

# LASKEEK BAY RESEARCH

## 13



edited by  
Tony Gaston

2003 & 2004

Laskeek Bay Conservation Society

**LASKEEK BAY RESEARCH**

**13**

**LASKEEK BAY CONSERVATION SOCIETY  
SCIENTIFIC REPORT, 2003 AND 2004**

**Edited by**

**ANTHONY J. GASTON**

December 2004

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*Box 867, Queen Charlotte City, B.C. V0T 1S0, Canada*

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**Cover design: Tony Gaston – Picture: Brian Gisborne**



**Pigeon Guillemots, Low Island (picture, Tony Gaston)**



## **LASKEEK BAY CONSERVATION SOCIETY**

**The Laskeek Bay Conservation Society** is a volunteer group based in the Queen Charlotte Islands. The society is committed to increasing the appreciation and understanding of the natural environment through:

**sensitive biological research that is not harmful to wildlife or its natural habitat**

**interpretation and educational opportunities for residents of and visitors to the Queen Charlotte Islands**

Since 1990, the Society has operated a field research station at East Limestone Island and is carrying out a diverse long-term monitoring, research and interpretation programme in the surrounding islands and waters of Laskeek Bay. We actively involve volunteers from our island communities, many other locations in British Columbia, as well as from overseas. For further information contact:

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## **BACKGROUND**

The goals and objectives of the Society are:

- 1. To undertake and support research and long term monitoring of wildlife populations of the marine and terrestrial ecosystems of Haida Gwaii, especially the Laskeek Bay area.*
- 2. To provide opportunities for non-scientists, especially students and local residents of Haida Gwaii, to participate as volunteers in our field programs, and to offer training to impart necessary field research skills.*
- 3. To promote better understanding of the marine and terrestrial ecosystems of Haida Gwaii, especially the Laskeek Bay area, by providing information to youth, local residents, and to the public in general in the form of publications, meetings, and exhibits.*
- 4. To promote the conservation of native species and to develop public awareness of the changes caused by introduced species to Haida Gwaii.*
- 5. To support and assist other programs aimed at providing better knowledge, management and conservation of ecosystems on Haida Gwaii.*

## INTRODUCTION

2003 and 2004 were the 14<sup>th</sup> and 15<sup>th</sup> years of the Laskeek Bay Conservation Society's volunteer field programme at East Limestone Island, Haida Gwaii. Concentrating mainly within the Laskeek Bay area, the Society's programme includes biological monitoring and research, interpretation for visitors, and learning opportunities for students and volunteers.

The scientific work of the Society is carried out in collaboration with researchers and management agencies having ongoing interests in the ecology and conservation of Haida Gwaii. The research programme is directed by a Scientific Advisory Committee that works closely with the Society's Board of Directors to develop research that is relevant to the conservation needs of Haida Gwaii and consistent with the goals of the Society. Research activities include marine bird and marine mammals population monitoring, studies of intertidal invertebrates, plants, and forest birds. In addition, the Society is a participant in the Research Group on Introduced Species, an umbrella organization devoted to studies of exotic species in Haida Gwaii and their impact on indigenous ecosystems. This research focuses especially on the impacts of introduced mammals, including deer, raccoons and squirrels, on island ecosystems.

The overall aim of the Society's research programme is to provide long-term information on the biology and ecology of Haida Gwaii ecosystems. Ongoing monitoring, using simple, standard techniques that allow year-to-year comparisons to be made, and allowing the direct participation of volunteers, is the cornerstone of the Society's approach. By monitoring a variety of indicator species in ocean, inter-tidal and terrestrial ecosystems, we can obtain an overall measure of their health. Because marine waters may be subject to cyclical or directional changes operating at the scale of decades, such observations become most valuable when they are tracked consistently over many years. Such long-term monitoring is becoming increasingly pertinent in the context of global climate change. In addition, the possibility of offshore oil developments in Hecate Strait makes the Society's long-term data on marine birds especially pertinent. In the event that such developments were to proceed, our information on population status and trends would be vital in monitoring impacts.





## ACKNOWLEDGEMENTS

The Laskeek Bay Conservation Society is a non-profit volunteer-run organization, and could not operate without the generous support from a wide variety of groups and individuals. We gratefully acknowledge the contributions in 2003 and 2004 of all our supporters and apologize to any we may have inadvertently omitted from this list:

**The Society gratefully acknowledges the generous financial support provided by:**

- Gwaii Trust (Project Limestone)
- Gwaii Haanas Park Reserve/Haida Heritage Site
- Canadian Wildlife Service, Pacific and Yukon Region
- Canadian Wildlife Service, National Wildlife Research Centre
- Science Horizons, Environment Canada
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- Forest Renewal BC
- South Moresby Forest Replacement Account
- Weyerhaeuser
- Canadian Nature Federation
- Haida Gwaii Museum
- Parks Canada
- Air Canada
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- Calgary Zoological Society
- British Columbia Gaming Commission
- Blue Water Adventures (t-shirt purchases and donations)
- Maple Leaf Adventures (t-shirt purchases and donations)

We would also like to acknowledge the following for loans or permits:

