighted, with 80% detection on field days, but less than 1% relative abundance.

Four species of dabbling ducks and geese were observed during surveys. The Canada goose had the highest relative abundance of all species on the Potomac River system, 38.59%, but was only detected on 90% of field days. Mallards were sighted in 100% of field days with 12.34% relative abundance. This is more than twice the individuals in 2009, and more than three times the number of mallards recorded in 2007. 2008 survey mallard numbers are similar to 2010. American black duck and wood duck, both SGCN, had less than 1% relative abundance.

Ten species of diving ducks were recorded. Lesser scaup were seen in large rafts, detected on 50% of field days with a 7.64 relative abundance. Ring-necked ducks were the second most common diving duck, detected on 70% of field days, but with only a 0.64 relative abundance. The bufflehead, common merganser, hooded merganser, and ruddy duck also had relative abundances of less than 1%. The

American wigeons and red-breasted mergansers were both observed on one field day. The greater scaup and canvasback both had only one observation for 2010.

Four raptor species were observed on the Potomac River system. The bald eagle (SGCN) was the most common, with three individuals observed on three field days.

American coot sightings were very similar to the numbers from the three previous years, with sixteen individuals and 60% detection on field days.

Gull species accounted for 34.78% of avian relative abundance on the Potomac River. Ring-billed gulls were most common with 30.39% of relative abundance and 100% detection on field days. Great black-backed gulls and herring gulls also had 100% detection frequency, but lower relative abundance, 3.33% and 1.01% respectively. Lesser black-backed gulls, Bonaparte's gulls, and one laughing gull were recorded as well, with less than 1% abundance.

The belted kingfisher was sighted on 60% of field days. A single American pipit was observed on the docks at Daingerfield Island Sailing Marina. Red-winged blackbirds were seen on 20% of field days.

Two corvid species were recorded on the Potomac River system. Fish crows were both seen on 50% of field days with similar a 1.07 abundance, and American crows were seen on 40% of survey days with a 0.10% relative abundance.

Discussion

Although the Anacostia River system supports fewer numbers of species during the winter than the Potomac River system, mean site species richness and avian abundance were higher along the Anacostia during the Winter Waterbird Survey of 2010 (Table 2.4).

Four SGCN were recorded on each river: bald eagle, red-shouldered hawk, American black duck, wood duck.

The Canada goose, ring-billed gull, mallard, great black-backed gull, and lesser scaup were the most abundant waterbird species to winter in District waters.

Many species that have wintered in District waters previously were not detected on the 2010 WWS, including loons, gadwall, green-winged teal, blue-winged teal, northern pintail, northern shoveler, and

redhead ducks. Other waterbirds were observed on only one or two occasions such as the red-breasted merganser, horned grebe, canvasback, greater scaup, American wigeon, and American pipit.

Waterbirds are subjected to multiple stressors that may affect wintering populations and distributions. Land use changes in breeding habitat, migration shifts due to climate change, water contamination, invertebrate population declines, and submerged aquatic vegetation are just a few factors that may impact winter waterbird surveys. Temperature, snow and ice cover, and human disturbance also may be factors in winter waterbird distribution in the District.

Little information exists on the influence of weather and weather events on waterfowl abundance during wintering months (Schummer, 2010). Severe cold temperatures and record-breaking snowfall may have altered avian distribution and rendered some areas unsuitable waterbird habitat for part of the survey season. Low temperatures, 18 days below 32 degrees Fahrenheit in December, and 23 days in January, froze large sections of both rivers, Constitution Gardens, Georgetown Reservoir, and the Tidal Basin (National Weather Service). Heavy snowfall in December (16.6 inches) and February (32.1 inches) compounded matters, covering shoreline feeding habitat and limiting access to several survey areas. Theodore Roosevelt Island, Haines Point, Washington Channel, and East Potomac Park all had limited access or complete closures. The frozen water surfaces and snow cover limited waterbird access to vital foraging opportunities. Mallards, the third most common waterbird observed, can be more tolerant of freezing temperatures, snowfall, and wetland icing than other waterbirds (Schummer, 2010).

