

Spatial and Temporal Trends in Habitat Composition at WildResearch's Iona Island Bird
Observatory,
Iona Beach Regional Park, Richmond, BC
2014

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Iona Island Bird Observatory (IIBO) is a program under non-profit organization, WildResearch.



The Iona Island Bird Observatory is situated at Iona Regional Park. Use of the park is permitted by Metro Vancouver Regional Parks.



Funding for IIBO in 2014 was provided by the Sitka Foundation, BC Nature, and BC Naturalists' Foundation



Volunteer Scheduling Software for IIBO in 2014 was donated by WhenToHelp



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EXECUTIVE SUMMARY

Iona Island Bird Observatory (IIBO) was founded in the spring of 2010, and is one of WildResearch's core programs. This report provides the results of vegetation surveys at IIBO for 2014, as a continuation of the vegetation study initiated at IIBO by Bishop and Forrester (2012). The purpose of the study is to correlate changes in vegetation to bird population responses as measured through avian monitoring at IIBO.

Survey points were established at four of the fourteen mistnets at IIBO. At each survey point, vegetation was described within four different plots: one 5m and one 50m radius plot centered 5m from the mistnet on a randomly selected side, one 5m plot centered 25m away from the center points nearest the net, and a 50m plot centered 100m away from the center points nearest the net. Observers estimated the total percent cover by each plant species within each plot from an aerial view adding up to 100%. Inundated areas were excluded and plants covering less than 1% were not included.

Results indicate that since 2012, area covered by Himalayan Blackberry, the primary invasive species on the island has expanded.

1. INTRODUCTION

WildResearch's Iona Island Bird Observatory (IIBO) is located within Iona Beach Regional Park, north of the Vancouver International Airport in Greater Vancouver Regional District of Richmond, BC (Figure 1). Birdlife International and its local partners, Bird Studies Canada and BC Nature, have designated Iona Beach Regional Park as an Important Bird Area (IBA). This urban park is an isolated patch of riparian and meadow habitat that is surrounded by an expanding matrix of residential, commercial and industrial development, and been demonstrated in previous years to act as a stop-over for a variety of passerines. In addition to fitting the criteria for a suitable urban study site, its close proximity to an easily accessible public park also allows for ample opportunity for training and public outreach.

Since the start of avian monitoring at IIBO, volunteers have made anecdotal observations of changes to vegetation around the park and the bird banding station. In 2012, Bishop and Forrester initiated a study to monitor these changes in order to correlate them to avian population data collected at IIBO. The purpose of this report is to update the results and recommendations reported in 2012.

2. METHODS

Standard vegetation survey procedures were used. Two 5m radius plots and two 50m plots were surveyed as per Martin et al (1997). The IIBO mistnet lanes surveyed in 2014 were initially selected for and survey in 2012 (Bishop and Forrester 2012). Selection criterion was based on representation of different plant communities around IIBO, ranging from cottonwood forest and shrubs to riparian and marsh vegetation (Bishop and Forrester 2012). The center of the 5m plot at the Survey Point, was placed 5m from a randomly selected side of the mistnet, centered along the length of the net. This point was also used as the center the first 50m plot. Next, in a randomly selected cardinal direction, the second 5m plot was centered 25m from the center of the Survey Point. Finally, the second 50m plot was placed with its center 100m from the center of the first 50m plot. Both of the random direction plots were centered along the same line transect in the randomly chosen cardinal direction.

For each survey plot, observers estimated total cover of trees, shrubs, and grass/forbs adding up to a total of 100% cover in each plot (Martin et al. 1997) and considered to be non-overlapping. Inundated areas were not included in area assessed. Survey points were designated using GPS coordinates at each mistnet surveyed and photographs were taken in each cardinal direction. Survey methodology is summarized in Appendix 1.

