

CALGARY BIRD BANDING SOCIETY
2006 ANNUAL TECHNICAL REPORT



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Custodire aves
Keep watch on birds

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Calgary Bird Banding Society Code of Ethics

1. Members are jointly responsible for the safety and welfare of the birds they capture and study. Stress, injuries and mortalities must be minimized. The following guidelines must be adhered to:

- handle each bird carefully, gently, quietly, and with respect
- capture only as many birds as you can safely process
- close traps or nets when predators in the area result in unacceptable risk to bird safety
- do not open nets in inclement weather
- assess the condition of nets frequently and repair or replace them quickly
- members must be properly trained and supervised
- check nets at least every 30 minutes
- close and properly furl all nets at the end of each banding day
- do not double bag birds
- use the correct band size and banding pliers for each bird
- treat all bird injuries in the most humane way

2. Members must continually assess their own work to ensure that the highest standards possible are maintained. The following guidelines must be adhered to:

- reassess methods and your approach whenever an injury or mortality occurs
- accept constructive and positive criticism from your peers

3. Members must offer honest and constructive assessment of other members work to help develop and maintain the highest standards possible. The following guidelines must be adhered to:

- provide criticism to other members in a constructive and positive manner
- inform members and others of innovations and improvements in capture, handling and banding techniques
- any mistreatment of birds or improper conduct by a member must be reported to the BIC and/or a member of the CBBS executive



Banding station at Las Caletas, Costa Rica 2006

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EXECUTIVE SUMMARY

The Calgary Bird Banding Society (CBBS) was incorporated in March 1995. The main objective of CBBS remains conducting migration monitoring and other banding-based studies at Inglewood Bird Sanctuary (IBS), a federal Migratory Bird Sanctuary. IBS has long been known as an important migration site for Neotropical migrants. Located within 80-km of the Rocky Mountains, the site is an integral component of the Canadian Migration Monitoring Network.

During 2006, in addition to membership dues and member donations CBBS received support from the Alberta Gaming and Liquor Commission, Petro-Canada Volunteer Grant Fund and Baillie Birdathon.

Spring migration monitoring was undertaken at IBS for the fifth consecutive year since it was initiated in 2002. The 2006 fall migration monitoring program marks the 12th year of monitoring and follows pilot programs in 1992 and 1994 and full fall programs in 1995 through 2005. Mist-nets were operated on 33 of the 38 days between 1 May and 7 June (2273 net-hrs) and 64 of the 69 days between 28 July and 4 October (4513 net-hrs). Total new bandings of 311 and 1625 were achieved for the spring and fall programs respectively. A total of 919 feather samples were collected from 28 species at IBS during 2004. A large subset of these samples has been analyzed and interpretation is underway in an effort to comprehensively characterize the breeding and/or natal areas of origin for species monitored at IBS.

The IBS MAPS site was operated again in 2006. The 139 new bandings of 22 species was the highest since the project was initiated in 1992. A MAPS pilot program was initiated at Dinosaur Provincial Park in 2006. Although 234 new bandings of 29 species was achieved in only 6 of 7 possible periods onerous logistics preclude continuation.

Migration monitoring was not continued during 2006 at Las Caletas, Costa Rica on the Osa Peninsula along the Pacific coast. Rather pilot Monitoreo de Sobrevivencia Invernal (MoSI) was carried out at both Las Caletas and a site on Isla Violin near the mouth of the Sierpe River. A total of 746 birds were captured of which 383 were new bandings. New species or subspecies captured in 2006 were Mangrove Hummingbird (2), Rufous Piha (1), Wood Thrush (1), White-throated Robin (5), Summer Tanager (2) and Great-tailed Grackle (2).

2006 marked the third year of full Northern Saw-whet Owl migration monitoring at a site in the foothills southwest of Calgary. A total of 158 Northern Saw-whet Owls were captured and banded on 37 evenings between 15 September and 7 November. 56% were HY and 59% were F. New owls captured/net-hr was 0.25 in 2006 compared to 0.27 and 0.29 in 2004 and 2005 respectively.

For the first time at IBS a Tennessee Warbler banded in a previous year was recaptured and for the second time a Yellow-rumped Warbler was recaptured. These would appear to be yet two more rare examples of stopover site fidelity at IBS. Two Northern Saw-whet Owls banded at

IBS were recaptured at other sites and reported to us in 2006. An HY-F banded on 9 October 2005 was recaptured near Edenwold, SK by Jared Clarke on 13 October 2006 as SY-F approximately 717-km E and an HY-F banded on 4 October 2004 was recaptured at the Wind Mountain Banding Station in Montana on 21 October 2005 as SY-F approximately 352-km SSE. Old birds recaptured at IBS included American Robins (≥ 9 -yrs and ≥ 5 -yrs) and a Yellow Warbler banded at Cominco and recaptured in Carburn Park (≥ 7 -years).

Trend analysis was undertaken on 28 species occurring as migrants at IBS and captured in sufficient quantity to allow analysis. It is interesting that three species (Traill's Flycatcher, Wilson's Warbler and White-crowned Sparrow) show significant ($P < 0.05$) increases which is consistent with an increasing supply of second growth and/or shrubby habitat.

Banders-in-Charge and volunteers contributed 442 person-days or approximately 3,536 hours to CBBS projects during 2006.

The number of mortalities during 2006 CBBS banding projects remained low at 0.24% while the injury rate in 2006 dropped back to 0.70%, the lowest level since CBBS was initiated.



Mangrove (Yellow) Warbler banded during MoSI in Costa Rica 2006

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;
- Promote involvement and expertise in bird banding; and
- Promote conservation of Neotropical migratory birds by fostering public awareness and understanding of Neotropical migratory birds.

Although the primary project of the CBBS is monitoring of migratory birds at Inglewood Bird Sanctuary (IBS) in Calgary, other complementary projects have also been undertaken:

- a Monitoring Avian Productivity and Survivorship (MAPS) station was established at IBS in 1992 and continued in 1993 and 1995-2006;
- spring banding was initiated in 1997 at Dunbow Road approximately 22-km SSE of the City of Calgary and continued in 1998 and 1999;
- spring and fall banding/migration monitoring was initiated at the Cominco Natural Area (CNA) in 2000 with spring banding continued in 2001;
- colour-banding and relocation of Red-tailed and Swainson's Hawks at Calgary International Airport was initiated in cooperation with the Calgary Airport Authority in 2000 and continued through 2004;
- pilot spring migration monitoring was initiated at Las Caletas on the Osa Peninsula, Costa Rica in 2002, continued in 2003 and full migration monitoring initiated in 2004 and continued in 2005;
- pilot Monitoreo de Sobrevivencia Invernal (MoSI) was undertaken in Costa Rica both at Las Caletas and another site on isla Violin in 2006;
- a Northern Saw-whet Owl migration monitoring pilot program was carried out at Inglewood Bird Sanctuary in 2000 and subsequently discontinued;
- pilot Northern Saw-whet Owl migration monitoring was carried out in 2003 and full migration monitoring was initiated in 2004 and continued in 2005 and 2006 at a location in the foothills southwest of Calgary; and
- pilot MAPS was undertaken at Dinosaur Provincial Park (DPP) in 2006.

As of 1998 the Calgary Bird Banding Society's Inglewood Bird Sanctuary site is a fully designated member of the Canadian Migration Monitoring Network (CMMN) a cooperative initiative of the member stations, Canadian Wildlife Service and Bird Studies Canada. This formal association of migrant monitoring sites across Canada significantly enhances the value of the work conducted at each site. The Calgary Bird Banding Society and Inglewood Bird Sanctuary hosted the 2003 CMMN national meeting.

Canadian Migration Monitoring Network (CMMN)



FUNDING AND ACKNOWLEDGEMENTS

Funding other than membership dues and member donations during 2006 were:

- funds raised by the CBBS through participation in the Baillie Birdathon;
- proceeds from Alberta Gaming and Liquor Commission arising from CBBS sponsored casinos; and
- a grant from the Petro-Canada Volunteer Grant Program.

Funds were used to provide a per diem to Banders-in-Charge (BICs), cover in-country costs for the Costa Rica migration monitoring project, purchase mist-nets, produce the annual technical report, conduct stable isotope analyses of feather samples and cover migration monitoring miscellaneous costs (field data sheets, batteries, film and processing etc.).

Sincere appreciation goes out to all CBBS members who have helped make 2006 another successful year for CBBS. Many non-members have helped immensely by volunteering at our casino, participating in the Baillie Birdathon and providing expertise such as carpentry, electrical etc. Thanks to you all.



Winter Wren banded at IBS during fall 2006

MIGRATION MONITORING AT INGLEWOOD BIRD SANCTUARY

Background

Neotropical migrants are birds that breed in the Nearctic biogeographic realm and winter in the Neotropics. The Neotropical migratory bird system involves some 5-10 billion birds of over 150 species (Greenberg 1992). Trends in data from the Breeding Bird Survey indicate that many Neotropical migrants in North America may be decreasing. Although destruction of tropical forests on the wintering grounds has been implicated in declines, increasing concern is being raised about the potential effect of accelerated land-use changes on breeding grounds.

Inglewood Bird Sanctuary (IBS) is a federal Migratory Bird Sanctuary known as an important site for migrating passerines. IBS is strategically located within 80-km of the Rocky Mountains (Figure 1) and is a unique and valuable member of the Canadian Migration Monitoring Network coordinated and administered by Bird Studies Canada. IBS is located within Calgary which greatly facilitates member involvement. Pilot monitoring, covering only a portion of the fall migration, was undertaken in 1992 and 1994. Full spring and fall migration monitoring has occurred since 2002 and 1995 respectively. 2006 is CBBS' 12th anniversary. Monitoring songbird population change based on fall mist-netting has been shown to be an effective technique (Dunn *et al.* 1997).

Methods and Study Site

Both spring and fall migration of Neotropical migrants were monitored in 2006 at Inglewood Bird Sanctuary (IBS). IBS's 35 hectares includes mature riverine balsam poplar forest known for its number and diversity of songbirds during spring and fall migration (Sherrington 1975, Elphinstone 1990). 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 (e.g. age, sex, wing chord, weight, fat reserves, capture net, time of capture) from each bird captured was carried out each day, weather permitting, during spring and fall migration. Twelve 12-m long x 30-mm mesh mist-nets were operated in permanent net lanes for approximately 6-hours each day beginning at sunrise. A daily census was obtained when possible. A census was not attempted when the number of migrants or volunteer shortage would result in unacceptable risk to captured birds (e.g. excessive holding time).

The migration monitoring protocol used at IBS was developed from procedures outlined in McCracken *et al.* 1993 (A manual for monitoring bird migration), Hagan *et al.* 1994 (Recommended methods for monitoring bird migration) and Hussell and Ralph 1996 (Recommended methods for monitoring bird populations by counting and capture of migrants). Net locations and the daily census route are shown on Figure 2.

Monitoring Schedule and Coverage

Spring

Spring migration monitoring at IBS was conducted from 1 May to 7 June. This was the fifth year of full spring migration monitoring at IBS. In addition to standardized constant-effort mist-netting, a census route was surveyed 2-3 hours from the start of the netting. Coverage of 87% was achieved. That is, mist-netting occurred on 33 of the 38 target days for a total of 2273 net-hours (Table 1a, Figure 3a). Inclement weather (3 days) and no BIC (2 day) resulted in 5 days of the monitoring period without banding. Inclement weather also resulted in 4 days with a reduced number of net-hours from the daily target of 72.

Fall

Fall migration monitoring at IBS was conducted from 28 July to 4 October. In addition to standardized constant-effort mist-netting, a census route was surveyed 2-3 hours from the start of the netting. Coverage of 90% was achieved. That is, significant mist-netting occurred on 62 of the 69 target days for a total of 4513 net-hours (Table 1b, Figure 3b). Inclement weather (3 days) and no BIC (2 days) resulted in 5 days of the monitoring period without any banding. Inclement weather also resulted in 2 days with a significantly reduced number of net-hours from the daily target of 72.

New Bandings

Spring

A total of 311 new bands were placed on birds of 41 species (Table 2a, Appendix 1a). New bandings in excess of 20 occurred on only 1 day – 3 May (Figure 3a). New banding totals by species at IBS are presented in Table 2a. The top 20 banded species over all years, and during 2006, are identified in Appendix 2. Species monitored at IBS based on criteria developed by Bird Studies Canada appear in Appendix 3 along with those criteria.

Fall

A total of 1625 new bands were placed on birds of 67 species (Table 2b, Appendix 1b). Days on which 50 or more new bandings occurred were 28 July, 22 August, and 9, 12, 20, 22, 23 September. Approximately 44% of new bandings occurred in August and 44% in September (Figure 3b). A much higher percentage of new bandings occurred in 2006 compared to 2004 and 2005. New bandings at IBS from 1992-2006 are presented in Table 2b. The top 20 banded species over all years, and during 2006, are identified in Appendix 2. Several species showed dramatic differences in 2006 in their rank compared to combined historical results. Least Flycatcher was 9th compared to 15th, Ruby-crowned Kinglet was 12th compared to 20th, Tennessee Warbler was 10th compared to 5th and White-throated Sparrow was 6th compared to

11th. Species monitored at IBS based on criteria developed by Bird Studies Canada appear in Appendix 3 along with those criteria.

General

Mist-netting can add another dimension to understanding the avifauna at a site particularly in detection of rare or elusive species. As in past years several species were banded at IBS that are infrequently reported by bird watchers: single Golden-crowned Kinglet, Gray-cheeked Thrush and Brown Thrasher during spring and a Rusty Blackbird during fall were first bandings at IBS of species rarely observed.

The *Oporornis* warblers are often difficult to detect and identify with binoculars. During 2006 migration monitoring at IBS 5 Mourning Warblers and 4 MacGillivray's Warblers were banded. IBS is in the zone of possible hybridization for these species which likely increases the difficulty in differentiating them. Stable isotope analysis of rectrices collected at IBS in 2003 and 2004 may help shed light on the geographic origin of Mourning and MacGillivray's Warblers banded at IBS.

Other areas of research have involved, or have the potential to involve, data from IBS. Banding data were provided to Erica Dunn of CWS as part of a cooperative study on mass gain among migrating songbirds at Canadian stopover sites. Ms. Dunn's analysis provided insight into the quality of IBS as a refueling stop for Neotropical migrants. A copy of her paper appeared in Appendix 4 of the 2003 ATR and is in the reference list. Based on that work IBS appears to be an important refueling stop for Neotropical migrants.

Stable Isotope Ecology

Techniques are being developed to identify the geographic origin of birds captured at CMMN sites using stable isotopes. This project offers the possibility of confirming the hypothesis that CMMN sites monitor birds from a wide area north-west of their respective locations. Preliminary results involving 1999 samples from Delta Marsh Bird Observatory and Atlantic Bird Observatory indeed indicated that CMMN stations are capturing birds from a broad area, not simply from a small region close to the station. To investigate the origin of birds captured at IBS during the fall migration, feather material was collected from 54 resident and migrant birds during 2003. A total of 919 feather samples were collected from 28 species at IBS during 2004. A large subset of these samples has been analyzed and interpretation is underway in an effort to comprehensively characterize the breeding and/or natal areas of origin for species monitored at IBS.

Daily Estimated Totals (DETs)

The daily estimated totals (DETs) represent the total number of birds, by species, detected at the IBS migration monitoring site each day. Each DET incorporates capture data as well as a standardized census and any casual observations made during banding operations. The DETs, after removal of probable and known stopovers (PKS), give an overall description of bird migration. DET is secondary, and inferior to, mist-netting as a monitoring measure at IBS. If high capture rates and/or personnel shortage create a risk to the welfare of the birds, a census (and therefore a DET) is not done.

Recaptures

Recaptures at IBS during migration monitoring totaled 690 of at least 450 different birds of 49 species (see table below). Recapture rates were highest in resident species (e.g. House Wren, Black-capped Chickadee, Downy Woodpecker). However some resident species evidenced a relatively low recapture rate suggesting that migrants swell the ranks (e.g. Yellow Warbler, Western Wood-Pewee, American Robin). A few migrant species appear to use IBS for moulting or extended re-migratory foraging as evidenced by high recapture rates (e.g. Northern Waterthrush, Tennessee Warbler, White-throated Sparrow).

Sixty-seven (67) birds banded at IBS in previous years were recaptured in 2006. All year-to-year recaptures from 1992-2006 are presented in Appendix 4. Most year-to-year recaptures occur in the year following banding. However in a few cases birds are recaptured in several subsequent years and occasionally re-appear a number of years after banding. Of note are:

- Brown-headed Cowbird banded in 2002 and recaptured every year since including 2006;
- Yellow Warblers (n=4) banded at Inglewood and Cominco and recaptured in adjacent areas of the city by a U of A PhD candidate studying connectivity – one of which was a bird banded in 2000!;
- American Robin banded in 2001 and recaptured for the 1st time in 2006;
- Tennessee Warbler banded in 2005 and recaptured in 2006 – a rare case of migration stopover site fidelity; and
- Gray Catbird banded at Cominco in 2001 and recaptured for the first time at Inglewood in 2006.

Species Recaptured at Inglewood Bird Sanctuary during MM 2006					
Species	Recap	Banded	Species	Recap	Banded
Solitary Sandpiper	2	7	Orange-crowned Warbler	35	155
Belted Kingfisher	6	18	Yellow Warbler	48	96
Downy Woodpecker	24	8	Magnolia Warbler	2	6
Hairy Woodpecker	1	1	Yellow-rumped Warbler	73	457
Western Wood-Pewee	4	15	Townsend's Warbler	1	2
Traill's Flycatcher	9	72	American Redstart	5	18
Least Flycatcher	6	48	Ovenbird	13	27
Eastern Kingbird	4	20	Northern Waterthrush	39	46
Warbling Vireo	4	18	Mourning Warbler	5	5
Red-eyed Vireo	1	4	MacGillivray's Warbler	2	3
Tree Swallow	10	14	Common Yellowthroat	4	15
Northern Rough-winged Swallow	3	4	Wilson's Warbler	56	171
Black-capped Chickadee	44	28	Canada Warbler	1	1
White-breasted Nuthatch	8	4	American Tree Sparrow	1	5
Brown Creeper	3	6	Clay-colored Sparrow	4	21
House Wren	78	69	Song Sparrow	14	14
Winter Wren	1	1	Lincoln's Sparrow	15	74
Golden-crowned Kinglet	1	6	Swamp Sparrow	2	2
Ruby-crowned Kinglet	1	32	White-throated Sparrow	40	69
Swainson's Thrush	6	63	White-crowned Sparrow	5	33
Hermit Thrush	1	3	Rose-breasted Grosbeak	1	2
American Robin	38	66	Brown-headed Cowbird	3	4
Gray Catbird	19	28	Baltimore Oriole	5	8
Cedar Waxwing	6	32	American Goldfinch	1	2
Tennessee Warbler	28	43			

MONITORING AVIAN PRODUCTIVITY AND SURVIVORSHIP (MAPS)

Background

The Monitoring Avian Productivity and Survivorship (MAPS) Program is a cooperative effort among public agencies, private organizations, and bird banders of North America . It provides long-term data on population and demographic parameters for target landbird species throughout the continent. The 2006 field season was MAPS 18th year of North American operation.

MAPS utilizes standardized, constant-effort mist-netting 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 capture data 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.

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

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

All of these species have been captured at IBS although only American Robin, Warbling Vireo, Yellow Warbler, Song Sparrow, and Lincoln's Sparrow are breeders. MAPS data is provided to the Institute for Bird Populations in Point Reyes, CA where it is integrated with data from the over 500 other North American stations.

Objectives

The overall objective of the MAPS Program is to contribute to an integrated avian population monitoring system for selected North American landbirds. The indices and estimates obtained:

- 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

The MAPS Program consists of standardized constant-effort mist-netting during the breeding season. The breeding season is considered to extend from May through mid-August and is divided into 10 ten-day periods. Ten 30-mm mist-nets are operated for 6 hours from sunrise on one day in each of the ten-day periods. Mist-netting commences the first ten-day period during which the majority of breeding adults of the target species have established territories and migrant individuals of these species are no longer passing through the area. The operation of the mist-nets must continue for a minimum of three periods in the adult "super-period" and two periods in the young "super-period". At IBS, MAPS initiates during period 4 (31 May - 9 June) and coverage entails the last 7 of the 10 ten-day periods. In recent years period 10 has been operated during fall migration monitoring. During 2003 period 9 was also operated during fall migration monitoring.

An additional requirement is to record the type and distribution of vegetation present at the MAPS station. Because changes in the vegetation at a station can cause changes in breeding populations and demographic parameters, the habitat is assessed every 5 years. CBBS conducted an initial habitat assessment in 2001.

MAPS Schedule and Coverage

2006 marked the 14th year of the MAPS project at IBS since 1992. Unavailability of qualified personnel precluded gathering data in 1994 and flooding in 2005 limited effort to 121 net-hours, all during the first two periods. Record rainfall and flooding precluded further access to the site until late July. Although period 4 is no longer required at stations at the latitude of IBS we have continued with it in most years out of tradition.

Results

The number of each species banded, by date, during 2006 are summarized in Table 4. The number of each species that was banded is summarized in Table 5 and Figure 5 for 2006 as well as the 13 previous years. Please note that 7 of the 10 MAPS nets are also MM nets and therefore many new bandings are both MM and MAPS birds and included in tables and appendices for both projects. New bandings totaled 139 of 22 species. Year-to-year recaptures are an important part of MAPS. In 2006 there were a total of 53 recaptures, many of which were birds banded in previous years (see Appendix 4).

Discussion

Lack of regeneration of balsam poplar has been an issue at IBS. The heavy flooding that occurred during 2005 may have stimulated poplar seedling recruitment thereby helping to alleviate this problem.

DINOSAUR PROVINCIAL PARK PILOT MAPS

Background

Dinosaur Provincial Park is a World Heritage Site located approximately 2 hours east of Calgary or 48-km northeast of the town of Brooks. Potential to band at Dinosaur Provincial Park was identified in 2006 based on discussions with park staff and CBBS decided to conduct a pilot MAPS project at a site within the reserve area just east of the southeastern corner of the public loop road. DPP staff were very supportive of CBBS, both in terms of providing accommodation and a work area for data input and reporting as well as contributing some volunteer effort during banding.

MAPS background and methodology is presented in the previous section of this report and will not be repeated here. The banding area at DPP is riparian forest on the floodplain of the Red Deer River, a rich habitat in terms of breeding birds.

Results

The number of each species banded, by date, during 2006 are summarized in Table 5. Only 6 of the target periods were covered (4,5,6,8,9,10). No banding occurred during period 7 (30 June – 9 July). New bandings totaled 234 of 29 species. An indication of the richness of the habitat at DPP is obtained by considering that 68% more new bandings of 32% more species was achieved at DPP compared to IBS in only 6 versus 7 sessions. Year-to-year recaptures are an important part of MAPS. Although in 2006 there were a total of 51 recaptures, of course, none were year-to-year.

Discussion

Although the site at DPP is interesting and has a good population of breeding birds the logistics of carrying out MAPS using personnel from Calgary is onerous and precludes continuing the project. CBBS intends to conduct pilot spring migration monitoring in 2007 as an alternative which may be more logistically friendly.

MONITEREO DE SOBREVIVENCIA INVERNAL (MoSI)

Introduction

A migration monitoring site on the Osa Peninsula on the Pacific coast of Costa Rica was identified in 1998 and pilot migration monitoring was initiated in 2002 and continued in 2003 (Figure 4). A full migration monitoring program was initiated in 2004 and continued in 2005 to monitor Neotropical migrants on their northward migration through Central America. During 2006 and December of 2005 CBBS undertook a pilot initiative based on the Monitero de Sobrevivencia Invernal (MoSI) program of the Institute for Bird Populations primarily aimed at quantifying over-winter survival of Neotropical migrants.

Study Site

The Las Caletas migration monitoring site is located on the Pacific coast of southwest Costa Rica on the Osa Peninsula just north of Corcovado National Park in the vicinity of the Las Caletas ecotourism lodge. Las Caletas is located on the south coast of Drake Bay, a few kilometres southwest of the small village of Agujitas. The lodge is on a hill looking north over the Pacific Ocean. The monitoring station is 200-m further uphill south of the lodge.

In addition to Las Caletas pilot MoSI was carried out at a site on Isla Violin near the mouth of the Sierpe River a short distance N of Las Caletas. This site is characterized by lowland tropical rainforest and mangroves. It is subject to tidal flooding.

Methods

Methods used at Las Caletas are similar to those at IBS. Constant-effort mist-netting and collection of associated morphometric and other data (e.g. age, sex, wing chord, weight, fat reserves, capture net, time of capture) from each bird captured was carried out on each day, weather permitting. Fifteen 12-m long x 30-mm mesh mist-nets were operated for approximately 6 hours each day beginning at sunrise (~ 0530 to 1130). USFWS aluminum bands were applied to migrants while CBBS-purchased bands were applied to species resident in the area including hummingbirds.

MoSI Schedule and Coverage

MoSI was conducted from 11-17 December 2005, 22-28 January 2006, 28 February-3 March 2005 (Isla Violin) and 5-10 March 2006. Mist-netting occurred on all 24 days for a total of 2074 net-hours (Table 6). Several days had slightly reduced net-hours due to set up, tear down and rain.

Stable Isotope Ecology

A paper has been accepted for publication in AUK, a peer-reviewed journal, based on 109 Swainson's Thrush retrices collected in Costa Rica in 2004. A copy of this paper, which examines the breeding and natal origins of the sampled birds and migration timing versus the expected breeding latitude among other things, will be included in a future ATR.

Captures

In total, 748 birds of 78 species were captured of which 383 (51%) were new bandings, 349 (47%) were recaptures and 16 (2%) were released or otherwise un-banded (Table 6, Appendix 5). New species or subspecies captured in 2006 were Mangrove Hummingbird (2), Rufous Piha (1), Wood Thrush (1), White-throated Robin (5), Summer Tanager (2) and Great-tailed Grackle (2).

A total of 21 over-wintering Neotropical migrants were banded:

- Yellow-bellied Flycatcher (1)
- Great Crested Flycatcher (1)
- House Wren (1)
- Wood Thrush (1)
- Tennessee Warbler (5)
- Chestnut-sided Warbler (2)
- Worm-eating Warbler (1)
- Northern Waterthrush (3)
- Kentucky Warbler (2)
- Mourning Warbler (2)
- Summer Tanager (2)

One Kentucky Warbler was recaptured in MoSI session 2 and another was recaptured in session 3 evidencing both winter site territoriality and over-winter survival. A single Chestnut-sided Warbler and a single Northern Waterthrush, banded in April 2005 were recaptured evidencing over-winter site fidelity and year-to-year survival.