The Washington Channel site was one of the few sites that did not freeze over during the survey, and was tied with Daingerfield Island Marina for the highest number of species and had the highest avian abundance on the Potomac River. The Daingerfield Marina has mechanical bubblers surrounding the docks on the marina site and over water on the eastern side that reduced surface freezing. The Marina site bubblers prevented surface icing and provided foraging opportunities for American coots, pied-billed grebes, American black ducks, and ruddy ducks during severe weather.

Rain and snowmelt combined to create increased discharge on both the Anacostia and Potomac Rivers. The Little Falls, Maryland Potomac River station (flood stage 10 feet) recorded water stages of 10.5 feet in January and 12.5 feet in March 2010 (United States Geological Survey, USGS). The high rate of flow, turbidity, and flooding of ponds and coves may have forced many dabbling ducks and shoreline loafing birds further down river to open water or into protected marshes that were not surveyed.

The Anacostia and Potomac Rivers and associated water bodies are impacted by human disturbance due to their urban setting. Human activity can alter natural animal behaviors that are crucial for survival during winter months. Waterbird behavioral changes are influenced by shoreline disturbance and development (Traut, 2003). When birds are flushed or avoid humans, they expend precious energy and lose time required for foraging. It has been shown that wintering ducks respond to activity based on the type of disturbance, species, and distance from the disturbance (Pease, 2005). For example, ducks are more disturbed by people walking and biking than vehicular traffic. The large number of hiking and biking trails on the Potomac River and a new trail being constructed on the Anacostia River could have a significant impact on the distribution of winter waterbirds in the District. Geese are vulnerable to disturbance by small watercraft (Owens, 1977). Therefore, rowing and kayaking, which are popular recreational activities on the rivers year round, may limit waterbird use on District waters. Resident Canada geese may be desensitized to human activities, but other migrating waterfowl may be more susceptible to disturbance. The need for lower rates of disturbance may encourage some species to avoid urban areas and utilize more rural water bodies.

Conclusion

A handful of species dominate the District's open water during the winter. The combination of weather events and human disturbance may have also contributed to the number, species and distribution of waterbirds in the District in 2010. Increasing submerged aquatic vegetation beds and improving water quality may increase the number of species and biomass of waterbirds utilizing District waters during the winter. The DDOE will continue to monitor waterbirds to establish long-term trends, recommend BMP for emerging development, and strive to conserve and improve wintering opportunities for waterbirds in the District.

	Anacostia	Potomac
SGCN	Bald Eagle	Bald Eagle
	Red-shouldered Hawk	Red-shouldered Hawk
	American Black Duck	American Black Duck
	Wood Duck	Wood Duck
One Record		Horned Grebe
		Canvasback
		Cooper's Hawk
		Greater Scaup
		American Pipit

Table 2.1 Species of greatest conservation need (SGCN) and species with only one sighting recorded during the 2009-2010 Winter Waterbird Survey.

Table 2.2 Winter Waterbird Survey summary data for the Anacostia River system 2007-2010