RESULTS AND RECOMMENDATIONS

The banding station area in Iona Beach Regional Park covers a variety of habitats. Net 5 is beside marshland and riparian vegetation (Figure 1-4; Table 1), net 9 (Figure 5-8; Table 2) is at the edge of cottonwood forest, net 11 (Figure 9-12; Table 3) is in the cottonwood forest and net 17 (Figure 13-16; Table 4) is nested in shrubs between the marsh and the cottonwoods. The area contains invasive species including Himalayan Blackberry (*Rubus armeniacus*), Scotch broom (*Cytisus scoparius*) and Reed Canary Grass (*Phalaris arundinacea*).

Differences between 2012 to 2014 suggest that Himalayan Blackberry may have expanded throughout the IIBO. In 2012, the dominant species recorded at net 11 was blackberry as the major species (Bishop and Forrester 2012), but this was not the case in 2014; cottonwoods were estimated at 87% cover in 2014. However, the photos indicate that one side of net 11 is almost entirely blackberry and the other side is primarily cottonwoods. Because a random side of the mist net was selected for surveying, it is obvious from the photos that the side with blackberry was chosen in 2012 (Bishop and Forrester 2012) and the side with the cottonwoods was selected in 2014 (Figure 10-13). This accounts for the change in data rather than an actual change in vegetation composition of IIBO at net 11.

At net 5, the photos show little to no blackberry in 2012 (Bishop and Forrester 2012), yet both photos and data show that blackberry was one of the most prominent species in 2014 (20-30% cover in 5m and 50m plots; Figure 1-4). Therefore, this area of the park has likely seen the most change. The 2014 survey results show no reductions in blackberry in any survey locations since 2012, though there appears to have been an increase in blackberry near the march at the western edge of IIBO since 2012.

For the benefit of the various species that use the habitats on Iona Beach Regional Park, including many bird species during migration, most of whose populations are in decline, a large scale Blackberry removal project would be recommended. This would make a big difference to the survival of the indigenous habitats as the original species including, various species of willow, dogwood and roses are still present in the park.

ACKNOWLEDGMENTS

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We would also like to extend a big thanks the BCIT Conservation Biology class for conducting the 2014 vegetation surveys and Dr. Eric Anderson for class instruction and protocol development, and WildResearch volunteers that assisted with the vegetation

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surveys and welcomed BCIT to IIBO including Ian Thomas (WildResearch Bander-in-Charge), Virginia Noble (WildResearch Director) as photographer, Christine Rock (WildResearch President), visit facilitator, and Sarah Nathan (WildResearch Director) provided advice on survey methodology and plant identification. Sarah is also acknowledged for devoting her time towards editing this report. Additionally, we would like to thank Dr. Christine Bishop and Timothy Forrester, MSc. for initiating the vegetation survey program in 2012.

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REFERENCES

- Bishop, C.A. and T. Forrester. (2012). Spatial and temporal trends in habitat composition at the WildResearch Banding Station in Iona Beach Regional Park. *Unpublished Report*.
- Martin, T.E., C.R. Paine, C.J. Conway, W.M. Hochachka, P. Allen, and W. Jenkins. (1997). BBIRD Field Protocol. Montana Cooperative Wildlife Research Unit, University of Montana, Missoula, Montana, USA.

Site: Iona Observers: Comments: Cardinal direction east.
 Net #: 5 Date: Sept.23/2014 Photos Taken: NSEW