Recapture of resident birds allows quantification of year-to-year survivorship. One hundred and sixty (160) birds banded in previous years (2002-2005) were recaptured during the December 2005-March 2006 MoSI pilot. Based on year-to-year data we get an indication of the survivorship that Neotropical resident birds exhibit (see table below).

Species	Y-Y survival	N
Gray-chested Dove	40%	14
Ruddy Quail-Dove	40%	8
Bronzy Hermit	17%	6
Band-tailed Barbthroat	23%	27
Long-billed Hermit	6%	34
Blue-throated Goldentail	10%	43
Charming Hummingbird	12%	57
Rufous-tailed Hummingbird	19%	19
Black-throated Trogon	20%	5
Blue-crowned Motmot	50%	4
White-whiskered Puffbird	50%	2
Rufous-tailed Jacamar	33%	3
Olivaceous Piculet	33%	6
Buff-throated Foliage-gleaner	35%	12
Plain Xenops	58%	22
Scaly-throated Leaf-tosser	10%	10
Tawny-winged Woodcreeper	67%	16
Long-tailed Woodcreeper	50%	2
Wedge-billed Woodcreeper	48%	42
Northern Barred Woodcreeper	47%	5
Cocoa Woodcreeper	100%	1
Streak-headed Woodcreeper	43%	17
Black-hooded Antshrike	52%	23
Slaty Antwren	47%	9
Dot-winged Antwren	22%	42
Chestnut-backed Antbird	37%	37
Bicolored Antbird	51%	27
Ochre-bellied Flycatcher	26%	103

Species	Y-Y survival	N
Northern Bentbill	42%	16
Golden-crowned Spadebill	17%	6
Ruddy-tailed Flycatcher	52%	9
Yellow-bellied Flycatcher	100%	1
Bright-rumped Attila	29%	21
Dusky-capped Flycatcher	17%	6
Thrush-like Schiffornis	35%	8
Orange-collared Manakin	35%	82
Blue-crowned Manakin	52%	38
Red-capped Manakin	33%	124
Tawny-crowned Greenlet	26%	11
Lesser Greenlet	100%	1
Black-bellied Wren	100%	1
Riverside Wren	26%	30
Long-billed Gnatwren	48%	21
Bananaquit	19%	38
Gray-headed Tanager	24%	25
White-shouldered Tanager	32%	22
Black-cheeked Ant-Tanager	26%	34
Cherrie's Tanager	22%	28
Green Honeycreeper	22%	11
Variable Seedeater	8%	37
Thick-billed Seed-Finch	8%	23
Orange-billed Sparrow	34%	73
Buff-throated Saltator	11%	9
Black-striped Sparrow	33%	5
Blue-black Grosbeak	30%	22
Scarlet-rumped Cacique	33%	3

It should be kept in mind that many of these survival rates are based on small sample sizes. In general sample sizes >60 seem to provide reliable estimates. Data from future years of monitoring will increase sample sizes to this level for many species and thereby refine survivorship rates.

Discussion

The MoSI pilot program undertaken by CBBS in December 2005-March 2006 provided a limited amount of information on over-winter survival of Neotropical migrants. The site on Isla Violin was interesting but poses untenable logistical constraints (uncertain tenure, tidal flooding, difficult access). Based on the 2005-2006 results CBBS has developed a go-forward plan to carry out a combination of migration monitoring and modified MoSI. For the 2006-2007 program year banding sessions at Las Caletas will be carried out in December (6 days), early March (6 days) and late March-April (30 days) to gather data both on over-wintering and migrating Neotropical migrants.



Kentucky Warbler (top) and Summer Tanager (bottom)
banded during MoSI in Costa Rica 2006

NORTHERN SAW-WHET OWL MIGRATION MONITORING

Background

During 2003 a site in the foothills southwest of Calgary was identified as having potential for monitoring migrating Northern Saw-whet Owls (Figure 1). After disappointing results at Inglewood Bird Sanctuary in 2000 the CBBS was pleased to have another opportunity to initiate a Northern Saw-whet Owl migration monitoring program. Pilot monitoring was undertaken in 2003 from 7 October-18 November with encouraging results. A full monitoring program was implemented in 2004 and continued in 2005 and 2006.

Methods

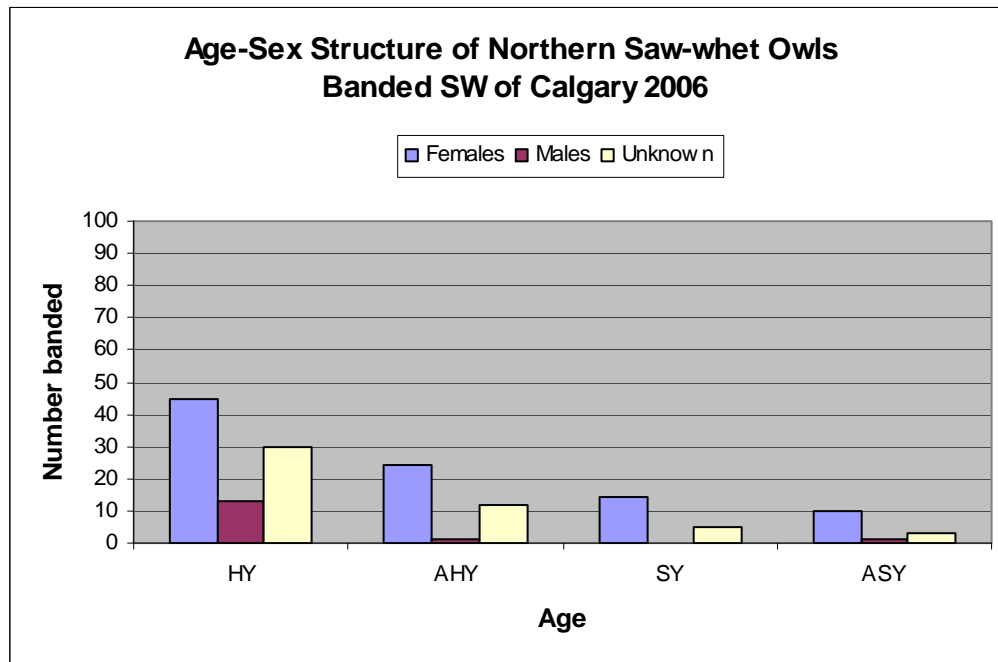
Monitoring was begun 15 September and continued through 7 November. Data from Delta Marsh Bird Observatory and Beaverhill Bird Observatory as well as our own experience indicates that the majority of Northern Saw-whet Owl movement occurs between 15 September and 31 October peaking in mid-October. A continuous recording of Northern Saw-whet Owl calls was played at 80% volume in a portable CD “boom box” from the center of an array (double H) of five 12-m long x 60-mm mesh mist-nets. The array was placed beneath a thick canopy of mature spruce trees. The area has been subject to cattle grazing and the understory and tree branches as high as a cow can rub are absent. Call playback commenced approximately 0.5-hrs after sunset and continued for 4-hrs, weather and other factors permitting. Nets were checked at least every 0.75-hrs by a Bander-in-Charge (BIC) and 1 or more volunteers. Sex, age and morphometric data were collected on all owls captured. Basic weather data (wind direction and speed, sky conditions and temperature) were noted at start and finish each evening.

Results

A total of 158 Northern Saw-whet Owls were captured and banded during 713 luring hours on 37 of 55 possible days between 15 September and 7 November (Figure 6). The 18 evenings when monitoring did not occur were primarily due to access being denied by the landowner (8 days). Eight (8) evenings were lost due to weather and two because a bander in charge was not available due to the CBBS casino. Peak movement occurred between 22 September and 27 October although owls were captured as early as 17 September and as late as 5 November.

Of the 158 new Northern Saw-whet Owl bandings HY, AHY, SY and ASY age birds comprised 56%, 23%, 12% and 9% respectively (see histogram below). Females comprised 59% and males 10% while 32% could not be sexed with confidence. The number of owls/net-hr in 2006, 2005 and 2004 between 15 September and 31 October was 0.25, 0.29 and 0.27 respectively.

Five owls were recaptured: 2 same evening, 1 the next evening and one each that were banded in 2004 and 2005 by CBBS. No owls originally banded elsewhere were captured. However an owl banded by CBBS in 2005 was recaptured in Saskatchewan and two owls banded by CBBS in 2004 and re-encountered in 2005 were reported to CBBS in 2006 (see Significant Recaptures).



Discussion

This site southwest of Calgary has proven itself as a good location for monitoring migration of Northern Saw-whet Owls. Monitoring sites for this species are well established in eastern North America but sparse in western North America (Figure 7). CBBS intends to continue a full monitoring program in 2007 and the future. CBBS will strive for full coverage during the monitoring period subject to restrictions imposed by the landowner.

SIGNIFICANT RE-ENCOUNTERS

Interesting re-encounters of birds banded in previous years are listed below. All recaptures of birds at CBBS study sites and banded prior to 2006 are indicated in Appendix 4. As in 2003, 2004 and 2005 no recoveries of Swainson's Thrushes banded in previous years occurred. However for the first time a Tennessee Warbler banded in a previous year was recaptured and for the second time a Yellow-rumped Warbler was recaptured. These would appear to be yet two more rare examples of stopover site fidelity at IBS. The choice of which recaptures to include below is somewhat arbitrary although species for which there are many recaptures over the years (e.g. Yellow Warbler, House Wren) are not included unless inferred age is >5 years. Other species that are recaptured more infrequently and for which longevity data may be lacking may be included even if inferred age is <5 years. Recoveries in years earlier than 2006 have just recently come to our attention and have not been presented in previous ATRs.

Swainson's Hawk 0987-28160 Banded as SY-M on 12 May 2004 at Calgary Airport and relocated to Drumheller (100-km ENE(67°). Found dead near Okotoks by Rick Field on 2 October 2005 (118-km SE (231°).

Swainson's Hawk 0987-28168 Banded as HY-M on 16 May 2004 at Calgary Airport and relocated to Red Deer (130-km N(6°). Found dead near Calgary on 28 July 2005.

Northern Saw-whet Owl 0924-25189 Banded as HY-F SW of Calgary, AB on 9 October 2005. Recaptured near Edenvold, SK by Jared Clarke on 13 October 2006 as SY-F. 717-km E (87°).

Northern Saw-whet Owl 1204-23480 Banded as AHY-M SW of Calgary, AB on 28 September 2004. Found dead in the next L-L block north by Brent Brown on 30 September 2005.

Northern Saw-whet Owl 1204-25322 Banded as HY-F SW of Calgary, AB on 4 October 2004. Recaptured at the Wind Mountain Banding Station in Montana on 21 October 2005 as SY-F. 352-km SSE (158°).

American Robin 1152-38721 Banded as AHY-U at Inglewood Bird Sanctuary on 25 July 1998. Recaptured there on 1 May 2006 as a male. At least 9-years old.

American Robin 8041-59443 Banded as HY-U at Cominco Natural Area on 5 August 2001. Recaptured at Inglewood Bird Sanctuary on 30 May 2006. 5-km N. At least 5-years old.

Tennessee Warbler 2300-06276 Banded as AHY-F on 30 July 2005 at Inglewood Bird Sanctuary in Calgary. Recaptured there as AHY-U on 20 September 2006.

Yellow Warbler 2220-34370 Banded as AHY-M at Cominco Natural Area on 18 August 2000. Recaptured in the same L-L block but different location (Carburn) on 12 July 2006. At least 7-years old.

Yellow-rumped Warbler 2290-37137 Banded as HY-U at Inglewood Bird Sanctuary on 12 August 2005. Recaptured there as AHY-M on 17 August 2006.

Brown-headed Cowbird 1791-28013 Banded as ASY-F at Inglewood Bird Sanctuary on 16 May 2002. Recaptured there on 5 June 2006. At least 6-years old.



Chestnut-mandibled Toucan at Las Caletas, Costa Rica 2006

TREND ANALYSIS

Table 8 and Appendix 7 present the results of trend analysis on those species that are monitored at Inglewood Bird Sanctuary during fall migration. Monitored species are, for the most part, those for which at least 10 individuals are captured on at least 5 different days (Appendix 3). It is interesting that three species (Traill's Flycatcher, Wilson's Warbler and White-crowned Sparrow) show significant ($P < 0.05$) increases which is consistent with an increasing supply of second growth and/or shrubby habitat.

Trend analysis is based on total captures from 1995-2006 and was performed by Bird Studies Canada (Tara Crewe). Note that scientific investigation normally requires a P level of < 0.05 and preferably < 0.01 in order to consider results significant. Due to net-lane inconsistencies year-to-year 11 species could only be analyzed using a subset of the data.

Although the trends with $P < 0.05$ are likely real, the cause behind them is open to interpretation. Only time and comparison to other CMMN stations will indicate whether significant trends are due to changes in regional populations or to other confounding variables such as weather or habitat change in and around IBS. Correlating trends between migration monitoring stations adds strength to the interpretation that a trend is reflecting regional population(s). Comparable annual indices from other stations were not available for comparison.



American Pygmy Kingfisher banded during MoSI in Costa Rica 2006

PERSONNEL

Volunteers

Volunteer participation in all of the CBBS projects continues to be the key to the success of research efforts. Banding at IBS is done in an area of the sanctuary designated "reserve" and off-limits to the public. A condition of operation is that no more than 3 people are in the reserve at one time, in order to minimize impact. Thus, on any given day, a Bander-in-Charge and 1 or 2 volunteers carry out the banding. Projects not based in IBS are not subject to this restriction. All participants in CBBS projects at IBS are required to complete the IBS orientation each year. In addition all participants in any CBBS project are required to complete the CBBS orientation.

Without donated time, primarily by members of the Calgary Bird Banding Society, the high degree of success of CBBS projects would not have been possible. Sincere appreciation is extended to all of the Banders-in-Charge (BICs) and volunteers listed in Table 9 who contributed approximately 8 hours in the field on each day indicated (442 person-days or 3,536 hours).

Banders-in-Charge (BIC)

No salaried staff are involved in CBBS projects. However, a per diem is available to all Banders-in-Charge during most CBBS projects. This arrangement provides an incentive for qualified individuals to assume the BIC duties and imposes accountability on the BIC to complete field data sheets and input data to computer files. No per diems are paid until all duties of the BIC, including data entry, have been fully discharged. The per diem established by the general membership for the 2006 field season was \$125/day for migration monitoring and MAPS at IBS, \$125/day for pilot migration monitoring at DPP and \$40/day for Northern Saw-whet Owl migration monitoring. No per diems were paid for BIC duties during MoSI.

MORTALITIES AND INJURIES

It continues to be a goal of the CBBS to achieve as low a rate of casualties as possible during all banding projects. Casualties here refer to all injuries, minor and serious, including fatalities. Our objective is to come as close to zero as possible.

Table 10 presents all casualties during the 2006 migration monitoring, including the Costa Rica, Northern Saw-whet Owl and MAPS projects. Note that the number captured, by species, is only given where that species experienced injury or mortality. The number of mortalities during CBBS banding projects remained low and in 2006 was split evenly between predation and shock due to capture or handling during banding. The injury rate in 2006 dropped back to 0.70%, the lowest level since CBBS was initiated (Figure 8).

Increases through 1997 were in part due to an increased awareness of banding personnel to record even slight abrasions. In other words, the data pre-1998 likely underestimates the rate of injury. CBBS BICs and volunteers take each mortality and injury very seriously and continuously endeavour to identify potential for reduction or avoidance of similar occurrences in the future.



Tiny Hawk banded during MoSI in Costa Rica 2006

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FIGURES

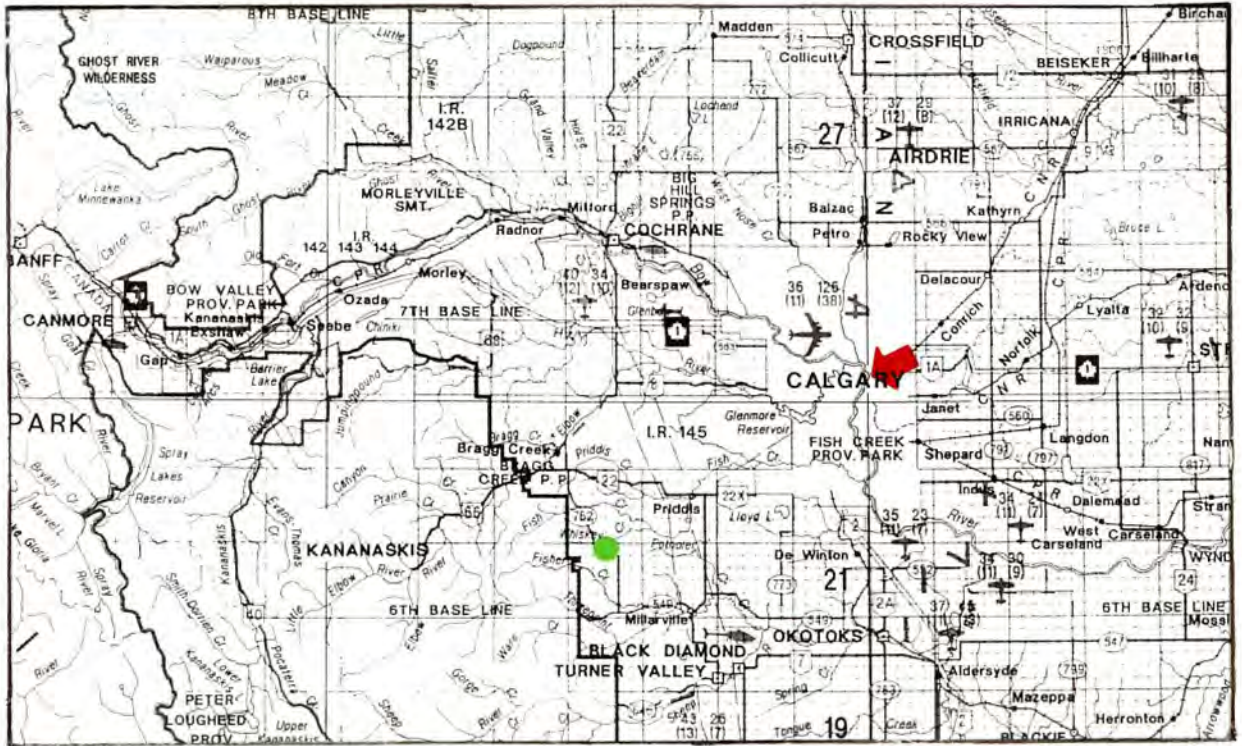


Figure 1. Topographic maps at 1:250,000 (top) and 1:50,000 (bottom) scales showing location of Inglewood Bird Sanctuary in southwestern Alberta. North is up.

Green dot indicates approximate location of CBBS Northern Saw-whet Owl migration monitoring site

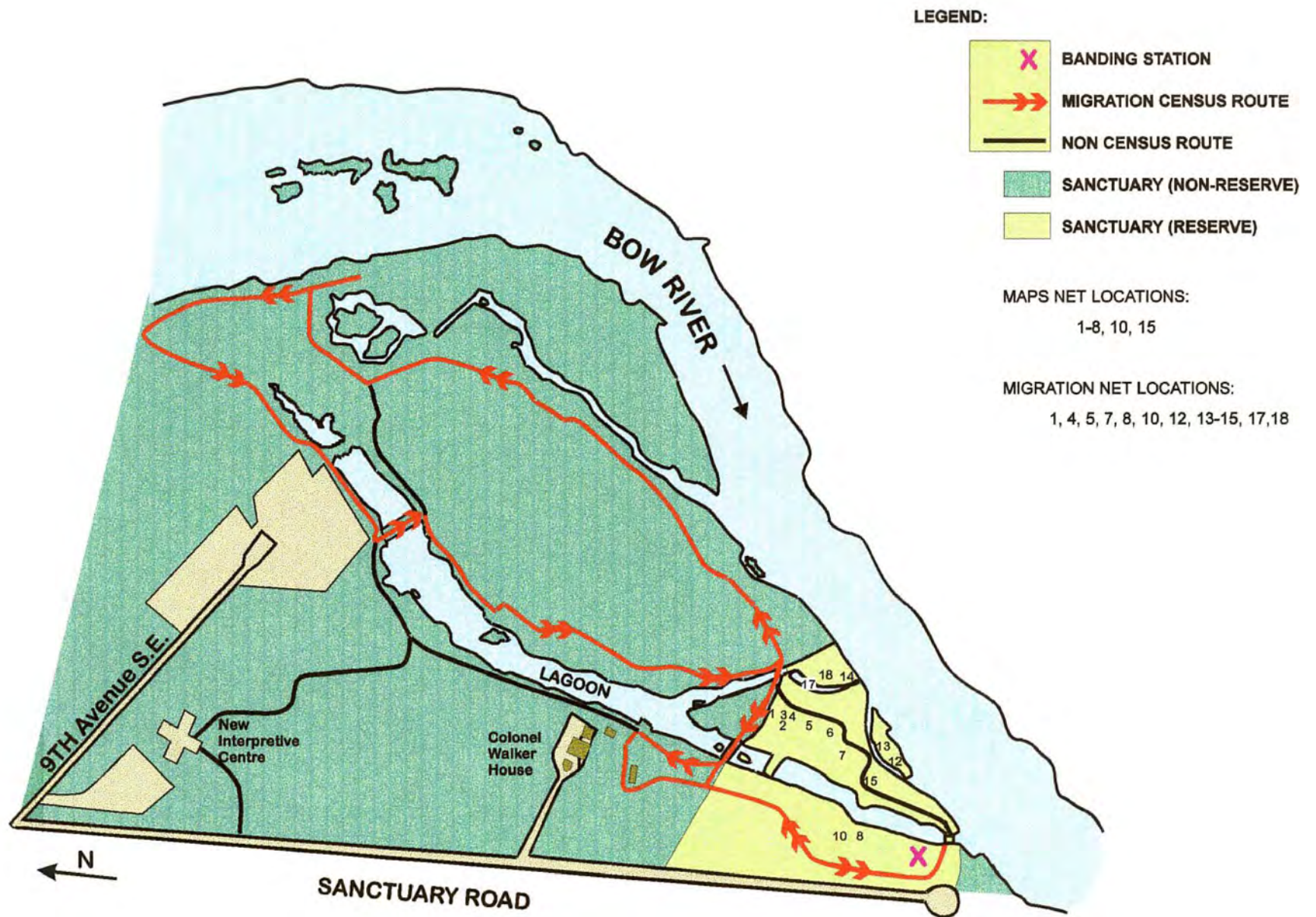


Figure 2. Schematic of Inglewood Bird Sanctuary migration monitoring station

Figure 3a. New bandings at Inglewood Bird Sanctuary - Spring 2006

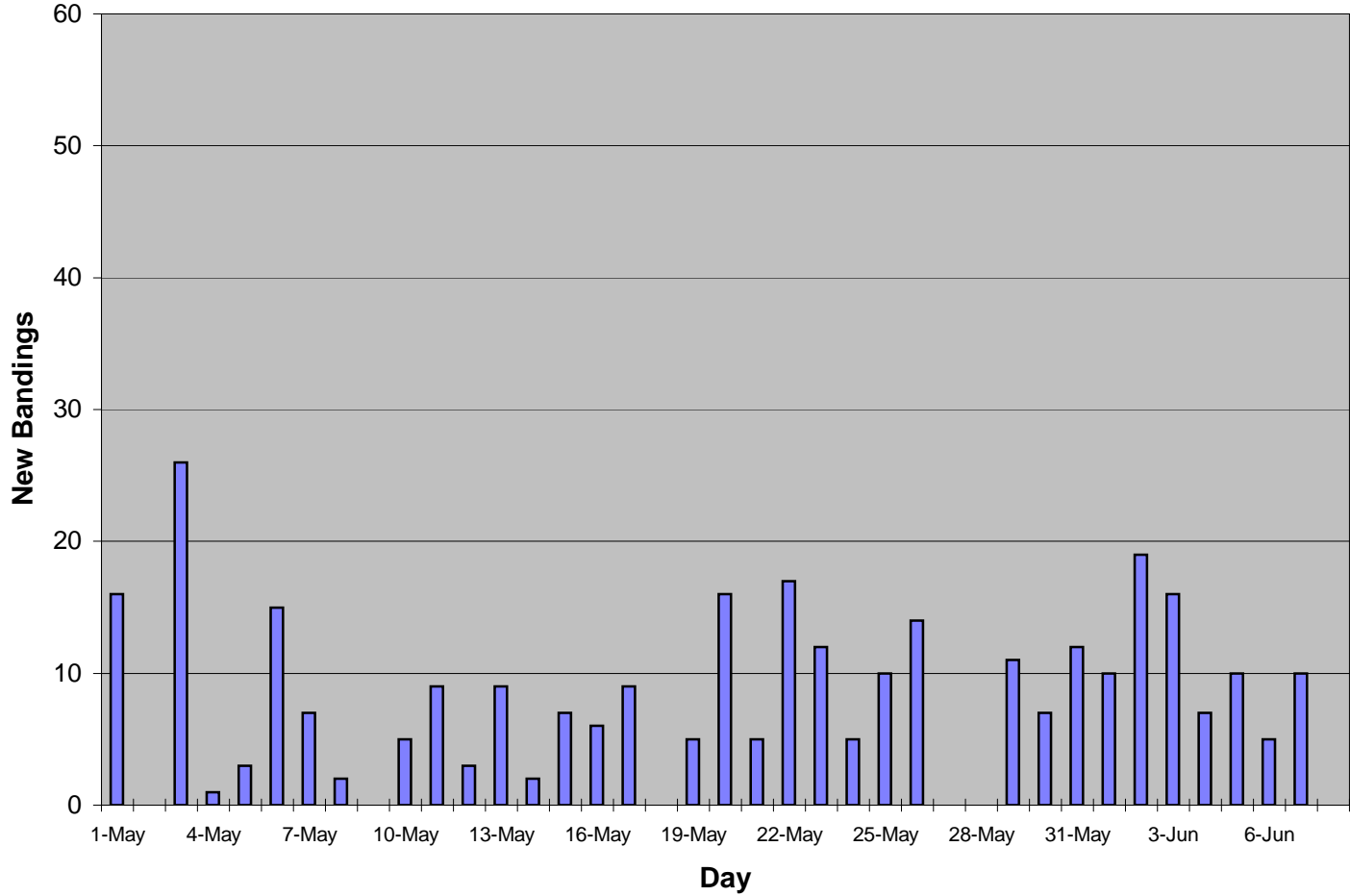
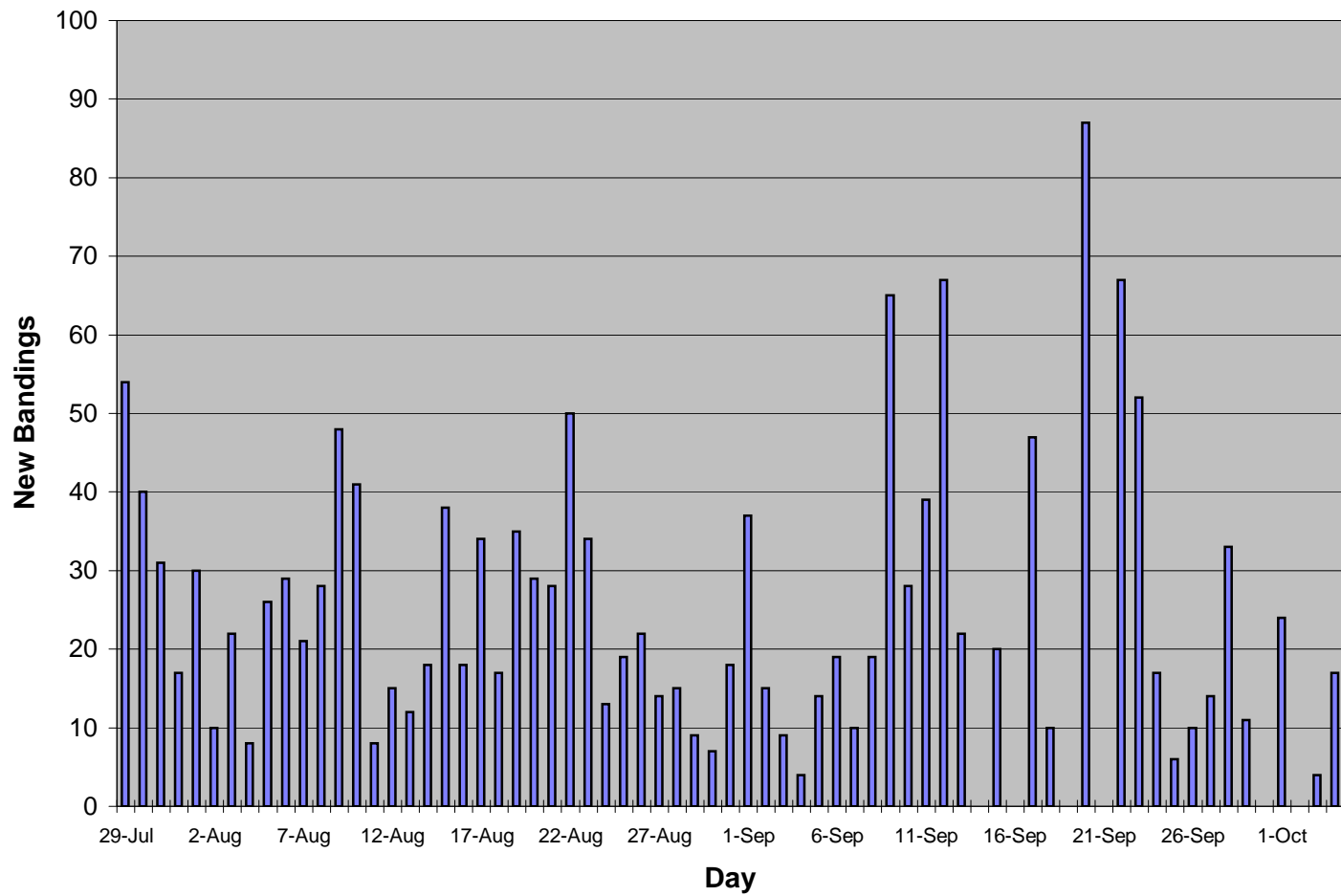


