CALGARY BIRD BANDING SOCIETY

1995 ANNUAL TECHNICAL REPORT

Prepared
by

Doug Collister
Grahame Booth
Greg Meyer
Brian Couronne

Published by

Calgary Bird Banding Society
247 Parkside Cr. SE
Calgary, AB T2J 4J3

January 1996

Frontispiece - Some of the 1995 new bandings at Inglewood Bird Sanctuary. Clockwise from top: Bay-breasted Warbler, Ovenbird, Common Yellowthroat, Palm Warbler. All photos by Peter Roxburgh except Bay-breasted Warbler by Pat Mitchell.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

EXECUTIVE SUMMARY

The Calgary Bird Banding Society (CBBS) was incorporated in March 1995 to conduct migration monitoring and other banding-based studies at Inglewood Bird Sanctuary (IBS).

Neotropical migrant birds are at risk due to resource exploitation both on their wintering and breeding grounds. IBS, a federal reserve, has long been known as an important migration site for Neotropical migrants. Located within 80 km of the Rocky Mountains, IBS is a necessary component of any national migration monitoring network.

After pilot migration monitoring in 1992 and 1994, a full fall program was implemented in 1995. Ten mist-nets were operated for a minimum of 6 hours per day on 54 of the 61 days between 1 August and 30 September. A total of 3,456 net-hours resulted in 1,549 new bandings of 61 species. Ninety percent or 1,389 were Neotropical migrants. Almost half the new bandings occurred in the last half of September. A Western Flycatcher was a new species for IBS and a rare Bay-breasted Warbler, on 30 September, was very late.

Recaptures totalled 302 involving at least 230 different birds of 33 species. Several birds, originally banded as early as 1992, were re-encountered.

Banding data was integrated with census data and incidental observations to generate estimated daily totals for all species on most days that migration monitoring occurred. A total of 121 species were detected with the highest daily species count being 48 on 7 September.

The MAPS site was operated again in 1995, building on previous data gathered in 1992 and 1994. A total of 107 birds were captured, of which 73 were new bandings.

Volunteers and Banders-in-Charge donated a total of 173 man-days to the banding projects (i.e. MAPS and migration monitoring). Three Banders-in-Charge were imported from outside Calgary to ensure maximum coverage during migration monitoring.

Eleven mortalities were sustained during the mist-netting of 2,085 birds, 3 of which were predations, at least 2 by a Long-tailed Weasel. Seventeen injuries were recorded, most minor (wing abrasions etc.).

IBS is a relatively low cost site and its operating budget could likely be provided from Baillie Birdathon proceeds if IBS became a designated monitoring site. Other evolving IBS projects include FLAP and Northern Saw-whet Owl monitoring.

INTRODUCTION

The Calgary Bird Banding Society (CBBS) was incorporated on 22 March 1995 with the following objectives:

- Quantify long-term population trends of Neotropical migratory birds using constant effort mist-netting at Inglewood Bird Sanctuary;
- Promote expertise and involvement in bird banding;
- Promote conservation of Neotropical migratory birds through fostering public awareness and understanding of Neotropical migratory birds; and
- To provide for the recreation of the members and to promote and afford opportunity for friendly and social activities.

Membership in CBBS is open to anyone interested in bird banding. Although the primary project of the CBBS is monitoring of migratory birds at Inglewood Bird Sanctuary (IBS) in Calgary, other complimentary projects have been undertaken as well.

- A Monitoring Avian Productivity and Survival station was established at IBS in 1992 and was continued in 1995.
- A member of the CBBS is an office building manager in downtown Calgary and has initiated a program to monitor birds that strike office buildings, modeled after the successful FLAPS program in Toronto.

Additional project ideas are currently in the formulation stage and will undoubtedly emerge in the next few years.

MIGRATION MONITORING

Background

Neotropical migrant birds are those species that breed in the Nearctic biogeographic realm and winter in the Neotropics. The Neotropical migratory bird system involves perhaps 5-10 billion birds of over 150 species (Greenberg 1992). Recent (1978-1988) trends in data from the Breeding Bird Survey indicate that a majority of Neotropical migrants in eastern North America decreased in their population index (Sauer & Droege 1992). Although destruction of tropical forests on the wintering grounds has been implicated in this decline, increasing concern is being raised over the potential effect of accelerating land-use changes on the breeding grounds as well.

Inglewood Bird Sanctuary (IBS) is a federal reserve long known as an important site for migrating passerines. IBS is strategically located within 80 km of the Rocky Mountains (Fig. 1) and will be a unique and valuable addition to the Canadian Migration Monitoring Network currently being encouraged by CWS and Long Point Bird Observatory. Because IBS is located within Calgary the potential for using volunteers will not be diminished due to remoteness. Pilot Neotropical migrant monitoring covering only a portion of the fall migration season was undertaken in both 1992 (842 birds of 52 species in 934 1.5" net hours) and 1994 (468 birds of 48 species in 1076 1.5" net hours).

Methods and Study Site

The fall migration of Neotropical migrants was monitored at Inglewood Bird Sanctuary, 35 acres of mature riverine balsam poplar forest, long known for its impressive fall migration of passerines. Constant effort mist-netting (i.e. constant number of nets in permanent locations for constant time period each day) and collection of associated morphometric and other data (age, sex, wing chord, weight, capture net, time of capture, fat reserves etc.) from each bird captured was carried out each day, weather permitting, during fall migration from 1 August through 30 September. Ten 12-m 1¼" mist-nets were operated in permanent net lanes for a minimum of 6 hours each day beginning at sunrise.

Spring migration was not monitored due to concerns of the Area Manager regarding potential adverse environmental impact. Spring conditions at the site are wetter than during fall. Nevertheless there is potential to expand the migration monitoring program to cover spring in subsequent years.

Migration monitoring procedures were developed for the IBS study site based on those standardized and outlined in *A manual for monitoring bird migration*

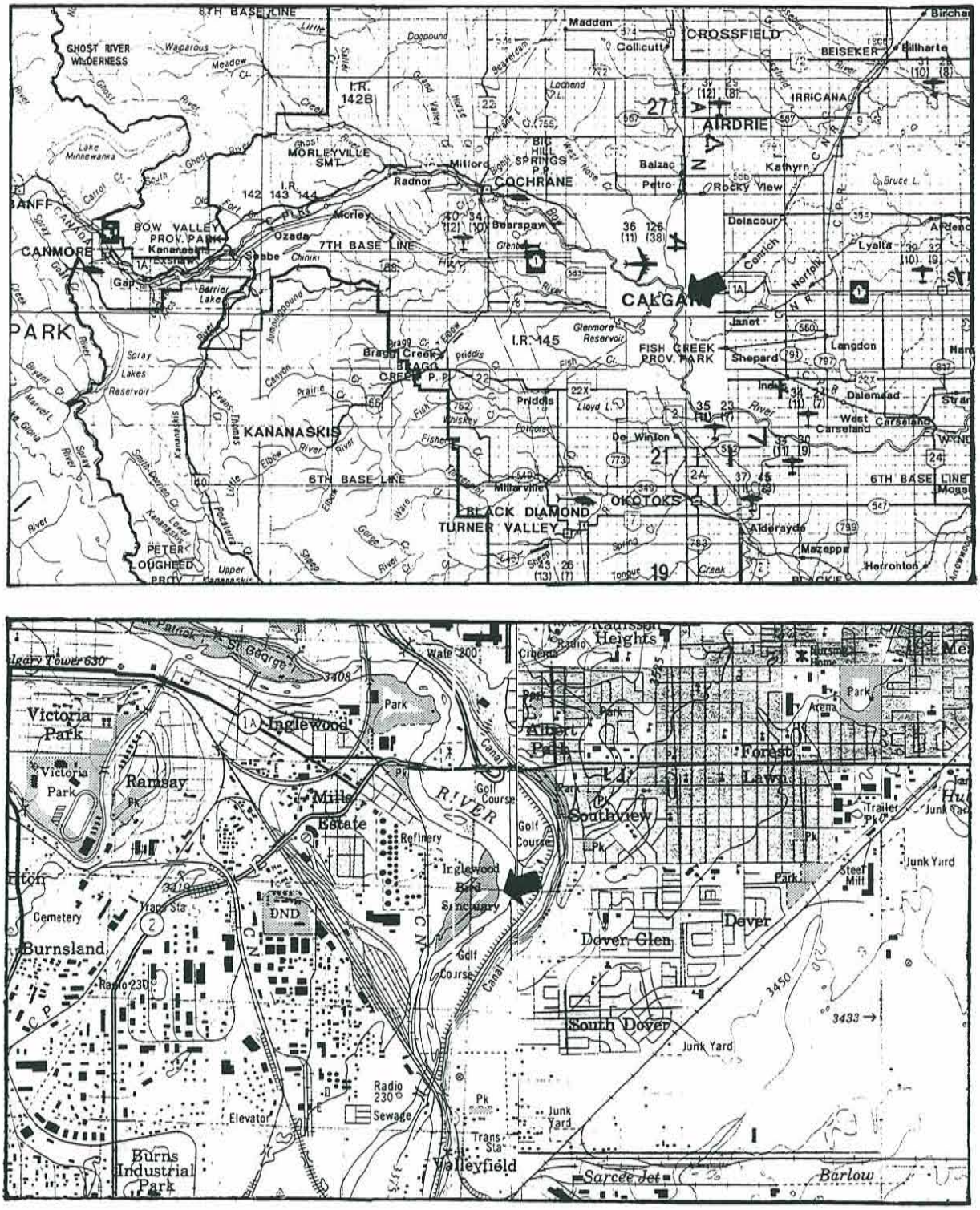

Figure 1. Topographic maps at 1:250,000 (top) and 1:50,000 (bottom) scales showing location of Inglewood Bird Sanctuary in southwestern Alberta. North is up.

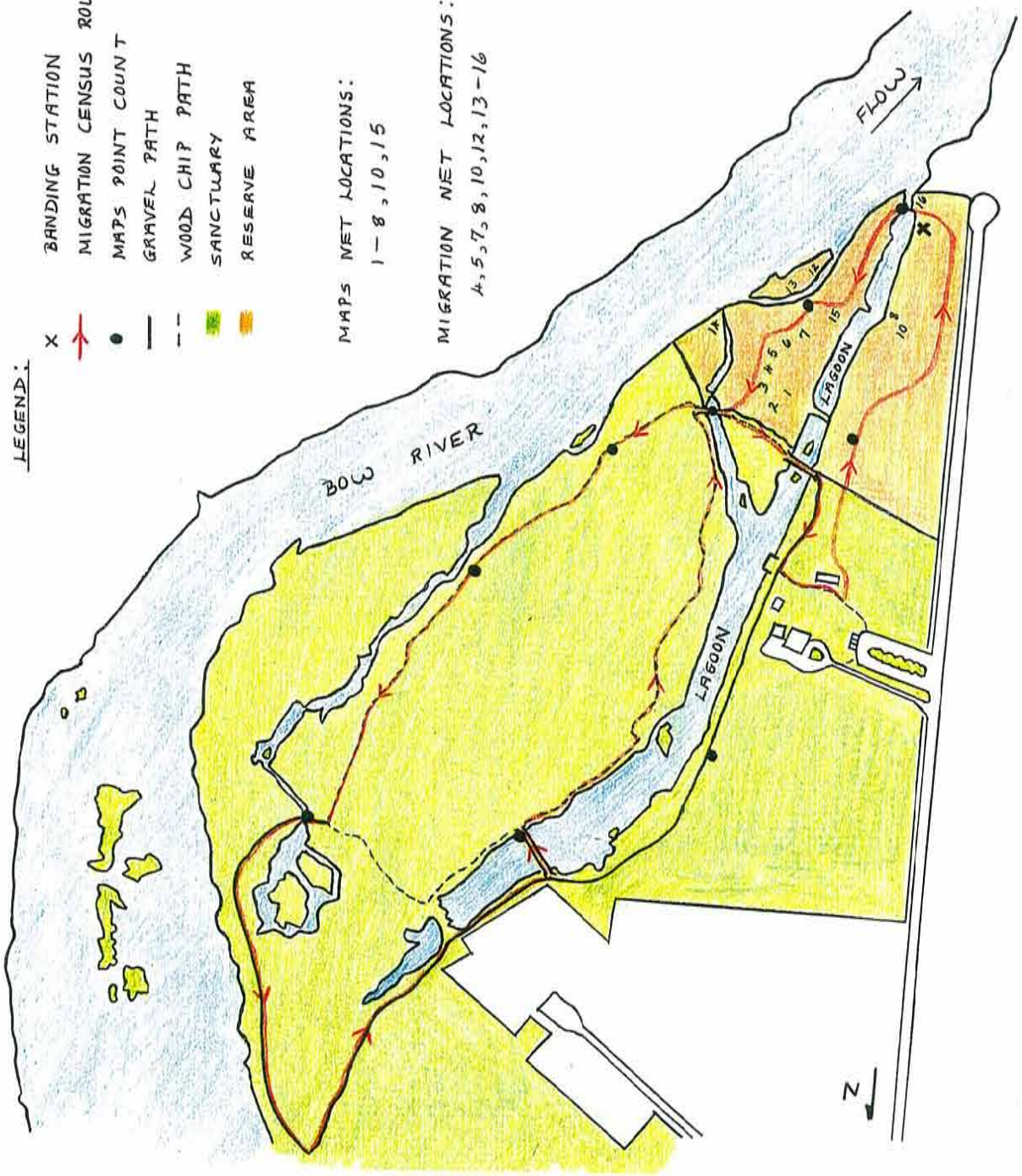

Figure 2. Schematic of Inglewood Bird Sanctuary migration monitoring station.

(McCracken *et al.* 1993) and *Recommended Methods for Monitoring Bird Migration* (Hagan *et al.* 1994), and modified to accommodate the specific requirements of the IBS site (Appendix 2). Net locations and the daily census route are shown on Figure 2.