- Canadian Wildlife Service (equipment loans)
- Research Group on Introduced Species (equipment loans)
- Ministry of Water, Land and Air Protection (research permit)
- Gwaii Haanas National Park Reserve/Haida Heritage Site (research permit)
- Environment Canada, Bird Banding Office (banding permit)

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- Dr. Graeme Ellis (Pacific Biological Station) for providing a camera and film to document whales even though there was less cooperation in 2004 from the whales
- The two years' crews of local and international volunteers for all their enthusiasm, hard work, good humour and good company.
- Project Limestone teachers and students for their dedication to the project and for teaching us just as much as we teach them.
- Jeremie Hyatt and the *m/v Wanderlust* for transporting gear at camp start-up and take-down and for helping with biffy building and dismantling.
- The *m/v Gwaii Haanas* for the transportation of lumber and supplies down to camp
- The *s/v Island Roamer* and *s/v Maple Leaf* for bringing such lively and interesting visitors and for their endless promotion of LBCS.
- Nathalie Macfarlane at the Haida Gwaii Museum, for continuing to provide a venue to promote the Society's work.
- Students, staff and parents of the Living and Learning School for hosting the "For the Birds" fundraising event for LBCS.
- Barb Rowsell, RGIS coordinator, for generous help whenever required.
- All the artists who donated works for our successful "Art of Limestone" exhibit.
- LBCS directors for their time and efforts in maintaining and developing funding, the field camp, and the scientific and educational projects.
- Kevin Borserio and all the students of Project Limestone, Gordon McMahon and the G.M. Dawson School, and Erin Sinclair and the Living and Learning School students.
- Our many friends – local residents, former volunteers, visitors – who values what we were doing and responded to our 2003 fundraising appeal.

Finally, thanks goes to the owners, staff and crew of South Moresby Air Charters, *s/v Anvil Cove*, and *m/v Tana Bay* for their professional services in transporting gear and people from Queen Charlotte City to Limestone

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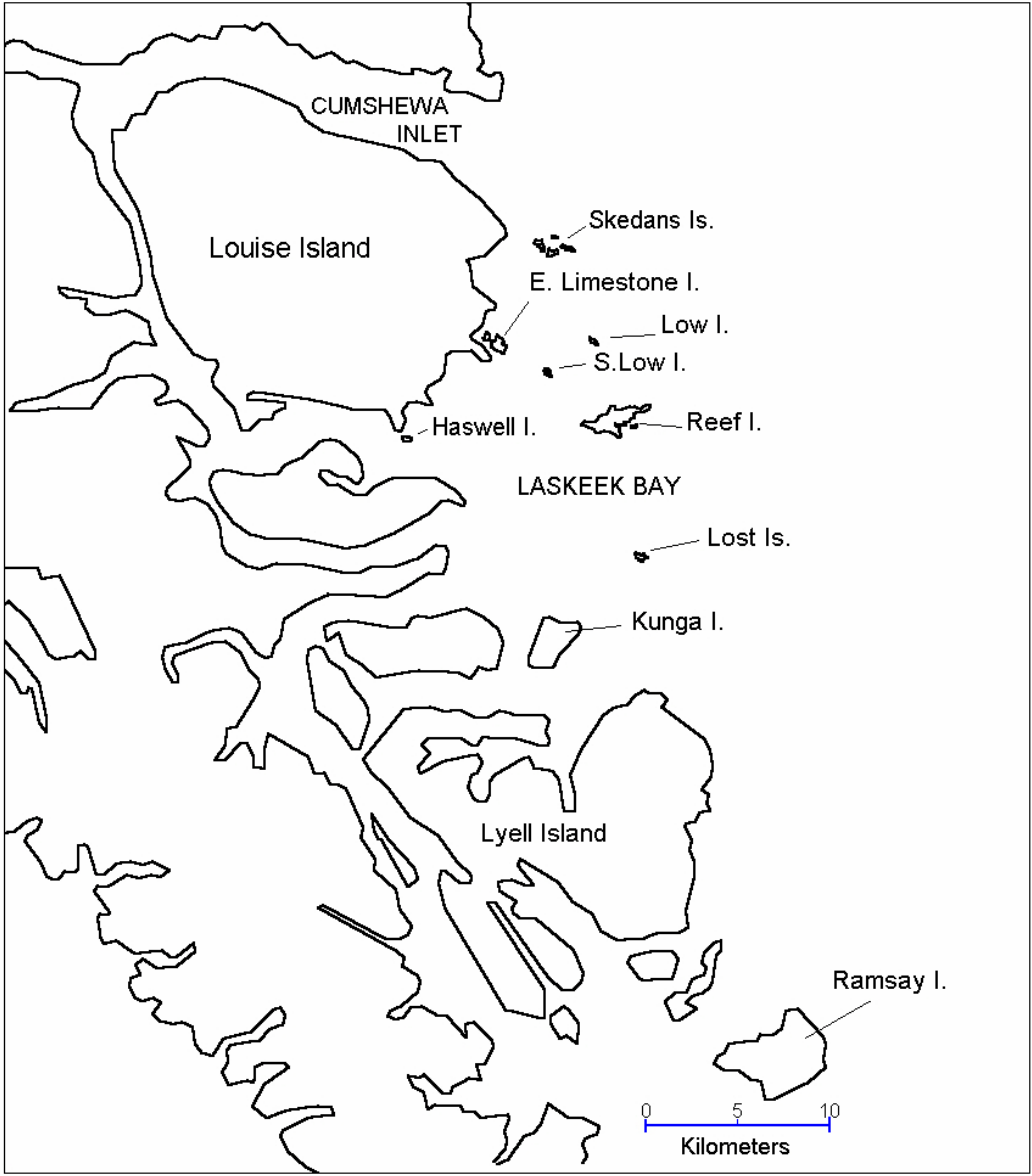
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**Mussels, East Limestone Island (photo, Tony Gaston)**