Figure 3b. New Bandings at Inglewood Bird Sanctuary - Fall 2006





MARINO BALLENA NATIONAL PARK

SAN JOSE

HEREDIA

ESCAZU

CORCOVADO NATIONAL PARK

OSA

PENINSULA

Golfo Dulce Forestal Reserves

COSTA RICA
Central America

LEGEND

- National Capital
- Provincial Capital
- Cantonal Capital
- District Town
- Route Number: Primary
- Secondary
- Emergency Hospital
- Hotels
- Gasoline Station
- Mountain Peaks
- Points of Interest
- Distances in Kilometers
- Protected Areas
- Wetland Areas
- Elevation in Meters

1:200,000 APPROX.
1 INCH = 6.2 MILES

0 30 40 KILOMETERS
0 20 MILES

Figure 4. Location of CBBS Migration Monitoring Site at Las Caletas, Costa Rica

Figure 5. MAPS at Inglewood Bird Sanctuary

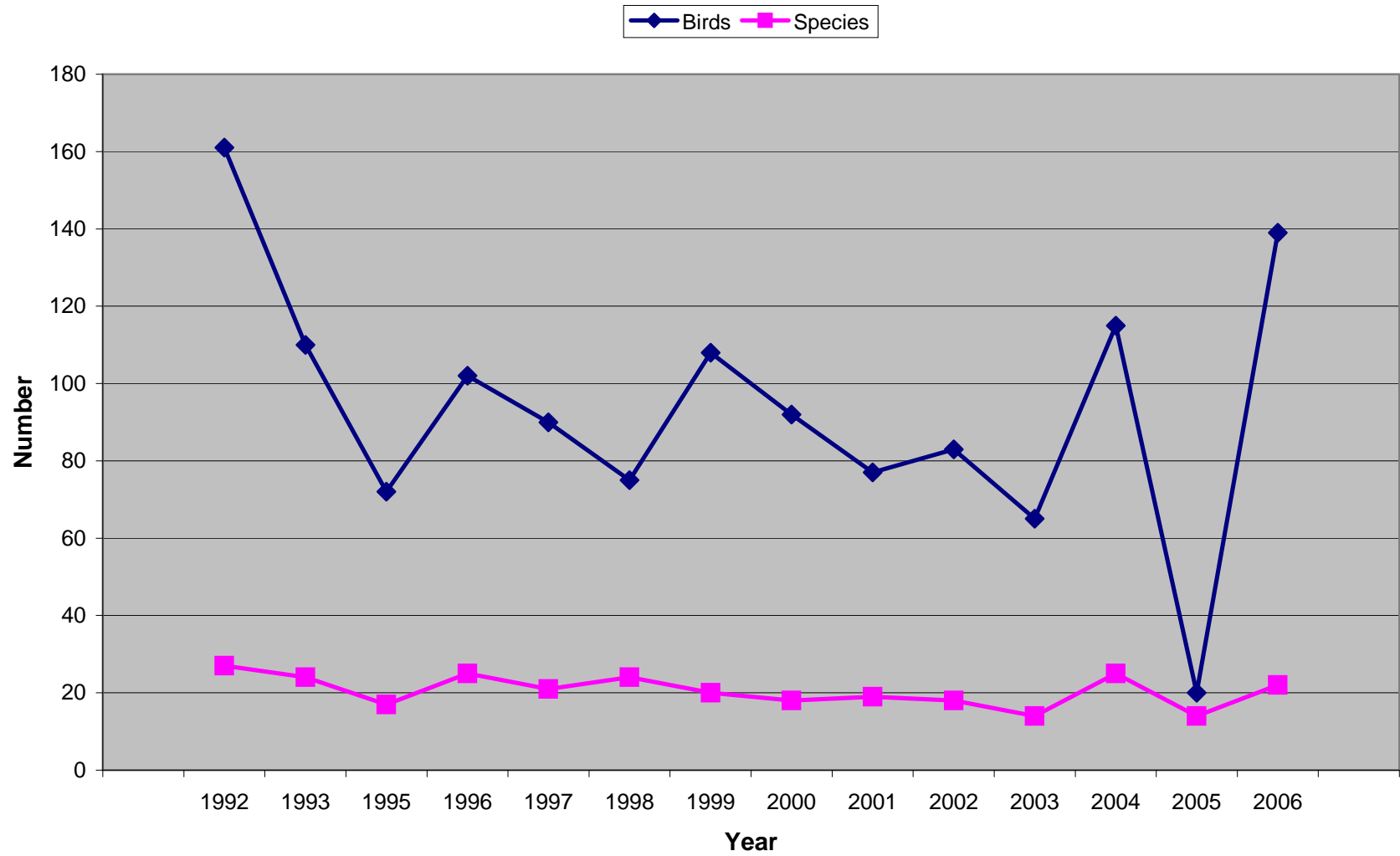
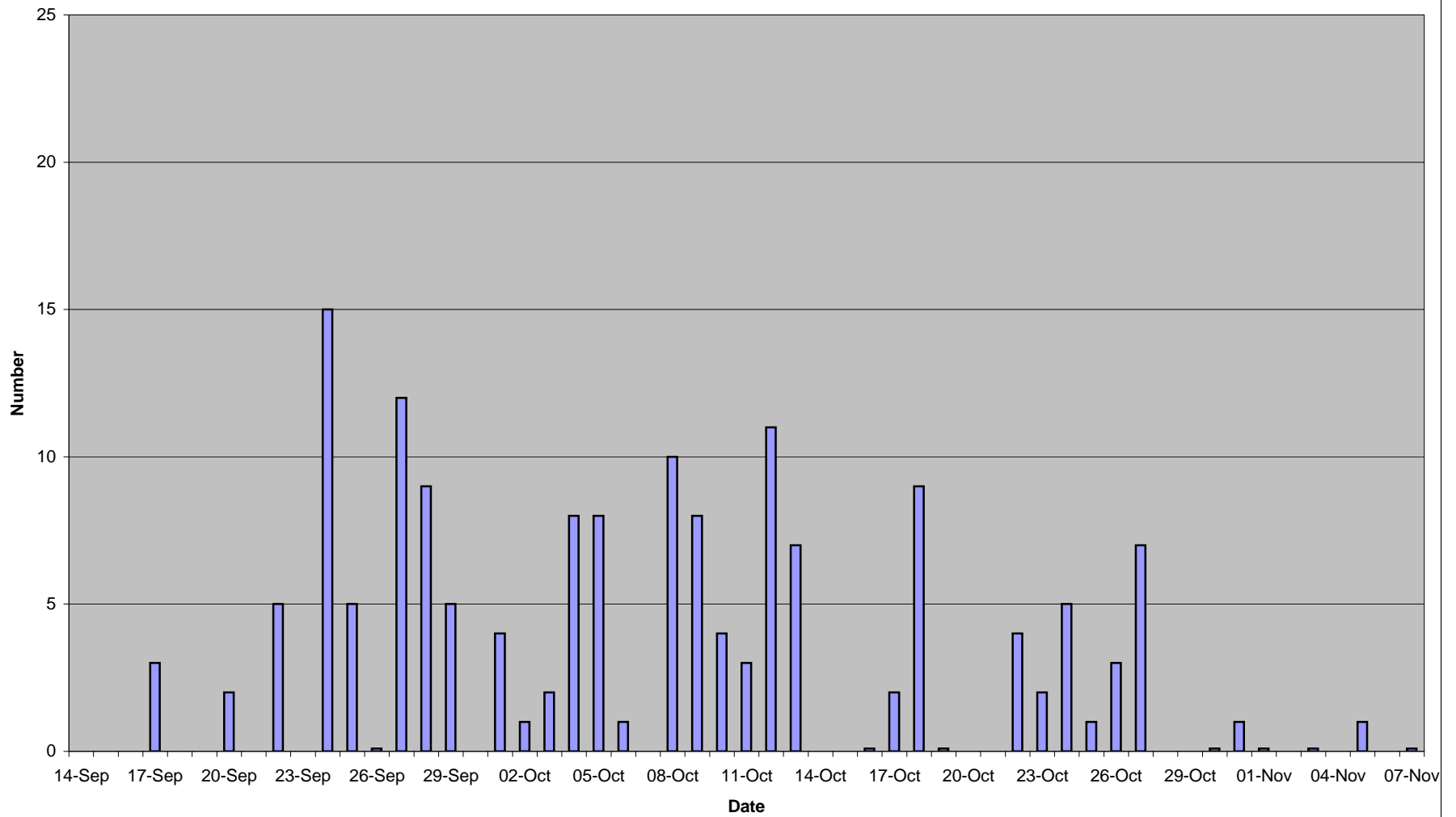


Figure 6. Northern Saw-whet Owl New Captures 2006
(new bands=158, unbanded=0)
Number = 0.1 indicates nets up but no owls captured



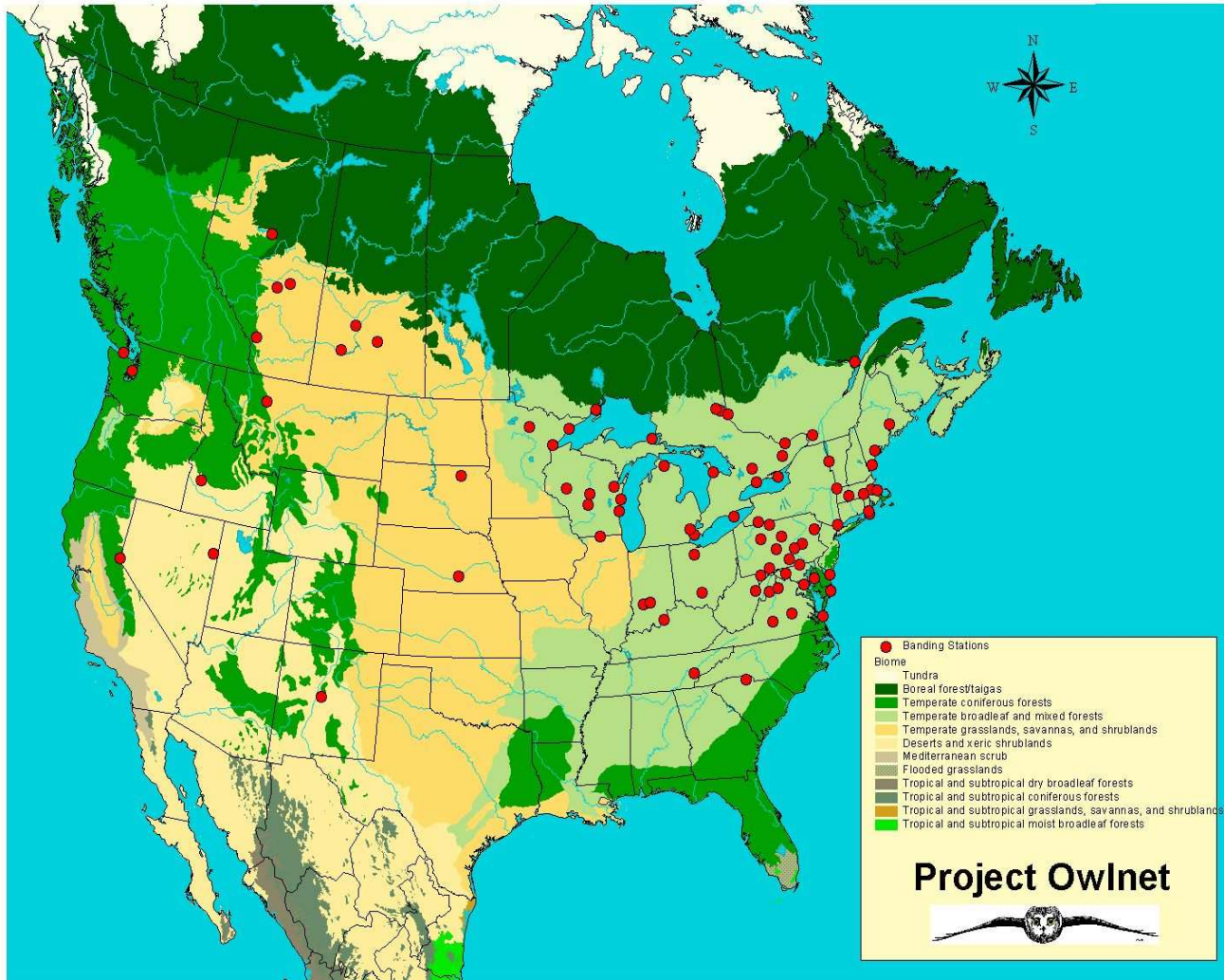
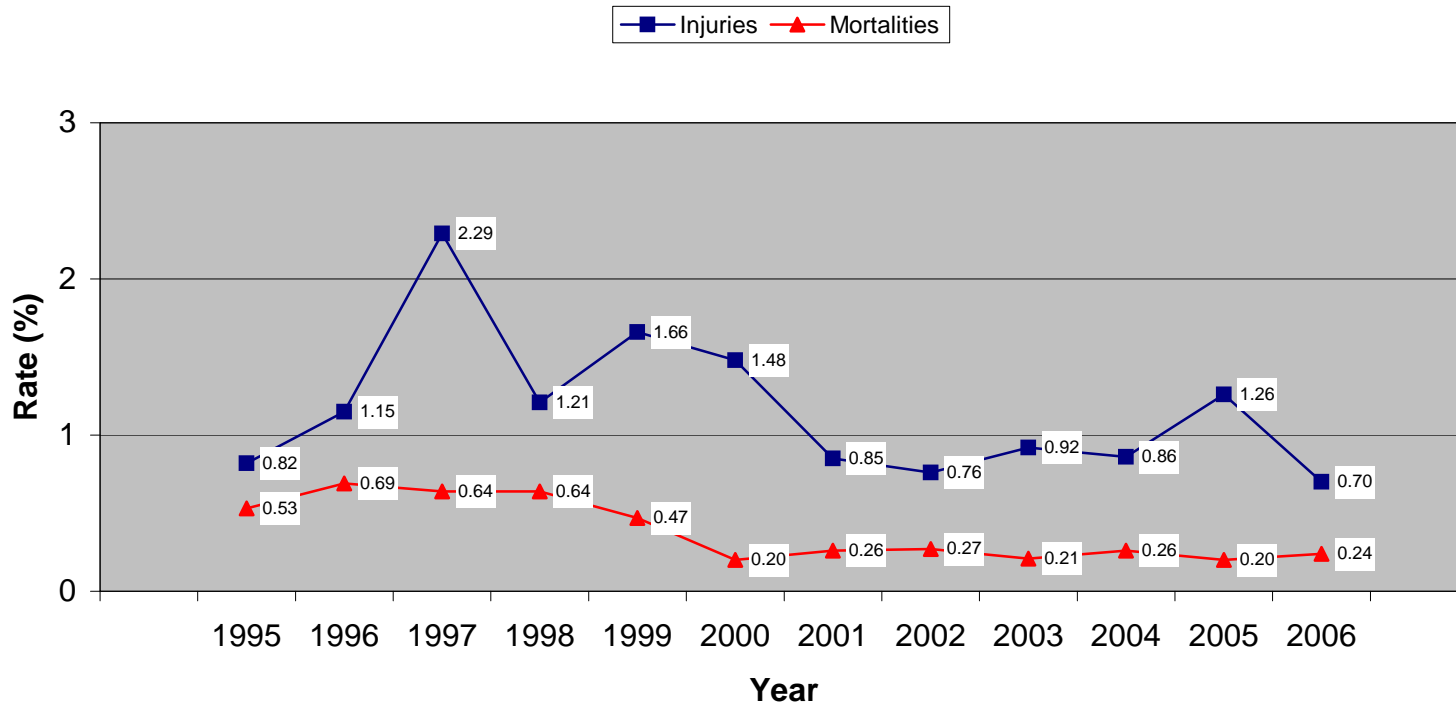


Figure 7. Northern Saw-whet Owl Migration Monitoring Stations Across North America

Figure 8. Casualty Rates for all CBBS Projects



TABLES

Table 1a. Coverage and Capture Rates During 2006 Spring MM at IBS

Date	Net-hours	Captures				Total	Captures/100 Net-hours
		New Bandings	Recaptures	Escapes	Mortalities		
01-May	64.3	16	5	5		26	40.4
02-May	wind					0	
03-May	17.6	26		1		27	153.4
04-May	57.6	1	2			3	5.2
05-May	72.2	3		3		6	8.3
06-May	72.9	15	7			22	30.2
07-May	72.8	7	1			8	11.0
08-May	72.4	2	2			4	5.5
09-May	no BIC					0	
10-May	72.0	5	1	1		7	9.7
11-May	72.5	9	2			11	15.2
12-May	72.2	3	1			4	5.5
13-May	72.0	9	2			11	15.3
14-May	72.0	2	2			4	5.6
15-May	72.2	7	4	2		13	18.0
16-May	72.6	6	3	8		17	23.4
17-May	72.5	9	2	5		16	22.1
18-May	no BIC					0	
19-May	72.2	5	1	3		9	12.5
20-May	73.3	16	2	1		19	25.9
21-May	72.0	5	2	1		8	11.1
22-May	73.0	17	6	1		24	32.9
23-May	73.6	12	5	2		19	25.8
24-May	72.3	5	4			9	12.4
25-May	72.2	10	4	2		16	22.2
26-May	45.8	14	7	1		22	48.0
27-May	rain					0	
28-May	rain					0	
29-May	60.3	11	10	1		22	36.5
30-May	72.0	7	10			17	23.6
31-May	72.0	12	9	1		22	30.6
01-Jun	72.3	10	7			17	23.5
02-Jun	72.9	19	7	3		29	39.8
03-Jun	72.1	16	5	1		22	30.5
04-Jun	72.0	7	2			9	12.5
05-Jun	73.1	10	4	1		15	20.5
06-Jun	71.8	5	7			12	16.7
07-Jun	72.5	10	2			12	16.6
Total	2273	311	128	43	0	482	21.2

Table 1b. Coverage and Capture Rates During 2006 Fall MM at IBS

Date	Net-hours	Captures				Total	Captures/100 Net-hours
		New Bandings	Recaptures	Escapes	Mortalities		
28-Jul	76.7	54	13	7		74	96
29-Jul	74.8	40	14	2		56	75
30-Jul	73.4	31	18	1		50	68
31-Jul	73.0	17	17			34	47
01-Aug	74.2	30	17	3	2	52	70
02-Aug	71.8	10	3	2		15	21
03-Aug	72.1	22	11	2		35	49
04-Aug	72.9	8	8		1	17	23
05-Aug	72.0	26	12	1	1	40	56
06-Aug	72.7	29	10			39	54
07-Aug	73.2	21	12			33	45
08-Aug	72.7	28	17			45	62
09-Aug	66.8	48	19	2		69	103
10-Aug	73.1	41	8	1		50	68
11-Aug	18.5	8	3			11	59
12-Aug	72.7	15	12			27	37
13-Aug	72.7	12	14			26	36
14-Aug	72.5	18	4			22	30
15-Aug	72.6	38	17	3		58	80
16-Aug	72.3	18	12	2	2	34	47
17-Aug	72.1	34	8	1		43	60
18-Aug	72.3	17	4	1		22	30
19-Aug	73.2	35	6	1		42	57
20-Aug	73.2	29	8			37	51
21-Aug	72.6	29	10	2		41	56
22-Aug	72.7	50	16	2		68	94
23-Aug	72.3	34	17			51	71
24-Aug	72.0	13	8		1	22	31
25-Aug	72.2	19	3	1		23	32
26-Aug	73.9	22	7	2		31	42
27-Aug	72.2	14	3			17	24
28-Aug	72.3	15	7			22	30
29-Aug	72.3	9	6			15	21
30-Aug	72.8	7	3	5		15	21
31-Aug	71.4	18	7	1		26	36
01-Sep	71.7	36	11	1		48	67
02-Sep	72.7	15	7	2		24	33
03-Sep	72.9	9	5			14	19

Table 1b. Coverage and Capture Rates During 2006 Fall MM at IBS

Date	Net-hours	Captures				Total	Captures/100 Net-hours
		New Bandings	Recaptures	Escapes	Mortalities		
04-Sep	72.0	4	1			5	7
05-Sep	72.5	14	5			19	26
06-Sep	74.0	19	7			26	35
07-Sep	71.8	10	6			16	22
08-Sep	73.6	19	3			22	30
09-Sep	72.5	65	17		1	83	114
10-Sep	72.8	28	4	1		33	45
11-Sep	73.4	39	9			48	65
12-Sep	73.1	67	9			76	104
13-Sep	25.8	22	3			25	97
14-Sep	no banding due to rain					0	
15-Sep	59.9	20	13			33	55
16-Sep	no banding due to rain					0	
17-Sep	66.7	47	16			63	94
18-Sep	67.0	10	7	1		18	27
19-Sep	no banding due to casino					0	
20-Sep	61.1	87	10	8		105	172
21-Sep	no banding due to no BIC					0	
22-Sep	73.4	67	2	1		70	95
23-Sep	73.2	52	10	2		64	87
24-Sep	72.0	17	9			26	36
25-Sep	72.3	6	3	3		12	17
26-Sep	73.0	10	4	1		15	21
27-Sep	72.4	14	3	1		18	25
28-Sep	71.6	33	5	1		39	54
29-Sep	72.5	11	5	1		17	23
30-Sep	72.0		1			1	1
01-Oct	73.6	24	12			36	49
02-Oct	no banding due to rain					0	
03-Oct	72.4	4	5			9	12
04-Oct	72.8	17	7	1		25	34
Total	4513	1625	553	66	8	2252	50

Table 2a. New Bandings at Inglewood Bird Sanctuary - Spring

Year	2002	2003	2004	2005	2006	Total
Start	01-May	01-May	01-May	01-May	01-May	
Finish	07-Jun	07-Jun	07-Jun	07-Jun	07-Jun	
# Days	27	31	31	32	33	
Total	624	347	440	370	311	2083
Species	46	36	41	40	41	57
Net-hours	1884	2138	2177	2248	2273	10648
Bandings/100 Net-hours	33.1	16.2	20.2	16.5	13.7	19.6
Sharp-shinned Hawk			1	1	1	3
Cooper's Hawk				1		1
American Kestrel	1					1
Solitary Sandpiper	1					1
Spotted Sandpiper	2		2		1	5
Belted Kingfisher	1			1	3	5
Red-naped Sapsucker				1		1
Downy Woodpecker	5	1	1	4	1	12
Northern Flicker	1		1	1		3
Olive-sided Flycatcher			1			1
Western Wood-Pewee	5	1	5		4	15
Traill's Flycatcher*	6	4	6	6	1	1
Least Flycatcher	16	6	6	7	5	40
Eastern Phoebe	1					1
Eastern Kingbird		3	1	2	3	9
Blue-headed Vireo	2	1				3
Warbling Vireo	4	2			1	7
Red-eyed Vireo		1				1
Black-billed Magpie			2	1		3
Tree Swallow	18	6	11	18	14	67
N Rough-winged Swallow	5		4	5	4	18
Bank Swallow		1	1	1		3
Barn Swallow	1					1
Black-capped Chickadee	3		2	2	1	8
Red-breasted Nuthatch	1		4	1		6
White-breasted Nuthatch	2				2	4
House Wren	13	15	8	13	10	50
Ruby-crowned Kinglet		2			3	5
Golden-crowned Kinglet					1	1