Species	2007			2008			2009			2010		
	No.	R/A	D/F	No.	R/A	D/F	No.	R/A	D/F	No.	R/A	D/F
Red-throated Loon	1	0.01	1	0	0.00	0	0	0.00	0	0	0.00	0
Horned Grebe	0	0.00	0	3	0.02	1	0	0.00	0	0	0.00	0
Pied-billed Grebe	1	0.01	1	4	0.03	3	3	0.04	3	16	0.13	3
Double-crested Cormorant	111	1.27	3	106	0.76	6	135	2.03	4	269	2.21	9
Black-crowned Night-heron	4	0.05	2	1	0.01	1	0	0.00	0	0	0.00	0
Great Blue Heron	10	0.11	5	34	0.24	6	15	0.23	4	26	0.21	8
Canada Goose	4162	47.78	6	7323	52.49	6	3727	56.03	4	5485	45.23	10
Wood Duck	0	0.00	0	0	0.00	0	3	0.04	1	8	0.06	2
Mallard	261	3.00	6	430	3.08	6	172	2.58	4	357	2.94	10
American Black Duck	4	0.05	3	15	0.11	1	0	0.00	0	29	0.23	4
Green-winged Teal	0	0.00	0	2	0.01	1	0	0.00	0	0	0.00	0
White-winged Scoter	0	0.00	0	0	0.00	0	1	0.01	1	0	0.00	0
Lesser Scaup	3	0.03	1	377	2.70	3	0	0.00	0	5	0.04	2
Bufflehead	0	0.00	0	2	0.01	1	0	0.00	0	0	0.00	0
Common Merganser	15	0.17	2	3	0.02	1	50	0.75	3	13	0.10	2
Hooded Merganser	14	0.16	3	38	0.27	6	15	0.23	3	28	0.23	5
Bald Eagle	3	0.03	2	4	0.03	4	2	0.03	2	1	0.01	1
Cooper's Hawk	0	0.00	0	0	0.00	0	0	0.00	0	3	0.02	2
Red-shouldered Hawk	1	0.01	1	6	0.04	4	1	0.01	1	15	0.12	8
Red-tailed Hawk	1	0.01	1	1	0.01	1	0	0.00	0	3	0.02	2
American Kestrel	0	0.00	0	0	0.00	0	0	0.00	0	2	0.01	1
Peregrine Falcon	0	0.00	0	0	0.00	0	0	0.00	0	2	0.01	2
American Coot	0	0.00	0	1	0.01	1	0	0.00	0	0	0.00	0
Killdeer	0	0.00	0	12	0.09	1	0	0.00	0	25	0.20	2
Laughing Gull	0	0.00	0	3	0.02	1	0	0.00	0	145	1.19	2
Ring-billed Gull	3255	37.37	6	4633	33.21	6	2056	30.91	4	4468	36.84	10
Herring Gull	507	5.82	6	103	0.74	6	278	4.17	4	237	1.95	10
Great black-backed gull	350	4.02	6	793	5.68	6	187	2.81	4	475	3.91	10
Belted Kingfisher	3	0.03	1	15	0.11	5	0	0.00	0	7	0.05	5
Tree Swallow	0	0.00	0	0	0.00	0	4	0.06	1	0	0.00	0
American Crow	0	0.00	0	0	0.00	0	0	0.00	0	286	2.35	9
Fish Crow	4	0.05	1	40	0.29	3	2	0.03	1	196	1.61	9
Red-winged Blackbird	0	0.00	0	0	0.00	0	0	0.00	0	21	0.17	3

Table 2.3 Winter Waterbird Survey summary data for the Potomac River system 2007-2010

Species	2007			2008			2009			2010		
	No.	R/A	D/F	No.	R/A	D/F	No.	R/A	D/F	No.	R/A	D/F
Horned Grebe	5	0.05	2	2	0.02	2	0	0.00	0	1	0.01	1
Pied-billed Grebe	2	0.02	2	20	0.15	5	21	0.16	4	25	0.23	9
Double-crested Cormorant	59	0.63	2	126	0.97	6	137	1.07	4	359	3.33	10
Black-crowned Night-heron	7	0.07	2	0	0.00	0	0	0.00	0	0	0.00	0
Great blue Heron	6	0.06	3	19	0.15	6	12	0.09	2	20	0.18	8
Canada Goose	2868	30.70	4	7187	55.27	6	6462	50.71	4	4151	38.59	9
Wood Duck	12	0.13	2	0	0.00	0	4	0.03	1	3	0.02	1
Mallard	381	4.08	4	1168	8.98	6	665	5.21	4	1328	12.34	10
American Black Duck	1	0.01	1	12	0.09	3	5	0.03	2	5	0.01	2
Northern Pintail	0	0.00	0	0	0.00	0	1	0.01	1	0	0.00	0
American Wigeon	0	0.00	0	0	0.00	0	4	0.03	2	2	0.01	1
Canvasback	0	0.00	0	0	0.00	0	0	0.00	0	1	0.01	1
Redhead	0	0.00	0	0	0.00	0	2	0.01	2	0	0.00	0
Ring-necked Duck	1	0.01	1	0	0.00	0	29	0.22	4	69	0.64	7
White-winged Scoter	0	0.00	0	0	0.00	0	1	0.01	1	0	0.00	0
Greater Scaup	0	0.00	0	0	0.00	0	0	0.00	0	1	0.01	1
Lesser Scaup	1685	18.04	4	500	3.84	6	508	3.98	3	822	7.64	5
Bufflehead	0	0.00	0	0	0.00	0	1	0.01	1	14	0.13	4
Common Merganser	16	0.17	2	5	0.04	2	17	0.13	4	21	0.19	4
Red-breasted Merganser	10	0.11	2	0	0.00	0	0	0.00	0	2	0.01	1
Hooded Merganser	7	0.07	2	21	0.16	4	1	0.01	1	3	0.02	2
Ruddy Duck	0	0.00	0	2	0.02	1	0	0.00	0	6	0.55	2
Osprey	1	0.01	1	0	0.00	0	0	0.00	0	0	0.00	0
Bald Eagle	1	0.01	1	7	0.05	2	2	0.01	2	3	0.02	3
Cooper's Hawk	0	0.00	0	0	0.00	0	0	0.00	0	1	0.01	1
Red-shouldered Hawk	0	0.00	0	2	0.02	2	0	0.00	0	2	0.01	2
Red-tailed Hawk	0	0.00	0	1	0.01	1	1	0.01	1	2	0.01	2
American Coot	16	0.17	3	22	0.17	6	15	0.11	4	16	0.14	6
Laughing Gull	0	0.00	0	0	0.00	0	0	0.00	0	1	0.01	1
Bonaparte's Gull	0	0.00	0	0	0.00	0	0	0.00	0	2	0.01	1
Ring-billed Gull	2609	27.93	4	3659	28.14	6	4249	33.34	4	3269	30.39	10
Herring Gull	1431	15.32	4	106	0.82	6	176	1.38	4	109	1.01	10