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# **EAST LIMESTONE ISLAND FIELD STATION: REPORT ON THE 2003 FIELD SEASON**

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## **SUMMARY**

The Laskeek Bay Conservation Society's 14<sup>th</sup> field season on East Limestone Island ran from 29 March 8 July 2003. This report summarizes the Education, Interpretation and Research and Monitoring programs. The 14-week field season involved 5 field staff, one in-town staff, eight Directors and 162 volunteers and visitors. Through Project Limestone, the camp was host to four school groups from Haida Gwaii. Ancient Murrelets continue to be the main focus with over 2500 adult Ancient Murrelets and 8800 chicks banded on Limestone Island since 1990. In 2003, 142 adults were caught, of which 46 were new birds. There were 16 active burrows monitored throughout the season, from which 21 chicks successfully fledged. Chick banding was just below the 14-year average with 523 chicks banded from the funnels. The Black Oystercatchers in the area were also surveyed and 22 active nest sites were found throughout the season. Surveys of Glaucous-winged Gull colonies yielded a total of 206 active nests, the majority on the Lost Islands. The Pigeon Guillemot nest boxes on East Limestone Island had the highest occupancy since they were put in place in 2001 with a total of 3 eggs found in 2 boxes. The return of the Cassin's Auklet to Limestone Island and significant petrel activity is also of great interest. Wildlife Trees were monitored and 20 active trees were found used by 4 species of cavity nesters. Although no Northern Saw-whet Owl nest was found, it was confirmed that a pair was on island when the female was banded and the male heard calling. Songbird banding was carried out at East Limestone, Reef, Low and West Skedans islands with 203 birds caught during banding sessions, including 2 birds that had moved between islands. There were 129 marine mammal sightings, including 2 spectacular Killer Whale encounters. Contributions by volunteers and staff alike to the long-term scientific research helped provide a unique learning experience for all.

## **INTRODUCTION**

### **2003 Field Staff**

The East Limestone Island camp opened on 29 March in 2003 and was open for a total of 99 days. This includes 2 days when camp closed temporarily on 25-26 April. This year's staff were: Laura Cowen (Camp Supervisor/Biologist (April/May)), Joëlle Fournier (Camp Supervisor/Biologist (June/July)), Suzanne Charest (Biologist/Interpreter), Charlotte Tarver (Interpreter/Naturalist), and Christine Gibb (Songbird Technician from Queen's University). Dr. Tony Gaston was on Limestone Island from 29 March – 4 April to assist with camp set-up, Ancient Murrelet burrow and nestbox monitoring and pre-laying Ancient Murrelet banding.

## **EDUCATION AND INTERPRETATION PROGRAM**

This program imparts to students, teachers and other visitors what we are learning from our research projects. It provides the opportunity for the Society to demonstrate the operation of a biological field station and enables visitors to take part in the data collection at a first-hand. The program draws visitors from local schools and tour boats in increasing numbers. Project Limestone is now a highly sought after field trip for local students, with more students wishing to come than there is space available. Tour operators report that their Limestone visit is a highlight of their tour for guests!

### **Project Limestone**

This was the thirteenth year for local students to come to Limestone. Thirty-nine youth, ages 10 to 18, came during the Ancient Murrelet chick departure time. Thirteen teachers and chaperones accompanied them, with each school group coming for an afternoon orientation and then returning at night. All students had a chance to help with captures, weighing, data entry and releasing the chicks at the edge of the ocean. On two occasions, students stayed after chick banding to help trap adult Ancient Murrelets.

### **Visitor Interpretation Program**

Two tour boats (*s/v Island Roamer* and *s/v Maple Leaf*) called in at Limestone seven times (May 17, 20, 24, 26, 30, June 20 and 28) bringing 94 people to learn about LBCS work. Each tour group was given a two-hour interpretive walk across the island ending at the cabin. The groups that came during the chick departure season also came ashore at night to sit in the forest listening to the activity of Ancient Murrelets in the nesting colony. They helped staff with the capturing and weighing of chicks and data entries. In June, tour groups came during the day to watch and learn about the forest bird banding project.

Nineteen other people came to Limestone and all were given an interpretive walk-about of the island. On May 9, five Gwaii Haanas Parks' staff were given a tour of the island and the camp facilities. Two private parties visited in May, two people in a small boat and four kayakers. An LBCS work party also stayed for three days in May to help with camp maintenance, cut firewood and to erect a new shower stall.