Table 2a. New Bandings at Inglewood Bird Sanctuary - Spring

	Year	2002	2003	2004	2005	2006	Total
Gray-cheeked Thrush						1	1
Veery			1				1
Swainson's Thrush		54	38	50	25	46	213
Hermit Thrush		2	2	1	2		7
American Robin		28	35	32	40	37	172
Gray Catbird		13	13	11	10	15	62
Brown Thrasher						1	1
Cedar Waxwing		3		12	8	8	31
Orange-crowned Warbler		19	6	12	18	1	56
Yellow Warbler		33	20	13	20	21	107
Yellow-rumped Warbler		249	100	136	43	45	573
Blackpoll Warbler		30	2	1	1		34
American Redstart		2	1			2	5
Ovenbird				1	1	1	3
Northern Waterthrush		8	3	7	2	3	23
MacGillivray's Warbler				1		1	2
Common Yellowthroat		21	6	12	4	6	49
Wilson's Warbler		4	1	3		3	11
Western Tanager		1		6	1		8
Chipping Sparrow		3	6	1		6	16
Clay-colored Sparrow		15	9	10	10	6	50
Savannah Sparrow		3		2	2	2	9
Fox Sparrow			1				1
Song Sparrow		3	1	8	7		19
Lincoln's Sparrow		19	31	37	42	16	145
White-throated Sparrow		5	2	7	7	2	23
White-crowned Sparrow		6	7	7	42	16	78
Dark-eyed Junco		1					1
Rose-breasted Grosbeak		1					1
Lazuli Bunting					1		1
Red-winged Blackbird		3	5	1	8	5	22
Common Grackle					1	2	3
Brown-headed Cowbird		5	3	7	8	4	27
Baltimore Oriole		4	7	6		6	23
American Goldfinch		1	4		2		7

*Note: Traill's Flycatcher includes both Willow and Alder

Table 2b. New Bandings at Inglewood Bird Sanctuary - Fall

Year	1992	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
Start	03-Aug	18-Aug	01-Aug	31-Jul	31-Jul	25-Jul	26-Jul	01-Aug	25-Jul	27-Jul	28-Jul	28-Jul	29-Jul	28-Jul	all
Finish	22-Sep	09-Sep	30-Sep	12-Oct	15-Oct	02-Oct	08-Oct	30-Sep	06-Oct	06-Oct	06-Oct	06-Oct	06-Oct	04-Oct	years
# Days	26	20	54	70	65	61	68	55	73	68	69	71	62	62	824
Total	841	466	1549	1121	1455	1898	1276	1262	1402	1466	1452	1872	1335	1625	19020
Species	52	48	61	59	64	64	66	68	64	66	60	73	67	67	106
Net-hours	934	1078	3456	4547	4608	4371	4426	3842	5152	4838	4928	4944	4387	4513	42182
Bandings/100 Net-hours	90.0	43.2	44.8	24.7	31.6	43.4	28.8	32.8	27.2	30.3	29.5	37.9	30.4	36.0	45.1
Wood Duck			1												1
Mallard							1								1
Green Heron												1			1
Sharp-shinned Hawk	2	2		1	5	4	3	1	1	3		1	2	3	28
Cooper's Hawk				1	1			1		1					4
Northern Goshawk				1											1
Broad-winged Hawk						1									1
Solitary Sandpiper	3	2	3	14	13	14	2	8	4	12	5	8	11	7	106
Spotted Sandpiper		1	2		3	3	2			5	1	4	4	3	28
Common Snipe								1		1					2
Mourning Dove												1			1
Belted Kingfisher	2	2	8	8	6	8	10	7	2	5	6	7	4	15	90
Yellow-bellied Sapsucker			1							1					2
Downy Woodpecker		1	2	3	5	7	3	9	9	13	12	16	9	7	96
Hairy Woodpecker								1		1		2		1	5
Northern Flicker	2	1	4	8	7	3	11	2		4	7	6	3	3	61
Olive-sided Flycatcher	3		3		5	2		2		2		2	3	1	23
Western Wood-Pewee	6	4	11	2	33	8	10	7	14	14	11	16	17	11	164

Table 2b. New Bandings at Inglewood Bird Sanctuary - Fall

Year	1992	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
Yellow-bellied Flycatcher			1				1					2			4
Trail's Flycatcher*	24	16	29	25	50	36	24	40	46	45	32	197	173	71	808
Least Flycatcher	16	5	16	9	30	14	11	21	20	21	9	40	45	43	300
Dusky Flycatcher			2	1									2		5
Pacific-slope Flycatcher			1		1							1			3
Eastern Phoebe		1						1			1		1		4
Great Crested Flycatcher									1						1
Eastern Kingbird	1	2	7	18	17	19	2	7	17	7	15	17	11	17	157
Yellow-throated Vireo											1				1
Blue-headed Vireo	1		1	1	2			1		2		2		1	11
Warbling Vireo	8	15	13	18	27	18	8	7	12	9	17	12	10	17	191
Philadelphia Vireo	1							1	1		1	1			5
Red-eyed Vireo	3	1	2	4	3	12	2	4	2	2	4		3	4	46
Blue Jay				1				1							2
Black-billed Magpie			2	1	8	2	2	1	3	1	3	3	3		29
Tree Swallow										1			7		8
N Rough-winged Swallow					2							1	2		5
Bank Swallow													1		1
Black-capped Chickadee	9	12	7	17	5	19	10	19	14	13	19	20	28	27	219
Boreal Chickadee														1	1
Red-breasted Nuthatch		3		2		4	2	20	7	1	2	4	2	3	50
White-breasted Nuthatch	1	1	6		4	4	4	5	5	5	7	5	2	2	51
Brown Creeper	1						1	1				1	1	6	11
House Wren	3	3	50	45	52	49	33	57	59	72	58	138	96	59	774
Winter Wren								1				2		1	4
Golden-crowned Kinglet	2		2	1	1	1	2	1		2		1	2	5	20

Table 2b. New Bandings at Inglewood Bird Sanctuary - Fall

Year	1992	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
Ruby-crowned Kinglet	3	1	10	18	20	14	5	11	15	14	24	18	11	29	193
Townsend's Solitaire				1					1		1			1	4
Veery	2					1						1			4
Gray-cheeked Thrush	1					1		1							3
Swainson's Thrush	34	13	17	52	10	28	19	13	30	13	19	31	27	17	323
Hermit Thrush	4		3	14	6	9	9	4	11	11	5	8	4	3	91
American Robin	5	11	114	81	81	31	60	32	105	37	89	28	43	29	746
Varied Thrush									1			5			6
Gray Catbird		1		5	7	6	5	4	14	8	19	14	14	13	110
Brown Thrasher					3						1		1		5
European Starling			2						4						6
Bohemian Waxwing							1								1
Cedar Waxwing	12	1	42	14	67	11	25	26	49	27	21	43	22	24	384
Tennessee Warbler	43	5	33	30	52	74	106	167	46	76	147	98	58	43	978
Orange-crowned Warbler	24	36	177	116	86	207	91	84	58	71	115	45	45	154	1309
Nashville Warbler				1	2	1	1	2	1	1			1	3	13
Yellow Warbler	56	19	44	62	137	91	138	89	101	119	82	165	126	75	1304
Chestnut-sided Warbler	1						1				1	1			4
Magnolia Warbler	9	4	2	2	4	4	2	2	1	9	6	4	5	6	60
Cape May Warbler											2				2
Yellow-rumped Warbler	293	171	496	92	191	638	195	200	246	248	223	148	73	412	3626
Black-throated Green Warbler					1	1	1								3
Townsend's Warbler	1				1	2	3	1	2	2		1	2	2	17
Palm Warbler		3	7	4	3	8	7	1	6	4	1	2	1	4	51
Bay-breasted Warbler			1				1	1			1				4
Blackpoll Warbler	17	5	17	8	6	30	5	8	11	7	7	1	11	7	140

Table 2b. New Bandings at Inglewood Bird Sanctuary - Fall

Year	1992	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
Black-and-white Warbler	4	1	1	2		3			2	3	3	1	2	1	23
American Redstart	19	4	3	6	4	20	5	3	16	27	18	19	7	16	167
Ovenbird	22	6	10	30	11	38	11	11	24	7	18	37	16	26	267
Northern Waterthrush	22	8	23	56	46	26	41	34	44	33	29	78	67	43	550
Connecticut Warbler	2	2	4	4	1	3	3	3	4	1		6	1	5	39
Mourning Warbler	4	2	5	10	3	9	1	4	5	7	10	7	5	5	77
MacGillivray's Warbler	2		3	8	10	6	2	5	4	4	5	6	4	4	63
Common Yellowthroat		1	6	1	8	10	8	4	12	8	9	7	2	9	85
Wilson's Warbler	121	68	102	175	119	113	100	167	152	145	224	251	120	168	2025
Canada Warbler	1			2	1	3	1	1	1	2		8		1	21
Western Tanager	1	1	12	1	3	2	4	1	5	6	3	5	3		47
American Tree Sparrow			10	3	3	7	2	1	1	2	4	4	3	5	45
Chipping Sparrow	4	1	29	14	151	27	83	50	47	92	23	155	34	1	720
Clay-colored Sparrow		1	1	6	21	37	26	9	30	26	6	12	14	15	204
Brewer's Sparrow							1								1
Savannah Sparrow		1			2			1	1					1	6
Fox Sparrow	1	1	1			2	1		2	1	1	2			12
Song Sparrow		1	9	9	15	18	21	9	3	13	5	15	21	14	153
Lincoln's Sparrow	9	7	53	28	13	59	48	30	39	88	43	30	44	58	549
Swamp Sparrow				2		7	3		1	2	1	2		2	20
White-throated Sparrow	13	11	73	28	39	77	54	18	35	51	25	40	34	67	565
Harris' Sparrow			1						1			1	1		4
White-crowned Sparrow	5	4	20	24	22	21	22	23	27	30	18	31	36	17	300
Dark-eyed Junco	5	3	15	15	3	10	8	6	1	6	3	11	4	14	104
Rose-breasted Grosbeak	6				1	3	2	3	1	3	7	5	3	2	36
Red-winged Blackbird			4				2			3		1			10

Table 2b. New Bandings at Inglewood Bird Sanctuary - Fall

Year	1992	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Total
Rusty Blackbird														1	1
Common Grackle			3								1		2	4	10
Brown-headed Cowbird			1	2	2	1		2	4	5	1	4	3		25
Baltimore Oriole	4		21	12	12	8	5	1	8	9	20	7	11	2	120
Purple Finch		1			2	1	1	2	6				2	1	16
House Finch													9	2	11
Pine Siskin					2							1			3
American Goldfinch	3			2	4	2	2	1	4	2		2	1	2	25
House Sparrow									3						3

*Note: Traill's Flycatcher includes both Willow and Alder

Table 3. Inglewood Bird Sanctuary MAPS New Bandings - 2006

	03-Jun	10-Jun	24-Jun	05-Jul	12-Jul	22-Jul	05-Aug	Total
Downy Woodpecker				2	1	2		5
Northern Flicker			2					2
Western Wood-Pewee		1				1		2
Alder Flycatcher		2						2
Least Flycatcher		3			2			5
Eastern Kingbird	1							1
Warbling Vireo						2		2
Tree Swallow				2	6			8
Black-capped Chickadee			3	1		4		8
White-breasted Nuthatch				1			1	2
House Wren	1			2	6	6		15
Swainson's Thrush	1				1	2		4
American Robin	1	2	1	20	15	6		45
Gray Catbird		1	2				1	4
Cedar Waxwing	3		1		4			8
Tennessee Warbler				1	1	3		5
Yellow Warbler	2	1		2		2	3	10
Yellow-rumped Warbler							2	2
Chipping Sparrow	1							1
Brown-headed Cowbird	1				1			2
House Finch				4	1			5
American Goldfinch		1						1
Total birds	11	11	9	35	38	28	7	139
Total species	8	7	5	9	10	9	4	22

Table 4. Inglewood Bird Sanctuary MAPS Summary

Species	New Bandings													Total	
	1992	1993	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005		2006
American Kestrel			1												1
Downy Woodpecker	1	3	1	5	4	1			1		1	3		5	25
Hairy Woodpecker	1	1	1			1									4
Northern Flicker	1	1	3	2			2							2	11
Western Wood-Pewee	6	1	1	1	1	2		1	3			3		2	21
Trail's Flycatcher				3	3		1	1	4	1	1	2	3	2	21
Least Flycatcher	14	8	3	2	3	4	2	1	2	1			1	5	46
Eastern Kingbird	2	1			3	1	3		2	1		3	1	1	18
Warbling Vireo	7	7	1	4	2		2	2	1	4	3		1	2	36
Red-eyed Vireo	1														1
Black-billed Magpie				1	2							2			5
Tree Swallow	3						2					4		8	17
Bank Swallow	1														1
Black-capped Chickadee	5	7	5	9	2	3	5	4	4	2	4	10	2	8	70
White-breasted Nuthatch	3	4		2						1		2		2	14
House Wren	5	11	9	9	13	8	9	18	11	2	11	9	1	15	131
Veery	2					1									3
Swainson's Thrush	10	8	6	4	3	1	4		3	1	1	4	1	4	50
Hermit Thrush								1							1
American Robin	21	6	26	25	23	10	8	14	20	19	19	21	1	45	258
Gray Catbird	3			1	1	4	8	1	6	16	9	12	1	4	66
European Starling			1												1
Cedar Waxwing	27	8		6	1	9	5	7	5	13	3	17	3	8	112
Tennessee Warbler	1	6		7	1	3	4	22	1	1	1	5		5	57
Orange-crowned Warbler						1						1			2
Yellow Warbler	20	14	7	2	6	9	24	13	4	7	9	4	2	10	131

Table 4. Inglewood Bird Sanctuary MAPS Summary

Species	New Bandings													Total	
	1992	1993	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005		2006
Yellow-rumped Warbler	10					2		2	1		1	1			17
American Redstart		1									1			2	4
Ovenbird	3			1		1									5
Northern Waterthrush						1	1		1						3
Mourning Warbler	1														1
Common Yellowthroat												1	1		2
Wilson's Warbler				2		1	1					1			5
Western Tanager		1	3	1	2		4					1			12
Chipping Sparrow		7			1							1		1	10
Clay-colored Sparrow		1				6	17	1	2						27
Song Sparrow		1		1		1	4				1		1		9
Lincoln's Sparrow		3	1	2	5	2		1				2			16
White-throated Sparrow				2						1		2			5
Rose-breasted Grosbeak				1											1
Common Grackle			1		2					1					4
Brown-headed Cowbird	6				3			1	1	2		2	1	2	18
Baltimore Oriole	3	7	2	8	9	1	2	1	5	9		2			49
Purple Finch		1						1							2
House Finch														5	5
American Goldfinch	2	2		1						1				1	7
House Sparrow	2					2									4
Total	161	110	72	102	90	75	108	92	77	83	65	115	20	139	1309
Species	27	24	17	25	21	24	20	18	19	18	14	25	14	22	47

Table 5. Dinosaur Provincial Park MAPS New Bandings - 2006

	03-Jun	17-Jun	24-Jun	Period 7	15-Jul	22-Jul	05-Aug	Total	
Yellow-bellied Sapsucker				No coverage	2	4		6	
Downy Woodpecker					1	1	1	3	
Northern Flicker							2	2	
Olive-sided Flycatcher						1		1	
Western Wood-Pewee		1				1	1	3	
Alder Flycatcher	1	2					3	6	
Least Flycatcher	3	5	2			1	8	19	
Eastern Kingbird		1						1	
Warbling Vireo	1	2					3	6	
Tree Swallow		1						1	
Black-capped Chickadee						11		11	
House Wren	12	4	3			13	12	5	49
Swainson's Thrush	10								10
American Robin	1	1						2	4
Gray Catbird	4	5	8			4	3	1	25
Brown Thrasher		1							1
Cedar Waxwing	1	9	2					2	14
Orange-crowned Warbler	1								1
Yellow Warbler	8	2	5			4		12	31
Common Yellowthroat							1		1
Spotted Towhee								2	2
Chipping Sparrow						1	2	1	4
Clay-colored Sparrow							1		1
Lark Sparrow								2	2
Song Sparrow								3	3
Rose-breasted Grosbeak	1							2	3
Brown-headed Cowbird		1				1			2
Baltimore Oriole	1		2				3		6
American Goldfinch	6	5	4				1		16
Total birds	50	40	26			27	49	42	234
Total species	13	14	7			8	13	15	29

**Table 6. Coverage and Capture Rates During
2005-2006 MoSI at Las Caletas and Isla Violin, CR**

Date	Net-hours	Captures				Total	Captures per 100 net-hours
		New Bandings	Recaptures	Unbanded	Mortalities		
Las Caletas							
11-Dec	89.4	43	28		1	72	81
12-Dec	94.0	29	27			56	60
13-Dec	89.9	23	18			41	46
14-Dec	79.1	16	13			29	37
15-Dec	92.4	30	18			48	52
16-Dec	85.3	15	15			30	35
17-Dec	92.9	22	8		1	31	33
22-Jan	91.2	22	26	2		50	55
23-Jan	89.4	23	19	1		43	48
24-Jan	90.3	14	20	2		36	40
25-Jan	90.5	11	17			28	31
26-Jan	91.1	15	17			32	35
27-Jan	89.1	13	13	2		28	31
28-Jan	69.0	12	14	1		27	39
05-Mar	92.0	10	17	1		28	30
06-Mar	90.0	9	10			19	21
07-Mar	90.1	9	16	1		26	29
08-Mar	91.1	7	11	2		20	22
09-Mar	93.9	12	21	1		34	36
10-Mar	90.0	9	13			22	24
Total	1781	344	341	13	2	700	39
Isla Violin							
28-Feb	60.6	10	2			12	20
01-Mar	73.8	7	2			9	12
02-Mar	78.6	11	2			13	17
03-Mar	80.1	11	2	1		14	17
Total	293	39	8	1	0	48	16

Table 7. New captures in Costa Rica 2002-2006

Species	2002*	2003*	2004	2005	2006**	Total
Start date	17 Mar	15 Apr	28 Mar	30-Mar	11-Dec	
Finish date	12-Apr	9 May	29 Apr	29-Apr	10-Mar	
net-hours	2041	2123	2468	2209	2074	
Tiny Hawk	1	2			1	4
Barred Forest-Falcon	2	1				3
Ruddy Ground-Dove		1		5	1	7
Blue Ground-Dove		1				1
White-tipped Dove	1	1		2	1	5
Gray-chested Dove	5	8	4	2	1	20
Ruddy Quail-Dove			5	3	2	10
Dove spp.	1			1		2
Pigeon spp.	1					1
Bronzy Hermit		8	6	1	4	19
Band-tailed Barbthroat	1	20	14	15	8	58
Long-billed Hermit	2	15	23	34	14	88
Stripe-throated Hermit		16	7	9	11	43
White-tipped Sicklebill	2					2
White-necked Jacobin	1	5	4	1	11	22
Violet-crowned Woodnymph		11	13	12	5	41
Blue-throated Goldentail		59	52	5	24	140
Charming Hummingbird		40	33	35	28	136
Mangrove Hummingbird					2	2
Snowy-bellied Hummingbird		1	1			2
Rufous-tailed Hummingbird		10	14	11	8	43
Purple-crowned Fairy				1		1
Hummingbird sp.	89			1		90
Black-throated Trogon	2			3	2	7
Blue-crowned Motmot	1	4			1	6
Green Kingfisher			4	1	3	8
American Pygmy Kingfisher	2	1	2	1	1	7
White-necked Puffbird		1	1			2
White-whiskered Puffbird	1		1	1		3
Rufous-tailed Jacamar		1	1	1	1	4
Olivaceous Piculet	3	1	1	1	1	7
Golden-naped Woodpecker			1	1		2
Buff-throated Foliage-gleaner	4	7	1		3	15
Plain Xenops	5	6	3	8	2	24
Scaly-throated Leaf-tosser	1	3	3	3		10
Tawny-winged Woodcreeper	6	2	3	6	3	20
Long-tailed Woodcreeper	1	1		2	1	5
Wedge-billed Woodcreeper	16	6	11	9	27	69
Northern Barred-Woodcreeper	2	4		1		7
Black-striped Woodcreeper	1			1		2
Streak-headed Woodcreeper	4	4	7	2	2	19
Woodcreeper sp.	1					1

Table 7. New captures in Costa Rica 2002-2006

Species	2002*	2003*	2004	2005	2006**	Total
Start date	17 Mar	15 Apr	28 Mar	30-Mar	11-Dec	
Finish date	12-Apr	9 May	29 Apr	29-Apr	10-Mar	
net-hours	2041	2123	2468	2209	2074	
Great Antshrike	1					1
Black-hooded Antshrike	8	9	4	3	4	28
Russet Antshrike	1		2		1	4
Slaty Antwren		2	1	6		9
Dot-winged Antwren	16	18	7	3	4	48
Chestnut-backed Antbird	9	15	6	11	8	49
Bicolored Antbird	2	9	4	12	10	37
Black-faced Antthrush	2	1		2	3	8
Streak-chested Antpitta	1	1		1		3
Ochre-bellied Flycatcher	21	23	35	28	7	114
Northern Bentbill	5	4	5	3	3	20
Eye-ringed Flatbill	1					1
Yellow-olive Flycatcher		3				3
Golden-crowned Spadebill	2	1	2	6	4	15
Ruddy-tailed Flycatcher	2	4	1	2	3	12
Sulphur-rumped Flycatcher	1	3	2	4	3	13
Black-tailed Flycatcher		1	1			2
Yellow-bellied Flycatcher	1		3		1	5
Acadian Flycatcher				1		1
Alder Flycatcher		35	10	1		46
Willow Flycatcher		3	3			6
Bright-rumped Attila	7	3	6	5	3	24
Rufous Mourner		3	1		1	5
Dusky-capped Flycatcher	4		5	1	1	11
Great Crested Flycatcher	2				1	3
Thrushlike Schiffornis	2	2	2	2		8
Rufous Piha					1	1
White-winged Becard		1				1
Orange-collared Manakin	28	16	17	23	6	90
Blue-crowned Manakin	7	11	12	8	8	46
Red-capped Manakin	23	31	23	53	28	158
Red-eyed Vireo	1	6	2	1		10
Yellow-green Vireo	9	10	4	4		27
Philadelphia Vireo			1			1
Tawny-crowned Greenlet	2	1	3	5	4	15
Lesser Greenlet		1	1		1	3
Black-bellied Wren		1	1	1	2	5
Riverside Wren	6	7	5	12	15	45
House Wren	2		1	3	1	7
Scaly-breasted Wren		2	1		2	5
Long-billed Gnatwren	13	1	3	5	1	23
Tropical Gnatcatcher		1		3		4

Table 7. New captures in Costa Rica 2002-2006

Species	2002*	2003*	2004	2005	2006**	Total
Start date	17 Mar	15 Apr	28 Mar	30-Mar	11-Dec	
Finish date	12-Apr	9 May	29 Apr	29-Apr	10-Mar	
net-hours	2041	2123	2468	2209	2074	
Swainson's Thrush	439	406	547	546		1938
Wood Thrush					1	1
Clay-colored Robin			1	2	3	6
White-throated Robin					5	5
Tennessee Warbler				3	5	8
Yellow Warbler			1			1
Mangrove Warbler					1	1
Chestnut-sided Warbler	2			4	2	8
Worm-eating Warbler	1				1	2
Northern Waterthrush	1	1	1	1	3	7
Louisiana Waterthrush	1					1
Kentucky Warbler	3		1		2	6
Mourning Warbler	1		1	2	2	6
MacGillivray's Warbler	1					1
Bananaquit	9	12	9	11	7	48
Gray-headed Tanager	5	9	5	8	14	41
White-throated Shrike-Tanager		2	1	4		7
White-shouldered Tanager	4	10	6	3	3	26
Black-cheeked Ant-Tanager	5	8	6	16	10	45
Summer Tanager					2	2
Scarlet Tanager	1					1
Cherrie's Tanager	7	5	7	10	6	35
Bay-headed Tanager	2		3			5
Golden-hooded Tanager		2		1		3
Blue Dacnis			1			1
Green Honeycreeper	5	4		7		16
Shining Honeycreeper				1		1
Red-legged Honeycreeper		3		2		5
Blue-black Grassquit	2		2			4
Variable Seedeater	15	10	10	17	14	66
Yellow-bellied Seedeater		2	4			6
Thick-billed Seed-Finch	6	4	6	7	4	27
Orange-billed Sparrow	12	17	19	26	5	79
Black-striped Sparrow	1	1	2	2	4	10
Buff-throated Saltator	8	4		9	3	24
Blue-black Grosbeak	4	9	4	5	3	25
Great-tailed Grackle					2	2
Yellow-billed Cacique				1		1
Scarlet-rumped Cacique			2	1		3
Spot-crowned Euphonia	1	1		2	1	5
Species	78	80	79	84	78	124
Total	871	979	1028	1079	397	4354

Table 7. New captures in Costa Rica 2002-2006

Species	2002*	2003*	2004	2005	2006**	Total
Start date	17 Mar	15 Apr	28 Mar	30-Mar	11-Dec	
Finish date	12-Apr	9 May	29 Apr	29-Apr	10-Mar	
net-hours	2041	2123	2468	2209	2074	

* pilot programs

** MoSI

**Table 8. Trend Analysis of Monitored Species
at Inglewood Bird Sanctuary 1995-2006**

Species	Analysis Interval	Trend	P	DQ
		%/year		
Solitary Sandpiper	1996-1998, 2000-2006	-7.3%		red
Western Wood-Pewee	1996-2006	2.4%		orange
Traill's Flycatcher	1995-2006	9.9%	*	yellow
Least Flycatcher	1995-2006	5.6%		yellow
Eastern Kingbird	1995-1998, 2000-2006	-1.8%		orange
Warbling Vireo	1995-2006	-2.2%		orange
House Wren	1995-2006	2.6%		green
Ruby-crowned Kinglet	1995-2006	2.2%		orange
Swainson's Thrush	1995-2006	-0.7%		yellow
American Robin	1995-2006	-9.2%	*	yellow
Cedar Waxwing	1995-1998, 2000-2006	-1.2%		yellow
Tennessee Warbler	1996-1998, 2000-2006	3.6%		green
Orange-crowned Warbler	1995-2006	-3.9%		green
Yellow Warbler	1995-2006	2.3%		green
Yellow-rumped Warbler	1996-2006	4.0%		green
Blackpoll Warbler	1996-2006	-3.7%		red
American Redstart	1995-2006	5.0%		orange
Ovenbird	1996-2006	0.1%		orange
Northern Waterthrush	1996-1998, 2000-2006	2.2%		yellow
Wilson's Warbler	1995-2006	5.5%	*	green
Chipping Sparrow	1996-1998, 2000-2006	-1.1%		yellow
Clay-colored Sparrow	1996-1998, 2000-2006	1.0%		orange
Song Sparrow	1995-1998, 2000-2006	1.6%		orange
Lincoln's Sparrow	1995-2006	4.1%		green
White-throated Sparrow	1995-2006	1.0%		yellow
White-crowned Sparrow	1995-2006	2.6%	*	yellow
Dark-eyed Junco	1995-2006	-0.2%		red
Baltimore Oriole	1995-2006	-5.1%		red