Coverage

Fall migration monitoring at IBS operated from 1 August - 30 September, a span of 61 consecutive days. For each of the 61 days, standardized constant-effort mist-netting is performed for a minimum of 6 consecutive hours starting at sunrise. Additionally a standardized census was taken 2-3 hours from the start of the netting. During 1995, a coverage of 88.5% was achieved. That is, mist-netting occurred on 54 of the 61 target days for a total of 3456 net-hours (Table 1). Seven days were missed due to the following (see Table 1):

- 3 days lost due to no Bander-in-Charge available, therefore no banding attempted; and
- 4 days lost due to adverse weather.

Daily census were obtained on 49 of the 54 days on which mist-netting occurred and 2 of the days on which mist-netting did not occur.

New Bandings

A total of 1,549 new bands were placed on birds of 61 species (Table 2). Of these, 1,389 (90%) were Neotropical migrants. Days on which 50 or more new bandings occurred were 13 August (50), 1 September (53), 13 September (120), 16 September (84), 19 September (156), 25 September (77), and 27 September (60). Just under 40% of new bandings occurred in the last half of September consistent with a general consensus that 1995 was a late year.

An attempt was made to continue the migration monitoring into October but adverse weather and the unavailability of a Bander-in-Charge precluded this initiative. Plans for the 1996 season should include the possibility of extending the migration monitoring period into October.

A banding station adds another dimension to understanding the avifauna at a site and the IBS station is no exception. Several species were recorded during banding operations that are infrequently reported by bird watchers. A Yellow-bellied Flycatcher banded on 29 August provided a rare record of this species for the Calgary area. A Western Flycatcher banded on 27 August apparently provided a first

record of this species for IBS. A Bay-breasted Warbler banded on 30 September provided a very late record of a species that is rare at any season anywhere in Alberta. The *Oporornis* warblers are often difficult to detect through conventional bird watching. During the 1995 migration monitoring at IBS 4 Connecticut Warblers, 5 Mourning Warblers and 3 MacGillivray's Warblers were banded indicating that all members of this complex migrate through IBS in similar numbers. Twelve Western Tanagers were banded prior to 23 August suggesting the existence of a significant early migration of this species through IBS. Two secretive sparrows were banded: a Fox Sparrow on 8 September and a Harris' Sparrow on 26 September.

Recaptures

Recaptures totalled 302 involving at least 230 different birds of 33 species (Table 3). Interestingly, recaptures do not always correlate with the apparent level of migration. On 13 September although 125 birds were banded only 1 bird was recaptured. Contrast that to 19 September when 156 birds were banded and 33 birds were recaptured.

Recaptures are, of course, highest in resident species. The Black-capped Chickadee illustrates this in dramatic fashion with 20 recaptures compared to 7 new bandings! Some migrant species, like the Chipping Sparrow with 29 new bandings and no recaptures, appear to pass through the IBS site very quickly. Significant recaptures during migration monitoring are summarized in Appendix 2).

Estimated Daily Totals (EDTs)

The estimated daily totals (EDTs) represent an estimate of the total number of birds by species present at IBS site each day. Each EDT incorporates the bird banding data as well as a standardized comprehensive census and any incidental observations made during banding. The EDTs give an overall picture of bird migration and form an integral part of CBBS's migration monitoring project. Tables 4 and 5 summarize the EDTs by species and day, and species and month respectively.

The EDTs at IBS during the 1995 fall migration documented 121 species seen, heard or captured. This total includes 21 species of warblers and vireos, 11 species of flycatcher and 15 sparrow and other finch species. Of the 121 species, many were only single sightings of one individual bird. Some of the more interesting of the 18 single bird observations were Horned and Western Grebe, Black Tern, Dusky Flycatcher, Yellow-bellied Flycatcher, Western Flycatcher, Townsend's Solitaire, and Harris' Sparrow.

Table 1. 1995 Fall Migration Coverage and Capture Rates

		Captures					
Date	Net-hours	New Bandings	Recaptures	Escapes	Mortalities	Total	Captures/ 100 Net-hour
801	59.6	8	2	1	0	11	18
802	62.4	14	2	2	0	18	29
803	58.4	11	1	0	1	13	22
804	62.4	23	4	1	0	28	45
805	62.8	36	5	2	0	43	68
806	0.0	0	0	0	0	0	n/a
807	0.0	0	0	0	0	0	n/a
808	56.6	31	3	5	2	41	72
809	60.7	21	11	1	1	34	56
810	62.4	30	4	1	0	35	56
811	61.3	28	4	1	0	33	54
812	63.0	22	4	0	0	26	41
813	59.0	50	3	1	1	55	93
814	62.7	5	0	1	0	6	10
815	58.5	25	8	3	0	36	62
816	62.1	10	3	1	0	14	23
817	62.6	21	3	0	0	24	38
818	62.5	5	2	0	0	7	11
819	61.9	9	4	0	0	13	21
820	62.3	22	4	0	0	26	42
821	60.6	13	3	0	1	17	28
822	62.7	25	7	0	0	32	51
823	61.4	7	3	0	0	10	16
824	60.6	7	1	0	0	8	13
825	61.3	19	6	2	1	28	46
826	0.0	0	0	0	0	0	n/a
827	60.3	32	1	0	0	33	55
828	63.9	26	4	0	0	30	47
829	65.2	11	2	0	0	13	20
830	64.6	36	3	0	1	40	62
831	0.0	0	0	0	0	0	n/a

Table 1. 1995 Fall Migration Coverage and Capture Rates

		Captures					
Date	Net-hours	New Bandings	Recaptures	Escapes	Mortalities	Total	Captures/ 100 Net-hour
901	61.6	53	7	4	0	64	104
902	60.9	20	4	1	0	25	41
903	61.3	15	9	0	0	24	39
904	66.1	20	5	1	0	26	39
905	60.5	10	6	0	0	16	26
906	0.0	0	0	0	0	0	n/a
907	60.9	34	9	4	0	47	77
908	60.0	15	3	1	0	19	32
909	61.6	21	7	0	0	28	45
910	65.5	16	3	1	0	20	31
911	66.8	5	1	1	0	7	10
912	69.0	16	1	0	0	17	25
913	59.2	120	1	33	0	154	260
914	71.0	38	4	0	0	42	59
915	54.0	10	1	0	0	11	20
916	65.8	84	5	4	1	94	143
917	62.4	38	12	1	0	51	82
918	0.0	0	0	0	0	0	n/a
919	85.8	156	33	11	0	200	233
920	72.2	14	17	3	0	34	47
921	80.8	35	10	2	0	47	58
922	62.4	20	7	1	0	28	45
923	65.3	28	11	5	1	45	69
924	67.7	17	2	3	0	22	32
925	69.8	77	8	8	0	93	133
926	77.7	35	17	4	0	56	72
927	78.8	60	7	4	0	71	90
928	65.6	21	11	1	1	34	52
929	0.5	3	0	0	0	3	n/a
930	61.4	21	4	1	0	26	42
Total	3456.4	1549	302	116	11	1978	57

Table 2. 1995 New Bandings at Inglewood Bird Sanctuary During Fall Migration

Date	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821
Species																					
WODU	1																				
SOSA			1																		
SPSA									1						1						
BEKI															1						1
YBSA																					
DOWO																			1	1	
NOFL		1											1								
OSFL											1		1			1					
WWPE							N		1		2	1	3		1	1	1				
YBFL							O														
TRFL		2			1			2			1	1	5				2			1	1
WEFL							B														
DUFL						R	A						1								
LEFL		1				A	N		1	1	1	1	1							1	
EAKI			2			I	D	1	1				1	1						1	
BBMA						N	I	1													
BCCH						E	N														
WBNU						D	G					2									
HOWR	3	5	1	6	5			5		1	1		1	1		1			1	1	1
GCKI						O	A														
RCKI						U	T														
SWTH				1	1	T	T				1				1						
HETH							E														
AMRO	4	3	2	6	8		M	11		11	10	1	5		1	2	8	3	1	2	2
CEWA		1					P	1	4		1	2	19		12						
EUST							T														
SOVI							E														
WAVI				1	1		D						1				2		1	2	
REVI																					
TEWA				1	4					2	1	1	1						1		
OCWA																				1	
YWAR			1	3				4	2	1	2	5	3		1	1	3		1	4	3
MAWA																					

Table 2. 1995 New Bandings at Inglewood Bird Sanctuary During Fall Migration

Date	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821
Species																					
YRWA				2				1		1	1	1	2	1	2	1	1	1		3	1
BBWA																					
BLPW																				1	
PAWA																					
BAWW																				1	
AMRE							N													1	
OVEN							O												1		1
NOWA					1					3	1	1	2	2	2		1				
CONW							B														
MOWA							A				1										
MGWA						R	N														
COYE						A	D														
WIWA						I	I		2				1		3		1	1	2		
WETA		1	2			N	N	2				3	1								1
ATSP						E	G														
CCSP						D															
CHSP				1	5		A		1	8	2					2	2				1
FOSP						O	T														
SOSP					1	U	T			1	1					1				2	
LISP					1	T	E														1
WTSP							M														
WCSP							P														
HASP							T														
DEJU							E														
RWBL				2			D	2													
COGR			2										1								
BHCO										1											
NOOR					8			1	8		1	3									
Total	8	14	11	23	36	0	0	31	21	30	28	22	50	5	25	10	21	5	9	22	13

Table 2. 1995 New Bandings at Inglewood Bird Sanctuary During Fall Migration

Date	822	823	824	825	826	827	828	829	830	831	901	902	903	904	905	906	907	908	909	910	911
Species																					
WODU																					
SOSA															1		1				
SPSA																					
BEKI			1	1					1		1								1	1	
YBSA																					
DOWO																					
NOFL											1										
OSFL																					
WWPE					N	1				N											
YBFL					O			1		O											
TRFL	1	1				5		1	2								1		1		
WEFL					B	1				B											
DUFL					A				1	A						R					
LEFL	1				N	1	1		1	N	1					A				1	
EAKI					D					D						I					
BBMA					I					I	1					N					
BCCH	2				N		1			N						E					
WBNU					G					G			1			D					
HOWR	2		1	3					1		1						1	3	2		
GCKI					A					A						O					
RCKI					T					T						U					
SWTH					T	3				T						T	1				
HETH					E					E											
AMRO	6	1	1		M	1				M											2
CEWA		2			P					P											
EUST					T					T											
SOVI					E					E											
WAVI					D			1	1	D	1				1		1				
REVI									1								1				
TEWA	3	1					1		4		1						2				
OCWA	1						1		2		11	3	3	4	1		13		2	1	
YWAR	2						2		1		2		1	1	1						
MAWA									1												

Table 2. 1995 New Bandings at Inglewood Bird Sanctuary During Fall Migration

Date	822	823	824	825	826	827	828	829	830	831	901	902	903	904	905	906	907	908	909	910	911
Species																					
YRWA	2			2		5	2		2		4	8	1	7	3		2	2	6	11	
BBWA																					
BLPW	1						1		2		2			4			1				
PAWA																					
BAWW																					
AMRE					N		1		1	N											
OVEN	1			2	O			1		O	1	1			1		1				
NOWA			1	3			2	1	1			2									
CONW					B				1	B					2						
MOWA			1		A					A							1	1			
MGWA					N		1		1	N						R					
COYE					D					D						A		1			
WIWA			1	8	I	13	12	2	9	I	17	3	3	3		I	2		1	1	
WETA	2				N					N						N					
ATSP					G					G						E					
CCSP																D					
CHSP		2	1		A		1		1	A	1	1									
FOSP					T					T						O		1			
SOSP					T					T						U		1			
LISP	1				E	2		4	2	E	3	1	2			T	4	2	4	1	1
WTSP					M					M		1					1	4	2		1
WCSP					P					P									2		1
HASP					T					T											
DEJU					E					E	5		4	1			1				
RWBL					D					D											
COGR																					
BHCO																					
NOOR																					
Total	25	7	7	19	0	32	26	11	36	0	53	20	15	20	10	0	34	15	21	16	5

Table 2. 1995 New Bandings at Inglewood Bird Sanctuary During Fall Migration

Date	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	Total
Species																				
WODU																				1
SOSA																				3
SPSA																				2
BEKI																				8
YBSA													1							1
DOWO																				2
NOFL																			1	4
OSFL																				3
WWPE																				11
YBFL																				1
TRFL										1										29
WEFL																				1
DUFL							R											R		2
LEFL				1		1	A								1			A		16
EAKI							I											I		7
BBMA							N											N		2
BCCH						1	E			1						2		E		7
WBNU							D		1	1				1				D		6
HOWR		2						1												50
GCKI							O									2		O		2
RCKI	1						U	3		2	1	1					1	U	1	10
SWTH					1	1	T	2	1	1				2				T	1	17
HETH						1							1			1				3
AMRO								1				1	5	3	4	7				112
CEWA																				42
EUST																2				2
SOVI								1												1
WAVI																				13
REVI																				2
TEWA		1		1	1			4		1				1	1					33
OCWA	3	10	7	5	7	10		23	2	10	1	8	4	14	7	12	3		8	177
YWAR																				44
MAWA						1														2

Table 2. 1995 New Bandings at Inglewood Bird Sanctuary During Fall Migration

Date	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	Total
Species																				
YRWA	6	95	20	2	63	10		94	3	8	12	11	1	44	12	25	10		5	496
BBWA																			1	1
BLPW		1			1			2							1					17
PAWA		1			3						1				1	1				7
BAWW																				1
AMRE																				3
OVEN																				10
NOWA																				23
CONW		1																		4
MOWA								1												5
MGWA							R			1								R		3
COYE		1	2				A	2										A		6
WIWA		1	1	1	3	3	I	7						1				I		102
WETA							N											N		12
ATSP		1					E					1	1	2	1	4		E		10
CCSP							D		1									D		1
CHSP																				29
FOSP							O											O		1
SOSP		1					U		1									U		9
LISP		2	1		3	2	T	3	3	1		2	2	2	2		1	T		53
WTSP	5	3	4			7		7	2	8	4	3	2	5	4	3	2		4	72
WCSP			3		2	1		5				1		2			3			20
HASP															1					1
DEJU	1										1					1	1			15
RWBL																				4
COGR																				3
BHCO																				1
NOOR																				21
Total	16	120	38	10	84	38	0	156	14	35	20	28	17	77	35	60	21	3	21	1549

