



Iona Island Bird Observatory 2011 Year End Report

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Introduction

Iona Island Bird Observatory (IIBO) was founded in the spring of 2010, and is a project of WildResearch. WildResearch (formerly Pacific Northwest Conservation) is a registered 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 Beach Regional Park, located north of Vancouver International Airport in Richmond, BC. Monitoring activities are primarily focused around the woodlot and area between the two outer ponds (Figure 1). 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 three programs:

- 1) Winter Songbird Monitoring Program;
- 2) Spring Migration Monitoring Program;
- 3) Fall Migration Monitoring Program.

This report summarizes the IIBO program activities in 2011.

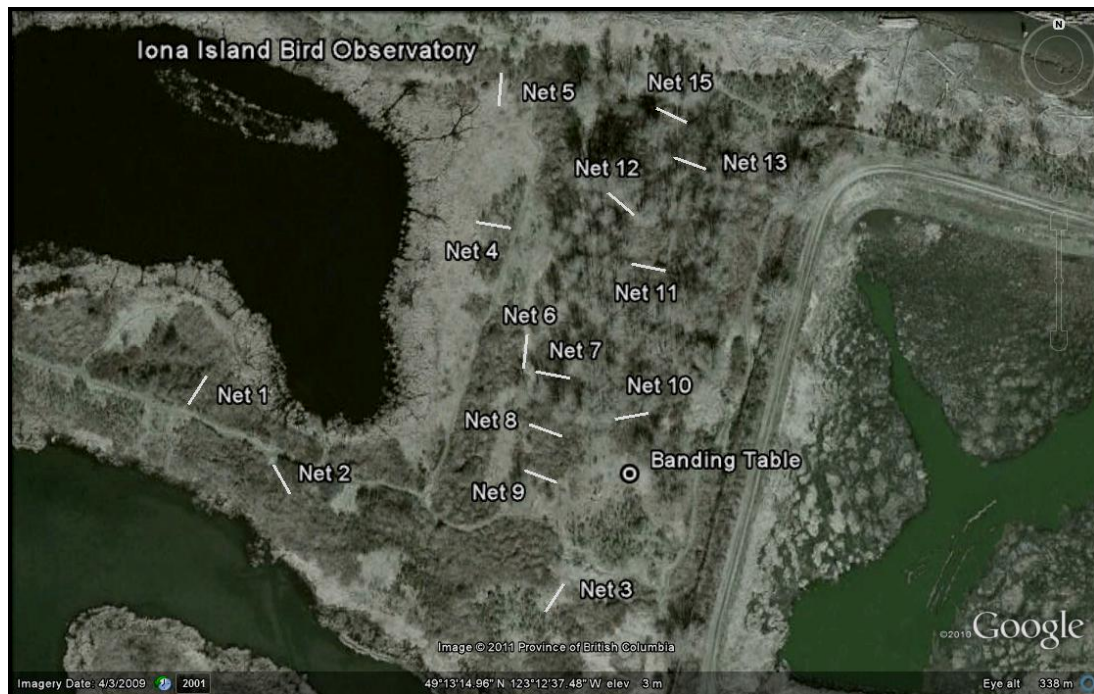


Figure 1. Map of the Iona Island Bird Observatory.

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Winter Songbird Monitoring Program

In the late fall of 2010 IIBO initiated a pilot Winter Songbird Monitoring program. It was modelled after the Monitoring Avian Winter Survival and MoSI programs run by the Institute for Bird Populations across the southern United States, Central America and the Caribbean (IBP 2011). These programs seek to provide a better understanding of the ecology of over-wintering songbirds, many of which are declining, by monitoring their body condition, site persistence, and survival rates (DeSante *et al.* 2009). This was the first time a winter monitoring program utilizing passive mist-netting was conducted in Canada.

Monitoring took place on 22 days between November 12, 2010 and March 17, 2011, and a cumulative 1396.81 mist-net hours were achieved. Rain was a frequent problem causing early closure on six of the 22 days. In addition, the higher than normal precipitation over the 2010/11 winter caused widespread flooding in the woodlot, resulting in some nets remaining closed due to high water levels. Despite the weather related issues, monthly and cumulative mist-netting hours indicate that the effort side of the program can be successfully implemented.