Lesser Black-backed Gull	0	0.00	0	0	0.00	0	0	0.00	0	4	0.03	2
Great Black-backed Gull	223	2.39	2	133	1.02	6	151	1.18	4	359	3.33	10
Belted Kingfisher	1	0.01	1	5	0.04	3	1	0.01	1	7	0.06	6
American Crow	0	0.00	0	0	0.00	0	0	0.00	0	11	0.10	4
Fish Crow	0	0.00	0	6	0.05	2	2	0.01	1	116	1.07	5
American Pipit	0	0.00	0	0	0.00	0	0	0.00	0	1	0.01	1
Red-winged Blackbird	0	0.00	0	0	0.00	0	0	0.00	0	18	0.16	2

Table 2.4 Winter Waterbird Survey – Data summary for Anacostia River and Potomac River systems from 2010.

Site	Location	Species Richness	Avian Abundance	#SGCN	Total #	Ave/Visit
Anacostia	River Mouth/Bolling AFB	12	4.7	0	1470	147
	Pumphouse	7	3.9	1	681	68.1
	Navy Yard	10	3.8	0	573	57.3
	Marinas	9	4.8	0	2198	219.8
	AREC	12	5.6	1	1431	143.1
	River Terrace	12	4.6	0	1373	137.3
	Langston South	10	3.3	1	2134	238.1
	Langston North	18	5.1	2	1356	169.6
	Kenilworth Aquatic Gardens	20	7.3	3	937	93.7
	Mean =	12.22	4.78	0.88	1350.33	141.55
	StanDev=	4.20	1.17	1.05	567.57	62.31
Potomac	T.R Channel	9	2.9	1	218	27.3
	VA side overlooks across from Fletcher's	8	2.5	0	131	13.1
	Chain Bridge	11	2.1	1	78	7.8
	Fletcher's Cove	9	2.3	2	125	12.5
	Georgetown Reservoir	9	2.6	0	857	85.7
	Ohio Drive/East Potomac Park	5	2.4	0	851	85.1
	Washington Channel	17	6.6	1	3906	390.6
	Tidal Basin	8	4.5	0	859	85.9
	Constitution Gardens	9	2.9	0	687	68.7
	Daingerfield Sail Marina	17	5.5	2	1082	108.2
	Alexandria Waterfront	11	4.0	1	1034	103.4
	Mean =	10.27	3.48	0.72	893.45	89.84
	StanDev=	3.69	1.48	0.78	1071.01	106.76

Job 3: Lower Kingman and Heritage Islands Survey

Abstract

Lower Kingman Island and Heritage Island were surveyed weekly for one year to inventory the number of bird species utilizing the islands' habitats. One hundred and eight species were recorded during the survey, including twelve Species of Greatest Conservation Need.

