



**Iona Island Bird Observatory
2010 Year-End Report**

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Introduction

Iona Island Bird Observatory (IIBO) was founded in the spring of 2010, and subsequently became a project of Pacific Northwest Conservation. Pacific Northwest Conservation is a non-profit organization that believes in identifying and developing objective scientific solutions to conservation issues through a multi-disciplinary approach using research, monitoring, training and public outreach.

IIBO conducted monitoring and research of birds that use Iona Island, located north of Vancouver International Airport in Richmond, BC. We are interested in the ecology of birds in urban parks, with focus on their abundance, diversity, survival, and stopover ecology.

This year IIBO carried out five pilot programs:

- 1) Spring Migration Monitoring and Training
- 2) Breeding Bird Monitoring
- 3) Fall Migration Monitoring
- 4) Northern Saw-whet Owl Monitoring
- 5) Monitoring Avian Winter Survival

This report summarizes the IIBO program activities in 2010.

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Spring Migration Monitoring and Training Summary

The spring of 2010 was focused on training volunteers to ensure that future programs would be able to operate smoothly. Limited banding also provided data on the chronology of spring migration, resident species and the commencement of breeding.

Initial setup began on April 7th and on April 9th the first morning of banding took place with five mist-nets. Training was conducted for twenty days, between April 9 and May 23. Protocols for spring banding were similar to those followed later on in the year, with mist-nets opening 30 minutes before sunrise and continuing for six hours, with net checks every 30 minutes. The number of nets was increased over the spring to a total of nine at the end of the season and 643.24 net hours were tallied.

During spring migration, a total of 604 birds of 33 species were banded and 68 birds were recaptured (Table 1). This yielded a surprisingly high capture rate of 1.04 birds/net hour, indicates that Iona Island is used by a significant number of birds during spring migration.

Table 1. Top five species banded in during the spring of 2010.

Species	No. Banded
Wilson's Warbler	125
Orange-crowned Warbler	66
Ruby-crowned Kinglet	47
Lincoln's Sparrow	43
Audubon's Warbler	43

Thirteen species were noted to have breeding characteristics (cloacal protuberance or brood patch) during the spring; however, some of these did not breed at Iona Island because they were not recorded later in the breeding season (Table 2). Black-capped Chickadees, American Robins, Song Sparrows and Spotted Towhees all had well-developed cloacal protuberances in mid-April and likely commenced nesting by the end of the month. Breeding characteristics were not detected in other species until mid-May.

Table 2. Species where breeding characteristics were detected during the spring.

Northern Rough-winged Swallow	American Robin	Common Yellowthroat	Red-winged Blackbird
Tree Swallow	European Starling	Fox Sparrow*	American Goldfinch
Marsh Wren	Yellow Warbler*	Song Sparrow	
Black-capped Chickadee	Wilson's Warbler*	Spotted Towhee	

*Migrant only.

Breeding Bird Monitoring Summary

With increasing urbanization and land development in Canada, management of protected areas within urban areas is increasingly important (Statistics Canada 2010). Knowledge of local songbird populations is useful for both local and regional managers to ensure the persistence and stability of

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these populations. Monitoring songbirds during the breeding season using a standardized banding protocol provides information on abundance, survival, productivity, and recruitment into these populations.

Iona Island is an isolated patch of riparian and meadow habitat surrounded by an expanding matrix of residential, commercial, and industrial development, potentially making it an important area for bird use. Our breeding bird monitoring program utilizes the Monitoring Avian Productivity and Survival (MAPS) protocols developed by the Institute for Bird Population for monitoring breeding birds.

The number of birds banded (n=254) during the breeding period was augmented by late spring migrants in early June and by young birds dispersing in late June through July. After the elimination of species believed to be migrants or dispersers (n=12), a total of 15 banded species were considered either probable or confirmed breeders (Table 3). Observations throughout the summer detected an additional 15 species that were probable or confirmed breeders (Table 4). Many breeding birds originally detected in the spring continued to be recaptured (n=79) through the summer. These birds, together with new adults banded during the breeding period, provide a baseline estimate of the breeding population around the station. The overall number of birds caught during the breeding period was much lower (0.45 birds/net hour) than during either spring or fall migration, and was reflected in the total catch effort.

Table 3. Species detected as probable or confirmed as breeding around IIBO using mist-netting.