A moderate overall capture rate and a high recapture rates indicate that many songbirds over-winter at IIBO and the potential for success in monitoring winter residents. IIBO banded 279 birds and recaptured 357 birds of 25 species, with an overall capture rate of 0.47 birds/net hour, and a recapture rate of 0.26 birds/net hour (Appendix 1). Colour-banding Black-capped Chickadees, Spotted Towhees, Fox Sparrows, Song Sparrows, and Golden-crowned Sparrows was also utilized to increase detection rates through the re-sighting of those birds (Figure 2). The overall capture rate varied considerably between monitoring dates, but overall declined over the course of the winter. The number of new birds banded did increase in March when the first spring migrants arrived. The majority of birds captured were Fox Sparrows, although Song Sparrows and Spotted Towhees were also captured in large numbers (Table 1). House Finches captures were likely fall migrants, as all were banded in November, except one, and none were recaptured. Most of the chickadees captured were recaptures of the family groups that bred in the area during the summer of 2010. Small numbers of chickadees were banded over the winter, mostly immature birds that were likely dispersing from nearby areas.

Table 1. Top five species banded and recaptured during the Winter Songbird Monitoring Program.

Species	Individuals Banded	Species	Number of Recaptures
Fox Sparrow	80	Fox Sparrow	77
Song Sparrow	43	Song Sparrow	67
House Finch	32	Spotted Towhee	49
Spotted Towhee	31	Black-capped Chickadee	49
Ruby-crowned Kinglet	18	Golden-crowned Kinglet	39



Figure 2. A colour-banded Black-capped Chickadee.

Volunteers were crucial to the implementation of this program. Thirty three volunteers provided 459.5 hours of assistance with running the winter monitoring program. Many of the volunteers were new to bird banding and monitoring, and this program provided a valuable experience for learning about bird identification, banding, and monitoring techniques for species of conservation concern (Figure 3).



Figure 3. A volunteer with a Downy Woodpecker.

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Spring Migration Monitoring Program

IIBO initiated a pilot daily Spring Migration Monitoring Program (SMMP) in 2011 to investigate the potential for running a full season program in the future. The goals of the SMMP are to determine the abundance, diversity, and arrival dates of spring migrants, and departure dates for wintering birds.

Daily monitoring using banding, census and observations, took place between March 25th and April 14th. Inclement weather prevented banding on 5 of the 21 days, and it also resulted in many incomplete days of banding, with nets remaining open for all six hours on only six days. Despite the many days of inclement weather a total of 911.75 net hours were tallied over the SMMP. Twenty five volunteers provided 249 hours of assistance, ensuring the successful completion of the pilot spring monitoring program.

The majority (75%) of the 433 birds banded were of five species, and two species represented 50% of the 205 birds recaptured (Table 2). Despite this 26 species were captured, including one new species: Northwestern Crow (Figure 4). The daily capture rate varied considerably from 0.17 to 2.37 birds/net hour, with an average of 0.73 birds/net hour over the SMMP.



Figure 4. First Northwestern Crow captured.

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Table 2. Top five species banded and recaptured in during the spring monitoring program.

Species	Number Banded	Species	Number Recaptured
Violet-green Swallow	143	Fox Sparrow	56
Audubon's Warbler	68	Song Sparrow	56
Song Sparrow	60	Spotted Towhee	13
Red-winged Blackbird	50	Ruby-crowned Kinglet	13
Tree Swallow	24	Audubon's Warbler	12

One of the objectives of the pilot SMMP was to determine arrival dates of early migrants, which would lead to better scheduling of our spring program. The arrival dates of the top five species banded provide insight into the start of spring migration at IIBO. Overall, spring migration began in earnest on April 11th, when Audubon's Warblers arrived in numbers, followed by large numbers of Violet-green and Tree Swallows, and Red-winged Blackbirds over the next three days. An increase in the number of Song Sparrows banded indicated that they first arrived on March 31st.