Introduction

Lower Kingman Island (LKI) and Heritage Island (HI) are both man-made islands in the Anacostia River. They were created from dredged materials from the Anacostia River, they were completed in 1916. After nearly a century of proposed land uses, legal challenges, and financial struggles, Mayor Anthony Williams proposed turning the islands into a formal wildlife refuge in 2005. The National Park Service and USGS islands enhanced the island, restoring marshlands on the western side of HI and eastern side of LKI.

The islands are largely undeveloped, with a network of footpaths and two bridges linking them to shore. Due to their unique creation, the islands are composed of native and invasive plant communities of varying levels of age and disturbance. This urban habitat provides a diversity of resources for resident birds that utilize the area year-round as well as species that make use of the islands on a seasonal basis.

As part of the Atlantic flyway, both islands are components of an important corridor for neotropical migratory birds. In addition, the river and its surrounding wetlands are important for wintering waterbirds, migratory shorebirds, and waterfowl species.

The DDOE began jointly monitoring birds with research staff of the Patuxent Wildlife Research Center (PWRC) on these islands in the summer of 2003. Although the PWRC terminated its involvement in the survey in 2004, the DDOE has continued the study to date.

Objectives

The purpose of this survey is to inventory and monitor the birds of LKI and HI, study seasonal changes in diversity and abundance, and document avian species richness and abundance during the construction of the wildlife refuge with educational classrooms and post-development to compare with pre-development data.

Location

The study area included LKI and HI, as well as Kingman Lake, the water channels between both islands and the shorelines, and their marshlands viewed from either the connecting bridges or island shorelines.

Construction began on both park entrances and the new outdoor classrooms in September of 2010. Several areas were cleared of trees and undergrowth, while trails were widened and heavy equipment was operated in many areas of the park. This is the first phase of enhancements to include outdoor classrooms and a new trail system. Boardwalks, butterfly gardens, education stations and a bird observation post will be included in later phases.

Methods

Bird Survey Procedures

Five- minutes bird counts were conducted on a weekly basis. The point counts were conducted at 14 pre-determined locations. Six points were located on LKI and six were on HI. The remaining two points were positioned on wooden bridges that spanned the eastern and western shores of HI to specifically document shorebirds and waterbirds. All birds seen or heard during the five-minute count were recorded.

Data Analyses

Summarized data provide estimates of species richness, detection frequency, and abundance. Each species sighted during counts was collated into a list that was used to compute the species richness for the two islands. Detection frequencies were calculated for each species by summing the number of days a given species was detected in a given season and dividing that figure by the total number of field days for that season. Relative abundance was calculated by summing all individuals of a given species recorded for a given season and dividing that figure by the total number of birds of all species observed during the same duration.

Results

A total of 108 species were seen at the Lower Kingman and Heritage Islands during the course of the study (see Table 3.1). This represents approximately 58% of the species reported to the Maryland Ornithological Society's "Annual Bird Sightings in the District of Columbia" compilation for the year 2006. Twelve of these are considered Species of Greatest Conservation Need in the DC Wildlife Action Plan (see Table 3.1).

Table 3. 1 Percent detection frequencies and relative abundance of bird species at Lower Kingman-Heritage Islands during four seasons of 2009-10.

The seasonal time periods have been delineated as follows:

Spring = March-May; Summer = June-August; Fall = September-November; Winter = December-February.

%DF = Detection Frequency %RA= Relative Abundance

(* = **SGCN** Species of Greatest Conservation Need)