Willow Flycatcher	American Robin	Song Sparrow
Tree Swallow	European Starling	Red-winged Blackbird
Northern Rough-winged Swallow	Cedar Waxwing	Brown-headed Cowbird
Black-capped Chickadee	Common Yellowthroat	House Finch
Marsh Wren	Spotted Towhee	American Goldfinch

Table 4. Species detected as probable or confirmed as breeding around IIBO through observation.

Canada Goose	Green-winged Teal	Common Nighthawk	Savannah Sparrow
Gadwall	Northern Pintail	Northwestern Crow	Yellow-headed Blackbird
Mallard	Virginia Rail	Purple Martin	Brewer's Blackbird
Northern Shoveler	Spotted Sandpiper	Barn Swallow	

Iona Beach Regional Park was used by a large number of dispersing hatch-year (HY) birds that were not found breeding in the park (Table 5). Many of these species likely bred in the areas surrounding IIBO, such as the east end of Iona Island, northern Sea Island, or Pacific Spirit Regional Park. IIBO detected an increasing number of HY birds relative to adult birds caught over the season (Figure 1). Areas of secondary growth and open shrubby areas, which typify much of the habitat found around the banding station, often attract birds following the breeding season. These areas are sought out for their dense cover to reduce the risk from predation (Vitz and Rodewald 2007). The dense shrubby vegetation

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surrounding the banding station may provide useful habitat for dispersing fledglings of species that don't breed within the park.

Table 5. Dispersing species detected at IIBO.

Downy Woodpecker	Bewick's Wren	Wilson's Warbler
Western Flycatcher	Swainson's Thrush	MacGillivray's Warbler
Warbling Vireo	Yellow-rumped Warbler	Black-headed Grosbeak

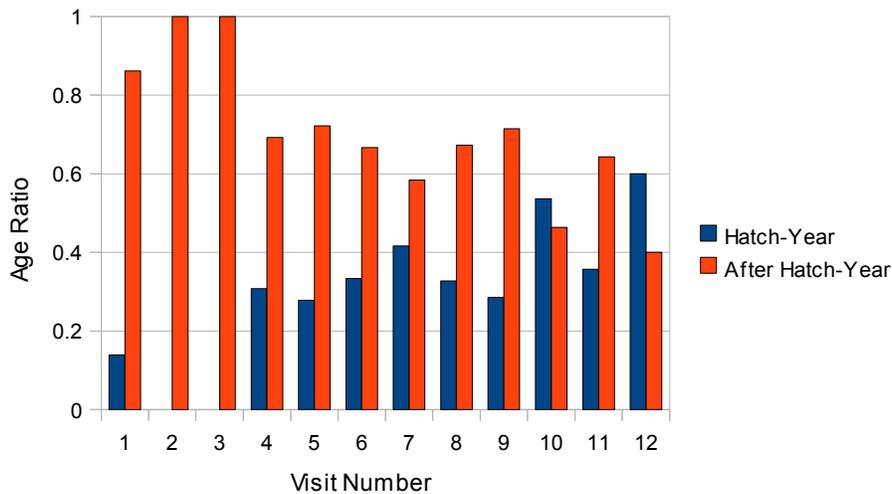


Figure 1. Ratio of HY and AHY birds caught at IIBO during breeding bird monitoring.

The wetlands on Iona Island are known as the sole breeding location for Yellow-headed Blackbirds in the Lower Mainland (Aitchison 2001). Observers recorded that Yellow-headed Blackbirds did not breed at Iona Island in 2009 and had left the island completely by late June. IIBO's breeding bird monitoring program provided an opportunity to observe the numbers of blackbirds present and to confirm if they bred. While at least five birds were present, only one nesting pair was found. The presence of two young in August indicated that this nest was likely successful. Most blackbird activity centred on the North Outer Pond, particularly on the north and west sides. However, on several occasions blackbirds were seen on the South Outer Pond, flying north across the Fraser River or east over the sewage plant, and foraging along the beach. Yellow-headed Blackbirds likely use these areas on a regular basis, and may also use the marshes on the north side of the Fraser River as well as areas along the east side of Iona Island. Searches of these other areas may yield additional nesting pairs.