Although the Research Group on Introduced Species (RGIS) was not operating a camp on Reef Island this year, we were fortunate to have visits from several of the researchers due to the filming of a documentary on the introduced species project. In June, the French film crew stayed on Limestone for two days to film parts of this documentary.

### **Haida Gwaii Watchmen**

In June, the two Haida Gwaii Watchmen from Skedans village, Laura and Marvin, visited Limestone Island on several occasions for dinner. They were given a tour of the island and a brief description of the programs run by LBCS. The invitation was reciprocated and Limestone Island staff and volunteers enjoyed an evening of desserts at Skedans with the Watchmen.

### **Volunteers**

Thirty-three volunteers worked alongside staff during the 14-week season. They contributed over 450 person-weeks of time towards the operation and maintenance of the field camp and towards the research programs. Twenty-four people were first-time volunteers, and thirteen were local residents. It is notable that six of the volunteers were children ages 10 to 14, contributing five weeks of work. Their youthful energy and inquisitive minds made for a lively camp. Without the efforts of our volunteers, we would not be able to accomplish all the tasks and work needed to run the research station.



## RESEARCH AND MONITORING PROGRAM

### Ancient Murrelets *Synthliboramphus antiquus*

#### Adult Banding

Adult Ancient Murrelets were caught while leaving the colony using large flight nets at three different locations on Limestone Island from 1-12 April (pre-laying) and from 15 May - 3 June (post-laying). The nets were opened on 17 nights, for a total of 37.15 hours from approximately 0300-0530 in April, and 0130 or 0200-0415 in May and June.

We caught 180 birds (46 new and 134 recaptures), but 38 birds were caught more than once, so the actual number of birds on which data was collected was 142 (46 new and 96 recaptures) (Table 1). Of these 142 birds, 99 were caught in April (27 new and 72 recaptures) and 43 in May and June (19 new and 24 recaptures).

**Table 1**

**The number of adult Ancient Murrelets caught on East Limestone Island in 2003. Birds with brood patches 10-19mm are of unknown breeding status. \*Does not include repeat captures in 2003**

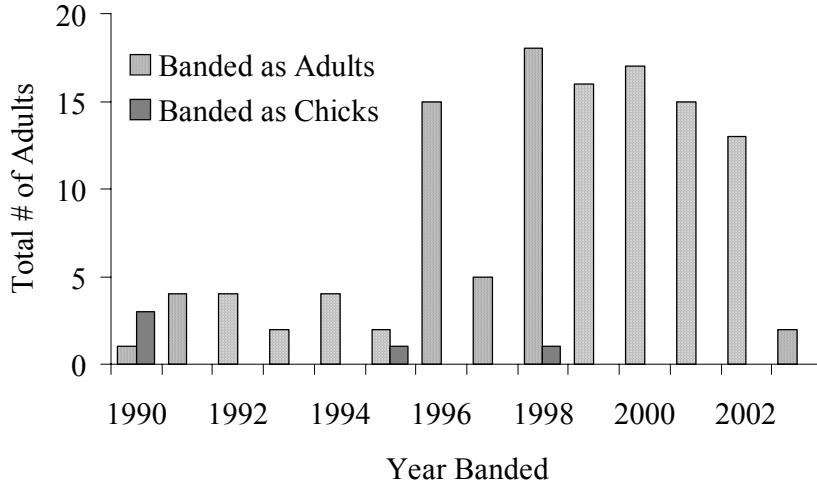
Timing	Capture Method	Breeding Status	New Birds	Recaptured Birds*	Total Birds
Pre-laying	Net	Breeder	27	72	99
Post-laying	Net	Breeder	4	7	11
	Net	Non-breeder	10	2	12
	Net	Unknown	3	8	11
	Burrow	Breeder	2	7	9
<b>Total</b>			<b>46</b>	<b>96</b>	<b>142</b>

The average weight (mean  $\pm$  1 SD) of breeding birds caught in the flight nets was  $201.2 \pm 13.1$  g, while non-breeders caught in the nets weighed  $179.1 \pm 9.9$  g and those from burrows weighed  $208.0 \pm 14.7$  g.

The net at North Cove was the most often deployed (7 nights for 13.1 hours) but caught the fewest birds (26 birds). The Spring Valley net was opened 6 nights (14.35 hours) and caught the most birds (85 birds). The Cabin net was only opened 4 nights (9.7 hours), but caught 53 birds and had our highest total for one night at 27 birds. The catching efficiencies for each net were therefore 14.2 birds/night at Spring Valley, 13.2 birds/night at the Cabin and 3.7 birds/night at North Cove.

The majority of birds recaptured this year were from 1998, including one bird banded as a chick in that year (Fig. 1). Four other birds caught had been banded as chicks: 1 in 1994 and 3 in 1990. One bird, banded as a breeder in 1990, must have been at least 15 years old. No birds two or three years old (banded as chicks in 2000 and 2001), usually the commonest age classes, were caught.

The number of non-breeders caught this year was the lowest ever. Only 12 non-breeders were caught and, based on the experience of people in camp, there were very few singing in the trees at night. To compare nightly vocalizations, counts of the number of calls heard and the number of calling individuals (excluding birds considered to be on the water calling to chicks) between 02.00 and 02.05 were recorded at cabin net each night from 25 May - 6 June.