Both Audubon's and Myrtle Warblers pass through the Vancouver area in the spring, however the number of Audubon's Warblers banded outnumbered Myrtle Warblers by a considerable margin (Campbell *et al.* 2001). Myrtle Warblers likely migrate later in April, potentially because of their more northerly breeding range. The Yellow-rumped Warblers that were banded in the winter remained to the end of the monitoring period, and were beginning their pre-alternate molt as migrant Audubon's Warblers arrived already in alternate plumage (Figure 5). Fox Sparrows also likely migrate later in April, as only a few were banded and several of the wintering birds were recaptured up until the last day of monitoring.



Figure 5. Banding an Audubon's Warbler.

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Two Northern Saw-whet Owls were also captured, potentially indicating that they migrate through the area in late March/early April. IIBO ran a pilot program in the fall of 2010 targeting saw-whet owls and only captured one, indicating that they don't migrate along the coast through Vancouver in the fall (PNC 2010). Capturing two without using an audio-lure may indicate a spring movement following coastal route through the Vancouver area.

The majority of the 12 Rufous Hummingbirds captured were in net one. These birds were likely attracted by a blooming salmonberry bush that had recovered following the removal of the Himalayan Blackberry (*Rubus discolor*) surrounding the net lane.

Fall Migration Monitoring Program

Fall migration monitoring in 2011 consisted of banding up to four days a week, weather permitting. The program ran from late August through mid-November, an extension of eight weeks compared to 2010 pilot season. Extending the season later into the fall provided data on late season migrants, which did not receive any coverage in 2010. While data is not directly comparable to 2010 due to the change in methodology, the data did provide insight into some changes in the abundance and timing of migration for some species.

Banding took place on 30 days, with a total of 2065.33 net hours. Late August through mid-September temperatures were above average and conditions were fairly dry resulting in few cancelations. Monitoring in October and November proved more difficult, due to weather problems from rain and wind. Monitoring was successful when weather allowed banding, as a minimum of 5:00 hours of banding was achieved on 25 of the 30 days of monitoring. Forty-four volunteers also ensured the success of the fall program by providing 1048 hours of assistance.

A total of 1393 birds were banded and 442 birds were recaptured of 41 species, with an overall catch rate was 0.87 birds/net hour. The overall number of birds captured was 15% lower this year compared to 2010, however, when the number of days spent monitoring is taken into consideration, it was only 6% lower. One of the most striking differences this fall compared to 2010 was the lack of migration occurring until October (Figure 6). In 2010 the first day with over 100 captures was August 20th, and an additional eight 100+ capture days occurred before the end of the season on September 14th. In 2011 the first 100+ capture day did not occur until October 2nd, however, following this migration picked up significantly. Of the following 16 days of monitoring, 13 had capture rates of 0.98 birds/net hour, and half resulted in over 100 captures.