Data Quality:	
if mean birds/season < 10 or mean observation days/season < 5	DQ=red
if mean birds/season >= 10 and mean days/season >= 5	DQ=orange
if mean birds/season >= 20 and mean days/season >= 10	DQ=yellow
if mean birds/season >= 25 and mean days/season >= 20	DQ=green

P Values (significance of trend):	
+	0.1
*	0.05
**	0.01
***	0.001
****	<0.0001

Table 9. Bander-in-Charge and Volunteer Effort 2006

Member/Guest	Bander-in-Charge (days)						Volunteer (days)						
	Inglewood			NSWO	Costa Rica	DPP	Inglewood			NSWO	Costa Rica	DPP	
	Spring MM	MAPS	Fall MM		MOSI	pilot	Spring MM	MAPS	Fall MM		MOSI	pilot	
Teresa Armstrong*										1			
Linda Bailey*										1		1	
Christine Bennett									3	2		1	
Liz Brennan									2				
Vivian Brissette*										6			
Joan Bruce*										1			
Amanda Cole									1		7		
Joanna Coleman										1			
Doug Collister					7								
Rainer Ebel					12								
Tom Glen								1	1				
Carole Hachey										5			
Steve Herrero*										1			
Michelle Koch										1			
Steve Lane	7	1	17	2		3				2			
Josh Levac							1			8		1	
David Lieske										2			
Shonna McLeod	10	1	10	20						2			
John Mendham*										1			
Greg Meyer	9	2	12			3	1	1	1	1		1	
Pat Mitchell	8	3	20	16								1	
Mike Mulligan							4			6	1	1	
Jeff Nugent							2						
Alexandra Oakwood							3			5	3		
El Peterson							1			5	1	7	2

Table 9. Bander-in-Charge and Volunteer Effort 2006

Member/Guest	Bander-in-Charge (days)					Volunteer (days)						
	Inglewood			NSWO	Costa Rica	DPP	Inglewood			NSWO	Costa Rica	DPP
	Spring MM	MAPS	Fall MM		MOSI	pilot	Spring MM	MAPS	Fall MM		MOSI	pilot
Kevin Peterson*										1		
Celina Praymak*												2
Lisa Quattrocchi								3				
Alberto Quesada-Calvo*											11	
Elizabeth Quesada-Calvo*											15	
Paula Schneider							15	3	4			
Terry Silverson							1					
Gwen Smiley							2		1			1
Tara Stephens							3					
Don Stiles									4			
Bill Taylor							10	4	13			
Barry Trakalo							1			2		
Marie Tremblay									2			
Amy Turnbull							1		8			1
Catherine Watson									3	1	12	
Linda Wiggins							1		1	1		
Amy Wilson									3		7	
Bruce Wilson												1
Scott Wilson			6		7							
Colin Young							6	1	15	6		1

* guest volunteer

Table 10. Injuries and Mortalities Sustained During 2006 CBBS Projects

Species	Number Captured	Injuries		Mortalities	
		Number	Type	Number	Cause
Stripe-throated Hermit	13			1	banding shock
Charming Hummingbird	39			1	banding shock
Northern Bentbill	11	1	broken leg		
Northern Flicker	7	1	wing strain		
Trail's Flycatcher	90			1	fatally injured in net
Least Flycatcher	80	1	wing strain		
Black-capped Chickadee	97	2	broken leg		
House Wren	254	1	broken leg	1	net shock
				1	deer predation
American Robin	170	1	cut tongue		
		2	wing abrasion		
		1	cut toe		
		1	predation lacerations		
		1	wing strain		
Gray Catbird	81	1	cut toe		
		1	cut tongue		
		1	wing abrasion		
Orange-crowned Warbler	195	1	wing strain		
Yellow Warbler	206	1	wing strain		
		1	cut toe		
Yellow-rumped Warbler	543	2	wing strain	4	predation (2 raptor, 1 deer, 1 unknown)
American Redstart	24			1	banding shock
Ovenbird	42	1	head abrasion		
		1	wing strain		
Northern Waterthrush	85	1	head abrasion		
		1	cut tongue		
Mourning Warbler	10	1	leg abrasion		
Wilson's Warbler	227	2	broken leg		
Lincoln's Sparrow	92	1	knee abrasion		
Rusty Blackbird	1	1	cut tongue		
Total Captures	4132	29	0.70%	10	0.24%

**TABLE 11. CALGARY BIRD BANDING SOCIETY
2006 MEMBERSHIP LIST**

Yousif Attia
Sandy Ayer
Christine Bennett
Grahame Booth
Liz Brennan
Amanda Cole
Joanna Coleman
Doug Collister
Alexandra Dubrovna
Rainer Ebel
Dick Flynn
Lenora Flynn
Tom Glen
Carole Hachey
Garry Hornbeck
Bev Kissinger
Maryanne Kissinger
Michelle Koch
Stephen Lane
Josh Levac
David Lieske
Shonna McLeod
Greg Meyer
Pat Mitchell
Mike Mulligan
Jeff Nugent
El Peterson
Lisa Quattrocchi
Schuyler Robinson

Carl Savignac
Paula Schneider
Ken Scott
Terry Silverson
Gwen Smiley
Cyndi Smith
Tara Stephens
Don Stiles
Bill Taylor
Barry Trakalo
Marie Tremblay
Amy Turnbull
Catherine Watson
Catherine Watson-MacDonald
Linda Wiggins
Amy Wilson
Bruce Wilson
Scott Wilson
Colin Young

Executive

President – Catherine Watson
Vice President – Shonna McLeod
Treasurer – El Peterson
Secretary – Gwen Smiley
Annual Report – Doug Collister
Director at Large – Greg Meyer
Director at Large – Bill Taylor
Director at Large – Barry Trakalo

Appendix 1

Appendix 1a. New Bandings at Inglewood Bird Sanctuary - Spring 2006

Species	May												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Sharp-shinned Hawk										1			
Spotted Sandpiper													
Belted Kingfisher										1			
Downy Woodpecker													
Western Wood-Pewee													
Alder Flycatcher													
Least Flycatcher													
Eastern Kingbird													
Warbling Vireo													
Tree Swallow				1		1					3	1	
N Rough-winged Swallow													
Black-capped Chickadee					1								
White-breasted Nuthatch													
House Wren													
Ruby-crowned Kinglet						1				1			1
Golden-crowned Kinglet								1					
Gray-cheeked Thrush													
Swainson's Thrush													
American Robin	3				1	1	1				4		
Gray Catbird													
Brown Thrasher													
Cedar Waxwing													
Orange-crowned Warbler	1												
Yellow Warbler													
Yellow-rumped Warbler	8		26			7	1			1			2
American Redstart													
Ovenbird													
Northern Waterthrush													
MacGillivray's Warbler													
Common Yellowthroat													
Wilson's Warbler													
Chipping Sparrow													
Clay-colored Sparrow													
Savannah Sparrow								1			1		
Lincoln's Sparrow	3				1	1	1			1			4
White-throated Sparrow													
White-crowned Sparrow	1					4	4					2	2
Red-winged Blackbird													
Common Grackle													
Brown-headed Cowbird											1		
Baltimore Oriole													

Appendix 1a. New Bandings at Inglewood Bird Sanctuary - Spring 2006

Species	May												
	14	15	16	17	18	19	20	21	22	23	24	25	26
Sharp-shinned Hawk													
Spotted Sandpiper													
Belted Kingfisher						1						1	
Downy Woodpecker			1										
Western Wood-Pewee								1					
Alder Flycatcher													
Least Flycatcher													2
Eastern Kingbird													
Warbling Vireo													
Tree Swallow	1		1	1		1	2	1		1			
N Rough-winged Swallow				1					1			1	
Black-capped Chickadee													
White-breasted Nuthatch													
House Wren								1	1				3
Ruby-crowned Kinglet													
Golden-crowned Kinglet													
Gray-cheeked Thrush							1						
Swainson's Thrush			2	2			3		6	4	1		3
American Robin		2	2	3		1	5		4		1	1	2
Gray Catbird										1			
Brown Thrasher													1
Cedar Waxwing													
Orange-crowned Warbler													
Yellow Warbler						1	1		1	1	1	1	1
Yellow-rumped Warbler													
American Redstart													
Ovenbird										1			
Northern Waterthrush							1					2	
MacGillivray's Warbler													
Common Yellowthroat												1	1
Wilson's Warbler				1					1				
Chipping Sparrow							2	2					
Clay-colored Sparrow		2				1				2			1
Savannah Sparrow													
Lincoln's Sparrow									3	1		1	
White-throated Sparrow		1											
White-crowned Sparrow		1		1						1			
Red-winged Blackbird							1				1		
Common Grackle													
Brown-headed Cowbird	1	1											
Baltimore Oriole											1	2	

Appendix 1a. New Bandings at Inglewood Bird Sanctuary - Spring 2006

Species	May					June							Total
	27	28	29	30	31	1	2	3	4	5	6	7	
Sharp-shinned Hawk													1
Spotted Sandpiper							1						1
Belted Kingfisher													3
Downy Woodpecker													1
Western Wood-Pewee						1					1	1	4
Alder Flycatcher						1							1
Least Flycatcher					2			1					5
Eastern Kingbird						1				1	1		3
Warbling Vireo										1			1
Tree Swallow													14
N Rough-winged Swallow							1						4
Black-capped Chickadee													1
White-breasted Nuthatch			1					1					2
House Wren			2				1			1	1		10
Ruby-crowned Kinglet													3
Golden-crowned Kinglet													1
Gray-cheeked Thrush													1
Swainson's Thrush			1	1	1	2	9	8	2	1			46
American Robin			1	2	1				1			1	37
Gray Catbird			1	1	1		2	2	2			5	15
Brown Thrasher													1
Cedar Waxwing						3		2		1	2		8
Orange-crowned Warbler													1
Yellow Warbler			3	2	1	1	2	1	1	3			21
Yellow-rumped Warbler													45
American Redstart					1			1					2
Ovenbird													1
Northern Waterthrush													3
MacGillivray's Warbler					1								1
Common Yellowthroat			1		2							1	6
Wilson's Warbler						1							3
Chipping Sparrow							1			1			6
Clay-colored Sparrow													6
Savannah Sparrow													2
Lincoln's Sparrow													16
White-throated Sparrow				1									2
White-crowned Sparrow													16
Red-winged Blackbird					1		1		1				5
Common Grackle					1		1						2
Brown-headed Cowbird										1			4
Baltimore Oriole			1									2	6

Appendix 1b. New Bandings at Inglewood Bird Sanctuary - Fall 2006

Species	July				August																				
	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Sharp-shinned Hawk																									
Solitary Sandpiper				1				1			1		1					1				1			
Spotted Sandpiper										1	1									1					
Belted Kingfisher	1	2	1				1								1										
Downy Woodpecker		2			1	1							1	1							1				
Hairy Woodpecker																									
Northern Flicker										1			1												
Olive-sided Flycatcher																						1			
Western Wood-Pewee	2			1					3	1			1						1			1		1	
Alder Flycatcher							3	1			1	1	2	3	2	2		2	5	2	4	1	6	5	8
Willow Flycatcher																									
Least Flycatcher	1	3	2	1	2					1			6	6	1		1		1	3	4	1		1	1
Eastern Kingbird			1										1	2		1			1	1	7	1		1	1
Blue-headed Vireo													1												
Warbling Vireo					2					1	1	1	1					2		1	2	1		1	1
Red-eyed Vireo																									1
Black-capped Chickadee	1	2	1		1					2		2						2			1				
Boreal Chickadee																									
Red-breasted Nuthatch													2	1											
White-breasted Nuthatch		1																							
Brown Creeper																									
House Wren	15	6	5		4	1	1	1		2		1		4				2	3			2			
Winter Wren																									
Golden-crowned Kinglet																									
Ruby-crowned Kinglet																									
Townsend's Solitaire																									
Swainson's Thrush			2	1															1						
Hermit Thrush																									
American Robin	3	1	3	2			2			1		1				2		1	1			1		1	
Gray Catbird								1	1										1		1	1	1		
Cedar Waxwing	1	4		3	3	2	1	1		1	1		5				1	1							
Tennessee Warbler	3	2	3	1	2	1		1	2	2	1	2	2	1	4				7						2
Orange-crowned Warbler																									
Nashville Warbler																									
Yellow Warbler	8	6		3	3	1	1	1	9	8	4	9	3	3		2			2	2					2
Magnolia Warbler																									
Yellow-rumped Warbler	17	9	12	3	8	3	9	2	9	6	6	8	16	3		1	2	3	6	2	6	5	4	8	4
Townsend's Warbler																									
Palm Warbler																									
Blackpoll Warbler																					1		1	1	
Black-and-white Warbler																									1
American Redstart														2					1		1		4	2	
Ovenbird														1					2	2	2		2	2	2
Northern Waterthrush	1				1				1		2	2	2	4		4	2	3	3	1	1	2	1	4	
Connecticut Warbler																									1
Mourning Warbler																	1	1							1
MacGillivray's Warbler																							2		1
Common Yellowthroat																									
Wilson's Warbler																1		3	1		2		9	2	1
Canada Warbler																									
American Tree Sparrow																									
Chipping Sparrow		1			1		2			1			1							2			1		
Clay-colored Sparrow			1		1								2	4				1						1	
Savannah Sparrow																									
Song Sparrow	1				1		2				3		1			1									
Lincoln's Sparrow														4							1			1	
Swamp Sparrow																									
White-throated Sparrow																			1				1		2
White-crowned Sparrow																							1		
Dark-eyed Junco																									
Rose-breasted Grosbeak														1				1							
Rusty Blackbird																									
Common Grackle																									
Baltimore Oriole																			1				1		
Purple Finch											1														
House Finch					1					1															
American Goldfinch		1		1																					

Appendix 1b. New Bandings at Inglewood Bird Sanctuary - Fall 2006

Species	August										September														
	22	23	24	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Sharp-shinned Hawk																									
Solitary Sandpiper	1																								
Spotted Sandpiper																									
Belted Kingfisher			2								1		2												1
Downy Woodpecker																									
Hairy Woodpecker																									
Northern Flicker							1																		
Olive-sided Flycatcher																									
Western Wood-Pewee																									
Alder Flycatcher	2	2	3	5	1	3				3	1	1					1								
Willow Flycatcher										1															
Least Flycatcher	1	1		1	1		1		1	1							1								
Eastern Kingbird																									
Blue-headed Vireo																									
Warbling Vireo			1						1													1			
Red-eyed Vireo	1								1									1							
Black-capped Chickadee							1															2			
Boreal Chickadee																1									
Red-breasted Nuthatch																									
White-breasted Nuthatch																									
Brown Creeper																									
House Wren	5				1	2				1	2								1						
Winter Wren																									
Golden-crowned Kinglet																			1						1
Ruby-crowned Kinglet												1				1					1	1			1
Townsend's Solitaire																									
Swainson's Thrush	1				1		1			1									2						
Hermit Thrush																									
American Robin															1										
Gray Catbird				1	1	1	2					1	1												
Cedar Waxwing																									
Tennessee Warbler	2	1							1							1							1	1	
Orange-crowned Warbler										1					2	5	2	4	5	3	9	10	6		1
Nashville Warbler																			1						
Yellow Warbler	3							1	1						2				1						
Magnolia Warbler			1		1		1				1														1
Yellow-rumped Warbler	27	14		1	5	1			2	1	1	1		2	3	2	2	4	37	19	13	30	4		
Townsend's Warbler		1																				1			
Palm Warbler																						1			
Blackpoll Warbler					1																				
Black-and-white Warbler																									
American Redstart		2				1					1												1		
Ovenbird	1	3			2		2	1		1	1				1	1				1					
Northern Waterthrush	2	2	4																						
Connecticut Warbler			1				1																	1	
Mourning Warbler												1													
MacGillivray's Warbler											1														
Common Yellowthroat																2				1		1	1		
Wilson's Warbler	2	5			6		2	1	1	1	6	16	4	1	2	3	1	1		1	4	7	9	6	6
Canada Warbler							1																		
American Tree Sparrow																									
Chipping Sparrow											1														
Clay-colored Sparrow		1						2																	
Savannah Sparrow																								1	
Song Sparrow			1	1		1			1																
Lincoln's Sparrow	2	2		2	3		3	1	2	2	7	1				3	2	1	5	2		5	1		5
Swamp Sparrow																			1						
White-throated Sparrow					6				1	1	5	5	3			2	2	3	7		6	4			5
White-crowned Sparrow												1			2			1			1		1		
Dark-eyed Junco																							1		
Rose-breasted Grosbeak																									
Rusty Blackbird																									
Common Grackle																		3							
Baltimore Oriole																									
Purple Finch																									
House Finch																									
American Goldfinch																									

Appendix 1b. New Bandings at Inglewood Bird Sanctuary - Fall 2006

Species	September														October				Total	
	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	1	2	3		4
Sharp-shinned Hawk							1					1							1	3
Solitary Sandpiper																				7
Spotted Sandpiper																				3
Belted Kingfisher							2		1											15
Downy Woodpecker																				7
Hairy Woodpecker		1																		1
Northern Flicker																				3
Olive-sided Flycatcher																				1
Western Wood-Pewee																				11
Alder Flycatcher																				70
Willow Flycatcher																				1
Least Flycatcher																				43
Eastern Kingbird																				17
Blue-headed Vireo																				1
Warbling Vireo																				17
Red-eyed Vireo																				4
Black-capped Chickadee		2	1						2		2		1	2		2				27
Boreal Chickadee																				1
Red-breasted Nuthatch																				3
White-breasted Nuthatch								1												2
Brown Creeper												3						3		6
House Wren																				59
Winter Wren																			1	1
Golden-crowned Kinglet																			3	5
Ruby-crowned Kinglet		2	1					3	1				10			6		1		29
Townsend's Solitaire																				1
Swainson's Thrush		4	1		1					1										17
Hermit Thrush										2										3
American Robin		1			8															29
Gray Catbird																				13
Cedar Waxwing																				24
Tennessee Warbler																				43
Orange-crowned Warbler		9	1		16		24	33	4			4	8	2		5				154
Nashville Warbler													1						1	3
Yellow Warbler																				75
Magnolia Warbler																				6
Yellow-rumped Warbler		1	1		37		26	3		1	3	1	7	3					8	412
Townsend's Warbler																				2
Palm Warbler														1		1		1		4
Blackpoll Warbler					2											1				7
Black-and-white Warbler																				1
American Redstart											1									16
Ovenbird		1																		26
Northern Waterthrush					1															43
Connecticut Warbler																				5
Mourning Warbler																				5
MacGillivray's Warbler																				4
Common Yellowthroat					3															9
Wilson's Warbler		24	2		15		11	8			1	1	1	1						168
Canada Warbler																				1
American Tree Sparrow																1			4	5
Chipping Sparrow																				10
Clay-colored Sparrow							1	1												15
Savannah Sparrow																				1
Song Sparrow																				14
Lincoln's Sparrow					1			1					1							58
Swamp Sparrow																1				2
White-throated Sparrow		1	3		1		1	1	3	1			1						1	67
White-crowned Sparrow		1			1			1		1		4	1	1						17
Dark-eyed Junco							1		6		3		2						1	14
Rose-breasted Grosbeak																				2
Rusty Blackbird																			1	1
Common Grackle					1															4
Baltimore Oriole																				2
Purple Finch																				1
House Finch																				2
American Goldfinch																				2

Appendix 2

Appendix 2. Top 20 New Bandings at Inglewood Bird Sanctuary

Spring				
Species	Total 2002-2006		2006	
	Rank	Number	Rank	Number
Yellow-rumped Warbler	1	573	2	45
Swainson's Thrush	2	213	1	46
American Robin	3	172	3	37
Lincoln's Sparrow	4	145	5	16
Yellow Warbler	5	107	4	21
White-crowned Sparrow	6	78	5	16
Tree Swallow	7	67	8	14
Gray Catbird	8	62	7	15
Orange-crowned Warbler	9	56		1
Clay-colored Sparrow	10	50	10	6
House Wren	10	50		1
Common Yellowthroat	12	49	10	6
Least Flycatcher	13	40	14	5
Blackpoll Warbler	14	34		
Cedar Waxwing	15	31	9	8
Brown-headed Cowbird	16	27	16	4
Baltimore Oriole	17	23	10	6
Northern Waterthrush	17	23	19	3
White-throated Sparrow	17	23		2
Traill's Flycatcher*	20	23		1
Red-winged Blackbird		22	14	5
N Rough-winged Swallow		18	16	4
Chipping Sparrow		16	10	6
Western Wood-Pewee		15	16	4
Wilson's Warbler		11	19	3
Eastern Kingbird		9	19	3
Belted Kingfisher		5	19	3
Ruby-crowned Kinglet		5	19	3

Fall				
Species	Total 1995-2006		2006	
	Rank	Number	Rank	Number
Yellow-rumped Warbler	1	3626	1	412
Wilson's Warbler	2	2025	2	168
Orange-crowned Warbler	4	1309	3	154
Yellow Warbler	3	1304	4	75
Tennessee Warbler	5	978	9	43
Traill's Flycatcher*	6	808	5	71
House Wren	8	774	7	59
American Robin	7	746	12	29
Chipping Sparrow	9	720		
White-throated Sparrow	11	565	6	67
Northern Waterthrush	10	550	9	43
Lincoln's Sparrow	12	549	8	58
Cedar Waxwing	13	384	16	24
Swainson's Thrush	14	323	17	17
Least Flycatcher	15	300	9	43
White-crowned Sparrow	15	300	17	17
Ovenbird	17	267	15	26
Black-capped Chickadee	18	219	14	27
Clay-colored Sparrow	19	204		
Ruby-crowned Kinglet	20	193	12	29
Warbling Vireo		191	17	17
Eastern Kingbird		157	17	17

* includes Alder and Willow Flycatcher

Appendix 3

**CRITERIA USED TO DEFINE AND PRIORITIZE MONITORED SPECIES
(From Bird Studies Canada)**

Monitored Species

Mean number banded each year ≥ 10 , and mean number of days each year on which individuals banded ≥ 5 .

Priority for Migration Monitoring

- A** Those species that have <50% of Canadian and Alaskan breeding range covered by the Breeding Bird Survey and <60% of winter range within Canada and U.S.
- B** Those species that have <50% of Canadian and Alaskan breeding range covered by the Breeding Bird Survey but 60% of their winter range is within Canada and U.S.
- C** Those species with <60% coverage of Canadian and Alaskan breeding range (but 50% of NA range) covered by the Breeding Bird Survey and have <60% of wintering range in Canada and U.S.
- D** Those species with <60% coverage of Canadian and Alaskan breeding range covered by the Breeding Bird Survey but have >60% of their wintering range in Canada and U.S.
- E** Those species with >60% coverage of Canadian and Alaskan breeding range covered by the Breeding Bird Survey but have <60% of their wintering range in Canada and U.S.
- F** Those species with >60% coverage of Canadian and Alaskan breeding range covered by the Breeding Bird Survey and have >60% of their wintering range in Canada and U.S.