Fall Migration Monitoring Summary

Many species of migratory birds are not adequately monitored on their breeding or wintering grounds. Migration monitoring offers an opportunity to generate population trends, and can provide information on productivity, migratory trends, and stopover length (Crewe et al. 2008). Stopover length, body condition, and age can also provide information regarding habitat quality for migrant birds (Yong et al. 1998, Crewe et al. 2008).

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IIBO monitored fall migrants from 11 August to 14 September 2010, covering most of the migratory period for neotropical migrants, and likely the overall peak of songbird migration. Banding took place on 31 days, providing data on demographics, stopover length and body condition. The number of birds using Iona Beach Regional Park during the fall migration was much higher than anticipated and resulted in 1728 birds banded, representing 47 species. The overall catch rate of 0.99 birds/net hour is among the highest in Canada.

The most frequently banded bird was Yellow Warbler (n=727), accounting for a surprising 42% of all birds banded (Table 6). This is much higher than all other migration monitoring stations in Canada, with the exception of the Delta Marsh Bird Observatory. Iona Island may be located on the principal migration route for Yellow Warblers in western BC, and this could provide valuable opportunities for future research into their migration and stopover ecology.

Table 6. Birds banded at IIBO during fall migration monitoring.

Species	No. Banded	Species	No. Banded
Yellow Warbler	727	Western Flycatcher	9
Orange-crowned Warbler	194	American Robin	7
Common Yellowthroat	184	Oregon Junco	6
Lincoln's Sparrow	87	Swainson's Thrush	6
Wilson's Warbler	62	Myrtle Warbler	5
Song Sparrow	53	Bewick's Wren	4
Warbling Vireo	39	Pacific Wren	4
Willow Flycatcher	36	Unknown Yellow-rumped Warbler	4
Puget Sound White-crowned Sparrow	31	Dusky Flycatcher	2
Audubon's Warbler	28	Hammond's Flycatcher	2
Spotted Towhee	27	Northern Rough-winged Swallow	2
Savannah Sparrow	25	Purple Finch	2
Cedar Waxwing	22	Townsend's Warbler	2
Fox Sparrow	21	White-crowned Sparrow	2
American Goldfinch	20	Western Tanager	2
Golden-crowned Kinglet	19	Brown-headed Cowbird	1
House Finch	19	Brown Creeper	1
Barn Swallow	15	Black-throated Gray Warbler	1
Golden-crowned Sparrow	13	Cooper's Hawk	1
Trail's Flycatcher	12	Downy Woodpecker	1
MacGillivray's Warbler	11	European Starling	1

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Marsh Wren	10	Red-eyed Vireo	1
Ruby-crowned Kinglet	10	Red-winged Blackbird	1
Black-capped Chickadee	9	Western Wood-Pewee	1
Bushtit	9		

An analysis of the ratio of HY birds to after hatch-year (AHY) for the top five species banded revealed a higher number of young caught than adults. In the fall it is expected that HY birds are caught at a higher rate than adults, usually at a ratio between 1:1 to 1:4 (Ralph 1971). Orange-crowned and Yellow Warblers had similar ratios to this, however the ratio for Wilson's Warbler, Common Yellowthroat and Lincoln's Sparrow was much higher. These species may be subject to the 'coastal effect', where a higher number of young (85-95%) are present at coastal sites than anywhere else along their migration route (Ralph 1981).

Recaptures (n=438) were predominantly comprised of three warbler species, Yellow (YWAR), Orange-crowned Warbler (OCWA) and Common Yellowthroat (COYE). The percentage of recaptures that were YWAR (38%) was similar to that of banded birds (42%). While an equal number of COYE and OCWA were banded (11%), more COYE than OCWA were recaptured (16% versus 6% of total recaptures). We hypothesize that YWAR and COYE found the habitat at Iona Beach Regional Park appeared more suitable for stopover than OCWA and remained for a longer period of time. Minimum stopover duration COYE remained for a significantly longer period of time than both YWAR and OCWA (10.12 days vs. 2.48, 3.52 days). Some birds that did stopover, often did so for extended periods of time, as 11 YWAR and 37 COYE remained for a week or longer. One Yellow Warbler captured during spring migration followed the same route in fall and was recaptured 88 days later!