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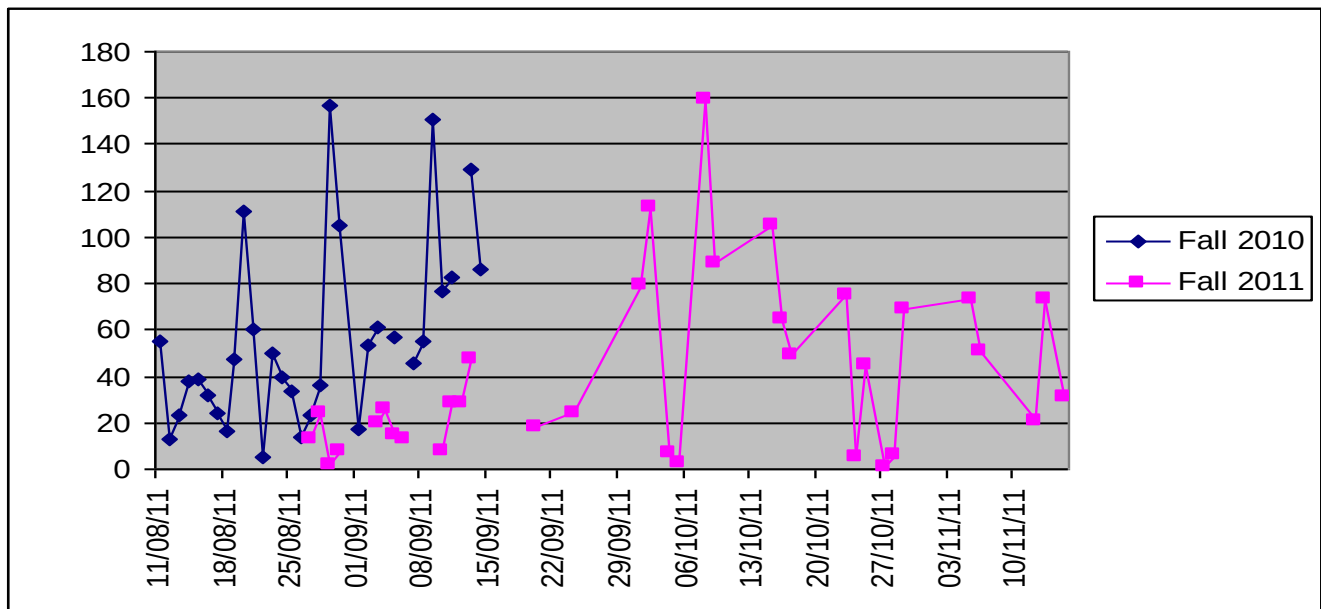


Figure 6. Number of birds banded per day during fall monitoring in 2010 and 2011.

Two additional species were also captured this fall that were new for the station: Anna's Hummingbird and White-throated Sparrow (Figure 7).



Figure 7. Anna's Hummingbird and White-throated Sparrow.

The most frequently banded bird was Fox Sparrow (353), accounting for 25% of all birds banded this fall (Table 3), and it is the highest number banded for a station in North America (Figure 8). Fox Sparrows appeared to prefer the dense blackberry scrub at IIBO, with the majority (60%) captured in nets 1-3. Many of these birds are likely winter residents as a number of these birds were recaptured later in the season, and several birds that were banded in the previous fall/winter were also recaptured.

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Figure 8. 'Sooty' Fox Sparrow.

Table 3. Birds banded at IIBO during Fall Migration Monitoring.

Species	Number Banded	Species	Number Recaptured
Fox Sparrow	353	Fox Sparrow	192
Song Sparrow	161	Black-capped Chickadee	54
Yellow Warbler	130	Song Sparrow	36
House Finch	128	Golden-crowned Kinglet	32
Lincoln's Sparrow	67	Spotted Towhee	29

The number of Yellow Warblers banded this fall (130) was considerably lower than last fall (727). The lack of daily coverage early in the season during the normal peak of Yellow Warbler migration would have resulted in a lower number banded. It is also likely that the overall low number of birds banded in September reflected other factors, such as a poor breeding season, with fewer young produced, and/or ideal conditions for migration resulting in fewer birds stopping over. The percentage of hatch-year (HY) birds relative to after hatch-year birds (AHY) can provide an index of the productivity of the breeding season. In 2011 there was a lower percentage of hatch-year Yellow Warblers (68%) compared to 2010 (82%), which may indicate that 2011 was a year of poor productivity.

The percentage of HY banded for the other top four species banded were compared to their numbers in 2010 (Table 4). A lower percentage of HY Song Sparrows and House Finches were banded in 2011 than 2010, whereas a higher percentage of HY Fox Sparrows and approximately the same percentage of HY Lincoln Sparrows were banded in 2011. It is interesting to note that Yellow Warblers, Song Sparrows, and House Finches all nest at lower elevations, whereas Fox and Lincoln's Sparrows are

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both nest at higher elevations. Cool, wet early summer conditions may have affected lower elevation nesting species, whereas those that nest at higher elevations, which typically do so later, when conditions may have improved, as was noted in the northern Cascades (Environment Canada 2012, Froehlich and Norman 2011).

Table 4. Percentages of HY and AHY for the top five banded birds in 2011 compared to 2010.