**Figure 1**  
**History of Adult Ancient Murrelets recaptured in 2003**

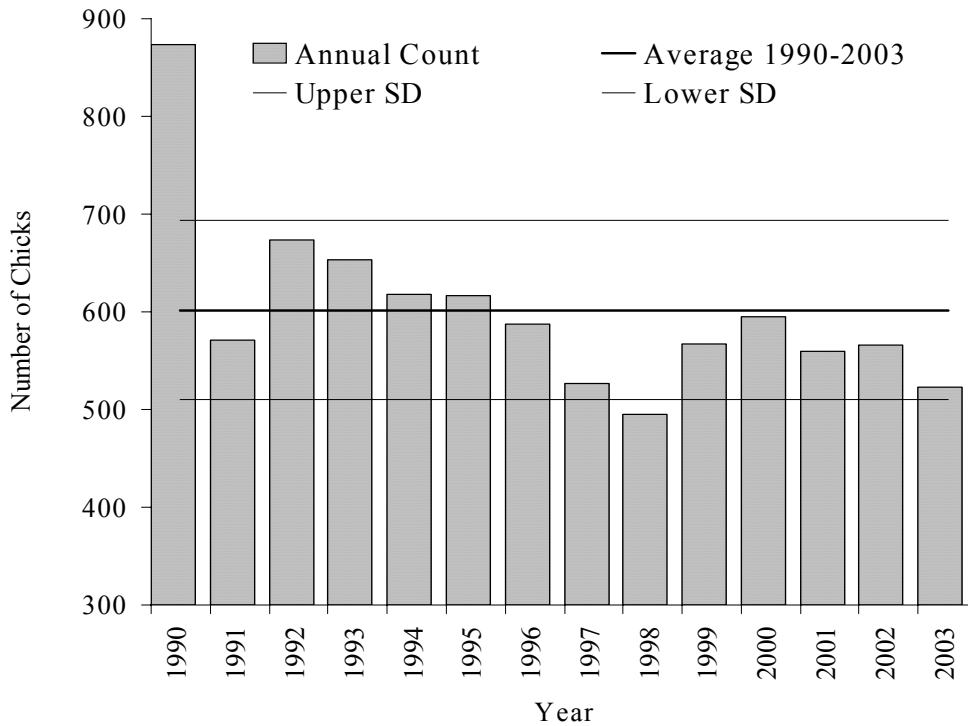
*Chick Banding*

Chick trapping was conducted by the usual methods, with six funnels in operation from 10 May - 7 June. The first chick arrived in funnel 5, beside the cabin, on 11 May (Table 2). Using the adjusted time protocol from 2001, funnel gates were closed from 2230-0230 for the first 3 weeks of May and from 2300-0230 from the end of May to the end of banding.

**Table 2**  
**Summary of Ancient Murrelet chick departures from Limestone Island, 1990-2003**

Year	Opening night	First night	Last night	Peak night	Peak count	Total days	Total chicks
1990	12 May	12 May	15 June	22 May	65	35	873
1991	8 May	8 May	6 June	26 May	48	30	561
1992	12 May	12 May	3 June			23	674
1993	9 May	10 May	15 June	18 May	70	37	653
1994	7 May	7 May	8 June	22 May	52	33	618
1995	7 May	10 May	11 June	22 May	64	33	617
1996	10 May	11 May	9 June	19 May	48	29	588
1997	8 May	11 May	11 June	24 May	41	31	527
1998	7 May	11 May	22 June	20 May	55	43	495
1999	9 May	11 May	11 June	21 May	54	31	567
2000	11 May	11 May	11 June	20 May	62	31	595
2001	8 May	10 May	15 June	18 May	54	37	560
2002	7 May	9 May	3 June	21 May	65	26	566
2003	10 May	11 May	7 June	21 May	52	28	523

A total of 549 chicks were banded: 523 within the funnels, 10 outside of the funnels and 16 from burrows. If the chicks caught in 1990 and the non-adjusted values in 1996 are included, the 2003 total is just within one standard deviation of the long-term average (Fig. 2). The peak number of chicks (52) occurred on 21 May, as in 2002 (Table 2 & Fig. 3). On average, chick weights were similar to those from previous years. Chicks from the burrows weighed  $31.0 \pm 2.8$  g, while those from the funnels weighed  $26.4 \pm 2.1$  g, a 15% weight loss.