Table 3. 1995 Recaptures at Inglewood Bird Sanctuary During Fall Migration

Date	801	802	803	804	805	806	807	808	809	810	811	812	813	814	815	816	817	818	819	820	821
Species																					
BEKI	1							1		1											
HAWO																					
DOWO		1							1										1		
NOFL		1	1																		
WWPE									1												
TRFL									1												1
LEFL																					
EAKI					1						1		1								
BCCH									2	1	1										
WBNU																	1			1	
HOWR	1			2	3			2	2							2		1	1		
RCKI																					
SWTH																					1
AMRO				1	1						1				1		1				
WAVI				1																	
TEWA															1						
OCWA																				1	
YWAR									1	2						1					
YRWA															2				1	2	1
BLPW																					
OVEN																			1		
NOWA													2		3		1	1			
CONW																					
MOWA																					
MGWA																					
COYE																					
WIWA																					
ATSP																					
LISP																					
WTSP																					
WCSP																					
DEJU																					
NOOR									3		1	4			1						
Total	2	2	1	4	5	0	0	3	11	4	4	4	3	0	8	3	3	2	4	4	3

Table 3. 1995 Recaptures at Inglewood Bird Sanctuary During Fall Migration

Date	822	823	824	825	826	827	828	829	830	831	901	902	903	904	905	906	907	908	909	910	911
Species																					
BEKI				1																	
HAWO																					
DOWO																					
NOFL																					
WWPE																					
TRFL			1																		
LEFL																					
EAKI																					
BCCH	2			1			1						1	2	1		1				
WBNU																		1			
HOWR	1	1		4		1									1				1		
RCKI																					
SWTH																					
AMRO																					
WAVI																	1				
TEWA																					
OCWA											2						1	1	2		1
YWAR		1						1							1						
YRWA	2								1								2				
BLPW												1					1			1	
OVEN	1											1	1				1		1		
NOWA		1											1					1		1	
CONW											2				1					1	
MOWA																			1		
MGWA									1					1							
COYE																					
WIWA							3	1			2		2	1	2		1				
ATSP																					
LISP									1			1	3				1		2		
WTSP																					
WCSP																					
DEJU											1	1	1	1							
NOOR	1																				
Total	7	3	1	6	0	1	4	2	3	0	7	4	9	5	6	0	9	3	7	3	1

Table 3. 1995 Recaptures at Inglewood Bird Sanctuary During Fall Migration

Date	912	913	914	915	916	917	918	919	920	921	922	923	924	925	926	927	928	929	930	Total
Species																				
BEKI																				4
HAWO			1																	1
DOWO									1											4
NOFL																				2
WWPE																				1
TRFL																				3
LEFL								1												1
EAKI																				3
BCCH						1				1		1	1		1	1	1			20
WBNU																				3
HOWR		1																		24
RCKI									1	1										2
SWTH					1			2	1	1	2	3		1	3		2			17
AMRO																				5
WAVI																				2
TEWA						1		2												4
OCWA			1	1		5		12	3	3		1		2	5	5	3		1	50
YWAR																				7
YRWA					2	1	2	7	2		1	1		2	2	1	2		1	35
BLPW															1					4
OVEN								1	1											8
NOWA	1																			12
CONW																				4
MOWA																				1
MGWA											1									3
COYE								1			1									2
WIWA					1	2		4		1										20
ATSP															1					1
LISP									1		1	2		1	1		1			15
WTSP			1			1		1	4	3	1	2	1	2	2		2		2	22
WCSP			1			1		1	2			1								6
DEJU					1			1	1						1					8
NOOR																				10
Total	1	1	4	1	5	12	0	33	17	10	7	11	2	8	17	7	11	0	4	302

Table 4. 1995 Estimated Daily Totals by Species and Day

AUGUST	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total
Species																																
Horned Grebe																																0
Western Grebe																																0
American White Pelican	2		3	11					1	3	23	11	3	11	7	3	4	5	4	3	3	3	2	6	7		3				1	119
Double-cr. Cormorant	2	2	2	17					2	3	6	4	4	4		3	3	1	5	1	3	2	2	5	3		6	6	8	1	4	99
Great Blue Heron			1	1					2								1		1					1								7
Black-crowned N.Heron																																0
Canada Goose	7			6	6								1		8	2	5		1	1	9	14	1	6			3		25		8	103
Wood Duck	14	5	11	16	10			3	20	19	12	12	12	20	5	9	12	5	12	14	10	25	18	20	6		6	7	20		24	347
Green-winged Teal																																0
Mallard	15	14	15	26	11			8	29	19	10	12	24	25	25	33	27	5	14	30	16	38	41	30	33		9	20	25	30	20	604
Blue-winged Teal	2								1	1					2													1				7
Northern Shoveler																				3												3
Gadwall					2				1																						3	6
American Widgeon		2	1	2							1	4	3	2	3	1	3			2	1	2	2		2						1	32
Common Goldeneye	2	7	4	9	13					4	3		8	2		3	4	4	1	2	2	2	2	4	1		3	7	2	5	2	96
Common Merganser	3		3	3	2			4	1		3		1		2	5	2	5		12	12	11	6	6	7		6	6			1	101
Hooded Merganser																		1		1		1		1	1							5
Osprey	1	1			1			1				1		1				3	3		1			1	1							15
Sharp-shinned Hawk																													2	1	1	4
N. Goshawk																											1					1
ACCIPITER SPP.									1														1				1					3
Swainson's Hawk									1			1	1		1				1		3		2					1			11
Red-tailed Hawk	1								1	1					1			1							1						1	7
American Kestrel	3	5	8	4	1			2	3	3	3	1	2	3	1	1	2	1	1					1					1	1		47
Merlin	1			1					1						1				1	1				1	1							8
Peregrine Falcon	1		1	1																												3
Gray Partridge												5																				5
Ring-necked Pheasant			1						1	1						1														1		5
Sora																						1	1	2							1	5
Killdeer												1													1		1					3
Solitary Sandpiper			1	1										1								1	1					1				6
Spotted Sandpiper	2	2		1	1			2	2	3	1	2	4	1	2	1	1	2	1	1	2			2			1				1	35
Common Snipe																																0
Franklin's Gull		1										2								3				2							2	10
Ring-billed Gull	4											4						15	23													46
California Gull	2																															2
Herring Gull	2											1											1								1	5
GULL SPP.	75	50	60	200	300				22	21	4		4	7	6	22	130		2	112	51	150	155	264	165		100	243	200	200	1050	3593
Black Tern																																0
Rock Dove	12	12	9	25	1				30	30	54		2		2	30	30	15		30	12	27	5	9					3			338
Mourning Dove	1																															1
Great Horned Owl	1												2				2		1													6
Common Nighthawk																																0
Belted Kingfisher	1			1				1	2	2		2		1	2	2	2	1	2	2	1	1	3	2	3					2	1	34
Yellow-bellied Flycatcher																																0
Downy Woodpecker	1			2					2	2		1	1			1		1	3	1	1			1					1	1		19
Hairy Woodpecker	2								1							1		1		1					1		1					8
Northern Flicker	8			7	5			2	5	7	8	3	5	5	7	4	3	3	4	4	3	2	1	1	1		1	1	4		5	99

Table 4. 1995 Estimated Daily Totals by Species and Day

AUGUST	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total
Species																																
Olive-sided Flycatcher										5	1	1	1			1						1			1					1	1	13
Western Wood-pewee	6			8	5			2	8		5	5	7	5	3	3	4	11	12	2		2			1		1					90
Dusky Flycatcher																														1		1
Traill's Flycatcher		2						2	1		1	1	5			1	2			1	2	1	1	1			5		1	2		29
Least Flycatcher	1	2	1	2					1	2	1	1	2	1		1				1		1					1	1		1		20
Yellow-bellied Flycatcher																													1			1
Western Flycatcher																											1					1
EMPID SPP.			1							1		2	3		1		1	12	9	1	2	1	1				4	1				40
FLYCATCHER SPP.																												1	4	3		8
Eastern Phoebe																							1									1
Great Crested Flycatcher																																0
Western Kingbird	1																															1
Eastern Kingbird	10	10	16	17	12			5	20	14	25	20	23	15	8	22	20	8	12	14	10	15	14	6	1				1		2	320
Tree Swallow	6		6	1					18			2			3	5																41
Bank Swallow		6	3	10	2				8				35	2																		66
N.Rough-winged Swallow			2						2					3																		7
Barn Swallow									1																							1
SWALLOW SPP.								18	30	75	27			8			40	7														205
Blue Jay												1							1						1							3
Black-billed Magpie	8	5	8	16	5			3	10	15	7	1	6	5	7	9	8	6	7	7	14	6	5	16	4		5	9	11	10	17	230
American Crow	3			5	4			1		2	1	1	2	1		2	5	1	1	2	2		1	2				1		1	1	39
Common Raven	2	1							1		1			1							1										2	9
Black-ca. Chickadee	9	3	16	14	3				8	9	7	2	12	12	7	9	12	3	7	12	15	14	6	12	13		4	12	30	4	6	261
Red-breasted Nuthatch																									1				1	1	1	4
White-breasted Nuthatch	1		1	1	1				1	1	1	3		1		2	2	1	1	1	2	2		1	1		1					25
House Wren	7	13	15	20	8			5	6	4	2	9	5	4	1	10	2	4	7	4	6	8	1	3	15		5	2	2	4	3	175
Golden-crowned Kinglet																																0
Ruby-crowned Kinglet																																0
Townsends Solitaire																																0
Swainson's Thrush				1	1						1				1		1	1	1		1				2		3					13
Hermit Thrush																																0
American Robin	30	24	40	55	20			30	35	80	40	50	50	55	45	70	65	30	60	30	45	55	57	40	10		7	5	15	5	6	1054
Gray Catbird	2		1																								1			1		5
Cedar Waxwing	10	14		30	8			7	20	26	20	30	38	24	29	30	60	30	35	55	12	11	100	24	5		35	5	7	12	10	687
European Starling	200	14	72	140	11			1	180	126	200	30	90	145	67	92	100	10	100	63	120	130	36	58	43		4	33	3	18	10	2096
Solitary Vireo																																0
Warbling Vireo	3	1	2	2	2				2	1			2	2		3	7		3	2	15	2			1		1	1	1	1	2	56
Red-eyed Vireo																1										1			1			3
Tennessee Warbler				1	4					2	1	1	1		1	1			7	2	10	3	1		2			1		4	2	44
Orange-cr. Warbler										1						1			1		1	1						1		2		8
Yellow Warbler		1	2	5	1			4	6	6	3	12	5	2	1	6	6	6	8	10	10	8	5	1	1			2	5	2	2	120
Magnolia Warbler																									1			1		1	1	4
Yellow-rumped Warbler				6				2	2	5	1	1	3	1	4	4	5	20	20	6	15	14	1	2	20		20	2	7	3	7	171
Townsends Warbler																	2	1														3
Palm Warbler																																0
Bay-breasted Warbler																																0
Blackpoll Warbler																				1		1			2					2		6
Black-and-white Warbler																				1								1				2

Table 4. 1995 Estimated Daily Totals by Species and Day

AUGUST	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total
Species																																
American Redstart														1						1	2				2		1	5	1	2	1	16
Ovenbird																			1		3	2							1			7
Northern Waterthrush					1					4	7	1	3	2	5		2	5					1	1	3			2	1	3	1	42
Connecticut Warbler																					1									1		2
Mourning Warbler											1									2				1								4
MacGillivrays Warbler																												1		1		2
Common Yellowthroat			1																													1
Wilson's Warbler									4				3		5		1	1	2		3		1	1	9		17	18	6	12	1	84
WARBLER SPP.			1						2		1			1						1			1	3				8	3	1	22
Western Tanager												3													1							4
Rose-breasted Grosbeak																									1					1		2
American Tree Sparrow																																0
Chipping Sparrow			10	10	5				4	22	8	10	4	19		5	8		1	4	1	4	4	2				4		1	3	129
Clay-colored Sparrow	1								1	1																						3
Fox Sparrow																																0
Song Sparrow	3	3	2	2	2			1	2	2	1			2	1	1			2	2	1								1			28
Lincoln's Sparrow					1							1									1	1			1		2		4	2		13
White-throated Sparrow																											6				1	7
White-crowned Sparrow	8		4																													12
Harris Sparrow																																0
Dark-eyed Junco											3					1														1		5
SPARROW SPP.																3											6					9
Red-winged Blackbird	3	2	2	10				2	2					1		1																23
Brewer's Blackbird																																0
Rusty Blackbird																																0
Common Grackle		4	4										1																			9
Brown-headed Cowbird									1	1	1	1				1																5
BLACKBIRD SPP.																		3														3
Northern Oriole	4		7	2	8			1	12	5	3	6	2	3	3	1	3	3	1	4	2	5	2	2								79
Purple Finch																				3												3
Pine Siskin		1			4							5	1									2		2	3						1	19
American Goldfinch		2	2	2	2			1	1	4		4	8	5	3	6	4	2	8	2	1	8		2	1		1		2		1	72
House Sparrow			2	4	1						2					4						5		1							19
TOTAL BIRDS	483	209	341	698	464	0	0	108	518	533	500	271	389	404	270	418	591	234	387	458	428	583	483	546	380	0	274	400	406	349	1210	
TOTAL SPECIES	46	30	39	37	33	0	0	26	49	40	39	44	42	40	35	46	39	39	42	47	44	41	36	41	43	0	37	30	35	38	42	
NOTES					3	4	4	1																		4		3			2	
Note #1 - No census performed this day																																
Note #2 - Census only, no banding or observations this day																																
Note #3 - No incidental observations performed this day																																
Note #4 - No migration monitoring this day																																