Radius (m)	Plot Type	UTM	Elevation	% Cover											Overall Total %	
				Species Name			% A1 (>Avg)	% A2 (Avg)	% A3 (<Avg)	Total A%	% B1 (2-10m)	% B2 (<2m)	Total B %	Total C %		
				Common	Genus	Species										
5m	At Survey Point	484 771 E 545 2042 N	N/A	Hardhack	Spiraea	douglasii						30	30		100	
				Himalayan Blackberry	Rubus	armeniacus					20		20			
				Willow	Salix						10		10			
				Paper Birch	Betula	papyrifera					5		5			
				Salmonberry	Rubus	spectabilis						1	1			
				Common Horsetail	Equisetum	arvense								1		
				Yellow Flag Iris	Iris	pseudacorus								5		
				Reed Canary Grass	Phalaris	arundinacea								5		
				Silverweed	Potentilla	anserina								1		
				Tule	Scirpus	lacustris								3		
				Purple Loosestrife	Lythrum	salicaria						5	5			
				Grass										14		
50m				Hardhack	Spiraea	douglasii							3	3		100
				Himalayan Blackberry	Rubus	armeniacus						28		28		
				Willow	Salix							4		4		
				Paper Birch	Betula	papyrifera						3		3		
				Salmonberry	Rubus	spectabilis						1		1		
				Common Horsetail	Equisetum	arvense						1		1		
				Reed Canary Grass	Phalaris	arundinacea									2	
				Silverweed	Potentilla	anserina									1	
				Tule	Scirpus	lacustris									10	
				Cattail	Typha	latifolia									5	
				Purple Loosestrife	Lythrum	salicaria									2	
				Black Cottonwood	Populus	balsamifera		5		5						
				Field Bindweed	Convolvulus	arvensis						1		1		
				Red Osier Dogwood	Cornus	stolonifera						2		2		
				Lady Fern	Athyrium	filix						1		1		
				Purple-leaved Willowherb	Epilobium	ciliatum						1		1		
				European Bittersweet								1		1		
Canada Thistle	Cirsium	arvense							1		1					
Scotch Broom	Cytisus	scoparius							3		3					
Nootka Rose	Rosa	nutkana							1		1					
Grass												25				
5m	In Random Direction			Himalayan Blackberry	Rubus	armeniacus						50	50		100	
				Black Cottonwood	Populus	balsamifera		30		30						
				Yellow Flag Iris	Iris	pseudacorus								20		
Scotch Broom				Cytisus	scoparius							4	4		100	
Reed Canary Grass				Phalaris	arundinacea									5		
Oregon Grape				Mahonia	nervosa							1	1			
Black Cottonwood				Populus	balsamifera		60		60							
Saskatoon				Amelanchier	alnifolia							1	1			
Shore Pine				Pinus	contorta						1		1			
Willow				Salix								2	2			
Fireweed				Epilobium	angustifolium							1	1			
Himalayan Blackberry				Rubus	armeniacus							25	25			

Table. 1

Site: Iona Observers: Comments: Cardinal direction north.
 Net #: 9 Date: Sept.23/2014 Photos Taken: NSEW

Radius (m)	Plot Type	UTM	Elevation	% Cover											Overall Total %	
				Species Name			% A1 (>Avg)	% A2 (Avg)	% A3 (<Avg)	Total A %	% B1 (2-10m)	% B2 (<2m)	Total B %	Total C %		
				Common	Genus	Species										
5m	At Survey Point	484 768 E 545 1901 N	N/A	Black Cottonwood	Populus	balsamifera		40		40					100	
				Red Osier Dogwood	Cornus	stolonifera					30		30			
				Black Hawthorn	Cratageus	douglasii					15		15			
				Himalayan Blackberry	Rubus	armeniacus						5	5			
				Reed Canary Grass	Phalaris	arundinaceae								3		
				Common Horsetail	Equisetum	arvense								4		
				Elderberry	Sambucus	racemosa								1		
				Arctic Rush	Juncus	acrticus								2		
50m				Black Cottonwood	Populus	balsamifera		10		10						100
				Red Osier Dogwood	Cornus	stolonifera					5		5			
				Black Hawthorn	Cratageus	douglasii					3		3			
				Oregon Grape	Mahonia	nervosa					1		1			
				Pacific Willow	Salix	lucida					1		1			
				Elderberry	Sambucus	racemosa					1		1			
				Fireweed	Epilobium	angustifolium								1		
				Himalayan Blackberry	Rubus	armeniacus					45		45			
				Purple-leaved Willowherb	Epilobium	ciliatum								1		
				Nightshade	Solanum	dulcamara								1		
				Lady Fern	Athyrium	filix								1		
				Alder	Alnus	rubra		1		1						
				Canada Thistle	Circium	arvense								1		
				Cleavers	Galium	aparine								1		
				Common Horsetail	Equisetum	arvense								1		
				Grass	Agrostis									5		
				Baldhip Rose	Rosa	gymnocarpa								1		
				Common Rush	Juncus	effusus								3		
				Mountain-ash	Sorbus	aucuparia								1		
				Scotch Broom	Cytisus	scoparius					10		10			
Reed Canary Grass	Phalaris	arundinaceae									4					
Dune Grass	Elymus	mollis									2					
5m	In Random Direction	484 774 E 545 1916 N		Himalayan Blackberry	Rubus	armeniacus					95		95		100	
					Elobium									1		
				Reed Canary Grass	Phalaris	arundinaceae								1		
				Nightshade	Solanum	dulcamara								1		
				Scotch Broom	Cytisus	scoparius					1		1			
				Arctic Rush	Juncus	acrticus								1		
50m				Scotch Broom	Cytisus	scoparius						7	7		100	
				Shore Pine	Pinus	contorta					1		1			
				Red Osier Dogwood	Cornus	stolonifera						4	4			
				Reed Canary Grass	Phalaris	arundinaceae								3		
				Cattail	Typha	latifolia						20	20			
				Nootka Rose	Rosa	nutkana						10	10			
				Exotic Rose	Rosa									15		
				Grass								20	20			
			Himalayan Blackberry	Rubus	armeniacus					20		20				
			Black Cottonwood	Populus	balsamifera											