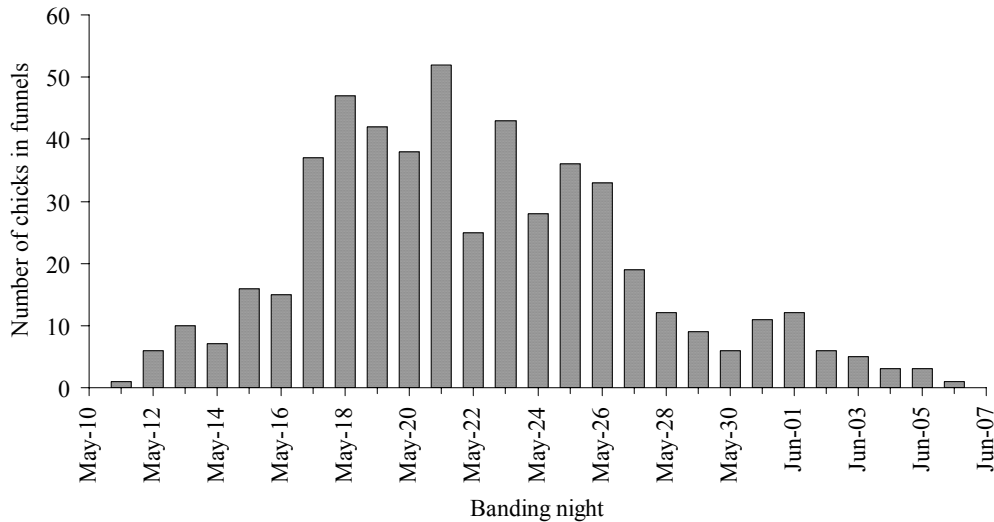


**Figure 2**  
**Annual counts of Ancient Murrelet chicks caught in funnels on East Limestone Island 1990-2003. The bold line is the long-term mean for 1990-2003 and the fine lines are one standard deviation from the mean**

*Burrows*

Fifty-three Ancient Murrelet burrows, 5 of which were new this year (S37, C99-C102), were checked daily for first eggs, signs of entry (knockdowns) and presence of incubating adults from April 4 to June 1 (June 21 for 2 late burrows). The first egg was found on April 4 and the last, over one month later on May 8. This year, there were 16 active burrows, containing a total of 29 eggs. From these burrows, 21 chicks fledged successfully (9 with 2 chicks, 3 with 1 chick) and 4 were deserted (1 with 1 egg, 3 with 2 eggs).

There were 3 burrows where it was thought that the nest cup was reached and the burrow unoccupied until an adult was found incubating eggs towards the end of its incubation period. Two of the three burrows fledged chicks, and it was suspected that the third was abandoned when one of the partners was predated outside of its burrow. An adult in burrow C44 was also found incubating eggs on May 22. There had been no knockdowns at C44 all season and therefore no reason to enter, until an alternate entrance was discovered.



**Figure 3**  
**Nightly chick numbers from funnels on East Limestone Island, May 10 to June 7**

Of the adults banded from burrows this year, 2 were new and 7 were recaptured. For two of the recaptured birds, it was their first year in their burrows (C35 & C101). The birds from S34 and C75 used the same burrows in 2001, C14 in 2000 and C44 in 2000 and 2001. This was the fifth year that the same bird has used burrow C21 (1996-1999 & 2003).

*Gathering Grounds*

Ancient Murrelets were counted on their gathering ground on the west side of Low Island every evening from 4 April - 19 June. The peak count was on 15 April, with 197 birds. Peak counts for other months were 1 May – 116, 2 June – 180.

*Nest Boxes*

All 100 nestboxes that were put in place in 2001 were checked daily from 4 April - 1 June for knockdowns and first eggs this year. Knockdowns were only found 9 times in the boxes and none of the boxes were occupied.

*Predation*

Predation level on Ancient Murrelets appeared normal this year, with no excessive burrow diggings, body parts or feather piles apparent (based on opportunistic surveys conducted as part of daily observations by staff and volunteers when moving around the colony). All burrow diggings appeared to be the work of river otters. One digging of interest was discovered on 13 May at Boat Cove near trail marker 510 on the main trail. A large and wide digging of a burrow was found at the base of a spruce tree, with an inverted carcass lying near-by. Upon investigation, two cold eggs were found in the burrow. The carcass, band number 1313-69365, was banded as a chick in 1999 at funnel 3 at North Cove. This predation is believed to be the work of a raven. Two other bands were found this year, one on 9 May on a leg near the upper part of the creek (band number 1313-69131, banded in 1999 as an adult). The third band was somewhat unusual in that it was found on a skinless tarsus on the path from the cabin to the woodshed on June 3. This bird was banded as an adult in 1999, band number 1313-69001.

### **Black Oystercatchers *Haematopus bachmani***

Laskeek Bay is home to 3% of the estimated national population of Black Oystercatchers and in 1999 BirdLife International, Bird Studies Canada and the Canadian Nature Federation designated it as an Important Bird Area for these remarkable birds. This year in Laskeek Bay, we found 22 active nest sites on 8 islands: Cumshewa Island (3), East Limestone (3), Kingsway Rock (2), Lost Islands (1), Low Island (2), Reef Island (6), Skedans Islands (3) and South Low Island (2). A new nest site with 2 eggs was found in May on East Limestone, just east-southeast of Bald Eagle *Haliaeetus leucocephalus* nest #4, between Cabin Cove and North Cove. However, 9 days after the second egg was laid, we watched from the cabin as a Raven *Corvus corax* predated the nest.