Common Name	Spring %DF	Spring %RA	Summer %DF	Summer %RA	Fall %DF	Fall %RA	Winter %DF	Winter %RA
Cormorants								
Double-crested Cormorant	62	2.57	54	1.51	77	6.31	50	0.28
Hérons and Egrets								
Black-crowned Night-heron*	8	0.11	15	0.15	0	0	0	0
Green Heron	8	0.05	8	0.07	0	0	0	0
Great Egret	0	0	62	4.22	77	2.91	0	0
Great Blue Heron	46	0.97	85	3.11	100	1.24	90	1.18
Snowy Egret	0	0	8	0.07	8	0.03	0	0
Ducks and Geese								
Canada Goose	92	10.94	54	9.65	85	4.04	90	17.32
Wood Duck*	46	0.8	31	1.99	46	1.13	0	0
Mallard	92	7.85	92	4.86	92	4.11	80	6.67
American Black Duck*	0	0	0	0	0	0	10	0.09
Common Merganser	15	0.22	0	0	0	0	50	3.26
Hooded Merganser	23	0.63	0	0	0	0	50	0.94
Vultures								
Turkey Vulture	15	0.11	8	0.07	15	0.11	0	0
Hawks and Eagles								
Osprey	46	0.57	85	1.27	8	0.03	0	0
Northern Harrier	1	0.05	0	0	0	0	0	0
Bald Eagle*	46	0.4	23	0.31	31	0.15	0	0
Sharp-shinned Hawk	0	0	0	0	0	0	10	0.04
Cooper's Hawk	23	0.17	8	0.07	8	0.11	0	0
Red-shouldered Hawk*	31	0.28	15	0.15	46	0.22	50	0.33
Red-tailed Hawk	8	0.05	0	0	0	0	0	0
Plovers								
Killdeer	38	0.85	8	0.07	8	0.03	0	0
Sandpipers								
Solitary Sandpiper	8	0.05	23	0.23	0	0	0	0
Semipalmated Sandpiper	0	0	8	0.23	0	0	0	0
Gulls and Terns								
Laughing Gull	0	0	31	2.39	31	1.43	0	0
Ring-billed Gull	85	4.53	38	1.91	92	9.9	100	21.2
Herring Gull	23	0.45	0	0	0	0	30	0.28
Great Black-backed Gull	15	0.11	0	0	0	0	30	1.23
Common Tern	0	0	8	0.07	0	0	0	0
Caspian Tern	0	0	0	0	15	0.11	0	0
Doves								
Rock Dove	15	0.85	0	0	15	0.18	10	0.23
Mourning Dove	8	0.05	77	2.55	31	0.22	0	0
Cuckoos								
Yellow-billed Cuckoo	0	0	46	0.55	0	0	0	0

Swifts

Chimney Swift*	23	0.4	38	0.47	8	0.64	0	0
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Hummingbirds

Ruby-throated Hummingbird	0	0	23	0.23	0	0	0	0
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Kingfishers

Belted Kingfisher	23	0.17	23	0.23	54	0.3	60	0.33
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Woodpeckers

Red-bellied Woodpecker	31	0.28	15	0.31	23	0.11	70	0.52
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Northern Flicker	46	0.74	23	0.55	69	0.68	70	0.66
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Yellow-bellied Sapsucker	0	0	0	0	23	0.11	20	0.14
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Downy Woodpecker	54	0.74	62	1.27	85	1.05	100	1.41
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Hairy Woodpecker	46	0.57	15	0.15	23	0.11	60	0.37
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Flycatchers

Eastern Phoebe	46	0.4	8	0.07	15	0.18	0	0
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Alder Flycatcher	15	0.17	0	0	0	0	0	0
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Great Crested Flycatcher	8	0.17	0	0	0	0	0	0
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Eastern Kingbird	8	0.22	23	0.23	0	0	0	0
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Vireos

Blue-headed Vireo	0	0	0	0	8	0.03	0	0
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Red-eyed Vireo	31	0.57	54	1.27	8	0.22	0	0
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Yellow-throated vireo*	0	0	0	0	8	0.03	0	0
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Jays and Crows

Blue Jay	0	0	0	0	46	0.34	10	0.04
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American Crow	31	1.77	31	0.31	54	0.41	100	2.93
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Fish Crow	62	1.77	38	0.47	31	0.41	80	1.79
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Swallows

Tree Swallow	46	0.85	62	2.47	0	0	0	0
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Barn Swallow	23	0.51	23	0.47	0	0	0	0
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Chickadees and Titmice

Tufted Titmouse	0	0	8	0.15	0	0	0	0
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Carolina Chickadee	84	1.94	77	4.15	77	1.09	100	1.51
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Creepers

Brown Creeper*	0	0	0	0	8	0.03	0	0
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Wrens

House Wren	0	0	0	0	8	0.03	0	0
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Winter Wren	0	0	0	0	0	0	20	0.09
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Carolina Wren	100	1.89	85	1.83	92	1.81	100	2.98
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Kinglets

Golden-crowned Kinglet	8	0.05	0	0	8	0.11	10	0.04
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Ruby-crowned Kinglet	38	0.4	0	0	46	0.3	50	0.03
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Gnatcatchers