Table. 2

Site: Iona Observers: Comments: Cardinal direction west, Random 50m mostly covered by water
 Net #: 11 Date: Sept.23/2014 Photos Taken: NSEW

Radius (m)	Plot Type	UTM	Elevation	% Cover											Overall Total %	
				Species Name			% A1 (>Avg)	% A2 (Avg)	% A3 (<Avg)	Total A%	% B1 (2-10m)	% B2 (<2m)	Total B %	Total C %		
				Common	Genus	Species										
5m	At Survey Point	484 833 E 545 1964 N	N/A	Black Cottonwood	Populus	balsamifera	5	82		87					100	
				Nightshade	Solanum	dulcamara								5		
				Red Elderberry	Sambucus	racemosa						1	1			
				Thistle	Circium	arvense								1		
				Reed Canary Grass	Phalaris	arundinacea								5		
50m				Black Cottonwood	Populus	balsamifera	6	50		56						100
				Nightshade	Solanum	dulcamara									1	
				Himalayan Blackberry	Rubus	armeniacus						20	20			
				Elderberry	Sambucus	racemosa					2	5	7			
				Red Osier Dogwood	Cornus	stolonifera						1	1			
				Purple Loosestrife	Lythrum	salicaria								5		
				Reed canary Grass	Phalaris	arundinacea								2		
				Paper Birch	Betula	papyrifera					1		1			
				Pacific Dogwood	Cornus	nuttallii					5		5			
				Black Hawthorn	Crataegus	douglasii					1		1			
5m	In Random Direction	484 809 E 545 1951 N		Unknown	N/A	N/A						1	1		100	
				Himalayan Blackberry	Rubus	armeniacus						10	10			
				Willow	Salix						5		5			
				Nightshade	Solanum	dulcamara								1		
				Alder	Alnus	rubra					5		5			
				Purple Loosestrife	Lythrum	salicaria								1		
				Black Cottonwood	Populus	balsamifera		89		89						
				Canada Thistle	Circium	arvense								1		
				Saskatoon	Amelanchier	alnifolia						1	1			
				Yellow Flag Iris	Iris	pseudacorus								1		
Reed Canary Grass				Phalaris	arundinacea								1			
50m				Willow	Salix						1		1		100	
				Red Osier Dogwood	Cornus	stolonifera					5		5			
				Reed Canary Grass	Phalaris	arundinacea								5		
				Himalayan Blackberry	Rubus	armeniacus					15		15			
				Grass spp.										1		
				Cattail	Typha	latifolia						72	72			
				Scotch Broom	Cytisus	scoparius					1		1			