Table 4. 1995 Estimated Daily Totals by Species and Day

SEPTEMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total
Species																															
Horned Grebe	1		1	1																											3
Western Grebe																														1	1
American White Pelican		6	2		2	1					1																				12
Double-cr. Cormorant	6	7	2	1	1	3	4	2	4		10	6	5	3	10	5	5		4	3	3	5	1	4	2					1	97
Great Blue Heron							1							1			2			1											5
Black-crowned N.Heron																												1			1
Canada Goose	40	4	15	61	12	7	17	9	19		34	32	35	33	50	35	64		24	30	24	70	55	70	21	50		15		38	864
Wood Duck	12	27	15	15	16	4	22	2	9		22	32	22	17	30	18	27		21	23	24	20	15	30	17	12		42		30	524
Green-winged Teal							1																								1
Mallard	40	12	25	10	6	32	26	34	28		37	51	40	24	20		23		19	35	56		26	51	22	17		40		60	734
Blue-winged Teal			1									1	1												1						4
Northern Shoveler																															0
Gadwall							2		9		1	6		9	11		2			3			5	3	5	6				18	80
American Widgeon	1	2						4	2								1			1			1	1	2			1		2	18
Common Goldeneye		1	3	1		3					2		2						1												13
Common Merganser	9	11	5	13		3		1	8			8	4	3	6		14			1	21	1	26	24	50	25	40	15		47	335
Hooded Merganser													1																		1
Osprey		1					1				2																				4
Sharp-shinned Hawk			1		1										1																3
N. Goshawk																					1										1
ACCIPITER SPP.																															0
Swainson's Hawk	1	1	1								1	1	1				1							1							8
Red-tailed Hawk			1										2		1						1										5
American Kestrel	2	1							1											1											5
Merlin		1	1		1								1	1			1						1				1	1		1	10
Peregrine Falcon																															0
Gray Partridge																															0
Ring-necked Pheasant			1				1							1							1										4
Sora			1	1																											2
Killdeer				1							2															1					4
Solitary Sandpiper	1	2	1	2	1	3	1																								11
Spotted Sandpiper																			1							1					2
Common Snipe															1																1
Franklin's Gull											3		5															1			9
Ring-billed Gull			2						60																11		200				273
California Gull									10														2				2				14
Herring Gull									3																						3
GULL SPP.	625	650	600	525	19	700	47	30			641	609	1850	500	750	40	1070		750	350	1000	1200	800	630	600	1000	400	900		362	16648
Black Tern						1																									1
Rock Dove	4	26	9	6	9	2	18	1				4	21	14	19	19	3			12	10	1				14		8		7	207
Mourning Dove																										1					1
Great Horned Owl																	1					1									2
Common Nighthawk							1																								1
Belted Kingfisher	2	1	1	1		1	1	1	1	1		2	2	2	2	1	1		3	1		1		1	2	2	2	1		1	34
Yellow-bl. Sapsucker																								1							1
Downy Woodpecker				2			2	3	1			3	1	1			1			2	2	1	2			2		3		1	27
Hairy Woodpecker		1		3				1				1		1		1	1		3		1	1		2	1		1	1			19
Northern Flicker	3	2	4	6	3	1	2	2	2			3	1	1	3	1	1		1	1	2	1	1	1	1	2	1	1		6	53

Table 4. 1995 Estimated Daily Totals by Species and Day

SEPTEMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total
Species																															
Olive-sided Flycatcher																															0
Western Wood-pewee	1		1	1																											3
Dusky Flycatcher																															0
Traill's Flycatcher							1		2												1										4
Least Flycatcher	1									1					1		1		1							1					6
Yellow-bellied Flycatcher																															0
Western Flycatcher																															0
EMPID SPP.	1		1										1																		3
FLYCATCHER SPP.																															0
Eastern Phoebe																															0
Great Crested Flycatcher																			1												1
Western Kingbird																															0
Eastern Kingbird				2		2		2	2																						8
Tree Swallow																															0
Bank Swallow																															0
N.Rough-winged Swallow																															0
Barn Swallow																															0
SWALLOW SPP.																															0
Blue Jay			1																			1									2
Black-billed Magpie	12	15	17	20			20	14	9		24	23	14	10	4	2	10		25	15	30	15	14	16	17	10	5	2		30	373
American Crow		1	2	3	1	1	2	1	1		3	5	9	4	3	2	5		2	8	5			3	2	7		12		1	93
Common Raven		1		1																2								2			6
Black-ca. Chickadee	32	5	15	12	4		10	4	7		11	8	8	6	4	5	12		19	10	10		12	10	20	12	3	10		12	261
Red-breasted Nuthatch	1	1	4									1																			7
White-breasted Nuthatch	1	1	2	2			1	2			2	1	1	1	1	1	2		1	2	2		2	1	3	2	1	2		1	35
House Wren	1	1		3	1		2	5	2		1		3	1			1		1												22
Golden-crowned Kinglet																											2				2
Ruby-crowned Kinglet	1											4	2				1		4	2	3	1	2					1		1	22
Townsends Solitaire													1																		1
Swainson's Thrush							1									2	1		4	2	2	3	3		3	2		1	1	25
Hermit Thrush																	1							1		1	1				4
American Robin	6	10	12	30	5	1	30	24	22		53	70	22	34	26	7	45		1	20	40	8	12	45	18	75	20	20		12	668
Gray Catbird																															0
Cedar Waxwing	20	3	6	12	6		3		8		14	3	50	14			12		1			4		3	2						161
European Starling	15	35	20	100	13	19	65	34	60		83	95	40	50	15	23	70			35	50	15	30	30	15	20	15	60		12	1019
Solitary Vireo			1																1												2
Warbling Vireo	1			1	1		2	1	1					1		1															9
Red-eyed Vireo			1				1	2			1																				5
Tennessee Warbler	1						2		1				2		1	1	2		6		2		1		1	1					21
Orange-cr. Warbler	13	3	4	6	2		15	5	6	1	2	4	18	8	6	9	15		36	5	20	1	12	6	14	12	12	10		8	253
Yellow Warbler	7		1	2	2		1																								13
Magnolia Warbler				1				1									1														3
Yellow-rumped Warbler	5	12	27	24	3	2	12	25	37	11	10	44	219	60	30	75	40		101	15	20	14	45	31	60	20	25	40		21	1028
Townsends Warbler																1															1
Palm Warbler													1			4					1	1	1			1	1	3			13
Bay-breasted Warbler																										1				1	2
Blackpoll Warbler	2	1		4			5		1	1			1			1			2							1					19
Black-and-white Warbler																															0

Table 4. 1995 Estimated Daily Totals by Species and Day

SEPTEMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total
Species																															
American Redstart																							1								1
Ovenbird	1	2	1	4	1		2		1	1									2	1											16
Northern Waterthrush		2	1					1		1		1																			6
Connecticut Warbler	2				3					1			1																		7
Mourning Warbler							1	1	1					3					1												7
MacGillivrays Warbler				1																	1	1									3
Common Yellowthroat							1	1						2					3			1					1				9
Wilson's Warbler	25	3	15	6	2		3	1	1	1	1		1	1	1	3	5		14	1	2			1	1			2			88
WARBLER SPP.	8	7		12	4		5				5	8	15				4		11		8				32			2			121
Western Tanager									1																						1
Rose-breasted Grosbeak			1																												1
American Tree Sparrow													1							2			1	7	10	3	4	10			38
Chipping Sparrow	3	8	1				1				1	1																			15
Clay-colored Sparrow							1		1											1				1				1			5
Fox Sparrow								1																							1
Song Sparrow								2					1							1											4
Lincoln's Sparrow	3	2	5	8			5	2	8	1	1		3	1		3	2		3	3	1	1	6	2	5	3		2			70
White-throated Sparrow		1		1			2	6	2		5	5	3	10		1	15		8	15	34	5	10	10	14	6	4	20		12	189
White-crowned Sparrow				1			6	3	3		3	2		4	13	2	2		6	7	4		6	3	2			3		1	71
Harris Sparrow																										1					1
Dark-eyed Junco	35	1	5	2			4		2			6				1			1	8	2	20	1			1	1	2			92
SPARROW SPP.						1							3							2	10			8							24
Red-winged Blackbird																					5		1			10					16
Brewer's Blackbird		20																													20
Rusty Blackbird																							3								3
Common Grackle					3						4			6			2				1			4			3				23
Brown-headed Cowbird																															0
BLACKBIRD SPP.																					2										2
Northern Oriole				1																											1
Purple Finch																															0
Pine Siskin																								1			3				4
American Goldfinch			2				2						2	4			4					3	13	4			1	2			37
House Sparrow																										1					1
TOTAL BIRDS	945	891	838	909	122	787	353	228	336	20	980	1040	2416	831	1009	264	1471	0	1092	621	1402	1396	1111	1006	954	1324	748	1236	0	688	
TOTAL SPECIES	39	40	45	42	26	21	48	34	38	10	31	31	43	35	25	27	39	0	35	35	37	27	32	33	30	35	24	35	0	27	
NOTES					1	2				1,3						1		4	3								1		4		
SEPTEMBER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	

Note #1 - No census performed this day

Note #2 - Census only, no banding or observations this day

Note #3 - No incidental observations performed this day

Note #4 - No migration monitoring this day

Table 5. 1995 Estimated Daily Totals by Species and Month

	August			September			Total		August			September			Total
	# birds	# days	Avg. birds per day	# birds	# days	Birds per day	Birds		# birds	# days	Birds per day	# birds	# days	Avg. birds per day	Birds
Horned Grebe	0			3	3	1.0	3	SWALLOW SPP.	205	7	29.3	0			205
Western Grebe	0			1	1	1.0	1	Blue Jay	3	3	1.0	2	2	1.0	5
American White Pelican	119	22	5.4	12	5	2.4	131	Black-billed Magpie	230	28	8.2	373	25	14.9	603
Double-cr. Cormorant	99	25	4.0	97	24	4.0	196	American Crow	39	20	2.0	83	23	3.6	122
Great Blue Heron	7	6	1.2	5	4	1.3	12	Common Raven	9	7	1.3	6	4	1.5	15
Black-crowned N.Heron	0			1	1	1.0	1	Black-ca. Chickadee	261	27	9.7	261	25	10.4	522
Canada Goose	103	16	6.4	864	26	33.2	967	Red-breasted Nuthatch	4	4	1.0	7	4	1.8	11
Wood Duck	347	27	12.9	524	26	20.2	871	White-breasted Nuthatch	25	19	1.3	35	23	1.5	60
Green-winged Teal	0			1	1	1.0	1	House Wren	175	28	6.3	22	12	1.8	197
Mallard	604	28	21.6	734	24	30.6	1338	Golden-crowned Kinglet	0			2	1	2.0	2
Blue-winged Teal	7	5	1.4	4	4	1.0	11	Ruby-crowned Kinglet	0			22	11	2.0	22
Northern Shoveler	3	1	3.0	0			3	Townsends Solitaire	0			1	1	1.0	1
Gadwall	6	3	2.0	80	13	6.2	86	Swainson's Thrush	13	10	1.3	25	11	2.3	38
Amercian Widgeon	32	16	2.0	18	11	1.6	50	Hermit Thrush	0			4	4	1.0	4
Common Goldeneye	96	24	4.0	13	7	1.9	109	American Robin	1054	28	37.6	667	27	24.7	1721
Common Merganser	101	21	4.8	335	22	15.2	436	Gray Catbird	5	4	1.3	0			5
Hooded Merganser	5	5	1.0	1	1	1.0	6	Cedar Waxwing	687	27	25.4	161	16	10.1	848
Osprey	15	11	1.4	4	3	1.3	19	European Starling	2096	28	74.9	1019	26	39.2	3115
Sharp-shinned Hawk	4	3	1.3	3	3	1.0	7	Solitary Vireo	0			2	2	1.0	2
N. Goshawk	1	1	1.0	1	1	1.0	2	Warbling Vireo	56	21	2.7	9	8	1.1	65
ACCIPITER SPP.	3	3	1.0	0			3	Red-eyed Vireo	3	3	1.0	5	4	1.3	8
Swainson's Hawk	11	8	1.4	8	8	1.0	19	Tennessee Warbler	44	17	2.6	21	12	1.8	65
Red-tailed Hawk	7	7	1.0	5	4	1.3	12	Orange-cr. Warbler	8	7	1.1	253	27	9.4	261
American Kestrel	47	20	2.4	5	4	1.3	52	Yellow Warbler	120	26	4.6	13	5	2.6	133
Merlin	8	8	1.0	10	10	1.0	18	Magnolia Warbler	4	4	1.0	3	3	1.0	7
Peregrine Falcon	3	3	1.0	0			3	Yellow-rumped Warbler	171	24	7.1	1028	28	36.7	1199
Gray Partridge	5	1	5.0	0			5	Townsends Warbler	3	2	1.5	1	1	1.0	4
Ring-necked Pheasant	5	5	1.0	4	4	1.0	9	Palm Warbler	0			13	8	1.6	13
Sora	5	4	1.3	2	2	1.0	7	Bay-breasted Warbler	0			2	2	1.0	2
Killdeer	3	3	1.0	4	3	1.3	7	Blackpoll Warbler	6	4	1.5	19	10	1.9	25
Solitary Sandpiper	6	6	1.0	11	7	1.6	17	Black-and-white Warbler	2	2	1.0	0			2
Spotted Sandpiper	35	21	1.7	2	2	1.0	37	American Redstart	16	9	1.8	1	1	1.0	17
Common Snipe	0			1	1	1.0	1	Ovenbird	7	4	1.8	16	10	1.6	23
Franklin's Gull	10	5	2.0	9	3	3.0	19	Northern Waterthrush	42	16	2.6	6	5	1.2	48
Ring-billed Gull	46	4	11.5	273	4	68.3	319	Connecticut Warbler	2	2	1.0	7	4	1.8	9
California Gull	2	1	2.0	14	3	4.7	16	Mourning Warbler	4	3	1.3	7	5	1.4	11
Herring Gull	5	4	1.3	3	1	3.0	8	MacGillivrays Warbler	2	2	1.0	3	3	1.0	5
GULL SPP.	3593	25	143.7	16648	26	640.3	20241	Common Yellowthroat	1	1	1.0	9	6	1.5	10
Black Tern	0			1	1	1.0	1	Wilson's Warbler	84	15	5.6	88	20	4.4	172
Rock Dove	338	19	17.8	207	20	10.4	545	WARBLER SPP.	22	10	2.2	121	13	9.3	143
Mourning Dove	1	1	1.0	1	1	1.0	2	Western Tanager	4	2	2.0	1	1	1.0	5
Great Horned Owl	6	4	1.5	2	2	1.0	8	Rose-breasted Grosbeak	2	2	1.0	1	1	1.0	3
Common Nighthawk	0	0		1	1	1.0	1	American Tree Sparrow	0			38	8	4.8	38
Belted Kingfisher	34	20	1.7	34	24	1.4	68	Chipping Sparrow	129	20	6.5	15	6	2.5	144
Yellow-bl Sapsucker	0	0		1	1	1.0	1	Clay-colored Sparrow	3	3	1.0	5	5	1.0	8
Downy Woodpecker	19	14	1.4	27	15	1.8	46	Fox Sparrow	0			1	1	1.0	1
Hairy Woodpecker	8	7	1.1	19	14	1.4	27	Song Sparrow	28	16	1.8	4	3	1.3	32
Northern Flicker	99	25	4.0	53	26	2.0	152	Lincoln's Sparrow	13	8	1.6	70	22	3.2	83
Olive-sided Flycatcher	13	9	1.4	0			13	White-throated Sparrow	7	2	3.5	189	22	8.6	196
Western Wood-pewee	90	18	5.0	3	3	1.0	93	White-crowned Sparrow	12	2	6.0	71	18	3.9	83
Dusky Flycatcher	1	1	1.0	0			1	Harris Sparrow	0			1	1	1.0	1
Traill's Flycatcher	29	16	1.8	4	3	1.3	33	Dark-eyed Junco	5	3	1.7	92	16	5.8	97
Least Flycatcher	20	16	1.3	6	6	1.0	26	SPARROW SPP.	9	2	4.5	24	5	4.8	33
Yellow-bellied Flycatcher	1	1	1.0	0			1	Red-winged Blackbird	23	8	2.9	16	3	5.3	39
Western Flycatcher	1	1	1.0	0			1	Brewer's Blackbird	0			20	20	1.0	20
EMPID SPP.	40	14	2.9	3	3	1.0	43	Rusty Blackbird	0	0		3	1	3.0	3
FLYCATCHER SPP.	8	3	2.7	0			8	Common Grackle	9	3	3.0	23	7	3.3	32
Eastern Phoebe	1	1	1.0	0			1	Brown-headed Cowbird	5	5	1.0	0			5
Great Crested Flycatcher	0	0		1	1	1.0	1	BLACKBIRD SPP.	3	1	3.0	2	1	2.0	5
Western Kingbird	1	1	1.0	0			1	Northern Oriole	79	21	3.8	1	1	1.0	80
Eastern Kingbird	320	25	12.8	8	4	2.0	328	Purple Finch	3	1	3.0	0			3
Tree Swallow	41	7	5.9	0			41	Pine Siskin	19	8	2.4	4	2	2.0	23
Bank Swallow	66	7	9.4	0			66	American Goldfinch	72	23	3.1	37	10	3.7	109
N.Rough-winged Swallow	7	3	2.3	0			7	House Sparrow	19	7	2.7	1	1	1.0	20
Barn Swallow	1	1	1.0	0			1								
								TOTALS	12335	1105		25007	934		37342