Appendix 3. Monitored Species at Inglewood Bird Sanctuary

Species	Spring		Fall		Priority
	2002-2006		1995-2006		
	Mean		Mean		
	Number	Frequency	Number	Frequency	
Western Wood-Pewee			13	8	C
Trail's Flycatcher			64	22	A
Least Flycatcher			23	15	C
Eastern Kingbird			13	9	C
Warbling Vireo			14	11	C
Tree Swallow	13	10			C
House Wren	12	7	65	25	E
Ruby-crowned Kinglet			16	10	B
Swainson's Thrush	43	14	23	14	A
American Robin	35	18	61	22	D
Gray Catbird	12	7			E
Cedar Waxwing			31	11	D
Tennessee Warbler			77	24	A
Orange-crowned Warbler	11	5	104	25	A
Yellow Warbler	22	11	103	25	C
Yellow-rumped Warbler	115	12	264	39	B
Blackpoll Warbler			10	7	A
American Redstart			12	8	C
Ovenbird			20	13	C
Northern Waterthrush			44	20	A
Common Yellowthroat	10	6			C
Wilson's Warbler			153	33	A
Chipping Sparrow			59	15	C
Clay-colored Sparrow	10	6	17	11	C
Song Sparrow			13	11	D
Lincoln's Sparrow	29	12	45	24	A
White-throated Sparrow			45	19	B
White-crowned Sparrow	16	7	24	13	B
Baltimore Oriole			10	5	E
	3		7		A
	2		4		B
	4		5		C

Appendix 4

**Appendix 4. Year-to-Year Recaptures at Inglewood Bird Sanctuary,
Dunbow Road, Cominco Natural Area and De Wit Ranch**

Species	Band	Location	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Northern Saw-whet Owl	1204-23480	De Wit ranch													B	d	
Northern Saw-whet Owl	1204-25371	De Wit ranch													B	x	r
Northern Saw-whet Owl	924-21506	De Wit ranch														B	r
Belted Kingfisher	1363-70918	IBS			B	r											
Belted Kingfisher	1363-70961	IBS											B	r			
Yellow-bellied Sapsucker	8051-65119	Dunbow						B	r								
Red-naped Sapsucker	8041-54901	Dunbow							B	r							
Downy Woodpecker	1451-67033	IBS				B	r	r	x	x	x	r					
Downy Woodpecker	1461-02314	IBS					B	r	r	r							
Downy Woodpecker	1461-05307	Dunbow						B	x	r							
Downy Woodpecker	1461-50837	Cominco									B	r					
Downy Woodpecker	1461-63690	IBS			B	r											
Downy Woodpecker	1461-84563	Cominco									B	r					
Downy Woodpecker	1761-28014	Cominco									B	r					
Downy Woodpecker	1791-28009	IBS											B	r	r		
Downy Woodpecker	1791-28131	IBS										B	r	r	r		
Downy Woodpecker	1811-73700	IBS													B	x	r
Downy Woodpecker	1871-73165	IBS														B	r
Downy Woodpecker	1871-73196	IBS														B	r
Downy Woodpecker	1871-73382	IBS														B	r
Downy Woodpecker	1871-73457	IBS													B	r	r
Hairy Woodpecker	0962-90911	IBS				B	x	x	x	x	r	x	r				
Hairy Woodpecker	1152-38713	IBS							B	x	r	x	r				
Hairy Woodpecker	8041-83240	IBS													B	x	r
Northern Flicker	1383-76804	IBS							B	x	x	r					
Northern Flicker	1383-76830	IBS											B	r	r		
Northern Flicker	1453-31301	IBS				B	r										
Western Wood-Pewee	2160-19068	IBS							B	x	x	r					
Western Wood-Pewee	2160-19487	IBS								B	x	r					
Western Wood-Pewee	2190-10406	IBS										B	r				
Western Wood-Pewee	2200-47351	IBS										B	r	r	r	r	
Western Wood-Pewee	2290-88513	IBS													B	r	

**Appendix 4. Year-to-Year Recaptures at Inglewood Bird Sanctuary,
Dunbow Road, Cominco Natural Area and De Wit Ranch**

Species	Band	Location	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Least Flycatcher	2050-70767	Dunbow						B	x	r							
Eastern Kingbird	1451-38640	IBS	B	x	x	r											
Eastern Kingbird	1461-31482	IBS							B	x	x	x	r				
Eastern Kingbird	1461-50853	Cominco									B	r					
Eastern Kingbird	1461-50898	Cominco									B	r					
Eastern Kingbird	1461-50899	Cominco									B	r					
Eastern Kingbird	1461-63719	IBS					B	r	x	r	x	x	r				
Eastern Kingbird	1461-63727	IBS					B	x	x	x	r						
Eastern Kingbird	1461-63750	IBS						B	r	r	x	x	r				
Eastern Kingbird	1761-28292	IBS										B	r				
Eastern Kingbird	1791-21021	IBS										B	x	r	r		
Eastern Kingbird	1811-73189	IBS												B	x	x	r
Eastern Kingbird	1871-73181	IBS														B	r
Eastern Kingbird	1871-73452	IBS													B	r	
Warbling Vireo	1950-45045	IBS			B	r											
Warbling Vireo	1950-45076	IBS			B	x	r	r	r								
Warbling Vireo	1950-48110	IBS		B	x	r											
Warbling Vireo	1990-57936	IBS									B	x	r	r			
Warbling Vireo	2050-70837	IBS						B	r								
Warbling Vireo	2050-70961	IBS					B	x	r								
Warbling Vireo	2091-55780	IBS														B	r
Warbling Vireo	2161-14605	IBS				B	x	x	r								
Warbling Vireo	2171-56330	Cominco									B	r					
Warbling Vireo	2190-10445	IBS										B	r				
Warbling Vireo	2220-34455	Cominco									B	r					
Warbling Vireo	2270-23115	IBS											B	x	r	r	
Warbling Vireo	2270-80426	IBS												B	r		
Warbling Vireo	3101-45254	IBS								B	r						
Warbling Vireo	3101-89999	IBS								B	x	x	r				
Warbling Vireo	3121-21265	Cominco									B	r					
Tree Swallow	1671-56106	IBS												B	r		
Tree Swallow	1671-56108	IBS												B	x	x	r

**Appendix 4. Year-to-Year Recaptures at Inglewood Bird Sanctuary,
Dunbow Road, Cominco Natural Area and De Wit Ranch**

Species	Band	Location	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Tree Swallow	1671-56126	IBS												B	r	r	
Tree Swallow	2161-08859	IBS													B	r	r
Tree Swallow	2161-08860	IBS													B	r	
Tree Swallow	2161-08869	IBS													B	r	
Tree Swallow	2161-08872	IBS													B	r	
Tree Swallow	2171-56486	IBS											B	x	r		
Tree Swallow	2171-56493	IBS											B	x	r		
Northern Rough-winged Swallow	2290-88401	IBS													B	r	
Northern Rough-winged Swallow	2290-37386	IBS														B	r
Black-capped Chickadee	1950-45065	IBS			B	r											
Black-capped Chickadee	1950-45186	IBS			B	r	r	r									
Black-capped Chickadee	1950-45254	IBS			B	r	r	x	x	r	r	r					
Black-capped Chickadee	1950-45255	IBS			B	x	x	x	x	x	r	r					
Black-capped Chickadee	1950-45256	IBS			B	r	r										
Black-capped Chickadee	1950-45258	IBS			B	r	r	r	r								
Black-capped Chickadee	1950-45786	IBS					B	r									
Black-capped Chickadee	1980-79991	IBS				B	r	r	r	r	r	r					
Black-capped Chickadee	1990-57154	IBS						B	r								
Black-capped Chickadee	2050-70142	IBS				B	x	r									
Black-capped Chickadee	2050-70427	IBS					B	r									
Black-capped Chickadee	2050-70849	IBS						B	r								
Black-capped Chickadee	2120-00102	Dunbow						B	r	r							
Black-capped Chickadee	2120-00103	Dunbow						B	r								
Black-capped Chickadee	2120-00105	Dunbow						B	r	r							
Black-capped Chickadee	2120-00107	Dunbow						B	r	r							
Black-capped Chickadee	2120-00109	Dunbow						B	r	r							
Black-capped Chickadee	2120-00110	Dunbow						B	r								
Black-capped Chickadee	2120-00113	Dunbow						B	r								
Black-capped Chickadee	2120-00114	Dunbow						B	r								
Black-capped Chickadee	2120-00117	Dunbow						B	r	r							
Black-capped Chickadee	2120-00124	Dunbow						B	x	r							
Black-capped Chickadee	2120-00125	Dunbow						B	r								

**Appendix 4. Year-to-Year Recaptures at Inglewood Bird Sanctuary,
Dunbow Road, Cominco Natural Area and De Wit Ranch**

Species	Band	Location	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Black-capped Chickadee	2120-00128	Dunbow						B	r								
Black-capped Chickadee	2120-00197	Dunbow						B	r								
Black-capped Chickadee	2160-18085	Dunbow							B	r							
Black-capped Chickadee	2160-18180	IBS						B	r								
Black-capped Chickadee	2160-18704	IBS							B	r							
Black-capped Chickadee	2160-19059	IBS							B	r							
Black-capped Chickadee	2160-19120	IBS							B	r	r	r	r	r			
Black-capped Chickadee	2160-19174	IBS							B	r							
Black-capped Chickadee	2160-19522	IBS								B	r	r	r	r	r		
Black-capped Chickadee	2190-10126	IBS									B	r	r				
Black-capped Chickadee	2190-10128	IBS									B	x	r				
Black-capped Chickadee	2200-47365	IBS										B	r				
Black-capped Chickadee	2220-34017	Cominco									B	r					
Black-capped Chickadee	2220-34132	Cominco									B	r					
Black-capped Chickadee	2220-34593	Cominco									B	r					
Black-capped Chickadee	2270-23454	IBS											B	r	r	r	r
Black-capped Chickadee	2270-80108	IBS											B	r	r	r	
Black-capped Chickadee	2270-80454	IBS												B	r	r	r
Black-capped Chickadee	2270-80480	IBS												B	r		
Black-capped Chickadee	2270-80687	IBS												B	r		
Black-capped Chickadee	2270-80989	IBS													B	r	
Black-capped Chickadee	2270-81230	IBS														B	r
Black-capped Chickadee	2290-88658	IBS													B	r	r
Black-capped Chickadee	2290-92058	IBS												B	r		
Black-capped Chickadee	2290-92141	IBS												B	r	r	r
Black-capped Chickadee	2290-92174	IBS												B	r		
Black-capped Chickadee	2290-37348	IBS														B	r
Black-capped Chickadee	2390-30780	IBS										B	r				
Black-capped Chickadee	2390-30780	IBS										B	x	r			
Black-capped Chickadee	2390-30962	IBS											B	r			
Black-capped Chickadee	3500-89670	Dunbow						B	r	r							
White-breasted Nuthatch	1461-31479	IBS							B	r	r						

**Appendix 4. Year-to-Year Recaptures at Inglewood Bird Sanctuary,
Dunbow Road, Cominco Natural Area and De Wit Ranch**

Species	Band	Location	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
White-breasted Nuthatch	1461-84757	IBS				B	r	x	r								
White-breasted Nuthatch	1761-15767	IBS											B	r			
White-breasted Nuthatch	1761-28100	IBS															
White-breasted Nuthatch	1791-28150	IBS										B	r				
White-breasted Nuthatch	1811-73193	IBS												B	x	r	
House Wren	1910-52261	IBS	B	r	x	r	r	r	r								
House Wren	1950-45790	IBS					B	r									
House Wren	1950-45886	IBS					B	r									
House Wren	1950-48126	IBS		B	x	r											
House Wren	1990-57803	Cominco									B	r					
House Wren	1990-57943	IBS									B	r					
House Wren	1990-57981	IBS									B	r	r	r	r	r	
House Wren	2060-28447	IBS						B	r								
House Wren	2160-18063	Dunbow							B	r							
House Wren	2160-18082	Dunbow							B	r							
House Wren	2160-19002	Dunbow							B	r							
House Wren	2190-10308	IBS									B	r					
House Wren	2190-10325	IBS										B	r				
House Wren	2200-47352	IBS										B	r				
House Wren	2200-47377	IBS										B	r	r	r		
House Wren	2220-13252	IBS											B	x	r	x	r
House Wren	2220-13258	IBS											B	x	r		
House Wren	2270-23312	IBS											B	r			
House Wren	2270-23375	IBS											B	r			
House Wren	2270-23485	IBS											B	r			
House Wren	2270-80132	IBS											B	r			
House Wren	2270-80192	IBS												B	r		
House Wren	2270-80296	IBS												B	x	x	r
House Wren	2270-80297	IBS												B	r	r	
House Wren	2270-80314	IBS												B	x	r	
House Wren	2270-80336	IBS												B	r		
House Wren	2270-80346	IBS												B	r		

**Appendix 4. Year-to-Year Recaptures at Inglewood Bird Sanctuary,
Dunbow Road, Cominco Natural Area and De Wit Ranch**

Species	Band	Location	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
House Wren	2270-80400	IBS												B	r		
House Wren	2270-80454	IBS												B	r		
House Wren	2270-81418	IBS													B	x	r
House Wren	2290-37017	IBS														B	r
House Wren	2290-37184	IBS														B	r
House Wren	2290-37331	IBS														B	r
House Wren	2290-37483	IBS														B	r
House Wren	2290-37489	IBS														B	r
House Wren	2290-88409	IBS													B	r	
House Wren	2290-88460	IBS													B	r	
House Wren	2290-92112	IBS												B	r		
House Wren	2290-92203	IBS												B	r		
Swainson's Thrush	1451-67159	IBS					B	x	r								
Swainson's Thrush	1461-63572	IBS						B	r								
Swainson's Thrush	1461-63682	IBS			B	x	r										
Swainson's Thrush	1461-63692	IBS			B	x	x	r									
Swainson's Thrush	1461-63741	IBS					B	r									
Swainson's Thrush	1461-69595	IBS					B	r									
Swainson's Thrush	1541-17673	IBS								B	r	x	r				
American Robin	0942-93625	IBS												B	d		
American Robin	0942-93635	IBS											B	r			
American Robin	0942-93643	IBS											B	r			
American Robin	0942-93654	IBS												B	r		
American Robin	0942-93655	IBS												B	r	x	r
American Robin	0942-93660	IBS												B	r		
American Robin	0942-93694	IBS												B	x	d	
American Robin	0942-93747	IBS												B	r		
American Robin	0942-93786	IBS												B	x	r	
American Robin	0962-90991	IBS				B	x	r									
American Robin	0972-30082	IBS										B	r				
American Robin	0972-30083	IBS										B	r	r			
American Robin	0972-30087	IBS										B	r				

**Appendix 4. Year-to-Year Recaptures at Inglewood Bird Sanctuary,
Dunbow Road, Cominco Natural Area and De Wit Ranch**

Species	Band	Location	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
American Robin	0972-30095	IBS										B	x	r			
American Robin	0972-30466	IBS				B	x	r									
American Robin	0942-93731	IBS												B	x	x	r
American Robin	1142-49046	IBS						B	r								
American Robin	1142-49201	Dunbow						B	r								
American Robin	1142-49212	Dunbow						B	x	r							
American Robin	1142-49217	Dunbow						B	r								
American Robin	1142-49221	Dunbow						B	r								
American Robin	1142-49261	IBS											B	r		r	
American Robin	1142-49270	IBS											B	x	r		
American Robin	1142-49272	IBS											B	x	x	x	r
American Robin	1142-55013	IBS										B	x	x	x	x	r
American Robin	1142-55058	IBS															
American Robin	1152-38703	Dunbow							B	r							
American Robin	1152-38721	IBS							B	x	x	x	x	x	r	r	r
American Robin	1152-38740	IBS							B	r	x	r	x	r			
American Robin	1152-38887	IBS									B	r					
American Robin	1202-13232	IBS													B	r	
American Robin	1202-13233	IBS														B	r
American Robin	1202-13232	IBS													B	r	
American Robin	1202-13243	IBS													B	r	
American Robin	1202-13272	IBS													B	r	r
American Robin	1202-13302	IBS														B	r
American Robin	1202-13308	IBS														B	r
American Robin	1202-13333	IBS														B	r
American Robin	1202-13337	IBS														B	r
American Robin	1202-13338	IBS														B	r
American Robin	1202-13345	IBS														B	r
American Robin	1202-13368	IBS														B	r
American Robin	1202-13384	IBS														B	r
American Robin	1202-13386	IBS														B	r
Gray Catbird	1681-67028	Cominco									B	r					

**Appendix 4. Year-to-Year Recaptures at Inglewood Bird Sanctuary,
Dunbow Road, Cominco Natural Area and De Wit Ranch**

Species	Band	Location	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Gray Catbird	1681-67080	IBS										B	r				
Gray Catbird	1681-67087	IBS										B	r			r	
Gray Catbird	1871-73213	IBS														B	r
Gray Catbird	8041-54948	IBS							B	r							
Gray Catbird	8041-54987	IBS								B	x	r	x	r			
Gray Catbird	8041-59433	Cominco										B	x	x	x	x	r
Gray Catbird	8041-83021	Cominco									B	r					
Gray Catbird	8041-83028	Cominco									B	r					
Gray Catbird	8041-83041	Cominco									B	r					
Gray Catbird	8041-83086	IBS											B	r			
Gray Catbird	8041-83101	IBS												B	r		
Cedar Waxwing	1461-50802	Cominco									B	r					
Cedar Waxwing	1461-63733	IBS					B	r									
Tennessee Warbler	2300-06276	IBS														B	r
Orange-crowned Warbler	2160-18542	IBS							B	r							
Yellow Warbler	1910-52230	IBS	B	x	x	r											
Yellow Warbler	1950-45519	IBS				B	r	x	r								
Yellow Warbler	1950-45878	IBS					B	r	r								
Yellow Warbler	1950-48086	IBS		B	x	r											
Yellow Warbler	1950-48129	IBS		B	x	r	r										
Yellow Warbler	1950-48133	IBS		B	x	r											
Yellow Warbler	1980-79983	IBS				B	r	r	r	r							
Yellow Warbler	1990-57104	Dunbow						B	r								
Yellow Warbler	1990-57734	Cominco									B	r					
Yellow Warbler	1990-57738	Cominco									B	r					
Yellow Warbler	1990-57802	Cominco									B	r					
Yellow Warbler	1990-57864	Cominco									B	r					
Yellow Warbler	1990-57898	Cominco									B	r					
Yellow Warbler	1990-57916	Cominco									B	r					
Yellow Warbler	1990-57935	IBS									B	x	r				
Yellow Warbler	2050-70144	IBS				B	r										
Yellow Warbler	2070-42756	IBS						B	r								

**Appendix 4. Year-to-Year Recaptures at Inglewood Bird Sanctuary,
Dunbow Road, Cominco Natural Area and De Wit Ranch**

Species	Band	Location	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Yellow Warbler	2120-00181	Dunbow						B	r								
Yellow Warbler	2160-19158	IBS							B	r							
Yellow Warbler	2160-18045	Dunbow							B	r							
Yellow Warbler	2160-18068	Dunbow							B	r							
Yellow Warbler	2160-18077	Dunbow							B	r							
Yellow Warbler	2160-19059	IBS							B	r							
Yellow Warbler	2160-19576	IBS								B	x	r					
Yellow Warbler	2160-19766	IBS								B	r	r					
Yellow Warbler	2190-10407	IBS										B	x	r			
Yellow Warbler	2200-47358	Cominco										B	x	r			
Yellow Warbler	2200-47371	IBS										B	x	x	r		
Yellow Warbler	2200-47400	IBS										B	r				
Yellow Warbler	2220-13037	IBS											B	r			
Yellow Warbler	2220-13250	IBS											B	r			
Yellow Warbler	2220-13252	IBS											B	x	x	x	r
Yellow Warbler	2220-13258	IBS											B	r			
Yellow Warbler	2220-13262	IBS											B	r			
Yellow Warbler	2220-13397	IBS											B	r			
Yellow Warbler	2220-34098	Cominco									B	r					
Yellow Warbler	2220-34171	Cominco									B	r					
Yellow Warbler	2220-34293	Cominco									B	r					
Yellow Warbler	2220-34320	Cominco									B	r					
Yellow Warbler	2220-34370	Cominco									B	x	x	x	x	x	r
Yellow Warbler	2220-34423	Cominco									B	r					
Yellow Warbler	2220-34438	Cominco									B	r					
Yellow Warbler	2270-23132	IBS											B	r			
Yellow Warbler	2270-23288	IBS											B	r			
Yellow Warbler	2270-23333	IBS											B	r			
Yellow Warbler	2270-23346	IBS											B	r			
Yellow Warbler	2270-23419	IBS											B	x	x	r	
Yellow Warbler	2270-80288	IBS												B	r	r	
Yellow Warbler	2270-80303	IBS												B	x	x	r

**Appendix 4. Year-to-Year Recaptures at Inglewood Bird Sanctuary,
Dunbow Road, Cominco Natural Area and De Wit Ranch**

Species	Band	Location	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Yellow Warbler	2270-80307	IBS												B	r		
Yellow Warbler	2270-80347	IBS												B	x	r	
Yellow Warbler	2270-80421	IBS												B	r		
Yellow Warbler	2270-80447	IBS												B	x	x	r
Yellow Warbler	2270-80596	IBS													B	x	r
Yellow Warbler	2270-80777	IBS													B	r	r
Yellow Warbler	2270-80781	IBS													B	r	
Yellow Warbler	2270-80785	IBS													B	x	r
Yellow Warbler	2270-80861	IBS													B	r	
Yellow Warbler	2290-37023	IBS														B	r
Yellow Warbler	2290-37050	IBS														B	r
Yellow Warbler	2290-37311	IBS														B	r
Yellow Warbler	2290-37383	IBS														B	r
Yellow Warbler	2290-88365	IBS													B	x	r
Yellow Warbler	2290-88550	IBS													B	r	r
Yellow Warbler	2290-92164	IBS												B	x	x	r
Yellow Warbler	2290-92197	IBS												B	r	r	
Yellow Warbler	2390-30570	IBS										B	r	x	r		
Yellow Warbler	3500-89667	Dunbow						B	x	r							
Yellow-rumped Warbler	1910-52603	IBS	B	r													
Yellow-rumped Warbler	2290-37137	IBS														B	r
Clay-colored Sparrow	1990-57805	Cominco									B	x	x	r			
Clay-colored Sparrow	2050-70675	Dunbow						B	x	r							
Clay-colored Sparrow	2120-00157	Dunbow						B	r	r							
Clay-colored Sparrow	2120-00170	Dunbow						B	x	r							
Clay-colored Sparrow	2120-00176	Dunbow						B	r								
Clay-colored Sparrow	2160-18022	Dunbow							B	r							
Clay-colored Sparrow	2160-18028	Dunbow							B	r							
Clay-colored Sparrow	2160-18030	Dunbow							B	r							
Clay-colored Sparrow	2160-19504	IBS								B	x	x	r				
Clay-colored Sparrow	2220-34456	Cominco									B	r					
Clay-colored Sparrow	2220-34615	Cominco									B	r					


**Appendix 4. Year-to-Year Recaptures at Inglewood Bird Sanctuary,
Dunbow Road, Cominco Natural Area and De Wit Ranch**

Species	Band	Location	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Clay-colored Sparrow	2270-23483	IBS									B	r					
Clay-colored Sparrow	2390-30503	IBS										B	x	r			
Vesper Sparrow	1461-05331	Dunbow						B	r								
Vesper Sparrow	1461-31412	Dunbow							B	r							
Savannah Sparrow	2171-56304	Cominco									B	r					
Song Sparrow	1541-17836	Cominco									B	r					
Song Sparrow	1541-17895	Cominco									B	r					
Song Sparrow	1861-68929	IBS													B	r	
Song Sparrow	1871-73157	IBS														B	r
Song Sparrow	1871-73227	IBS														B	r
Lincoln's Sparrow	1671-56128	IBS												B	r		
Lincoln's Sparrow	2091-55732	IBS														B	r
Lincoln's Sparrow	2161-14607	IBS				B	r										
Lincoln's Sparrow	3121-21261	Cominco									B	r					
White-throated Sparrow	1791-28046	IBS											B	r			
White-throated Sparrow	1871-73465	IBS													B	r	
Red-winged Blackbird	8041-83032	Cominco									B	r					
Brown-headed Cowbird	1461-05333	Dunbow						B	r								
Brown-headed Cowbird	1461-31414	Dunbow							B	r							
Brown-headed Cowbird	1541-17842	Cominco									B	r					
Brown-headed Cowbird	1761-28251	IBS										B	r				
Brown-headed Cowbird	1791-28013	IBS											B	r	r	r	r
Brown-headed Cowbird	1811-73648	IBS													B	r	
Brown-headed Cowbird	1871-73167	IBS														B	r
Brown-headed Cowbird	1871-73199	IBS														B	r
Brown-headed Cowbird	8041-54991	Cominco									B	r					
Brown-headed Cowbird	8041-54992	Cominco									B	r					
Brown-headed Cowbird	8041-83003	Cominco									B	r					
Brown-headed Cowbird	8041-83005	Cominco									B	r					
Brown-headed Cowbird	8041-83019	Cominco									B	r					
Baltimore Oriole	8041-54908	IBS							B	r							
Baltimore Oriole	8041-83030	Cominco									B	r					

**Appendix 4. Year-to-Year Recaptures at Inglewood Bird Sanctuary,
Dunbow Road, Cominco Natural Area and De Wit Ranch**

Species	Band	Location	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Baltimore Oriole	8041-83090	IBS											B	r	r		
Baltimore Oriole	8041-83201	IBS													B	r	
Baltimore Oriole	8041-83221	IBS													B	r	
Baltimore Oriole	8041-83222	IBS													B	x	r
Baltimore Oriole	8041-83274	IBS														B	r
Baltimore Oriole	8051-65131	IBS						B	r								
American Goldfinch	1990-57875	Cominco									B	r					
American Goldfinch	2120-00188	Dunbow						B	x	r							
American Goldfinch	2190-10309	IBS									B	x	r	r	r		
American Goldfinch	2220-34131	Cominco									B	r					
American Goldfinch	2220-34245	Cominco									B	r					
American Goldfinch	2270-23364	IBS											B		r		
American Goldfinch	2270-80350	Cominco												B	r		
American Goldfinch	2270-80353	Cominco												B	r		
American Goldfinch	2290-37381	IBS														B	r

B year banded
r recaptured
d bird dead or remains found
x not detected but survival deduced from re-encounter in subsequent year

 banding location different than recapture location

Appendix 5

Appendix 5. New captures during MoSI at Las Caletas and Isla Violin 2005-2006

	Las Caletas							Las Caletas						Isla Violin				Las Caletas						
	11-Dec	12-Dec	13-Dec	14-Dec	15-Dec	16-Dec	17-Dec	22-Jan	23-Jan	24-Jan	25-Jan	26-Jan	27-Jan	28-Jan	28-Feb	01-Mar	02-Mar	03-Mar	05-Mar	06-Mar	07-Mar	08-Mar	09-Mar	10-Mar
Tiny Hawk													1											
Ruddy Ground-Dove		1																						
White-tipped Dove																								1
Gray-chested Dove																					1			
Ruddy Quail-Dove																								
Bronzy Hermit	1								1															1
Band-tailed Barbthroat	2	1	1								1	1					1							
Long-billed Hermit	2	2			2				1						1									
Stripe-throated Hermit	1	2				2			1															2
White-necked Jacobin		4	1	1					1		2	1	1											
Violet-crowned Woodnymph		1															1							2
Blue-throated Goldentail	4	3	2	2	1		2	3																
Charming Hummingbird	3	3	1	2	3	2	2																	2
Mangrove Hummingbird																								
Rufous-tailed Hummingbird	2			1		1					1													
Black-throated Trogon													1											
Blue-crowned Motmot																								1
Green Kingfisher												1												
American Pygmy Kingfisher						1																		
Rufous-tailed Jacamar						1																		
Olivaceous Piculet																								
Buff-throated Foliage-gleaner				1							1													
Plain Xenops											1													1
Tawny-winged Woodcreeper																								
Long-tailed Woodcreeper																								
Wedge-billed Woodcreeper	6	4	1	2	5																			1
Streak-headed Woodcreeper																								1
Black-hooded Antshrike																								
Russet Antshrike	1																							
Dot-winged Antwren	1	1	2																					
Chestnut-backed Antbird				1		1																		
Bicolored Antbird	1				1	3																		
Black-faced Antthrush	1																							
Ochre-bellied Flycatcher																								
Northern Bentbill				1																				
Golden-crowned Spadebill																								1
Ruddy-tailed Flycatcher	1			1		1																		
Sulphur-rumped Flycatcher																								1
Yellow-bellied Flycatcher																								
Bright-rumped Attila																								
Rufous Mourner																								1
Dusky-capped Flycatcher																								
Great Crested Flycatcher																								
Rufous Piha	1																							
Orange-collared Manakin				1																				