Table. 3

Site: Iona Observers: Comments: Cardinal direction east, Survey Point 50m mostly covered by water.
 Net #: 17 Date: Sept.23/2014 Photos Taken: NSEW

Net #.	17	Date.	Sept.23/2014	Photos Taken.	N5E9W	% Cover									
Radius (m)	Plot Type	UTM	Elevation	Species Name			% A1 (>Avg)	% A2 (Avg)	% A3 (<Avg)	Total A%	% B1 (2-10m)	% B2 (<2m)	Total B %	Total C %	Overall Total %
				Common	Genus	Species									
5m	At Survey Point		N/A	Himalayan Blackberry	Rubus	armeniacus					90		90		100
				Nootka Rose	Rosa	nutkana						3	3		
				Black Twinberry	Lonicera	involucrata						2	2		
				Grass									2		
				Trailing Blackberry	Rubus	ursinus							1		
Red Elderberry				Sambucus	racemosa						2	2			
Himalayan Blackberry				Rubus	armeniacus					85		85			100
Tule				Scirpus	lacustris						2	2			
Nootka Rose				Rosa	nutkana						2	2			
Grass													3		
Red Elderberry				Sambucus	racemosa					2		2			
Willow				Salix						1		1			
Red Osier Dogwood				Cornus	stolonifera					1		1			
Black Hawthorn				Crataegus	douglasii					1		1			
Scotch Broom				Cytisus	scoparius						1	1			
Reed Canary Grass	Phalaris	arundinacea								1					
Exotic Rose	Rosa								1	1					
5m	In Random Direction	49.21897 E 123.20865 N	N/A	Himalayan Blackberry	Rubus	armeniacus					96		96		100
				Grass									1		
				Nootka Rose	Rosa	nutkana						1	1		
				Mountain-ash	Sorbus	aucuparia					2		2		
				Black Cottonwood	Populus	balsamifera		30		30					
Nightshade				Solanum	dulcamara						10	10		100	
Cattail										10		10			
Tule				Scirpus	lacustris						10	10			
Reed Canary Grass				Phalaris	arundinacea								10		
Himalayan Blackberry				Rubus	armeniacus						20		20		
Red Elderberry				Sambucus	racemosa						5		5		
Tall Oregon Grape				Mahonia	aquifolium							3	3		
Evergreen Blackberry				Rubus	laciniatus							2	2		

Table. 4



Figure.1 (Net 5, North)



Figure. 2 (Net 5, South)



Figure. 3 (Net 5, East)



Figure. 4 (Net 5, West)



Figure. 5 (Net 9, North)



Figure. 6 (Net 9, South)



Figure. 7 (Net 9 East)



Figure. 8 (Net 9, West)



Figure. 9 (Net 11, North)



Figure. 10 (Net 11, South)



Figure. 11 (Net 11, East)



Figure. 12 (Net 11, West)



Figure. 13 (Net 17, North)



Figure. 14 (Net 17, South)



Figure. 15 (Net 17, East)

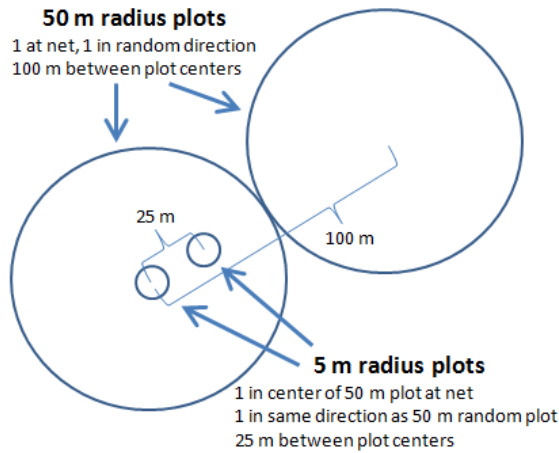


Figure. 16 (Net 17, West)