Column Heading Descriptions:	
# birds	The number of birds observed this month
# days	The number of days this species was observed this month
Birds per day	The average number of birds observed when this species was present on a given day
Total Birds	The total number of all birds of this species observed during migration monitoring

The greatest number of species observed in one day was 48 on 7 September. A total of 37,342 birds were recorded. On an average day, more than 36 species were seen. Of course, many of these were the same individuals observed over many days. By far the largest group, over half of the birds seen, were the 4 gull species with 20,603 observed. However, not every bird observed was a gull! There were more than 2,000 warblers, 500+ flycatchers and 135 birds of prey recorded in and around IBS during migration monitoring.

The number of species and total birds observed did not decline significantly during the final two weeks of the project. This suggests that in certain years migration monitoring should be continued into October if resources permit.

References

Greenberg, R. 1982. The nonbreeding season: Introduction. Pages 175-177 *In* Hagan, J.M. and Johnston, D.W. editors. Ecology and conservation of Neotropical migrant landbirds. Smithsonian Institution Press, Washington. Proceedings of a symposium hosted by Manomet Bird Observatory, 6-9 December, 1989.

Hagan, J.M., K.A. Hobson, D.J.T. Hussell, N. Nur and C.J. Ralph. 1994. Recommended methods for monitoring bird migration. Draft prepared by the Intensive Sites Technical Committee of the Migration Monitoring Council. 22 pp.

McCracken, J.D., D.J.T. Hussell, and E. Dunn. 1993. A manual for monitoring bird migration. Long Point Bird Observatory, Port Rowan, Ontario. 65 pp.

Sauer, J.R. and S. Droege. 1992. Geographic patterns in population trends of Neotropical migrants in North America. Pages 26-42 *In* Hagan, J.M. and Johnston, D.W. editors. Ecology and conservation of Neotropical migrant landbirds. Smithsonian Institution Press, Washington. Proceedings of a symposium hosted by Manomet Bird Observatory, 6-9 December, 1989.

MONITORING AVIAN PRODUCTIVITY AND SURVIVAL (MAPS)

Background

The Monitoring Avian Productivity and Survivorship (MAPS) Program is a cooperative effort among public agencies, private organizations, and the bird banders of North America to provide critical, long-term data on population and demographic parameters for target landbird species throughout the continent. The 1995 field season was MAPS seventh year of operation.

MAPS utilizes standardized, constant-effort mist-netting and banding and standardized point counts during the breeding season at a continent-wide network of stations. Annual regional indices of adult population size and post-fledging productivity are estimated from data on numbers and proportions of young and adult birds captured during the breeding season. Annual regional estimates are made of adult survivorship, adult population size and recruitment into the adult population from capture-recapture data. Additional independent estimates of adult population size are inferred from point-count data collected in the vicinity of the MAPS stations.

The continent is divided into eight major regions based on biogeographical and meteorological considerations, and each region has target species identified within it. IBS falls into the Northwest Region whose target species are:

- Dusky Flycatcher;
- Western Flycatcher complex;
- Swainson's Thrush;
- American Robin;
- Warbling Vireo;
- Orange-crowned Warbler;
- Yellow Warbler;
- MacGillivray's Warbler;
- Wilson's Warbler;
- Song Sparrow;
- Lincoln's Sparrow; and
- "Oregon" Dark-eyed Junco.

All of these species have been captured at IBS although only American Robin, Warbling Vireo, Yellow Warbler, and Song Sparrow are regular breeders. MAPS data is provided to The Institute for Bird Populations in Point Reyes, CA where it is integrated with data from other stations across North America.

Objectives

The overall objective of the Monitoring Avian Productivity and Survivorship (MAPS) Program is to contribute to an integrated avian population monitoring system for selected North American landbirds. The indices and estimates described above are to be used to:

- determine annual changes and, ultimately, longer-term trends in population and demographic parameters of target species in each region;
- relate these trends to readily-measured environmental co-variates such as climatic factors, habitat type, and management practice; and
- refine current population models and develop new ones.

Methods

MAPS protocol requires the standardized operation of ten 30-mm mist-nets at a permanent site on one day during each of six to twelve consecutive ten-day periods between May and August. An additional requirement is the collection of three sets of point-count data taken during the first three periods of mist-netting, and a habitat description.

The MAPS Program consists of standardized constant-effort mist-netting and standardized point counts during the breeding season. The breeding season is considered to extend from May through August and is divided into 12 ten-day periods. Mist-netting is started during the first ten-day period during which the great majority of the breeding adults of the target species have established territories and migrant individuals of these species are no longer passing through the area, and continues for at least six periods. For our location this start period is period 4 (31 May - 9 June). Further, other mist-netting cannot be performed during the ten-day periods, and thus we are prevented from netting during periods 11 (9-18 August) and 12 (19-28 August) because of our migration monitoring project. Therefore, our MAPS coverage entails 7 of the 12 ten-day periods.

Coverage

For the third time in the three years that this project has been operated at the Inglewood Bird Sanctuary, 100% coverage of the 7 possible periods was achieved. This means that mist-netting occurred for 6 consecutive hours, starting at sunrise, on one day in each of the targeted 7 ten-day periods, for a total of 462 net-hours. Also, the three standardized point count surveys were completed as was the vegetation

survey.

Results

The number of each species captured, by date, during 1995 are summarized in Table 6. The number of each species that were banded, recaptured or escaped before banding are summarized in Table 7 for 1995 as well as 1992 and 1993, the two previous years during which MAPS was conducted. The number of each species that were detected on the point counts during each of 1992, 1993 and 1995 are presented in Table 8. Significant recaptures during MAPS are summarized in Appendix 2.

Discussion

The total number of captures has steadily decreased from 1992 to 1995 although a careful examination by species will show a variety of trends. For example numbers of American Robins captured dropped dramatically from 1992 to 1993 but increased just as dramatically from 1993 to 1995. House Wrens appear to have increased while Yellow Warblers have declined steadily.

The number of migrants detected during MAPS can vary significantly depending on the year. 1995 was a late year and therefore few fall migrants would be expected. Note that in 1992 a total of 10 Yellow-rumped Warblers, a migrant, were captured compared to none in both 1993 and 1995.

Reference

DeSante, D.F. and K.M. Burton. 1994. The Monitoring Avian Productivity and Survivorship (MAPS) Program Third Annual Report (1992). *Bird Populations* 2:62-89.

Table 6. 1995 MAPS Summary by Species and Date

Date	4 June		17 June		25 June		7 July		15 July		22 July		29 July		TOTAL
Species	BANDED	OTHER	BANDED	OTHER	BANDED	OTHER	BANDED	OTHER	BANDED	OTHER	BANDED	OTHER	BANDED	OTHER	
AMKE									1						1
RUHU														1	1
YSFL													1		1
FLIN					1								1		2
DOWO													1		1
HAWO									1						1
WEWP									1						1
LEFL	1		1	1			1							1	5
BCCH			1	2	1	2			1		2	1			10
HOWR	2	3	5	3		2	1			2	1	1		2	22
SWTH	2	1					1		2		1	1			8
AMRO					1		1		6	1	10		8	1	28
EUST	1									2					3
WAVI					1	1									2
YWAR	3	2	2				1	2			1	1			12
WTSP										1					1
LISP					1										1
BAOR	2														2
COGR											1				1
WETA									1		3				4
TOTAL	11	6	9	6	5	5	5	2	13	6	19	4	11	5	107
SPECIES	6	3	4	3	5	3	5	1	7	4	7	4	4	4	20
NET-HRS	60.2		69.5		67.9		68.8		73.3		61.5		61.0		462.0
CAPTURES/ 100 NET-HRS	28		22		15		10		26		37		26		23

Note: Other = recaptures + escapes

Table 7. 1992-95 MAPS Summary by Species

Year	1992		1993		1995		
Species	BANDED	RECAPTURES	BANDED	RECAPTURES	BANDED	RECAPTURES	ESCAPES
AMKE					1		
RUHU							1
YSFL	1		1		1		
FLIN					2		
DOWO	1	2	3	1	1		
HAWO	1		1		1		
EAKI	2		1				
WEWP	6	2	1	3	1		
LEFL	14	9	8	4	3	1	1
TRES	3						
BANS	1						
BCCH	5	3	7	2	5	5	
WBNU	3		4	1			
HOWR	5	1	11	3	9	11	2
SWTH	10	1	8		6	2	
VEER	2	4					
AMRO	21		6		26		2
GRCA	3	1					
CEDW	27	2	8	3			
EUST					1		2
REVI	1						
WAVI	7	1	7		1	1	
TEWA	1		6	1			
MYWA	10						
YWAR	20	16	14	16	7	5	
MOWA	1						
OVEN	3	1					
AMRE			1				
SOSP			1				
CHSP			7				
CCSP			1				
WTSP							1
LISP			3	2	1		
BHCO	6	2		2			
BAOR	3		7	1	2		
COGR					1		
WETA			1		3		1
HOSP	2						
AMGO	2		2				
PUFI			1				
TOTAL	161	45	110	39	72	25	10
SPECIES	27	13	24	12	18	6	7

Table 8. 1992-1995 MAPS Point Count Summary by Species and Date

	1992			1993			1995		
Date	3 June	10 June	25 June	9 June	20 June	28 June	3 June	11 June	24 June
Species									
DCCO						1	1	1	
GBHE						1			1
CAGO	13		18	13	6	8	20	8	
MALL	7	7	4	8	4	9	17	16	7
GADW		2		2	1				
AMWI							4	2	
BWTE	1			1			4		
WODU	1				1	1		2	1
COGO	4	2	4	13	2	3	8	8	4
COME	4	2	1	1	3	2	9	3	1
KILL	2								
LBCU								2	
SPSA		3	1	1		1			
RBGU	37		18	6	16	9	5	6	7
CAGU	1								
FRGU									73
RTHA	1	1	1	1	1	1			1
SWHA	1						1		
OSPR								1	
AMKE	3	2	2	1	1	1	2	2	3
RNPH	1			1	1		1	1	1
RODO	2	13	2	7	12	28	17	20	6
BEKI						1	2	2	1
YSFL	2	3	2	3	5	2	4		4
FLIN					1		1		1
DOWO	1	1				1			1
EAKI	6	6	4	8	4	6	6	8	8
WEWP	2	6	3	6	3	3	4	7	6
LEFL	1	4	5	5	6	1	2	1	2
TRES	5	6	4	10	7	5	3	7	11
BANS	15	60	54	80	55	200	60	16	22
NRWS			1						
BBMA	14	11	15	12	7	15	17	16	22
AMCR	4	3	2	3	2		3	6	10
CORA						6			
BCCH	1			2	2	5	2	3	8
WBNU					1				
RBNU	2								
HOWR	11	7	11	9	12	12	15	9	11
AMRO	7	2	7	4	9	8	11	2	2
GRCA		1	2	1				1	1
BRTH					2				
CEDW	3	10	6	1	3	4	8	11	4
EUST	31	72	33	71	47	27	55	52	37
WAVI	5	2	4	3	4	3		4	6
TEWA		2							
YWAR	7	10	9	12	12	9	9	14	6
SOSP	3	2	2	3		2	2		
CHSP							1		
CCSP	5	3	5	2	1	1	1	1	2
LISP	1				1				
COGR									6
RWBL	2	3	3	8	5	4	6	4	8
BHCO	3	11	10	6	9	19	5	9	4
BAOR	6	5	5	5	4	11	6	6	5
HOSP			2	3					
AMGO		2		4	3	1	2		
TOTAL	**215**	**264**	**240**	**316**	**253**	**411**	**314**	**251**	**293**
SPECIES	**37**	**31**	**31**	**35**	**35**	**34**	**34**	**32**	**35**

PERSONNEL

Volunteer Field Assistants

Volunteer participation in both the MAPS and migration monitoring projects was the key to the success of our research efforts. Since banding at IBS is done in an area of the sanctuary designated reserve and off-limits to the public, the Area Manager has made it a condition of operation that no more than 3 banders are in the reserve at one time in order to minimize impacts. Thus, on any given day, a Bander-in-Charge and 2 volunteers will be carrying out the banding.