Further examination of stopover data revealed that COYE were not able to add fat (-0.1) during their stopover. Yong et al. (1998) found that 'sink' or poorer quality habitats had a higher ratio of young birds, as well as a longer stopover durations, and slower rates of fat deposition. The habitat in Iona Beach Regional Park may appear to be appropriate for stopover, but may be acting as a sink for migrating COYE, as birds were primarily HY, stopovers were long, and birds were not able to put on fat over their stay. Increased stopover data will provide a better picture of the habitat quality present at Iona Beach Regional Park.

Both HY OCWA and YWAR stayed significantly longer than AHY birds (3.96 vs. 1.00 days, 2.58 vs 1.76 days). AHY OCWA were not able to gain fat between capture events (-0.25 fat) and HY OCWA gained little fat (+0.3 fat), whereas HY YWAR were able to gain slightly more fat (+1.05) than adults (+0.72). The low number of recaptures and lack of fat gain suggests that the site is of poor quality for OCWA. The opposite is likely true for YWAR, which stayed for, on average, a short period of time and were able to gain fat over their stay. Higher quality habitat may also explain why so many YWAR were captured at IIBO.

Northern Saw-whet Owl Monitoring Summary

Northern Saw-whet Owls are a migratory species of owl that breeds primarily across northern Canada and winters from southern Canada through the northern United States. Project OwlNet was created to

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improve knowledge of Northern Saw-whet Owl migration, and monitoring stations are now established across North America. The majority of the stations are located in central and eastern Canada and the United States, and only two are located in the Pacific Northwest. Increased monitoring of Northern Saw-whet Owl migration in the Pacific northwest would increase knowledge of long term population changes, demography and migration routes.

In fall 2010, IIBO initiated a pilot Northern Saw-whet Owl monitoring program. Surveying took place over a total of five days, October 5, 6, 10, 13 and November 16, for a total of 84.0 net hours. Only one saw-whet owl was caught on October 6, while two others were also detected that night. Previously there were only four records of saw-whet owl for Iona Island, so the total number of records was almost doubled. Despite this, the number of owls caught was considered extremely low compared to other stations such as Rocky Point Bird Observation near Victoria, which routinely bands 300-400 saw-whet owls in a fall. It is unlikely that saw-whet owl banding will take place in the future due to the low level of success this year.

Monitoring Avian Winter Survival Summary

Many species of migratory songbirds have undergone declines over the past three decades. In response to this several monitoring programs have been initiated to gain information regarding abundance, survivorship, productivity, and recruitment. One of these programs Monitoring Avian Winter Survivorship (MAWS) was initiated to monitor short-distance migrant songbirds that winter in the southern United States. Data from this program have been useful in pinpointing where declines have been caused by problems on the wintering ground. The MAWS program has been successful, however funding has been an issue, and only a couple of stations in California continue to participate. No programs currently operate in Canada that are able to monitor the composition and health of overwintering songbirds.

Southwestern BC provides wintering habitat for many species of short-distance migratory songbirds, due to its relatively mild winter climate. The mild climate also provides an opportunity to use passive mist-netting during the winter months and could allow for a network of stations to monitor overwintering songbirds. In the late fall of 2010 IIBO started a pilot project to determine whether or not the MAWS program could be used in southwestern BC to monitor overwintering songbirds.

Initial results are promising, but preliminary. Recapture rates indicate that migration had essentially ended by mid-November and most birds present were winter residents. A large portion of the songbird population at Iona Island had been banded by late November, which will provide data on diversity, abundance, survival, body condition, and spring departure dates. Habitat on Iona Island may represent a large component of the yearly habitat needs for wintering residents, as some arrived as early as late August. This program may also reveal information regarding site fidelity, as one Fox Sparrow that was banded in April returned by early November. Weather conditions have been problematic, however enough days have been available to conduct a winter monitoring program. Coverage throughout the winter will provide a better picture of the winter bird community at Iona Island and determine whether or not this program will be successful and duplicated elsewhere.

Volunteer Training and Visitor Education

Increasing public awareness and appreciation of wildlife and their habitat is critical in achieving

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support for conservation initiatives. Training of young biologists and naturalists is necessary for them to acquire the field skills needed for conservation work, both as professionals and as citizen scientists. The project provides high quality training opportunities for interested young biologists and naturalists. Owing to the close proximity of 2.5 million residents in the Greater Vancouver area, the project provides an excellent opportunity to educate the public through community outreach.