Blue-gray Gnatcatcher	54	1.71	92	2.63	8	0.11	0	0
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Thrushes

Eastern Bluebird	0	0	8	0.23	0	0	0	0
Swainson's Thrush	8	0.28	0	0	0	0	0	0
American Robin	69	2.8	77	13.24	85	21.88	40	3.12

Mockingbirds and Thrashers

Gray Catbird	38	1.26	54	2.15	77	1.54	40	0.33
Northern Mockingbird	15	0.11	31	0.55	8	0.11	0	0
Brown Thrasher*	23	0.22	0	0	0	0	0	0

Starlings

European Starling	46	2.8	54	7.5	31	8.57	20	6.19
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Waxwings

Cedar Waxwing	23	4.64	8	0.31	38	2.75	10	0.04
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Warblers

Cape May Warbler	8	0.05	0	0	0	0	0	0
Orange-crowned Warbler	0	0	0	0	8	0.03	0	0
Northern Parula	0	0	0	0	15	0.11	0	0
Magnolia Warbler	8	0.05	0	0	15	0.07	0	0
Yellow-rumped Warbler	15	1.31	0	0	46	1.77	0	0
Black-and-white Warbler	0	0	0	0	23	0.15	0	0
Black-throated Blue Warbler	0	0	0	0	8	0.03	0	0
Black-throated green Warbler	0	0	0	0	8	0.03	0	0
Wilson's Warbler	8	0.05	0	0	8	0.03	0	0
Common Yellowthroat	23	0.28	8	0.07	15	0.07	0	0
Prairie Warbler	0	0	0	0	8	0.03	0	0
Blackpoll Warbler	23	5.84	0	0	8	0.03	0	0
Pine warbler	0	0	0	0	8	0.03	0	0
Palm Warbler	15	0.11	0	0	23	0.15	0	0
Yellow Warbler	8	0.11	8	0.15	8	0.07	0	0
Canada Warbler	8	0.05	0	0	0	0	0	0
Ovenbird *	0	0	0	0	8	0.03	0	0
Louisiana Waterthrush*	23	0.17	0	0	15	0.07	0	0
Northern Waterthrush	8	0.11	0	0	0	0	0	0
American Redstart	15	0.17	0	0	15	0.37	0	0

Towhees

Eastern Towhee*	38	0.68	0	0	8	0.03	0	0
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Sparrows

Chipping Sparrow	23	0.17	0	0	8	0.03	0	0
Song Sparrow	69	1.31	31	0.55	69	0.86	90	1.37
Swamp Sparrow	23	0.34	0	0	0	0	10	0.4
White-throated Sparrow	84	7.56	0	0	69	8.04	100	17.84
Dark-eyed Junco	0	0	0	0	8	0.56	0	0

Cardinals, Grosbeaks and Buntings

Northern Cardinal	84	2.63	100	6.54	100	2.75	90	2.46
Blue Grosbeak	23	0.17	46	0.63	15	0.18	0	0
Indigo Bunting	15	0.28	85	1.99	8	0.15	0	0

Blackbirds and Orioles

Red-winged Blackbird	92	4.01	77	6.62	69	2.38	30	0.47
Common Grackle	46	5.27	92	3.83	15	0.34	0	0
Brown-headed Cowbird	8	0.17	0	0	0	0	0	0
Orchard Oriole	0	0	15	0.15	0	0	0	0
Baltimore Oriole	15	0.11	8	0.07	0	0	0	0

Finches

Purple Finch	0	0	0	0	8	0.11	0	0
House Finch	8	0.05	8	0.07	31	0.34	0	0
Pine Siskin	0	0	0	0	8	0.07	0	0
American Goldfinch	54	1.48	54	0.87	85	1.39	0	0

Old World Sparrows

House Sparrow	15	0.97	8	0.31	0	0	10	0.04
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Seasonal Dynamics

Spring

A total of 77 species were recorded during spring. This constitutes approximately 71 percent of species recorded over the annual cycle. Eight of these species are considered SGCN.

The ten most commonly observed species during the spring of 2010 are depicted in Table 3.2.