**Table 3**  
**Banded Black Oystercatchers seen in Laskeek Bay in 2003**

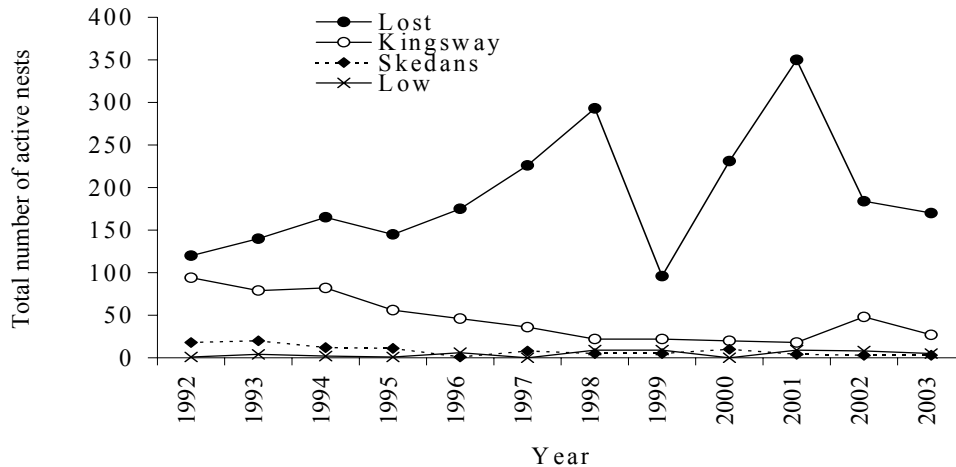
<b>Band Combination</b>	<b>Location seen (nest site)</b>	<b>Year Banded (Location if known)</b>	<b>Banded as (if known)</b>
Metal only (right)	Cumshewa (CUM-2)	Unknown	Unknown
Aluminum-BK/M	Lost Islands (LOS-9)	Unknown	Unknown
Metal only (right)	Low Island	Unknown	Unknown
W-BR/M	Reef Sea Lion Rocks	2001	Chick
BK/M-W	Reef Sea Lion Rocks	Unknown	Unknown
W-BR/M	Reef Island (east of REE-8)	2001	Chick
A2-BK/M	Reef Island (REE-1)	2000 (REE-1)	Adult
W-BK/M	Reef Island (REE-2)	2000	Chick
W-BR/M	Skedans Bay	2001	Chick
W-M	Skedans Islands (SKE-6)	Unknown	Unknown
?-BK/M	Skedans Islands (SKE-6)	Unknown	Unknown
?3-BK/M	South Low (SLW-5)	possibly 2000 (ELI-3)	Adult
W-W/M	South Low (SLW-8)	1994	Chick
W-BK/M	West Limestone	2000	Chick

During the season, 21 Black Oystercatcher chicks were found from the 22 nests. Fifteen of these chicks were still alive as of July 8, 8 of which were large enough to be banded: 2 on Kingsway Rock, 2 on East Limestone, 3 on Reef Island and 1 on South Low Island. Bands were also spotted on 14 adult Oystercatchers throughout the season (Table 3). Of note, 32 adult Black Oystercatchers were counted at Reef Island in the afternoon of July 7, only 2 of which were banded. When camp closed in July, 13 nests were still successful to some degree: 2 with 2 eggs, 1 with 1 egg, 6 with 1 chick, 3 with 2 chicks and 1 with 3 chicks.

### **Glaucous-winged Gulls *Larus glaucescens***

Glaucous-winged Gull colonies in Laskeek Bay were censused for adult presence and timing of laying twice during the season, except for the colonies on Cumshewa Rocks and East Skedans Islands which were only censused once. On June 22, 20 adult gulls and 80 juveniles were counted on Cumshewa Rocks, along with one nest with 2 cold eggs. The same day, 16 adults, 1 juvenile, 3 active nests (i.e. nests containing eggs or chicks) and 3 empty nests were counted on East Skedans Island. The final counts made on June 19 on Low Island yielded 20 adults, 5 active nests and 7 empty nests and on Kingsway Rock, 95 adults, 27 active nests and 15 empty nests were counted. On June 28, the final census of the Lost Islands yielded 612 adults, 20 juveniles, 170 active nests, including one with 4 eggs and 8 with chicks and 153 empty nests. The Reef Island colony was not censused this year. Since 1992, the total number of active

nests on Low is slightly increasing, while the total on East Skedans is decreasing slightly (Fig. 4). The number of active nests on Kingsway Rock continues to decrease, despite a slight rise in 2002. There is an overall increase in active nests on the Lost Islands since 1992, however this years numbers were lower than those since 1997 (excluding 1999) (Fig. 4).



**Figure 4**  
**Number of Glaucous-winged Gull nests with eggs in Laskeek Bay 1992-2003. The low 1999 Lost Island count is likely a reflection of nests not counted due to adverse weather**

### **Pigeon Guillemots *Cepphus columba***

In 2001, 10 Pigeon Guillemot nestboxes were put in place on the cliffs below and beside Lookout Point. The Guillemots began using the boxes in 2002, when 3 eggs laid by 2 different females were found in box #10. This year, 2 boxes were found to be active when they were checked on July 2. Box #8 contained 1 egg, while box #9 contained 2 eggs. Both nests were being incubated by adults who flew from the boxes upon our arrival on the cliff.