Without the donated time, primarily by members of the Calgary Bird Banding Society, the high degree of success achieved would not have been possible. Sincere appreciation is extended to all of the people listed in Table 9 who donated approximately 8 hours on each day indicated.

Banders-in-Charge (BIC)

No salaried staff are involved in any CBBS projects. However it has been decided by the CBBS general membership to offer an honorarium to the Bander-in-Charge (BIC) each day during migration monitoring. Such an arrangement provides a modest incentive for qualified individuals to assume the BIC duties and imposes an accountability on the BIC to complete field data sheets and input and validate the data promptly. Furthermore, in order to cover as many days as possible during the 1995 migration monitoring season it was necessary to bring in several BICs from outside Calgary. This requirement is anticipated to persist into the foreseeable future. The honorarium decided upon by the general membership for the 1995 migration monitoring field season was $90/day, conditional on availability of funds. No honorariums are paid until all duties of the BIC, including data input, have been fully discharged.Individuals who assumed the BIC responsibilities during migration monitoring are listed below.

BIC	Days
Grahame Booth	28[1]
Doug Collister	9[1]
Ross Dickson	8[1]
Rainer Ebel	8[2]
Don Smith	1[1]

[1] donated [2] received honorarium

Table 9. Number of days of volunteer effort contributed by various individuals during the MAPS and migration monitoring projects at Inglewood Bird Sanctuary in 1995.

Individual	Migration Monitoring	MAPS
Mairi Babey	3	
Josh Bilyk	2	
Grahame Booth		7
Michelle Boutin	3	
Wayne Congden	10	
Alyson Comack	1	
Brian Couronne	3	
Ross Dickson	1	
Jon Dudley		1
Marcel Gerard	1	
Dick Graham	2	1
Diane Haselmeyer	1	
Janice Jarvis	2	
Dwight Knapik	12	
Greg Meyer	16	2
Pat Mitchell	11	2
Dale Patton	1	
El Peterson	9	2
Peter Roxburgh	5	1
Peter Sherrington		1
Annie Smith		1
Don Smith	1	1
Don Stiles	5	
Alexandra Torn	9	5
Catherine Watson-McDonald	5	

MORTALITIES AND INJURIES

It is a goal of the CBBS to achieve as low a rate of mortalities and injuries as possible during all banding projects. While we recognize that a rate of zero may not be achievable, we aim to come as close to zero as possible. Casualties here refers to all injuries, minor and serious, and fatalities.

A couple of factors may have contributed to increase the casualty rate this year. Firstly, the nets we purchased from Spider Technologies appeared to have an "edge" on them. Wing abrasions regularly occurred on thrushes. Secondly, we were training many inexperienced volunteers. Since the migration monitoring project at IBS was a new initiative many of the volunteers were new to mist-netting and therefore were all on the steep part of the learning curve. While the number of casualties in 1995 was unacceptable to us, we believe that the experience gained by the volunteers in 1995 will result in reduced casualties in future years.

Documented below are the casualties incurred during the migration monitoring and MAPS projects combined. Note that the number captured, by species, is only given where that species experienced injury or mortality.

	Number	Injuries		Mortalities	
Species	Captured	Number	Type	Number	Cause
SOSA	3	1	wing abrasion		
BCCH	37	1	wing abrasion	2	strangled
HOWR	96	1	wing abrasion	2	predation by Long-tailed Weasel
				2	shock
SWTH	42	2	wing abrasion		
AMRO	145	5	wing abrasion		
		1	leg abrasion		
		1	cut tongue		
TEWA	37	1	leg pinched-bled		
YWAR	63			1	predation (unidentified)
MYWA	531	1	neck abrasion	1	strangled
CONW	8			1	shock-severe cut in wing pit
NOWA	35	1	skull abrasion		
ATSP	11			1	shock
CHSP	29	1	broken leg		
WTSP	95	1	leg abrasion		
WCSP	26			1	predation by Long-tailed Weasel
Total	2085	17	(0.82%)	11	(0.53%)

EQUIPMENT

Mist-nets

At the beginning of the banding season 15 mist-nets were purchased from Spider Technologies in Finland using Baillie Fund grant funds. The nets were 30-mm mesh, 2 ply, 2.6-m high by 12-m long. Although we knew that the quality of these nets was inferior to some others, we were disappointed to learn that the nets would not last us more than a couple years. The main reason for this is that due to the potential for trespassers in the Sanctuary we were uncomfortable leaving furled nets in the field. The putting up and taking down of the nets each day took its toll over the course of the season. Many loops became unstitched, panel ties regularly broke or came untied, and rough edges on the loops consistently snagged the mesh.

The current condition of the 15 Finnish nets is as follows:

- 1 was completely destroyed by a Mule Deer;
- 1 requires considerable repair and may not be reusable;
- 4 require some repair but are acceptable;
- 7 are in quite good condition; and
- 2 are still unused.

Additionally we still have ten 12-m x 38-mm mist-nets donated by the Canadian Wildlife Service (Loney Dickson) in 1992 to facilitate the pilot migration monitoring and MAPS that was conducted from 1992-1994. These mist-nets have suffered some wear and tear but are still very serviceable, especially for projects other than migration monitoring and MAPS. The standardization of these two projects dictates the use of 30-mm mist-nets.

Net Poles and Re-bar Stakes

We have a good supply of both net poles (0.5" electrical conduit) and the re-bar that we use as stakes. These items are easily purchased at relatively low cost from most hardware stores.

Banding Equipment

The Bander-in-Charge (BIC) is responsible for providing his/her own banding pliers, circlip pliers, wing rule, weigh scale, etc. This system worked well with the only problem occurring being that weigh scales with differing sensitivities were owned by different BICs. In some cases weight data was lost due to a scale being too small for

the larger birds. It is the intention of the CBBS to acquire a digital scale in order to standardize the acquisition of mass data.

Lab Equipment

Our banding lab in 1995 was in the field. Equipment (table, chairs, tarp etc.) was supplied by the members of CBBS. This arrangement was satisfactory although it would be advantageous for CBBS to acquire a permanent folding field table and several sturdy chairs. There is a possibility that an indoor site may be available in the next several year for use as a banding lab.

Summary

Due to the condition of our nets it will be necessary to purchase 12 higher quality Japanese nets from a supplier like the British Trust for Ornithology (BTO). It is estimated that such nets can be acquired for approximately $100 Cdn. each. We would also like to purchase an AC/DC powered weigh scale to ensure all mass data is consistently recorded. We estimate the cost of this item at $400-500 Cdn.

FUNDING AND ACKNOWLEDGEMENTS

Funding for migration monitoring at IBS was provided by:

- a grant through The James L. Baillie Memorial Fund from a contribution by Environment Canada, supplemented with funds raised through the annual Baillie Birdathon ($1,000);
- funds raised by the CBBS through participation in the Baillie Birdathon (approximately $500); and
- funds raised by the CBBS by conducting a bird banding course (approximately $680).

Most of the grant from the Baillie Fund was used to purchase mist-nets. The bulk of the funds raised by the CBBS were used to provide an honorarium to a Bander-in-Charge brought in from Edmonton for two weeks to optimize coverage of the fall migration. A very high percentage of Bander-in-Charge duties were donated to the project this year. It is not anticipated that this will continue in 1996 and subsequent years. We therefore foresee a requirement for increased levels of funding to ensure qualified Banders-in-Charge can be retained to fulfil the project objectives as well as maintain adequate equipment (primarily mist-nets).

Field data forms for migration monitoring were modified from forms designed for the Last Mountain Lake Observatory in Saskatchewan. We acknowledge John Pollock's spirit of cooperation in sharing digital copies of these forms for our use.

We are optimistic that the IBS migration monitoring project will become part of a Canada-wide system of monitoring sites and thereby qualify for enhanced funding through the Baillie Birdathon. Annual funding requirements for this project are in the $5,000-7,000 range. The majority of this annual funding requirement could be raised though the Baillie Birdathon if the CBBS received 50% of the proceeds.

FATAL LIGHT AWARENESS PROGRAM (FLAP) CALGARY

Introduction

Colliding with glass is often fatal for birds. Of the many and varied threats we humans pose on our avian friends, this one literally hits us close to home. Window "predation" rates high among the list of threats that are often overlooked by man as simply just a cost of doing business. Concerned, the CBBS initiated a research project to determine:

- to determine the number of avian mortalities that occur in the downtown core, especially during the migration periods; and

- if weather conditions and building lights have an effect on birds in our area. Many species of birds migrate at night, using the stars to navigate. When fog or overcast conditions occur, the ceiling at which the birds fly is lowered and this can cause fatalities as the birds could home-in to any building lights left on and potentially hit the buildings (The Fatal Light Awareness Program (FLAP) in Toronto records over 2,000 birds annually).

As there is not much existing information about this problem in the Calgary area, all of our information is new and will be compiled for a minimum five-year period to determine if any fluctuations are evident.

1995 Activities

The study sought the cooperation of 20 of the larger buildings in the downtown core. The location covered the entire stretch from the Nova Building on the west end, to Petro Canada Centre on the east end. We asked that the building services staff call us with any information on any birds that they may find dead or alive (most building staff are cleaning the sidewalks as we are waking up). Additionally, visual reconnaissances through the downtown area were undertaken by CBBS volunteers on selected days, particularly on overcast days or during major weather events.

Table 10 summarizes the data gathered. It appears that Calgary does not experience the same avian mortality magnitude due to building collisions as Toronto. During the spring-fall migration period we had only 33 reported incidents and of those reported, 5 were released alive and 3 banded. Calgary did not experience many overcast nights during the 1995 season, which likely reduced the FLAP syndrome. Twenty-one percent of reported incidents involved raptors and over 3/4 of them collided with the buildings during daylight hours.

During the periods when the CBBS migration monitoring station at IBS had its big days, 13 and 19 September, the downtown area (see Table 9) did not report any fatalities. Apparently the mature riparian poplar forest habitat along the Bow River provides a much more attractive refuge than the downtown core.

The intent in 1996 is to organize more buildings into the program and increase patrols on the days that cold fronts are coming through the area. Over the next few years we hope to better quantify the level of mortality sustained by migrating birds in downtown Calgary.

Table 10. 1995 Records of Birds Colliding with Buildings in Downtown Calgary

			Building		Weather
Species	**Date**	**Time**	**Name**	**Side**	**Overnight**
Yellow - bellied Sapsucker	501	1145	Barron Building	S	
American Robin	508	725	Elveden Centre	N	
Raptor sp.	515	?	*Western Gas Tower	N	
Merlin (female)	524	1445	*Cadillac Fairview Tower	S	
Yellow Warbler	529	600	*Western Canadian Place	E	+8/overcast
Swainson's Thrush	530	1030	*Western Gas Tower	E	
Yellow Warbler	601	900	*Western Canadian Place	N	
Mallard	606	1230	Norcen Tower	S	
Rock Dove	627	1135	*Cadillac Fairview Tower	N	
House Sparrow	707	1030	Elveden Centre	W	+12/clear
**House Sparrow	730	1145	Elveden Centre	E	
**House Sparrow	810	1230	*Eaton Centre	N	
Belted Kingfisher	813	?	Royal Bank Building	N	
House Sparrow	814	945	*Encor Tower	W	
American Kestrel	822	1515	SunLife Plaza	N	
Townsend's Warbler	825	900	*Canterra Tower	W	+10/clear
**Wilson's Warbler	827	?	*Western Gas Tower	N	
Merlin	828	1715	First Canadian Centre	W	+21/cloudy
American Kestrel	907	1600	First Canadian Centre	N	+20/cloudy
Warbler sp.	908	?	*Gulf Canada Sq.	N	
American Tree Sparrow	908	?	*Gulf Canada Sq.	N	
Wilson's Warbler	908	915	*Western Canadian Place	N	
White-throated Sparrow	909	?	*Canterra Tower	N	
American Robin	910	?	Can Oxy Building	N	
American Kestrel	920	?	*Western Canadian Place	N	+8/rain
**Swainson's Thrush	922	800	Elveden Centre	N	+8/rain
Gull sp.	1021	1000	Norcen Tower	S	
House Sparrow	1023	1130	First Canadian Centre	W	
Northern Goshawk	1024	1330	Alberta Stock Exchange	N	
Common Redpoll	1026	830	*Western Canadian Place	S	
**Rusty Blackbird	1104	1230	*Cadillac Fairview Tower	N	+6/clear
Common Redpoll	1120	1030	Elveden Centre	W	-3/overcast
Cedar Waxwing	1122	?	*Western Canadian Place	N	
** alive and released/ SWTH, RUBL, WIWA banded and released			* mirrored finish office towers		

THE FUTURE

If the success of our first year is any indication, the future of the CBBS looks bright. The migration monitoring project at IBS will continue and may be extended into October. Banders will have to brave cool October mornings but may be rewarded by later migrating species such as White-crowned, White-throated and Harris's sparrows. There are still a number of hardy warblers moving during this time too.