Appendix 5. New captures during MoSI at Las Caletas and Isla Violin 2005-2006

	Las Caletas							Las Caletas						Isla Violin				Las Caletas						
	11-Dec	12-Dec	13-Dec	14-Dec	15-Dec	16-Dec	17-Dec	22-Jan	23-Jan	24-Jan	25-Jan	26-Jan	27-Jan	28-Jan	28-Feb	01-Mar	02-Mar	03-Mar	05-Mar	06-Mar	07-Mar	08-Mar	09-Mar	10-Mar
Blue-crowned Manakin	1	1											1			1	1	1	1					
Red-capped Manakin	1	3	2		2	1	4	3	3	1				1	1			1		2			1	1
Tawny-crowned Greenlet	1																							1
Lesser Greenlet					1																			
Black-bellied Wren		1				1																		
Riverside Wren	2		1	2	1			1	1	1			1	1					1		1	1	1	
House Wren									1															
Scaly-breasted Wren									1				1											
Long-billed Gnatwren												1												
Wood Thrush																								1
Clay-colored Robin	1			1																				
White-throated Robin	1		2		2																			
Tennessee Warbler						1			1									3						
Mangrove Warbler																		1						
Chestnut-sided Warbler																			1					1
Worm-eating Warbler														1										
Northern Waterthrush															1	1				1				
Kentucky Warbler	1				1																			
Mourning Warbler																			1				1	
Bananaquit	1			1		1									3		1							
Gray-headed Tanager	1	1		1		1		2	3		1		2						1				1	
White-shouldered Tanager						1		1		1														
Black-cheeked Ant-Tanager	1		1					1	1		1	1										1	2	1
Summer Tanager						1							1											
Cherrie's Tanager								1					1								2		1	1
Variable Seedeater	2		2	1			4						1		1	1				1				1
Thick-billed Seed-Finch						1			1			1												
Orange-billed Sparrow			1						1			2	1											
Black-striped Sparrow		1							1	1												1		
Buff-throated Saltator	2																							1
Blue-black Grosbeak	1				1																			
Great-tailed Grackle																	2							
Spot-crowned Euphonia	1																							

Appendix 6

Appendix 6. Year-to-Year Recaptures at Las Caletas, Costa Rica

Species	Band	2002	2003	2004	2005	2006
Gray-chested Dove	1204		B	x	r	
Gray-chested Dove	1210		B	r	r	
Gray-chested Dove	1211		B	x	x	r
Gray-chested Dove	1215			B	r	
Ruddy Quail-Dove	2806			B	x	r
Ruddy Quail-Dove	2808			B	x	r
Ruddy Quail-Dove	2813				B	x
Bronzy Hermit	0066			B	r	
Band-tailed Barbthroat	0072			B	r	
Band-tailed Barbthroat	0086			B	x	r
Band-tailed Barbthroat	0290(0094)			B	r	r
Band-tailed Barbthroat	0166				B	r
Band-tailed Barbthroat	0237				B	r
Band-tailed Barbthroat	0285					B
Band-tailed Barbthroat	0329					B
Long-billed Hermit	0097				B	r
Long-billed Hermit	0099				B	r
Long-billed Hermit	0260				B	r
Long-billed Hermit	0330					B
Long-billed Hermit	0379					B
Violet-crowned Woodnymph	0332(0190)				B	r
Violet-crowned Woodnymph	0338(0156)				B	r
Blue-throated Goldentail	0050			B	x	x
Blue-throated Goldentail	0101			B	r	r
Blue-throated Goldentail	0116			B	x	r
Blue-throated Goldentail	0137			B	x	r
Blue-throated Goldentail	0225					B
Charming Hummingbird	0016			B	r	
Charming Hummingbird	0047			B	r	
Charming Hummingbird	0163				B	r
Charming Hummingbird	0177				B	r
Charming Hummingbird	0196				B	r
Charming Hummingbird	0197				B	r
Charming Hummingbird	0326					B
Charming Hummingbird	0328					B
Charming Hummingbird	0375					B
Charming Hummingbird	0382					B
Rufous-tailed Hummingbird	0090			B	x	r
Rufous-tailed Hummingbird	0160				B	r
Rufous-tailed Hummingbird	0162				B	r
Rufous-tailed Hummingbird	0278					B
Black-throated Trogon	839	B	x	r		

Appendix 6. Year-to-Year Recaptures at Las Caletas, Costa Rica

Species	Band	2002	2003	2004	2005	2006
Blue-crowned Motmot	1203		B	r		
Blue-crowned Motmot	1208		B	r	x	r
White-whiskered Puffbird	666			B	r	
Rufous-tailed Jacamar	774		B	r		
Olivaceous Piculet	0038	B	r			
Olivaceous Piculet	0099	B	r			
Olivaceous Piculet	0650				B	r
Buff-throated Foliage-gleaner	813	B	r	x	r	r
Buff-throated Foliage-gleaner	0904	B	r	r	r	r
Plain Xenops	0009	B	x	x	x	r
Plain Xenops	0037	B	r	r	r	r
Plain Xenops	0046	B	r	r	r	
Plain Xenops	0049	B	r	x	r	x
Plain Xenops	00120		B	r	x	r
Plain Xenops	0194			B	x	r
Plain Xenops	0346				B	r
Plain Xenops	0363				B	r
Plain Xenops	0422					B
Scaly-throated Leaf-tosser	746		B	r		
Tawny-winged Woodcreeper	791		B	r		
Tawny-winged Woodcreeper	897		B	r		
Tawny-winged Woodcreeper	0705	B	r	r		
Tawny-winged Woodcreeper	0714	B	r	x	r	r
Tawny-winged Woodcreeper	0720	B	r			
Tawny-winged Woodcreeper	736		B	x	x	r
Tawny-winged Woodcreeper	795			B	r	
Tawny-winged Woodcreeper	0286				B	r
Tawny-winged Woodcreeper	0300				B	r
Tawny-winged Woodcreeper	0302				B	r
Tawny-winged Woodcreeper	0626				B	r
Tawny-winged Woodcreeper	0636				B	r
Tawny-winged Woodcreeper	0665				B	r
Long-tailed Woodcreeper	0286				B	r
Long-tailed Woodcreeper	0419					B
Wedge-billed Woodcreeper	0006	B	r	r		
Wedge-billed Woodcreeper	0016	B	r			
Wedge-billed Woodcreeper	0022	B	r			
Wedge-billed Woodcreeper	0041	B	r	r		
Wedge-billed Woodcreeper	0047	B	r	r	r	
Wedge-billed Woodcreeper	0082	B	r			
Wedge-billed Woodcreeper	0097	B	x	x	x	r
Wedge-billed Woodcreeper	00139		B	r	r	x

Appendix 6. Year-to-Year Recaptures at Las Caletas, Costa Rica

Species	Band	2002	2003	2004	2005	2006
Wedge-billed Woodcreeper	0118		B	x	r	
Wedge-billed Woodcreeper	0151		B	r		
Wedge-billed Woodcreeper	0154		B	r	r	x
Wedge-billed Woodcreeper	0212			B	r	r
Wedge-billed Woodcreeper	0218			B	r	
Wedge-billed Woodcreeper	0219			B	x	x
Wedge-billed Woodcreeper	0223			B	r	
Wedge-billed Woodcreeper	0233			B	r	r
Wedge-billed Woodcreeper	0254			B	r	r
Wedge-billed Woodcreeper	0279				B	r
Wedge-billed Woodcreeper	0300				B	r
Wedge-billed Woodcreeper	0302				B	r
Wedge-billed Woodcreeper	378					B
Wedge-billed Woodcreeper	0390					B
Wedge-billed Woodcreeper	0393					B
Wedge-billed Woodcreeper	0418					B
Northern Barred-Woodcreeper	920		B	x	x	r
Northern Barred-Woodcreeper	924		B	x	r	x
Cocoa Woodcreeper	0701	B	r			
Cocoa Woodcreeper	755		B	x	r	
Cocoa Woodcreeper	783			B	r	
Cocoa Woodcreeper	785			B	r	
Cocoa Woodcreeper	787			B	r	
Cocoa Woodcreeper	789			B	r	x
Cocoa Woodcreeper	791			B	x	r
Cocoa Woodcreeper	714					B
Cocoa Woodcreeper	0316				B	r
Black-hooded Antshrike	0810	B	r	x	x	r
Black-hooded Antshrike	0816	B	r	r	x	r
Black-hooded Antshrike	0819	B	r			
Black-hooded Antshrike	0824	B	r	x	x	r
Black-hooded Antshrike	737		B	r	r	r
Black-hooded Antshrike	738		B	x	r	r
Black-hooded Antshrike	0563		B	r	x	x
Black-hooded Antshrike	769		B	x	x	r
Black-hooded Antshrike	1657			B	r	
Black-hooded Antshrike	1665			B	r	
Black-hooded Antshrike	1660			B	x	r
Black-hooded Antshrike	0643				B	r
Black-hooded Antshrike	0666				B	r
Slaty Antwren	00153		B	r		
Slaty Antwren	0187			B	r	r

Appendix 6. Year-to-Year Recaptures at Las Caletas, Costa Rica

Species	Band	2002	2003	2004	2005	2006
Slaty Antwren	00172			B	x	r
Slaty Antwren	0350				B	x
Slaty Antwren	0354				B	x
Slaty Antwren	0370				B	r
Dot-winged Antwren	00104		B	r		
Dot-winged Antwren	00106		B	r		
Dot-winged Antwren	0033	B	x	r	r	x
Dot-winged Antwren	0110	B	x	r		
Dot-winged Antwren	0131		B	r		
Dot-winged Antwren	0199			B	x	r
Dot-winged Antwren	0238			B	x	r
Chestnut-backed Antbird	0832	B	r			
Chestnut-backed Antbird	901	B	r	r	r	r
Chestnut-backed Antbird	0902	B	r			
Chestnut-backed Antbird	1602		B	r		
Chestnut-backed Antbird	758		B	r	r	r
Chestnut-backed Antbird	868		B	x	x	r
Chestnut-backed Antbird	780			B	r	
Chestnut-backed Antbird	1637			B	r	
Chestnut-backed Antbird	1638			B	r	
Chestnut-backed Antbird	1662			B	r	r
Chestnut-backed Antbird	0322				B	r
Chestnut-backed Antbird	0331				B	r
Chestnut-backed Antbird	0382					B
Chestnut-backed Antbird	0392					B
Chestnut-backed Antbird	0395					B
Bicolored Antbird	0713	B	r			
Bicolored Antbird	893		B	r	r	r
Bicolored Antbird	0604			B	r	r
Bicolored Antbird	0605			B	r	r
Bicolored Antbird	0357				B	r
Bicolored Antbird	0358				B	r
Bicolored Antbird	0368				B	r
Bicolored Antbird	0369				B	r
Bicolored Antbird	0668				B	r
Bicolored Antbird	0669				B	r
Bicolored Antbird	0670				B	r
Bicolored Antbird	0690					B
Bicolored Antbird	0724					B
Black-faced Antthrush	957					B
Black-faced Antthrush	958					B
Ochre-bellied Flycatcher	0008	B	r	r		

Appendix 6. Year-to-Year Recaptures at Las Caletas, Costa Rica

Species	Band	2002	2003	2004	2005	2006
Ochre-bellied Flycatcher	00128		B	r		
Ochre-bellied Flycatcher	0014	B	r			
Ochre-bellied Flycatcher	0021	B	r	r		
Ochre-bellied Flycatcher	0060	B	r	r		
Ochre-bellied Flycatcher	0067	B	r	r		
Ochre-bellied Flycatcher	0094	B	r			
Ochre-bellied Flycatcher	0134		B	r		
Ochre-bellied Flycatcher	0144		B	x	r	x
Ochre-bellied Flycatcher	0101			B	r	
Ochre-bellied Flycatcher	0177			B	r	r
Ochre-bellied Flycatcher	0202			B	r	
Ochre-bellied Flycatcher	0203			B	r	
Ochre-bellied Flycatcher	0206			B	r	x
Ochre-bellied Flycatcher	0207			B	r	
Ochre-bellied Flycatcher	0226			B	r	
Ochre-bellied Flycatcher	0247			B	r	
Ochre-bellied Flycatcher	0250			B	x	r
Ochre-bellied Flycatcher	0252			B	x	r
Ochre-bellied Flycatcher	0276				B	r
Ochre-bellied Flycatcher	0277				B	r
Ochre-bellied Flycatcher	0289				B	r
Ochre-bellied Flycatcher	0306				B	r
Ochre-bellied Flycatcher	0307				B	r
Ochre-bellied Flycatcher	0416					B
Ochre-bellied Flycatcher	0424					B
Ochre-bellied Flycatcher	0425					B
Ochre-bellied Flycatcher	0432					B
Northern Bentbill	0004	B	r			
Northern Bentbill	00121		B	r		
Northern Bentbill	00149		B	r		
Northern Bentbill	0101			B	r	r
Northern Bentbill	00164			B	r	
Northern Bentbill	0120				B	r
Northern Bentbill	00162			B	x	r
Northern Bentbill	00185				B	r
Golden-crowned Spadebill	00187				B	r
Ruddy-tailed Flycatcher	00159		B	r		
Ruddy-tailed Flycatcher	0024	B	r			
Ruddy-tailed Flycatcher	0096	B	r	x	r	r
Ruddy-tailed Flycatcher	00182				B	r
Ruddy-tailed Flycatcher	0165				B	r
Sulphur-rumped Flycatcher	0284				B	x

Appendix 6. Year-to-Year Recaptures at Las Caletas, Costa Rica

Species	Band	2002	2003	2004	2005	2006
Sulphur-rumped Flycatcher	0420					B
Sulphur-rumped Flycatcher	0450					B
Yellow-bellied Flycatcher	230006703	B	r			
Bright-rumped Attila	0767		B	r	x	r
Bright-rumped Attila	0852	B	x	r	x	r
Bright-rumped Attila	0609			B	r	r
Bright-rumped Attila	0675				B	x
Dusky-capped Flycatcher	784			B	x	x
Dusky-capped Flycatcher	790			B	r	
Thrush-like Schiffornis	841	B	x	r	r	
Thrush-like Schiffornis	753		B	r		
Orange-collared Manakin	0503	B	x	r	r	
Orange-collared Manakin	0504	B	r			
Orange-collared Manakin	0506	B	x	r		
Orange-collared Manakin	0509	B	r			
Orange-collared Manakin	0518	B	r			
Orange-collared Manakin	0520	B	r	r		
Orange-collared Manakin	0531	B	r	r		
Orange-collared Manakin	0537	B	r			
Orange-collared Manakin	0546	B	r	r		
Orange-collared Manakin	0556	B	r	r		
Orange-collared Manakin	0557	B	x	r	x	x
Orange-collared Manakin	0146		B	r	r	r
Orange-collared Manakin	0567		B	r	r	r
Orange-collared Manakin	0567		B	r	x	r
Orange-collared Manakin	0568		B	r		
Orange-collared Manakin	0602		B	r	r	
Orange-collared Manakin	0618		B	r	r	
Orange-collared Manakin	0651				B	r
Orange-collared Manakin	0272				B	r
Orange-collared Manakin	0280				B	r
Orange-collared Manakin	0274				B	r
Orange-collared Manakin	0343				B	r
Orange-collared Manakin	0344				B	r
Orange-collared Manakin	0368				B	r
Blue-crowned Manakin	0007	B	r	r	x	r
Blue-crowned Manakin	00133		B	r		
Blue-crowned Manakin	0059	B	x	r		
Blue-crowned Manakin	00109		B	x	r	r
Blue-crowned Manakin	0119		B	r	r	r
Blue-crowned Manakin	0126		B	x	r	
Blue-crowned Manakin	0140		B	x	r	r

Appendix 6. Year-to-Year Recaptures at Las Caletas, Costa Rica

Species	Band	2002	2003	2004	2005	2006
Blue-crowned Manakin	00142		B	x	r	
Blue-crowned Manakin	0160		B	r		
Blue-crowned Manakin	0176		B	x	r	r
Blue-crowned Manakin	0230			B	r	r
Blue-crowned Manakin	0244			B	r	r
Blue-crowned Manakin	0287				B	r
Blue-crowned Manakin	0323				B	r
Blue-crowned Manakin	0371				B	r
Blue-crowned Manakin	0392					B
Red-capped Manakin	0511	B	r	r	r	
Red-capped Manakin	0512	B	x	r	r	
Red-capped Manakin	0514	B	x	x	x	r
Red-capped Manakin	0516	B	x	x	r	
Red-capped Manakin	0519	B	x	r	r	
Red-capped Manakin	0522	B	x	x	r	
Red-capped Manakin	0529	B	x	x	r	
Red-capped Manakin	0532	B	r			
Red-capped Manakin	0535	B	r			
Red-capped Manakin	0540	B	x	r		
Red-capped Manakin	0550	B	r	r	r	
Red-capped Manakin	0552	B	x	r		
Red-capped Manakin	0554	B	x	x	r	
Red-capped Manakin	0125		B	r	r	r
Red-capped Manakin	0569		B	r	x	r
Red-capped Manakin	0570		B	x	r	
Red-capped Manakin	0572		B	r		
Red-capped Manakin	0578		B	r	r	x
Red-capped Manakin	0579		B	r		
Red-capped Manakin	0601		B	r		
Red-capped Manakin	0612		B	x	x	r
Red-capped Manakin	0626		B	r	r	
Red-capped Manakin	0659				B	r
Red-capped Manakin	0674				B	x
Red-capped Manakin	1001			B	r	
Red-capped Manakin	1005			B	r	
Red-capped Manakin	1011			B	r	
Red-capped Manakin	1012			B	x	x
Red-capped Manakin	1025			B	r	
Red-capped Manakin	1046			B	x	r
Red-capped Manakin	1067					B
Red-capped Manakin	0696					B
Tawny-crowned Greenlet	13	B	r			

Appendix 6. Year-to-Year Recaptures at Las Caletas, Costa Rica

Species	Band	2002	2003	2004	2005	2006
Tawny-crowned Greenlet	0208			B	r	
Lesser Greenlet	00161			B	x	r
Black-bellied Wren	0306				B	r
Riverside Wren	816	B	x	x	x	r
Riverside Wren	731		B	r		
Riverside Wren	739		B	x	x	r
Riverside Wren	788			B	r	
Riverside Wren	0618				B	r
Riverside Wren	0676					B
Riverside Wren	0678					B
Riverside Wren	0721					B
Long-billed Gnatwren	0023	B	r	r	x	r
Long-billed Gnatwren	0053	B	r			
Long-billed Gnatwren	0063	B	r	x	r	
Long-billed Gnatwren	0103	B	r			
Long-billed Gnatwren	0508	B	x	r	r	r
Long-billed Gnatwren	0269				B	r
Long-billed Gnatwren	288				B	r
Northern Waterthrush	227080501		B	x	x	x
Northern Waterthrush	229037603				B	r
Chestnut-sided Warbler	230006803				B	r
Bananaquit	0029	B	r	r		
Bananaquit	0070	B	r			
Bananaquit	0093	B	r			
Bananaquit	00115		B	x	r	
Bananaquit	00191				B	r
Bananaquit	00197				B	r
Bananaquit	0114					B
Bananaquit	0124					B
Gray-headed Tanager	1623		B	r	r	r
Gray-headed Tanager	0823	B	r			
Gray-headed Tanager	0843	B	r			
Gray-headed Tanager	748		B	r		
Gray-headed Tanager	881		B	x	x	x
Gray-headed Tanager	0630				B	r
Gray-headed Tanager	0388					B
Gray-headed Tanager	0686					B
Gray-headed Tanager	0694					B
White-shouldered Tanager	0722	B	x	r		
White-shouldered Tanager	0730	B	r			
White-shouldered Tanager	0597		B	r		
White-shouldered Tanager	0582		B	x	x	x

Appendix 6. Year-to-Year Recaptures at Las Caletas, Costa Rica

Species	Band	2002	2003	2004	2005	2006
White-shouldered Tanager	0586		B	x	r	
White-shouldered Tanager	794			B	r	
White-shouldered Tanager	797			B	r	x
White-shouldered Tanager	1024			B	r	
White-shouldered Tanager	0695					B
Black-cheeked Ant-Tanager	0859	B	r			
Black-cheeked Ant-Tanager	1604		B	r	x	r
Black-cheeked Ant-Tanager	865		B	r	r	
Black-cheeked Ant-Tanager	1700		B	x	r	
Black-cheeked Ant-Tanager	0302				B	r
Black-cheeked Ant-Tanager	0319				B	r
Black-cheeked Ant-Tanager	1696				B	x
Black-cheeked Ant-Tanager	1697				B	r
Black-cheeked Ant-Tanager	0418					B
Black-cheeked Ant-Tanager	0701					B
Cherrie's Tanager	1606		B	r		
Cherrie's Tanager	0805	B	r	r		
Cherrie's Tanager	771		B	x	x	x
Cherrie's Tanager	1650			B	r	r
Cherrie's Tanager	0315				B	x
Cherrie's Tanager	0324				B	r
Cherrie's Tanager	0327				B	r
Bay-headed Tanager	0725	B	x	x	x	x
Green Honeycreeper	708	B	x	x	r	
Green Honeycreeper	604		B	x	r	
Green Honeycreeper	0593		B	x	r	x
Green Honeycreeper	0652				B	x
Green Honeycreeper	0658				B	x
Red-legged Honeycreeper	0631				B	x
Variable Seedeater	0141		B	x	r	r
Thick-billed Seed-Finch	0527	B	x	x	x	x
Thick-billed Seed-Finch	0528	B	x	r		
Thick-billed Seed-Finch	1066					B
Thick-billed Seed-Finch	1070					B
Orange-billed Sparrow	801	B	r	r	r	x
Orange-billed Sparrow	0802	B	r			
Orange-billed Sparrow	0806	B	r			
Orange-billed Sparrow	0818	B	r	r	r	
Orange-billed Sparrow	0842	B	r			
Orange-billed Sparrow	0848	B	r			
Orange-billed Sparrow	0851	B	x	x	r	x
Orange-billed Sparrow	0861	B	r	x	r	

Appendix 6. Year-to-Year Recaptures at Las Caletas, Costa Rica

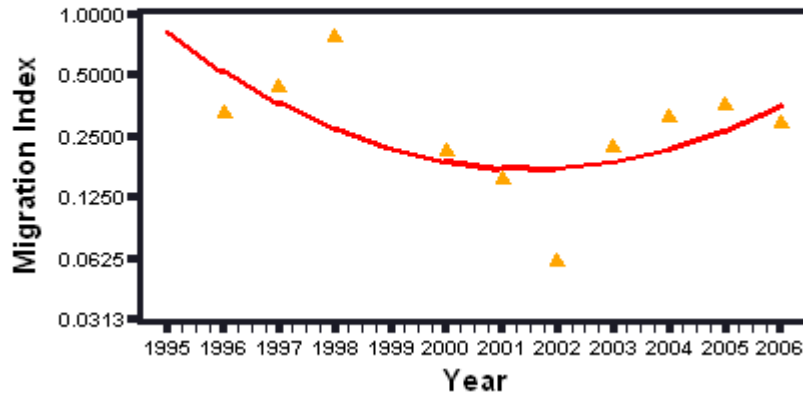
Species	Band	2002	2003	2004	2005	2006
Orange-billed Sparrow	869		B	r	r	x
Orange-billed Sparrow	873		B	r		
Orange-billed Sparrow	880		B	r	r	
Orange-billed Sparrow	888		B	x	x	x
Orange-billed Sparrow	1629			B	r	r
Orange-billed Sparrow	1644			B	r	r
Orange-billed Sparrow	1664			B	r	
Orange-billed Sparrow	1688			B	r	
Orange-billed Sparrow	0310				B	r
Orange-billed Sparrow	0328				B	r
Orange-billed Sparrow	0334				B	r
Orange-billed Sparrow	0614				B	r
Orange-billed Sparrow	0639				B	r
Orange-billed Sparrow	0386					B
Black-striped Sparrow	1619		B	x	r	
Black-striped Sparrow	0374					B
Buff-throated Saltator	922		B	x	x	x
Buff-throated Saltator	933				B	r
Buff-throated Saltator	0336				B	x
Blue-black Grosbeak	878		B	r	r	
Blue-black Grosbeak	883		B	r		
Blue-black Grosbeak	890		B	r	r	r
Blue-black Grosbeak	0416			B	x	r
Blue-black Grosbeak	0313				B	r
Blue-black Grosbeak	0371					B
Scarlet-rumped Cacique	2804			B	r	

B year banded
 r recaptured
 d bird dead or remains found
 x not detected but survival deduced from re-
 encounter in subsequent year
 start of species
 neotropical migrant

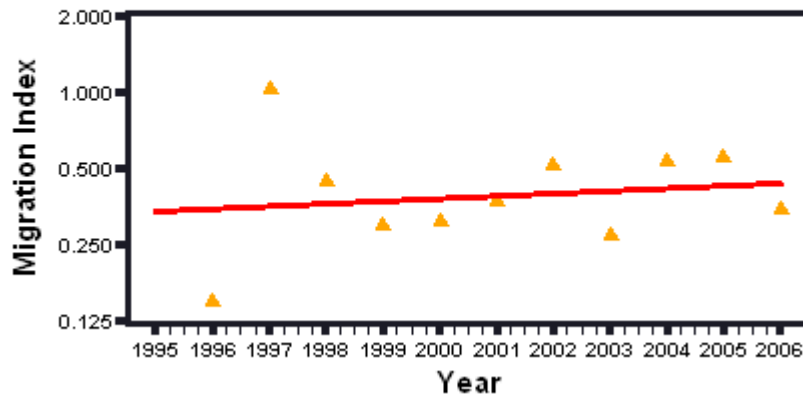
Appendix 7

Appendix 7. Trend Analysis Charts

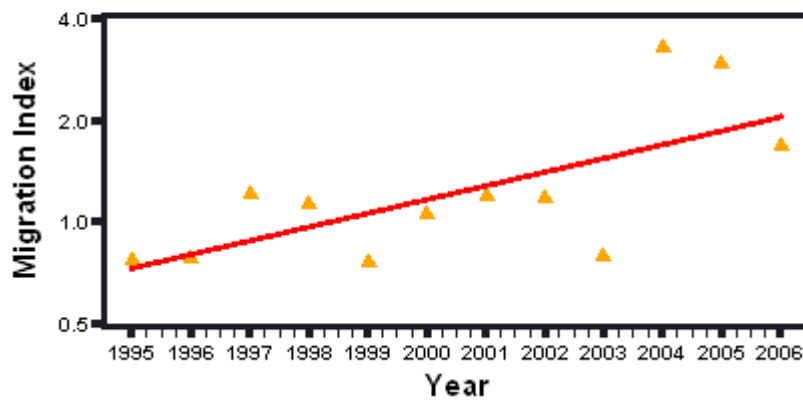
Solitary Sandpiper Inglewood Bird Sanctuary



Western Wood Pewee Inglewood Bird Sanctuary



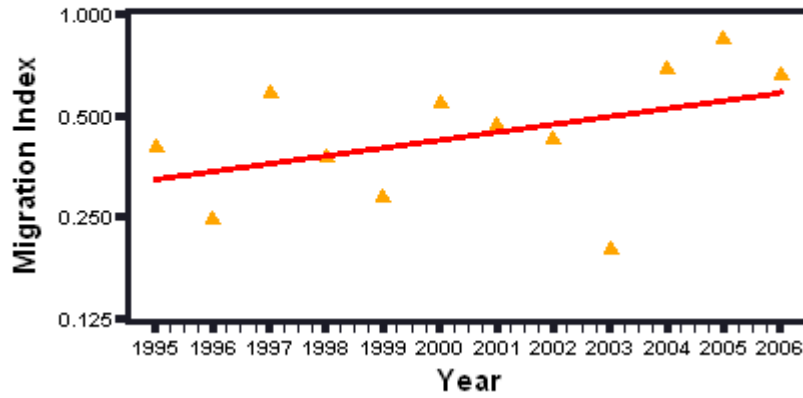
Trail's Flycatcher Inglewood Bird Sanctuary