Table 3.2 Most frequently detected species over all spring season counts	
Species	% Relative Detection Frequency
Carolina Wren	100
Canada Goose	92
Mallard	92
Red-winged Blackbird	92
Ring-billed Gull	85
Carolina Chickadee	84
White-throated Sparrow	84
Northern Cardinal	84
Song Sparrow	69
American Robin	69

The ten most relatively abundant species recorded over the spring counts are shown in Table 3.3.

Table 3.3 Most abundant species over all spring season counts	
Species	% Relative Abundance
Canada Goose	10.94
Mallard	7.85
White-throated Sparrow	7.56
Blackpoll Warbler	5.84
Common Grackle	5.27
Cedar Waxwing	4.64
Ring-billed Gull	4.53
Red-winged Blackbird	4.01
Northern Cardinal	2.63
Double-crested Cormorant	2.57

Summer

A total of 59 species were recorded during summer. This constitutes approximately 55 percent of species recorded over the annual cycle. Five species are considered SGCN.

The twelve most commonly observed species during the summer are depicted in Table 3.4.

Table 3.4. Most frequently detected species over all summer season counts	
Species	% Relative Detection Frequency
Northern Cardinal	100
Blue-gray Gnatcatcher	92
Mallard	92
Common Grackle	92
Great Blue Heron	85
Osprey	85
Carolina Wren	85
Indigo Bunting	85
Carolina Chickadee	77
Red-winged Blackbird	77
Mourning Dove	77
American Robin	77

The ten most relatively abundant summer species summer are shown in Table 3.5.

Table 3.5 Most abundant species over all summer season counts	
Species	% Relative Abundance
American Robin	13.24
Canada Goose	9.65
European Starling	7.50
Red-winged Blackbird	6.62
Northern Cardinal	6.54
Mallard	4.86
Great Egret	4.22
Carolina Chickadee	4.15
Common Grackle	3.83
Great Blue Heron	3.11

Fall

A total of 75 species were recorded during the fall. This constitutes approximately 69 percent of species recorded over the annual cycle. Five species are considered SGCN.

The nine most regularly observed species during the fall are shown in Table 3.6.

Table 3.6 Most frequently detected species over all fall season counts	
Species	% Relative Detection Frequency
Great Blue Heron	100
Northern Cardinal	100
Mallard	92
Ring-billed Gull	92
Carolina Wren	92
American Robin	85
Canada Goose	85
Downy Woodpecker	85
American Goldfinch	85

The ten most abundant species recorded during fall counts are shown in Table 3.7.

Table 3.7 Most abundant species over all fall season counts	
Species	% Relative Abundance
American Robin	21.88
European Starling	8.57
White-throated Sparrow	8.04
Double-crested Cormorant	6.31
Mallard Duck	4.11
Canada Goose	4.04
Great Egret	2.91
Cedar Waxwing	2.75
Northern Cardinal	2.75
Red-winged Blackbird	2.38

Winter

A total of 37 species were recorded during the winter. This constitutes approximately 34 percent of species recorded over the annual cycle. Two species are considered SGCN.

The eleven most frequently detected species in the winter are depicted in Table 3.8.

Table 3.8 Most frequently detected species over all winter season counts	
Species	% Relative Detection Frequency
Ring-billed Gull	100
Downy Woodpecker	100
American Crow	100
Carolina Chickadee	100
White-throated Sparrow	100
Canada Goose	90
Great Blue Heron	90
Song Sparrow	90
Northern Cardinal	90
Fish Crow	80
Mallard	80

The ten most abundant species recorded during winter counts are shown in Table 3.9.

Table 3.9 Most abundant species over all winter season counts	
Species	% Relative Abundance
Ring-billed Gull	21.2
White-throated Sparrow	17.84
Canada Goose	17.32
Mallard	6.67
Common Merganser	3.26
American Robin	3.12
Carolina Wren	2.98
American Crow	2.93
Northern Cardinal	2.46
Fish Crow	1.79

Discussion

The continuing value of Lower Kingman and Heritage Islands is apparent through the high species richness and the number of avian SGCN (12 of 34) recorded during the survey. The results are impressive for an urban area of approximately 50 acres. The tidal mudflats, river, marsh, scrub, and forest habitats allow for a variety of uses such as a migration corridor, wintering ground, or breeding habitat, although the islands are surrounded by parking lots, high density housing, and highways.

Further monitoring is needed to assess the impacts of current construction projects and improvements to the islands.

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