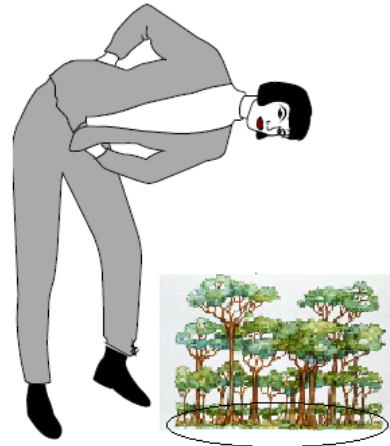
APPENDIX 1

Field Notes for Iona Island Bird Observatory Vegetation Survey

Plot layout at each net:



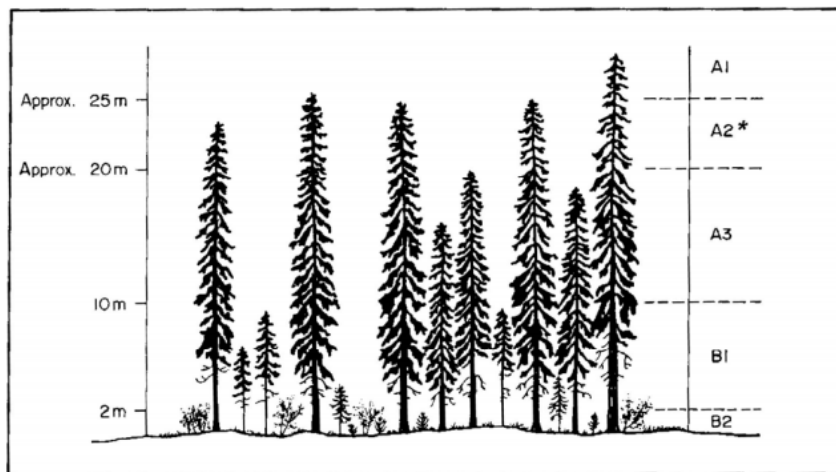
Overhead cover (adds to 100% in each plot):



Definitions of tree, shrub and herb layers:

The **tree layer** includes all woody plants greater than 10 m tall. Three sub-layers are recognized:

- A1 Dominant trees** - includes the dominant (tallest) trees of the main canopy, which may be veterans of one or more fires (previously classed as A0), or the tallest trees of the same age class as the main canopy; usually a minor portion of the stand composition.
- A2 Main tree canopy (codominant trees)** - the main layer of tree cover, composed of trees whose crowns form the upper layer of foliage; typically the major portion of the stand composition.
- A3 Sub-canopy trees** - includes trees greater than 10 m high that do not reach the main canopy; may form a distinct secondary canopy; often a mixture of trees of various heights younger than those in the main canopy or may be suppressed trees of the same age; includes "intermediate" and "overtopped" trees (terminology of MOF Resources Inventory Branch).



*some exceptions for very low growing stands

Figure 2. Example tree layers (A, tree layers; B, shrub layer).

The **shrub layer** includes all woody plants less than 10 m tall, except low (usually < 15 cm tall) woody or trailing plants which are considered part of the herb layer (see Table 3.1). Established tree regeneration more than two years of age and less than 10 m in height is considered part of the shrub layer. Two sub-layers are recognized:

- B1 Tall shrub layer** - includes all woody plants 2-10 m tall, including shrubs and advance tree regeneration and trees in poorly growing stands where the canopy is less than 10 m high.
- B2 Low shrub layer** - includes all woody plants less than 2 m high, except low (< 15 cm) woody or trailing plants (see Table 3.1); includes shrubs and established tree regeneration more than two years old and dwarfed or immature specimens of species normally considered in the shrub category (e.g., young *Vaccinium membranaceum*, or dwarf alpine forms of normally taller shrubs).

The **herb layer** includes all herbaceous species, regardless of height, and some low woody plants less than 15 cm tall (see Table 3.1).