Species	2010		2011	
	Hatch-year	After Hatch-year	Hatch-year	After Hatch-year
Fox Sparrow	70.5	29.5	84.5	15.5
Song Sparrow	94.7	5.3	80.8	14.2
Yellow Warbler	82.4	17.6	67.9	32.1
House Finch	50	44	44.5	36.7
Lincoln's Sparrow	88.6	11.4	86.6	8.6

Catch rates per net were not equally distributed across all nets (Table 5). Nets (1-5) in the blackberry scrub around the ponds had the highest catch rates, principally Yellow Warblers, sparrows, and House Finches. Nets in the woodlot caught fewer birds, but catch rates again were not evenly distributed; nets in the south end of the woodlot (6, 7, and 11) caught fewer birds than those in the north end (12, 13, and 15). Several additional species were caught disproportionately across the banding area, with more Bushtits in nets 4 and 5, Pacific Wrens in nets 8, 9, and 10, and Hermit Thrushes in nets 12, 13, and 15.

Table 5. Catch rates (birds/net hour) per net for the Fall Migration Monitoring Program.

Net	Catch Rate	Net	Catch Rate	Net	Catch Rate
1	1.56	6	0.21	11	0.24
2	2.02	7	0.25	12	0.43
3	2.10	8	0.61	13	0.41
4	2.27	9	0.92	15	0.38
5	1.35	10	0.48		

An analysis of fat scores of the top five banded birds found that nearly 50% of Lincoln's and Song Sparrows had no fat when initially captured, whereas only 30% of Yellow Warblers and Fox Sparrows had no fat (Figure 9). In addition, nearly 50% of Yellow Warblers banded had more than a trace amount of fat, whereas for the remaining four species 31-37% had more than a trace amount of fat.

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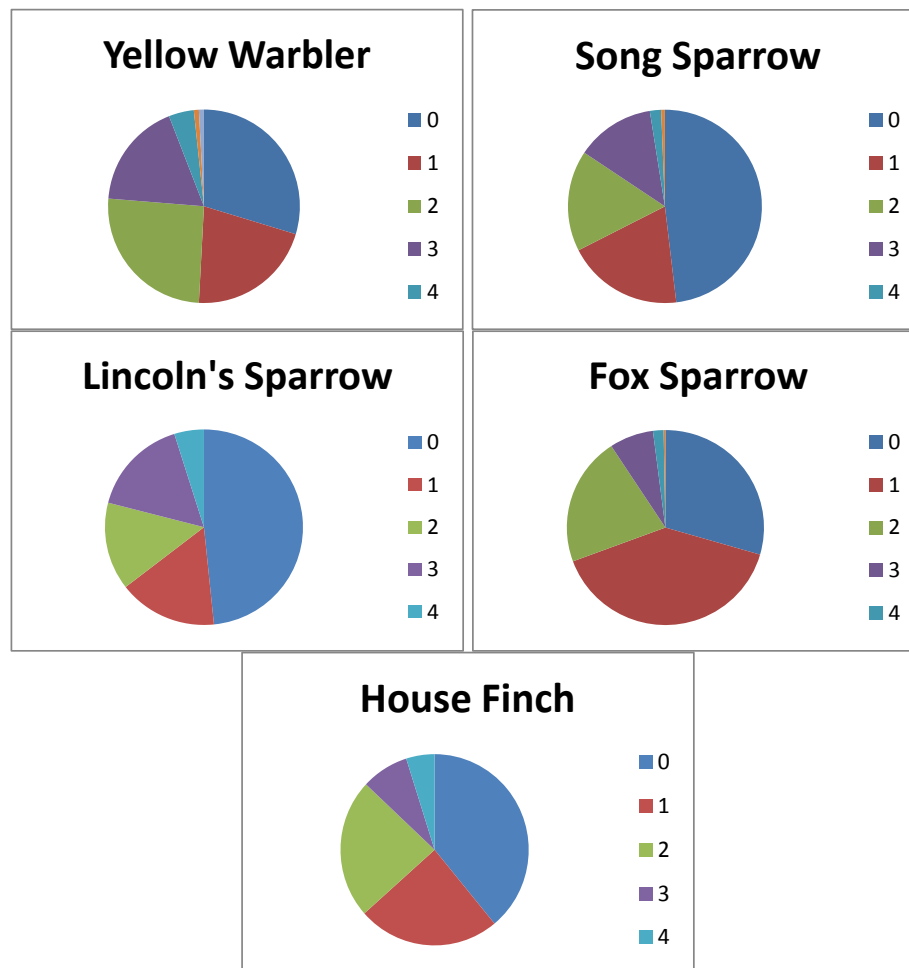


Figure 9. Fat scores for the top five banded birds.