Appendix 7. Trend Analysis Charts

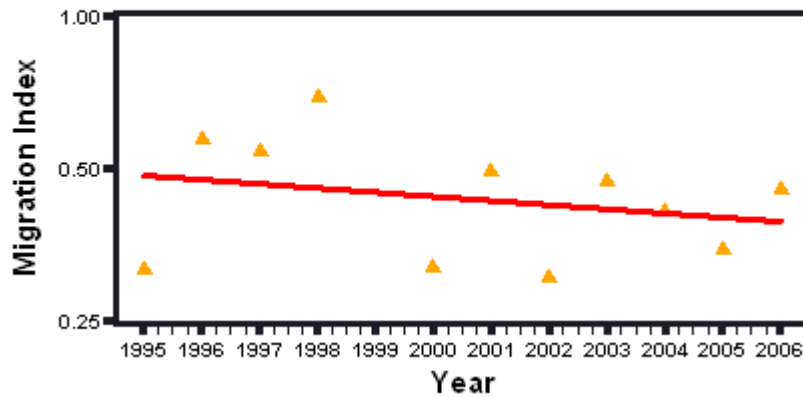
Least Flycatcher

Inglewood Bird Sanctuary



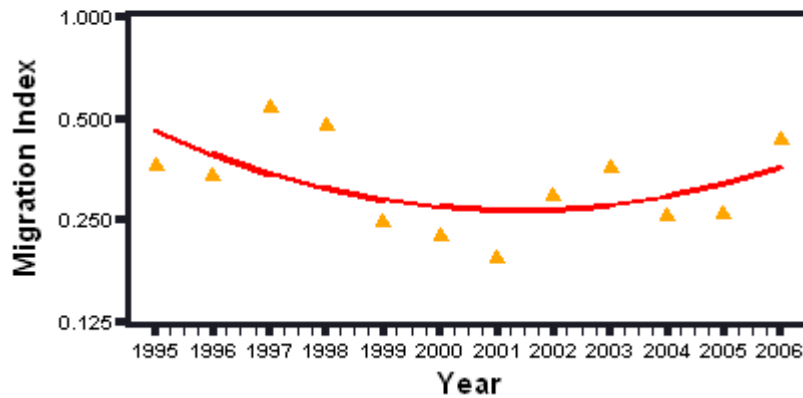
Eastern Kingbird

Inglewood Bird Sanctuary



Warbling Vireo

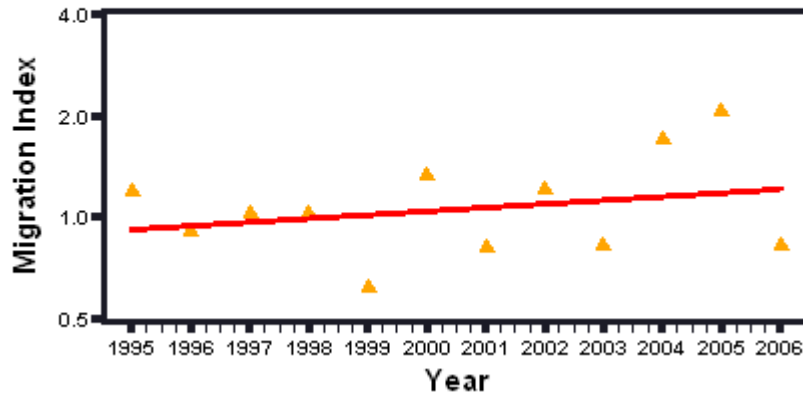
Inglewood Bird Sanctuary



Appendix 7. Trend Analysis Charts

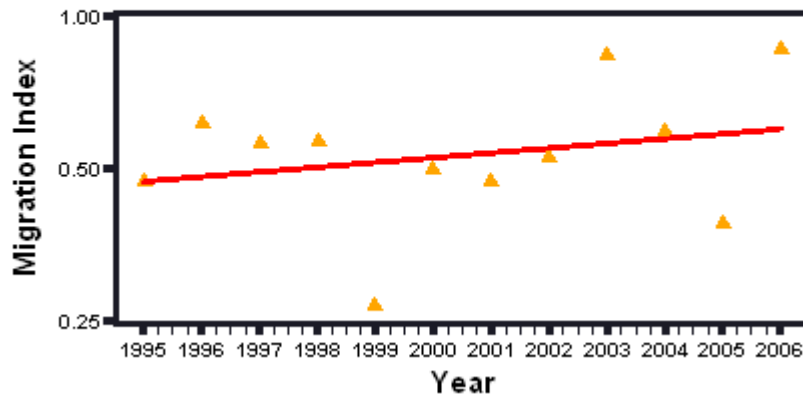
House Wren

Inglewood Bird Sanctuary



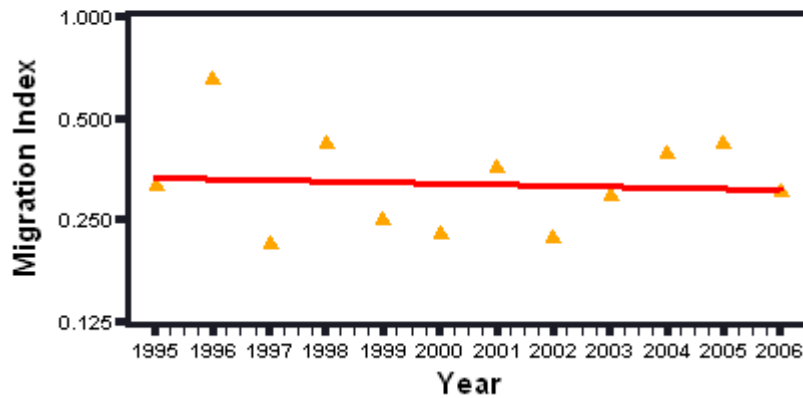
Ruby-crowned Kinglet

Inglewood Bird Sanctuary



Swainson's Thrush

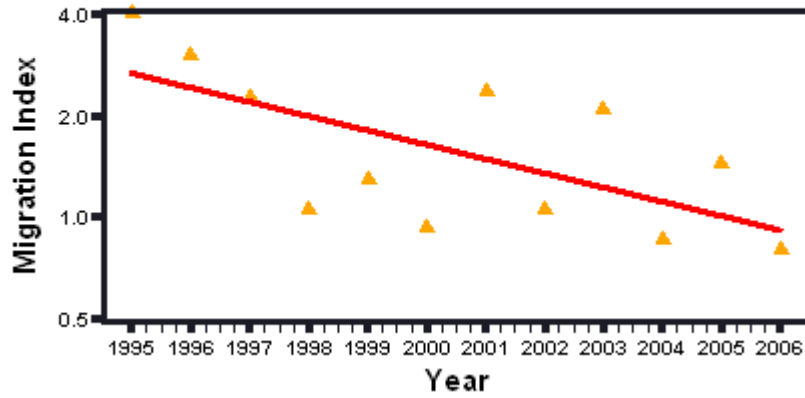
Inglewood Bird Sanctuary



Appendix 7. Trend Analysis Charts

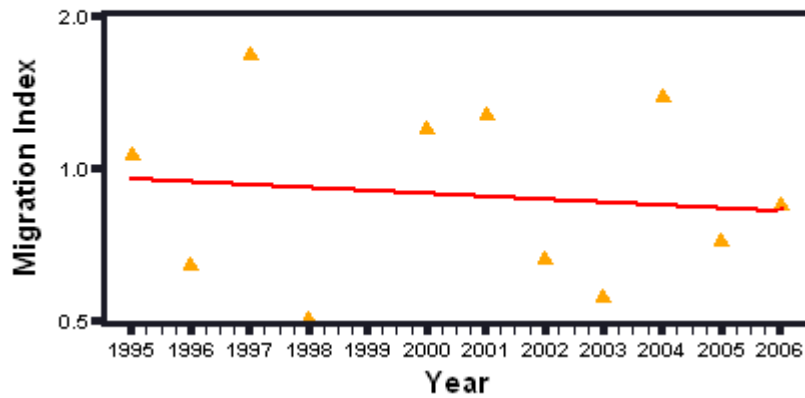
American Robin

Inglewood Bird Sanctuary



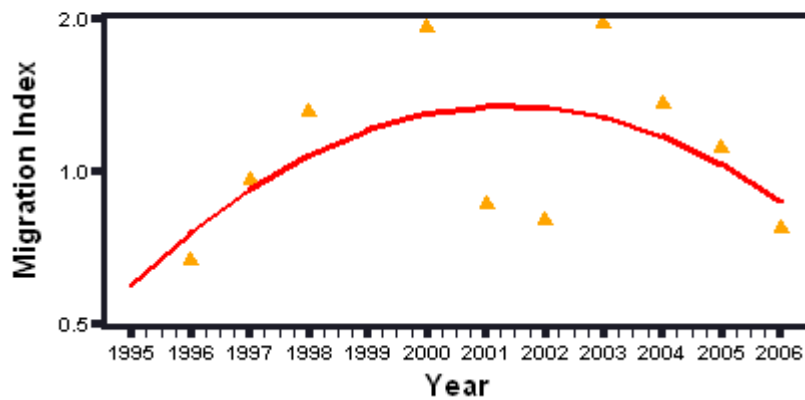
Cedar Waxwing

Inglewood Bird Sanctuary



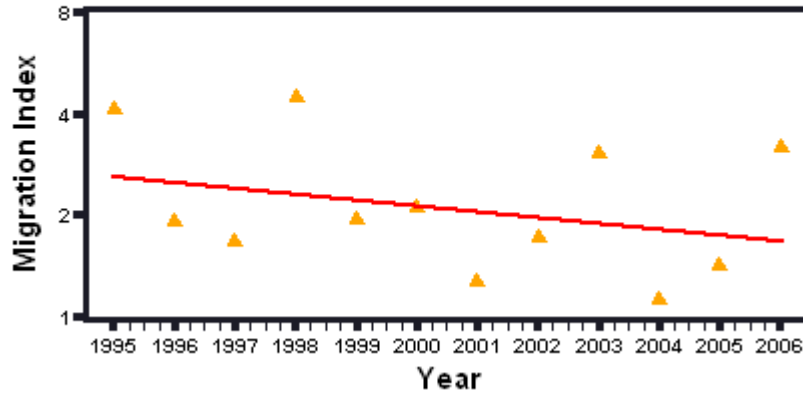
Tennessee Warbler

Inglewood Bird Sanctuary

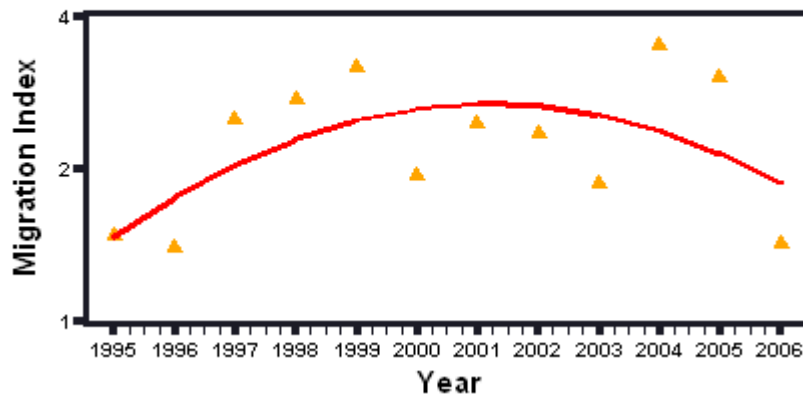


Appendix 7. Trend Analysis Charts

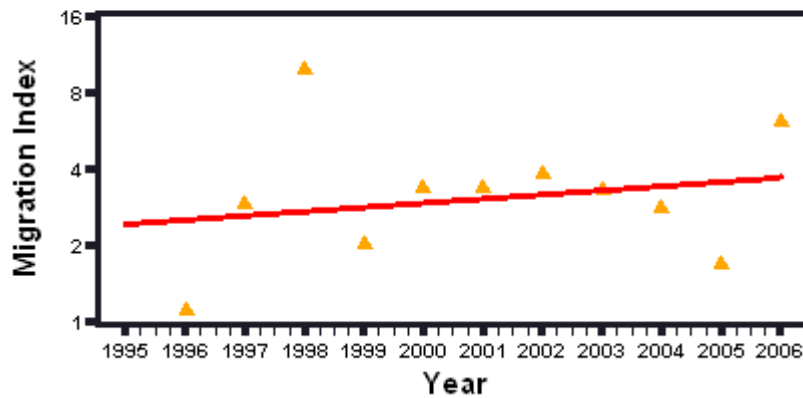
Orange-crowned Warbler Inglewood Bird Sanctuary



Yellow Warbler Inglewood Bird Sanctuary

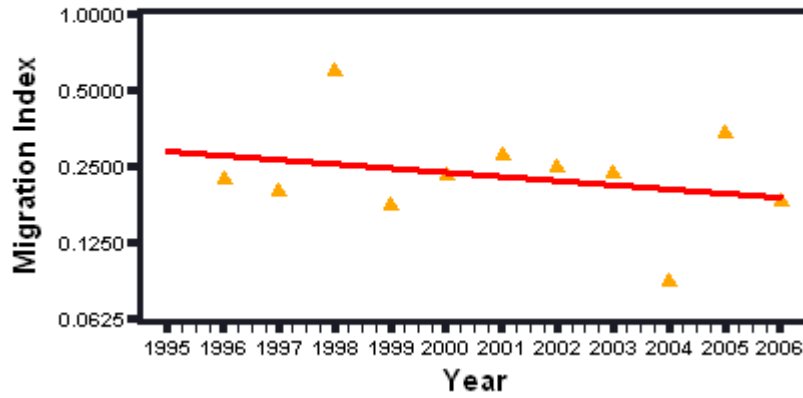


Myrtle Warbler Inglewood Bird Sanctuary

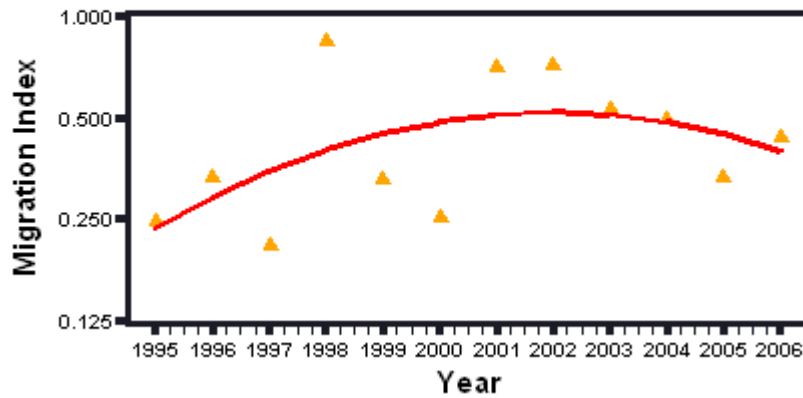


Appendix 7. Trend Analysis Charts

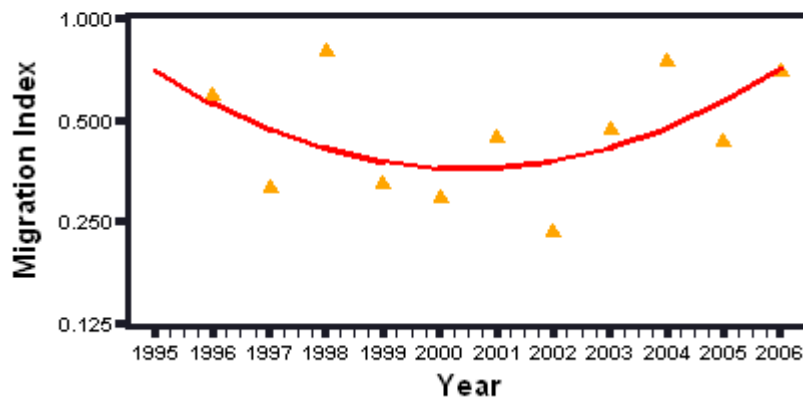
Blackpoll Warbler Inglewood Bird Sanctuary



American Redstart Inglewood Bird Sanctuary



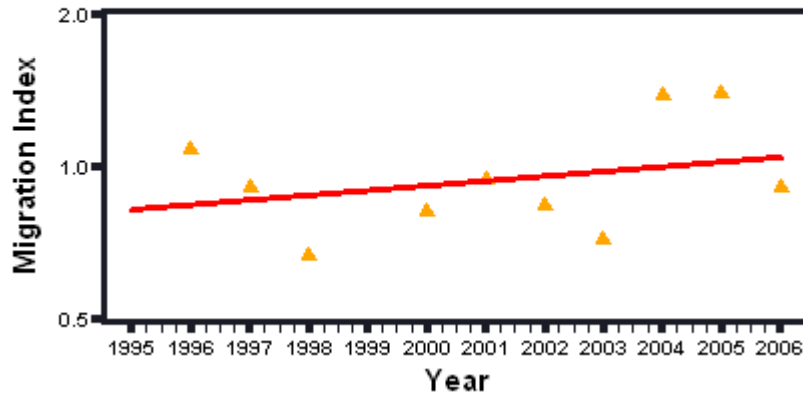
Ovenbird Inglewood Bird Sanctuary



Appendix 7. Trend Analysis Charts

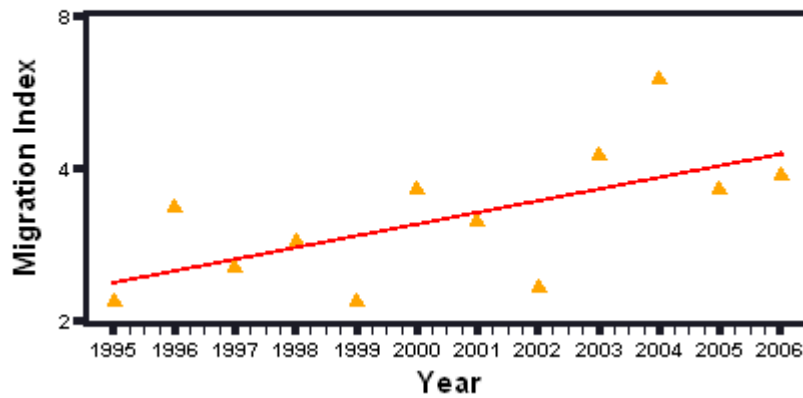
Northern Waterthrush

Inglewood Bird Sanctuary



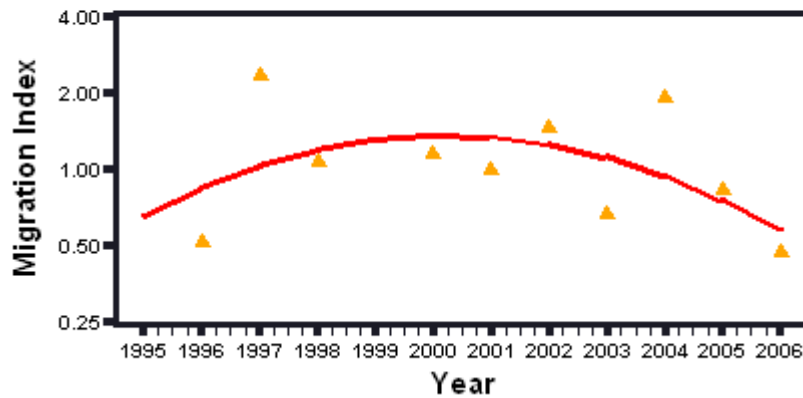
Wilson's Warbler

Inglewood Bird Sanctuary



Chipping Sparrow

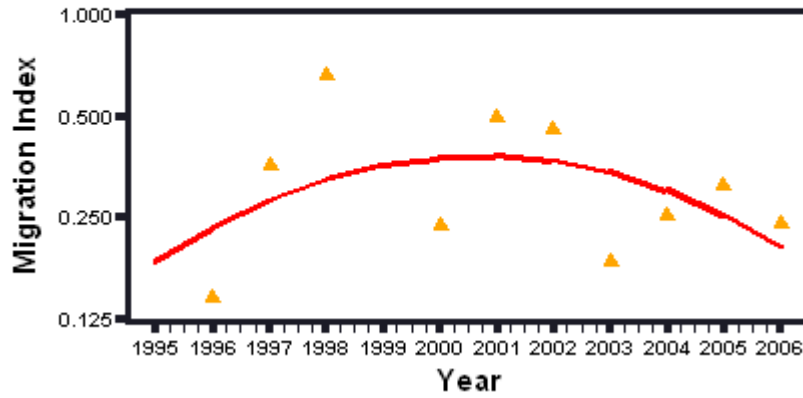
Inglewood Bird Sanctuary



Appendix 7. Trend Analysis Charts

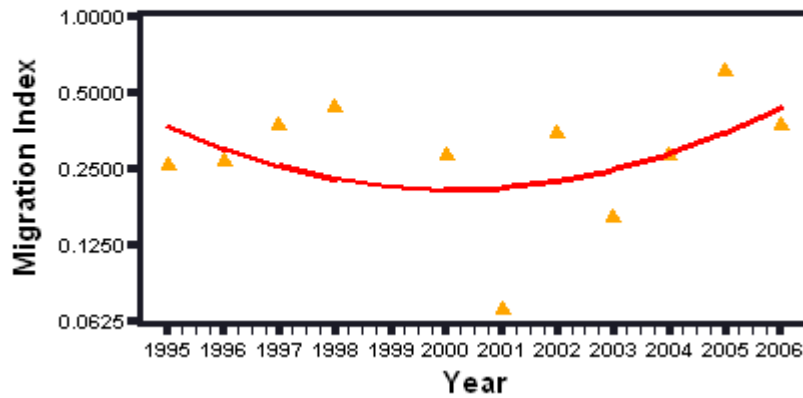
Clay-coloured Sparrow

Inglewood Bird Sanctuary



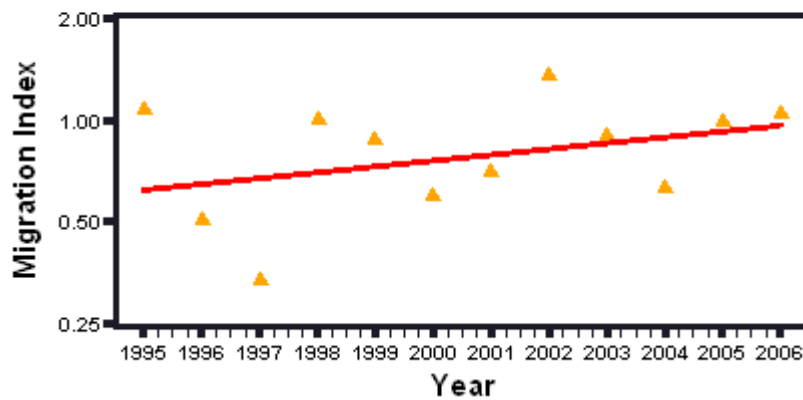
Song Sparrow

Inglewood Bird Sanctuary



Lincoln's Sparrow

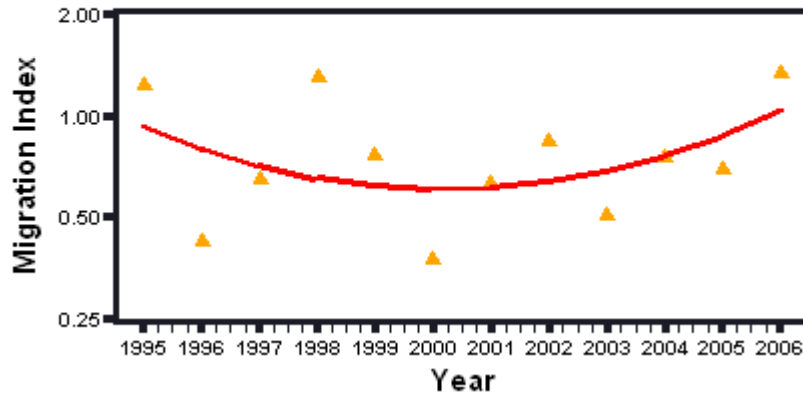
Inglewood Bird Sanctuary



Appendix 7. Trend Analysis Charts

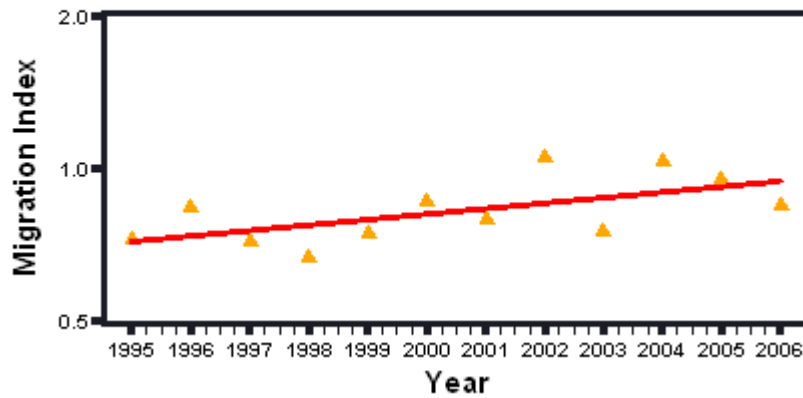
White—throated Sparrow

Inglewood Bird Sanctuary



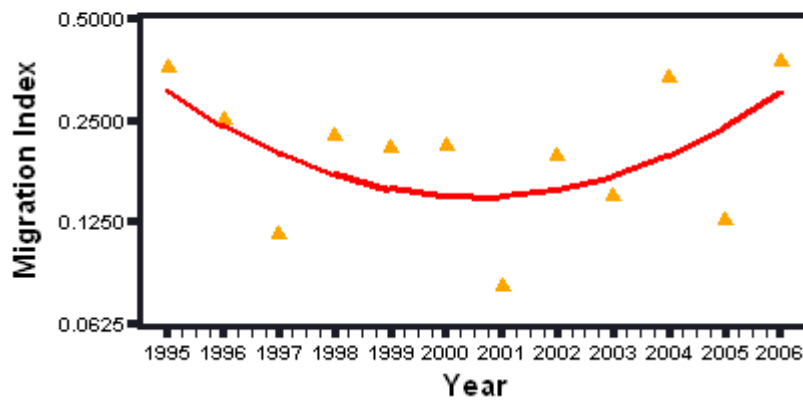
White—crowned Sparrow

Inglewood Bird Sanctuary



Dark—eyed Junco

Inglewood Bird Sanctuary



Appendix 7. Trend Analysis Charts

Baltimore Oriole
Inglewood Bird Sanctuary