Volunteer interest in the station was higher than initially anticipated. A total of 58 volunteers helped at the station over the last year for a total of more than 1810 hours of volunteer effort. The majority of our volunteers are graduate and undergraduate students from the University of British Columbia and Simon Fraser University. Other volunteers came from the Canadian Wildlife Service, Bird Studies Canada, and citizens interested in birds and conservation.

An estimated 130 visitors to Iona Beach Regional Park were educated about our programs and avian conservation. A demonstration was also provided to a Metro Vancouver Parks school group, and was received with great reviews and requests for more demonstrations in the future.

Future Work

After a successful initial year, IIBO is planning on continuing with and expanding most programs in 2011.

Both our winter and breeding monitoring programs have been demonstrated to be successful. Continued work with these programs in 2011 will yield valuable data on year to year variation and will lay the groundwork for conducting trend analysis.

The fall migration monitoring was a resounding success, with a high capture rate, a significant number of Yellow Warblers banded, many volunteers hours contributed, and a large number of visitors educated about our programs and avian conservation. Continued migration monitoring will provide detailed data and confidence in the stopover ecology, migratory and population trends for a larger number of species, in addition to the species examined this year. Expanding our fall program to encompass more of fall migration will provide more data on bird usage of Iona Island. Although large numbers of sparrows winter on Iona Island and many more are suspected to pass through during migration, their usage of the park is unknown.

We will partner with Bird Studies Canada (BSC) to conducting Coastal Waterbird Surveys and Beached Bird Surveys. The Beached Bird Surveys will help to identify mortality of offshore waterbirds and provide an opportunity for training volunteers with waterbird identification.

Expanding our songbird migration monitoring to cover spring migration is a priority for IIBO in 2011. This program would complement our other programs by providing information on the composition and abundance of species that use Iona Island, their stopover ecology, and population trends. There are no spring migration monitoring programs currently in operation in BC and this program would provide information for a variety of species for which little information is known during spring migration. Incidental observations also recorded hundreds of Black Swifts moving through the park in late-May. This may provide an excellent opportunity to develop and implement programs to monitor Black Swift, a species that is not currently monitored in Canada.

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Several species that were banded both during spring and fall migration monitoring have well defined subspecies that can be identified with experience. We have chosen three species Fox Sparrow, Orange-crowned and Wilson's Warblers, as all are species suffering from long-term declines, for expanded documentation to determine what the subspecific composition of each of these is at Iona Island (Sauer et al. 2008). Data on subspecific composition, abundance and demographics could provide more detailed analysis on population trends for these species.

Initiating spring and extending fall migration monitoring will provide increased opportunities for volunteer training and involvement with the programs at IIBO. It is expected that over 110 volunteers will contribute over 3500 hours to IIBO programs in 2011. Volunteers who have been trained at IIBO will be able to use the skills they have developed to volunteer with our community groups and find employment both locally and abroad.

Increasing opportunities for visitor education will be pursued in 2011. Educating the public about birds and bird conservation is important for developing community support and engagement in conservation initiatives. Metro Parks and several community groups have already enquired into banding presentations for 2011. Advertising in the local community for banding presentations will allow for IIBO to engage with more visitors about our programs and bird conservation.

Overall IIBO has had a very successful year and it will now build upon these successes with continued and expanded programs. These will help provide information about the bird communities both on a local, regional and international scale, help further develop and provide training to devoted community of committed volunteers, and provide a venue to engage the public in conversations about birds and bird conservation.

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The Heligoland Bird Observatory (Vogelwarte Helgoland in German), one of the world's first ornithological observatories, is operated by the Ornithologische Arbeitsgemeinschaft Helgoland e.V., a non-profit organization which was founded in 1991 to support research on the fauna of Heligoland, a small German archipelago, comprising the islands of Heligoland and D  ne, in the Heligoland Bight of the North Sea. The principal research focus is on bird migration through banding studies. Over 400 species have Introduction Iona Island Bird Observatory (IIBO) was founded in the spring of 2010, and subsequently became a project of Pacific Northwest Conservation. Pacific Northwest Conservation is a non-profit organization that believes in identifying and developing objective scientific solutions to conservation issues through a multi-disciplinary approach using research, monitoring, training and public [Show full abstract] outreach. IIBO conducted monitoring and research of birds that use Iona Island, located north of Vancouver International Airport in Richmond, BC. We are interested in the ecology