A number of birds banded in 2010 were recaptured this past fall, including both permanent residents and winter residents (Table 6). One House Finch recaptured that had been banded the previous fall, was difficult to place in either category as small numbers of House Finches are present year-round at IIBO, however, more can be found as winter residents. The most interesting 'recapture' this fall was a House Finch that was found dead in early December near Oak St and 13th Ave in Vancouver. This bird was originally banded on November 6th, and had travelled over 7 km.

Table 6. Recaptures of birds banded in 2010.

Permanent Resident	Number Recaptured	Winter Resident	Number Recaptured
Black-capped Chickadee	3	Ruby-crowned Kinglet	2
Song Sparrow	3	Pacific Wren	3
Spotted Towhee	6	Golden-crowned Sparrow	1
		Fox Sparrow	13

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Acknowledgements

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Appendix 1. Tallies of birds banded during the Winter Songbird Monitoring, Spring Migration Monitoring and Fall Migration Monitoring Program.

Species	Winter Banded	Spring Banded	Fall Banded	Winter Recaptured	Spring Recaptured	Fall Recaptured	Total
Sharp-shinned Hawk	1						1
Cooper's Hawk			1				1
Wilson's Snipe	1	1					2
Northern Saw-whet Owl		2					2
Downy Woodpecker		1	2	1	2	1	7
Red-shafted Flicker	2			1			3
Trail's Flycatcher			6			1	7
Willow Flycatcher			10			2	12
Western Flycatcher			1				1
Hammond's Flycatcher			2				2
Northern Shrike	2	1					3
Warbling Vireo			10			3	13
Tree Swallow		24					24
Violet-green Swallow		143			1		144
Northern Rough-winged Swallow		3					3
Barn Swallow		1	2				3
Black-capped Chickadee	9	4	18	49	10	54	144
Red-breasted Nuthatch			1				1
Brown Creeper			1				1
Bewick's Wren	1		4	10		6	21
Pacific Wren	7	1	46	6	1	12	73
Marsh Wren	7	8	6		8	3	32
Golden-crowned Kinglet	10	3	48	39		32	132
Ruby-crowned Kinglet	18	10	59	35	13	16	151
Bushtit	7		35	6		10	58
Swainson's Thrush			1				1
Hermit Thrush	1		34			18	53
American Robin	6	5	2	5	4		22
Varied Thrush	6		3	4			13
European Starling	2						2
Orange-crowned Warbler		5	61		1	6	73
MacGillivray's Warbler			3				3
Common Yellowthroat		2	24			2	28
Yellow Warbler			161			8	169
Unknown Yellow-rumped Warbler		5	1		1		7
Audubon's Warbler	2	68	16		12		98
Myrtle Warbler	3	4		2	2		11
Black-throated Gray Warbler							0
Wilson's Warbler			15			1	16
Spotted Towhee	6	2	42	49	13	29	141
Savannah Sparrow			13				13
Fox Sparrow	80	11	353	77	56	192	769
Song Sparrow	43	60	130	67	56	36	392

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Lincoln's Sparrow		11	67	2	7	4	91
White-throated Sparrow			2			1	3
White-crowned Sparrow			11				11
Puget Sound White-crowned Sparrow			3				3
Golden-crowned Sparrow	7	1	44	4	7	3	66
Oregon Junco		5	14			1	20
Red-winged Blackbird	1	50			2		53
Purple Finch			2				2
House Finch	32	1	128			1	162
American Goldfinch		11	11		1		23
Totals	254	443	1393	357	197	442	3086