As the CBBS grows, so will the number and types of projects. One of the projects to look for next year is tape-luring of Northern Saw-whet Owls for banding and to document migration. The fall movement of this species is thought to start around 15 October and lasts about a month.

The MAPS project at IBS will continue. There are not as many banding days during MAPS but participants get a greater variety of tasks such as a vegetation survey and listening counts. There is a possibility that a second MAPS station could be started on the Cominco land along the Bow River south of IBS.

Another possible project for next year involves bird banding during the winter months. This will help those of you who still get the itch to band and can't wait until spring. Banding can't be attempted when it is too cold, but when a Chinook blows in there is no reason we can't get out there and band. For example Greg Meyer and Grahame Booth are setting up a project to study wintering Pine Grosbeaks in the foothills west of Calgary.

APPENDIX 1

MIGRATION MONITORING PROTOCOL

Inglewood Bird Sanctuary

This migration monitoring protocol is based on methods described in section 6.9 of Hagan *et al.* (1994) and reflects modifications required to optimize migration monitoring at Inglewood Bird Sanctuary in Calgary.

Goals and Objectives

The Calgary Bird Banding Society (CBBS) will conduct intensive monitoring of fall bird migration at the Inglewood Bird Sanctuary (IBS) during the months of August and September.The intent of the CBBS is to maintain an ongoing long-term commitment to this project. Migration data will be collected in a standardized manner and will be integrated with similar data from other monitoring projects as part of a continent-wide analysis of population trends.

Definition of Monitored Area

The monitored area will include the entire Inglewood Bird Sanctuary, located adjacent to the Bow River in the City of Calgary, Alberta (Figure 2). Birds seen or heard, on or above adjacent lands and the Bow River will be included.

Definition of Count Period

The daily count period will start at sunrise and continue for the first six hours following sunrise.

Personnel Requirements

There will be at least two participants present each day, weather permitting, during the migration monitoring period. This will include a Bander-in-Charge (BIC) and one other participant capable of completing a daily census. Due to constraints imposed by the Area Manager, a maximum of three persons may participate at one time on any given day. The third person may be a trainee, participant or other observer.

Migration Count Methods

Three sources of data will be integrated into an estimated daily total (EDT) of migrants at IBS. These sources of data are a daily census, birds captured for banding and incidental observations.

Daily Census

A daily census will be taken along a predetermined route (Figure 2). The census should begin one or two hours after sunrise, although weather conditions or numbers of captured birds may force it to be delayed until later in the morning. This census will cover the majority of the sanctuary and should take approximately 1 hour to complete. All birds seen or heard on or above IBS and adjacent lands will be counted and recorded (see data form). The census taker must be an experienced birder with the ability to identify all or most of the expected species by sight and sound. More than one census taker may participate with this fact noted.

Mist-Netting

The CBBS will operate ten 12-m x 30-mm mist-nets at standardized locations in the reserve portion of IBS (Figure 2). Mist-nets will be open every day for six hours starting at sunrise. This requirement will only be waived when dictated by adverse weather conditions, potential for capture of more birds than can be handled safely or the unavailability of a qualified bander-in-charge. All birds captured, recaptured and repeating (same day) will be recorded. Closure and opening times must be recorded (see data form).

The minimum data taken from each captured bird will be species, age and sex (See record-keeping procedures below). Wing chord, body mass, skull ossification, fat condition and molt condition will also be measured unless there are more birds being captured than can be processed in a reasonable amount of time or other extenuating circumstances. An attempt to band all birds captured will be maintained although no individual bird will be held for more than one hour. This requirement creates the possibility of releasing unprocessed birds. In this unusual circumstance, an entry will be made on a "rapid release form" (see data form).

Checking for trapped birds should take place at least every 30 minutes. The order in which the nets are checked is not critical although the usual sequence is: 11, 15, 12, 13, 7, 5, 4, 14, 8, and 10. Nets 7, 13, 12, 15, and 11 are re-checked on the return trip.

Incidental Observations

Throughout the day, personnel will make note of any birds in the station area or on net runs, apart from the ones they count on census or capture in banding operations. These observations must be written down at or near the times they take place (see data form). Data collected will include species, number of birds, time seen and other comments such as location, direction of travel and behaviour. Care should be taken not to duplicate entries although the length of time observed may be helpful in estimating numbers of stopovers and residents.

Estimated Daily Total (EDT)

An estimated daily total number of individuals of each species present in the station area will be made at the end of each day. Totals should be compiled by all personnel present after all other record-keeping for the day has been completed. Personnel should try to arrive at a consensus for each species. The method for arriving at the EDT is taken directly from McCracken *et al.* 1993, section 6.4. This publication should be referred to for detailed specifications. A brief summary follows:

- on log sheets (see data form), record the numbers of species banded, retrapped, seen on census and incidentally observed;
- run down the list on the log sheet asking for other observations. Some judgements must be made and can include good estimates but not extrapolations. It should not include repeated counts of the same birds. Take behaviour, time of day, and other relevant circumstances into account; and
- the estimated daily total is derived from data that appear in the four columns of the log sheet. Inspect all of these numbers together, and along with all other participants, try to derive the best estimate of the number of birds present that day.

Record-Keeping Procedures

Clear and concise records must be kept for all activities performed during normal operation of the bird banding station at IBS. The following data forms are expected to be filled out for every day of field operations with the exception of the "rapid release form":

- **Daily Log** - includes the names of all participants present including Bander-in-Charge (BIC), census taker and volunteer helpers. A short narrative is included focusing on bird migration, bird injuries and mortalities, non-avian fauna and flora, and any management of the station that had to be performed;
- **Field Banding Sheet** - contains space for all data taken from individual birds captured by mist-netting. The minimum data recorded on these sheets for banded birds must include disposition code, band number, species, age, sex, time banded, trap number and bander. Secondary data, listed in order of importance, will also be collected whenever possible - wing chord, skull ossification, mass, cloacal protuberance (CP), brood patch (BP), fat condition and primary molt;

- **Net Log** - this form contains columns for the opening and closing times for each net, total amount of time each net is up, as well as space to write a brief weather report at specific times during the day;

- **Incidental Observations** - this form is intended for any incidental observations made during the day. The data recorded will include species, number seen, time of day and as well as additional comments such as location, direction of flight, behaviour etc;

- **Rapid Release Form** - this form is intended for use when there is a very large influx of birds which cannot be processed in a normal way without compromising safety. It will be used as a last resort to collect a minimum amount of information (see above) on as many birds as possible. This form contains columns for net number, species, sex, age, time and recorders name; and

- **Estimated Daily Totals** - this form is the end result of each day's effort from all personnel involved at the migration monitoring station. It contains columns for each species of bird likely to occur during fall migration at IBS. Next to the species names are columns for numbers of newly banded birds, repeat captures, census tally and incidental observations. From this data and discussion amongst the days participants, a daily estimated daily total is arrived at.

Knowledge, Skills and Experience Required

The most stringent criteria in this section applies to the Bander-in-Charge (BIC). The BIC must be a qualified bird bander holding mist-netting authorization of passerine birds. The BIC must have good identification skills and be able to use the age and sex keys contained in the CWS bird banding manual. The BIC must exercise good judgement as to when mist-nets should be closed for weather related reasons or other extenuating circumstances and must also be willing to provide training.

The census taker must be an experienced birder who is able to identify all or most species of birds by sight and sound. Training will be provided by the CBBS to ensure an adequate supply of research volunteers capable of maintaining the migrant monitoring project. This training will consist of hands-on experience taking birds out of nets, record keeping, and census taking. An emphasis will be placed on bird identification by sight and sound as well as increasing the participants ability to recognize situations which may compromise the safety of the birds.

Potential Habitat Changes

The habitat at IBS consists of mature riparian balsam poplar forest with a well developed shrub understorey. The CBBS does not anticipate any significant habitat changes during the foreseeable future.

Site-specific Field Procedures

The Area Manager has placed some restraints on field procedures. These restraints reduce human impact within the environmentally sensitive reserve portion of IBS where all bird-banding will be performed.

A maximum of three persons will be in the reserve at any one time. Personnel must stay on the established pathways. Personnel must minimize their exposure to the general public while in the reserve and should wear low-visibility clothing. All questions and enquiries should be referred to the Area Manager. Spring migration monitoring is currently not authorized in the reserve due to the potential for increased environmental impact. The Area Manager requires that all captured European Starlings and House Sparrows be destroyed.

References

Hagan, J.M., K.A. Hobson, D.J.T. Hussell, N. Nur and C.J. Ralph. 1994. Recommended methods for monitoring bird migration. Draft prepared by the Intensive Sites Technical Committee of the Migration Monitoring Council. 22 pp.

McCracken, J.D., D.J.T. Hussell, and E. Dunn. 1993. A manual for monitoring bird migration. Long Point Bird Observatory, Port Rowan, Ontario. 65 pp.

Daily Log

Calgary Bird Banding Society
Inglewood Bird Sanctuary

Date_____

Banders	Recorders	Net Monitors	
bic			

Narrative

(see Manual)

Bird Migration

Bird Injuries and Mortalities

Non-avian Fauna and Flora

Management of the Station

signed (bic)

Band Size_________ Location:________________________ BIC: ____

D	Band Number	Species Code	Age	How	Sex	How	Wing mm	Mass gm	Skull	Primary Molt											Fat	CP	BP	Date	time banded	trap type	trap #	bander	comments
										1	2	3	4	5	6	7	8	9	10	11									
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				
								.																	:				

Instructions For Completing Field Banding Sheets

1. **Print neatly All information** on every banding sheet.
2. No ditto marks; use a vertical line down from repeated entry.
3. If data are not collected leave the appropriate column blank.
4. Start a new page for each day or banding station or location.
5. For definitions of disposition and age codes see banding manual.
6. For recommended band sizes, see appendix 5, LMBO Manual.
7. **Check the band number for each bird before banding and recording.**
8. Do not band sick, injured or unidentified birds
9. For species codes, rules for species codes, see appendix 5, LMBO Manual.
10. For exceptions to rules for species codes see below.
11. For number of primaries see appendix 5, LMBO Manual.
12. For determining presence of cloacal protuberance or brood patch see Pyle et al (1987).
13. Record time using a 24 hour clock.
14. Under trap number enter the number of the mist net, nest box, etc.

Exceptions to Four Letter Species Codes

Northern Flicker: Yellow-shafted	YSFL	Yellow-rumped Warbler: Myrtle	MYWA	Savannah Sparrow		SAVS
Red-shafted	RSFL	Audubon's	AUWA	Baird's Sparrow		BAIS
Tree Swallow	TRES	Black-throated Green Warbler	BTNW	White-crowned Sparrow		WCSP
Bank Swallow	BANS	Blackburnian Warbler	BLBW	Gambel's White-crowned		GWCS
Barn Swallow	BARS	Palm Warbler: Western	WPWA	Dark-eyed Junco: Slate-colored		SCJU
Gray Jay	GRAJ	Blackpoll Warbler	BLPW		Oregon	ORJU
Cedar Waxwing	CEDW	Connecticut Warbler	CONW	Northern Oriole:	Baltimore	BAOR
Northern Shrike	NSHR	MacGillivray's Warbler	MGWA		Bullock's	BUOR
Yellow Warbler	YWAR	Luzuli Bunting	LAZB	Rosy Finch:	Gray-crowned	GCRF
		Lark Bunting	LARB			

Disposition Codes

0 -dead; not banded
1 -banded
2 -repeat, < 90 days
3 -return, > 90 days
7 -recovery
8 -band lost

Age Codes

0 - U unknown
1 - AHY after hatching year
2 - HY hatching year
4 - L local
5 - SY second year
6 - ASY after second year
7 - TY third year
8 - ATY after third year

How Aged/Sexed Codes

1 - plumage
2 - skull
3 - eye colour
4 - wing length
5 - cloacal protuberance
6 - brood patch
7 - bill/mouth
8 - weight

Sex Codes

U - unknown
M - male
F - female

Skull Codes

1 - unpneumatized
2 - partially pneumatized
3 - fully pneumatized

Cloacal Protuberance

Y - present
N - absent

Brood Patch

Y - present
N - absent

Primary Moult Codes

0 - worn
1 - missing, pin, <1/3 grown
2 - 1/3 grown
3 - 2/3 grown
4 - almost fully grown
5 - fresh, fully grown

Furcular Fat Codes (fat)

0 - none
1 - pit <1/3 full
2 - pit 1/3 - 2/3 full
3 - pit 2/3 - almost full
4 - pit full
5 - pit full, fat over breast

Trap (how caught)

MN - mist net
HA - hand
HE - heligoland trap
GT - ground trap
NB - nest box

Net Log

Calgary Bird Banding Society

Inglewood Bird Sanctuary

Date _____

NOTES:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

A.M.

net #	times open open-close	hours min.	hours tenths
1	: - :		.
2	: - :		.
3	: - :		.
4	: - :		.
5	: - :		.
6	: - :		.
7	: - :		.
8	: - :		.
9	: - :		.
10	: - :		.
11	: - :		.
12	: - :		.
13	: - :		.
14	: - :		.
15	: - :		.
16	: - :		.
17	: - :		.
18	: - :		.
19	: - :		.
20	: - :		.
	: - :		.
	: - :		.
	: - :		.
	: - :		.
	: - :		.
		Total	.

Weather	temp.	wind	direction	sky condition
opening				
midpoint				
close				

_____

signed (bic)

P.M.

net #	times open open-close	hours min.	hours tenths
1	: - :		.
2	: - :		.
3	: - :		.
4	: - :		.
5	: - :		.
6	: - :		.
7	: - :		.
8	: - :		.
9	: - :		.
10	: - :		.
11	: - :		.
12	: - :		.
13	: - :		.
14	: - :		.
15	: - :		.
16	: - :		.
17	: - :		.
18	: - :		.
19	: - :		.
20	: - :		.
	: - :		.
	: - :		.
	: - :		.
	: - :		.
	: - :		.
		Total	.

Weather	temp.	wind	direction	sky condition
opening				
midpoint				
close				

_____

signed (bic)

Beaufort Wind Scale		
force		**K.P.H.**
0	smoke rises straight	0 to 2
1	smoke drifts, but no wind vane movement	3 to 5
2	wind felt on face, leaves rustle	6 to 11
3	leaves and small twigs in constant motion wind extends light flag	12 to 20
4	dust and loose paper raised, small branches moved	21 to 29
5	small trees in leaf begin to sway	30 to 39
6	large branches in motion, whistling in wires	40 to 50
7	whole tree in motion	51 to 61

Time Protocol	
Record in tenths of an hour	
min.	**tenths**
5	0.1
10	0.2
15	0.3
20	0.3
25	0.4
30	0.5
35	0.6
40	0.7
45	0.8
50	0.8
55	0.9

Sky Condition Codes:		
0 clear or a few clouds	4 fog or smoke	7 snow
1 partly cloudy (scattered) or variable sky	5 drizzle	8 showers
2 cloudy (broken) or overcast		

Incidental Observations
Calgary Bird Banding Society
Inglewood Bird Sanctuary

Date: ______________

species	**number**	**time**	**comments** (location, direction of flight)

Rapid Release Form

Date____________________

net #	species	sex	age	time	name

net #	species	sex	age	time	name

*use a vertical line instead of ditto marks

Recorder_____

Calgary Bird Banding Society - Inglewood Bird Sanctuary
Estimated Daily Totals

DATE_____

	new	repeat	census	observed	E.D.T.
American White Pelican					
Double-cr. Cormorant					
Great Blue Heron					
Canada Goose					
Wood Duck					
Mallard					
Blue-winged Teal					
Common Goldeneye					
Common Merganser					
Sharp-shinned Hawk					
Cooper's Hawk					
Swainson's Hawk					
Red-tailed Hawk					
American Kestrel					
Gray Partridge					
Ring-necked Pheasant					
Sora					
Killdeer					
Lesser Yellowlegs					
Solitary Sandpiper					
Spotted Sandpiper					
Common Snipe					
Franklin's Gull					
Ring-billed Gull					
California Gull					
Common Tern					
Black Tern					
Mourning Dove					
Rock Dove					
Great Horned Owl					
Common Nighthawk					
Hummingbird					
Belted Kingfisher					
Yellow-be. Sapsucker					
Downy Woodpecker					
Hairy Woodpecker					
Northern Flicker					
Olive-sided Flycatcher					
Western Wood-Pewee					
Trail's Flycatcher					

	new	repeat	census	observed	E.D.T.
Least Flycatcher					
Empidonax sp.					
Eastern Phoebe					
Eastern Kingbird					
Tree Swallow					
N Rough-winged Swallow					
Bank Swallow					
Cliff Swallow					
Barn Swallow					
Swallow sp.					
Blue Jay					
Black-billed Magpie					
American Crow					
Black-capped Chickadee					
Red-breasted Nuthatch					
White-breasted Nuthatch					
House Wren					
Golden-crowned Kinglet					
Ruby-crowned Kinglet					
Swainson's Thrush					
Hermit Thrush					
American Robin					
Gray Catbird					
Brown Thrasher					
American Pipit					
Cedar Waxwing					
European Starling					
Solitary Vireo					
Warbling Vireo					
Philadelphia Vireo					
Red-eyed Vireo					
Tennessee Warbler					
Orange-cr. Warbler					
Yellow Warbler					
Chestnut-sided Warbler					
Magnolia Warbler					
Cape May Warbler					
Yellow-rumped Warbler					
Townsend's Warbler					
Black-thr. Green Warbler					

	new	repeat	census	observed	E.D.T.
Palm Warbler					
Bay-breasted Warbler					
Blackpoll Warbler					
Black-and-white Warbler					
American Redstart					
Ovenbird					
Northern Waterthrush					
Connecticut Warbler					
Mourning Warbler					
MacGillivray's Warbler					
Common Yellowthroat					
Wilson's Warbler					
Canada Warbler					
Western Tanager					
Rose-breasted Grosbeak					
American Tree Sparrow					
Chipping Sparrow					
Clay-colored Sparrow					
Savannah Sparrow					
Le Conte's Sparrow					
Fox Sparrow					
Song Sparrow					
Lincoln's Sparrow					
Swamp Sparrow					
White-throated Sparrow					
White-crowned Sparrow					
Harris' Sparrow					
Dark-eyed Junco					
Red-winged Blackbird					
Rusty Blackbird					
Brewer's Blackbird					
Common Grackle					
Brown-headed Cowbird					
Northern Oriole					
Purple Finch					
Pine Siskin					
American Goldfinch					
House Sparrow					
TOTAL BIRDS					
TOTAL SPECIES					

APPENDIX 2

SIGNIFICANT RECAPTURES

Belted Kingfisher 1363-70918 Banded as HY-M by Doug Collister at Inglewood Bird Sanctuary on 09 Sep 1994. Recaptured there as AHY-M on 01 Aug, 08 Aug, and 10 Aug 1995. 1 year old.

Downy Woodpecker 1461-63690 Banded as U-F by Doug Collister at Inglewood Bird Sanctuary on 27 Aug 1994. Recaptured there as AHY-F on 19 Aug 1995. At least 1 year old.

Eastern Kingbird 1451-38640 Banded as AHY-F by Ross Dickson at Inglewood Bird Sanctuary on 07 Jul 1992. Recaptured there as AHY-F on 11 Aug 1995. At least 4 years old.

Black-capped Chickadee 1950-45065 Banded as AHY-U by Doug Collister at Inglewood Bird Sanctuary on 20 Aug 1994. Recaptured there as AHY-F on 17 Jun 1995 and AHY-U on 09 Aug 1995. At least 2 years old.

... 1950-45186 Banded as HY-U by Doug Collister at Inglewood Bird Sanctuary on 31 Aug 1994. Recaptured there as AHY-U on 22 Jul, 11 Aug, and 26 Sep 1995. 1 year old.

... 1950-45254 Banded as HY-U by Doug Collister at Inglewood Bird Sanctuary on 06 Sep 1994. Recaptured there as AHY-F on 17 Jun 1995, and U-U on 17 Sep 1995. 1 year old.

... 1950-45256 Banded as AHY-U by Doug Collister at Inglewood Bird Sanctuary on 06 Sep 1994. Recaptured there as AHY-U 04 Sep 1995. At least 2 years old.

... 1950-45258 Banded as AHY-U by Doug Collister at Inglewood Bird Sanctuary on 06 Sep 1994. Recaptured there as AHY-U on 24 Sep 1995. At least 2 years old.

House Wren 1950-48126 Banded as AHY-U by Ross Dickson at Inglewood Bird Sanctuary on 10 Jun 1993. Recaptured there as AHY-F on 04 Jun 1995. At least 3 years old.

... 1910-52261 Banded as AHY-U by Ross Dickson at Inglewood Bird Sanctuary on 21 Jul 1992. Recapturd there as AHY-F on 04 Jun and 17 Jun 1995, and AHY-U on 09 Sep 1995. At least 4 years old.

Warbling Vireo 1950-48110 Banded as AHY-F by Ross Dickson at Inglewood Bird Sanctuary on 31 May 1993. Recaptured there as AHY-F on 25 Jun 1995. At least 3 years old.

... 1910-52290 Banded as AHY-F by Ross Dickson at Inglewood Bird Sanctuary on 28 Jul 1992. Recaptured there as AHY-U on 04 Aug 1995. At least 4 years old.

... 1950-45045 Banded as AHY-U by Doug Collister at Inglewood Bird Sanctuary on 19 Aug 1994. Recaptured there as AHY-U on 07 Sep 1995. At least 2 years old.

Yellow Warbler 1950-48086 Banded as AHY-U by Ross Dickson at Inglewood Bird Sanctuary on 20 May 1993. Recaptured there as AHY-F on 04 Jun 1995. At least 3 years old.

... 1950-48133 Banded as AHY-M by Ross Dickson at Inglewood Bird Sanctuary on 01 Jul 1993. Recaptured there as AHY-M on 18 Aug 1994 and 04 Jun 1995. At least 3 years old.

... 1950-48129 Banded as AHY-M by Ross Dickson at Inglewood Bird Sanctuary on 25 Jun 1993. Recaptured there as ASY-M on 07 Jul 1995. At least 3 years old.

... 1910-52230 Banded as AHY-M by Ross Dickson at Inglewood Bird Sanctuary on 16 Jun 1992. Recaptured there on 23 Aug 1995. At least 4 years old.

APPENDIX 3

WEATHER

A comparison of the weather experienced at the Inglewood Bird Sanctuary migration monitoring station from April through May is tabulated below. It is noteworthy that temperatures were slightly cooler than normal (30-year mean) during July and August. Precipitation was significantly higher than normal during July and lower than normal during August and September.

Following is a tabulation of weather conditions taken during migration monitoring. During August and early September the weather was stable with no major frontal passages. However in the latter half of September several major cold fronts came through, accompanied by large numbers of birds as documented in the main body of this report.

1995	Mean Daily Temperature (C)	Normal Daily Temperature (C)	Total Precipitation (mm)	Normal Total Precipitation (mm)
April	9.6	10.6	31.8	25.1
May	15.8	16.4	71.9	52.9
June	20.7	20.6	43.4	76.9
July	21.3	23.2	133.4	69.9
August	20.3	22.7	34.2	48.7
September	19.2	17.4	27.9	48.1
October	10.7	12.6	14.4	15.5

Source: Environment Canada, *Monthly Meteorological Summary*, April-October 1995, Calgary "A", (YYC - Calgary Internatioal Airport), Alberta

Weather Conditions at Inglewood Bird Sanctuary During Fall Migration

Date	Nets Opened				Midpoint				Nets Closed			
	Temp deg C	Wind		Sky	Temp deg C	Wind		Sky	Temp deg C	Wind		Sky
		Beaufort	Direction			Beaufort	Direction			Beaufort	Direction	
801	12	0		1		2	SW	1	18	3	NW	1
802	8	0		2		1	SE	1	16	2	SE	0
803	9	0		0		3		0	21	3		0
804	13	0		0		2	W	0	24	1		0
805	14	2	W	0		4	W	1	18	3	W	2
806				8				8				8
807												
808	7	0		2		1		2	9	0		8
809	9	3	W	1		5	W	0	16	5	W	1
810	12	0		2					22	1		2
811	9	0		2		1		2	17	2		1
812	12	1		2	12	1		2	20	1		1
813	8	5	W	5		5	W	2	15	5	W	1
814	8	0		0		2		0	17	3	SW	2
815	10	0		2		2	SE	1	18	4	SE	2
816	10	0		0	15	0		0	20	0		0
817	9	3	NW	1		4	NW	1	15	5	NW	1
818	6	0		2		1	SW	1	15	4	SW	1
819	8	0		0		2		0	19	2		1
820	7	0		0		0		0	19	3	SE	1
821	7	0		0		2		0	22	4	SW	0
822	9	0		1		2	E	1	19	3	E	0
823	11	1	W	4	16	1	N	0	26	0		0
824	10	0		2		2	N	2	12	0		8
825	5	0		0	15	0		0	22	0		0
826												
827	9	0		0	15	2	E	0	23	2	E	1
828	7	0		0	10	0		0	22	0		0
829	9	2	S	2	10	1	S	1	12	2	S	8
830	6	0		1		0		1	18	1	S	0
831												

Weather Conditions at Inglewood Bird Sanctuary During Fall Migration

Date	Nets Opened				Midpoint				Nets Closed			
	Temp deg C	Wind		Sky	Temp deg C	Wind		Sky	Temp deg C	Wind		Sky
		Beaufort	Direction			Beaufort	Direction			Beaufort	Direction	
901	11	0		0		2	N	0	19	2	N	0
902	2	0		0		2		0	25	3		0
903	8	0		0		0		0	26	2	NE	0
904	7	0		0		2		0	21	4	SE	0
905	11	3	N	2		0		8	16	5	NE	2
906				8				8				8
907	9	0		2		3	SE	2	13	2	SE	2
908	8	0		0	13	0		0	18	2	SW	2
909	5	1	W	0	11	0		0	21	0		0
910	7	0		0	15	0		0	21	0		0
911	10	0		0	18	0		0	24	1		0
912	11	0		0	12	0		0	24	0		0
913	13	0		2		0		2	24	2	S	0
914	7	0		0	11	0		0	21	2	S	0
915	12	3	NNW	2	9	4	N	2	9	4	NNE	2
916	5	0		1		4	SSE	1	12	5	SE	0
917	6	0		2		4	N	0	11	5	NE	2
918				7				7				7
919	1			2	7			0	12			0
920	0	1		7	2	1		7	5	1		2
921	-2			0					16			0
922	8	2	NW	1					22	6	NW	1
923	2	0		0		2		0	13	2		0
924	4	1	W	0		2		0	22	3	NW	0
925	6	0		0					21	0		0
926	1	0		0					22	5		0
927	8			2					22	5		0
928	8			0					19	2	NW	1
929				8				8				8
930	4	0		2		2	SW	2	16	1	SW	2