### **Cassin's Auklet *Ptychoramphus aleuticus***

In 1991 raccoons nearly decimated the Cassin's Auklet colony on Cassin's Tower on Limestone Island. A year later, 16 nestboxes were installed which provided alternate nesting that would also lend protection from raccoon predation. By 1994, the first successful use of the nestboxes was confirmed but the boxes were not used in 1995. From 1996-2002 Cassin's Tower was not monitored.

Knockdown sticks were first set up at Cassin's Tower on April 13 and were placed at the entrances of all burrows and nestboxes that could be found, i.e. 71 burrows and 5 nestboxes. Burrows and boxes were not marked with tags or numbers because the degree of monitoring that would occur in 2003 was not yet known. It was then difficult to know if all burrows were checked in subsequent knockdown checks. Many nestboxes have collapsed but some may still be somewhat intact. The nestboxes by Cabin Cove were not monitored. Burrows and nestboxes were next checked for knockdowns on May 22, and all were knocked down, although strong gale force winds throughout May were suspected of causing many of these. All sticks were placed back up and then checked again for knockdowns on June 4. On this check, 62 out of 67 burrows and all 4 nestboxes had knockdowns. It is possible that some of these knockdowns were due to storm petrels (as recorded in 1995) but the majority of these burrow entrances gave off the strong odour of

regurgitated plankton suggestive of Cassin's Auklets. All sticks were again replaced. On June 24, an attempt was made to band Cassin's Auklets chicks on Cassin's Tower. However, any chicks that were once present had already fledged leaving only eggshells and egg membranes as evidence of their occupancy. On this check, only twenty-six burrows were found with knockdowns, as were 4 nest boxes. None of the nestboxes contained evidence of use and all were partially collapsed and difficult to enter. Of the burrows, 2 had eggshells, 1 had eggshells and feathers, 3 had egg membranes and 7 contained feathers. Therefore, at least 13 burrows were occupied by Cassin's Auklets at Cassin's Tower in 2003.

Knockdown sticks were first set up at Cassin's Tower on 13 April and were placed at the entrances of all burrows and nestboxes that could be found (71 burrows and 5 nestboxes). Many nestboxes had collapsed but some may still be more or less intact. The nestboxes by Cabin Cove were not monitored.

Burrows and nestboxes were next checked for knockdowns on 22 May, when all were knocked down, although gale force winds throughout May were suspected of causing many of these. All sticks were replaced and checked again on 4 June, when 62 out of 67 burrows and all 4 nestboxes had knockdowns. Some of these knockdowns may have been due to storm petrels (as recorded in 1995) but the majority of the burrow entrances gave off the strong odour of regurgitated plankton, suggestive of Cassin's Auklets. All sticks were again replaced. On 24 June we examined as many burrows as possible, in an attempt to band Cassin's Auklets chicks on Cassin's Tower. However, chicks had already fledged, leaving only eggshells and egg membranes as evidence of their occupancy. On this check, only 26 burrows were found with knockdowns, as were 4 nest boxes. None of the nestboxes contained evidence of use and all were partially collapsed and difficult to enter. Of the burrows, 2 had eggshells, 1 had eggshells and feathers, 3 had egg membranes and 7 contained feathers. Therefore, at least 13 burrows were occupied by Cassin's Auklets at Cassin's Tower in 2003.

### **Fork-tailed Storm Petrel *Oceanodroma furcata***

In past years, Fork-tailed Storm Petrels were known to nest on Cassin's Tower but there was no previous record of them at Cabin Cove. This year, Petrels were heard on numerous nights and seen on several occasions north of the cabin, however it was not confirmed that they were indeed nesting in that area.

During Ancient Murrelet chick banding in the last week of May, unfamiliar calls were heard coming from burrows at North Cove. These calls were suspected to be from Petrel chicks, however neither chicks nor adults were ever seen at the burrow and therefore it could not be confirmed that Petrels were nesting at North Cove.

### **At-sea Surveys**

During the 2003 field season five nearshore/offshore seabird surveys (20 April, 10 May, 26 May, 10 June and 30 June-1 July) and five Hecate Strait surveys (17 April, 5 and 19 May, and 4 and 25 June) were conducted. Weather was fairly cooperative and only one nearshore/offshore survey had to be continued over two days due to rough sea conditions. The Hecate Strait transects on 19 May had to be altered slightly to avoid excessive spray and were run only 5.7 km out in the Strait instead of 9 km.

The main purpose of the seabird surveys is to continue monitoring the numbers of Marbled Murrelets *Brachyramphus marmoratus* in Laskeek Bay, as these birds are listed as threatened in BC and federally as endangered. Numbers of Marbled Murrelets counted during the nearshore/offshore surveys this year are as follows: 20 April – 100, 10 May – 4, 26 May – 18, 10 June – 125, and 30 June/1 July – 44. The highest count during a complete nearshore/offshore survey for 2003 was 125 birds, lower than the last three years. As is typical it occurred in mid-June.

A total of twenty-eight species were seen during the nearshore/offshore transects (Table 4). Of special note are the sightings of Northern Fulmar *Fulmarus glacialis*, Great Blue Heron *Ardea herodias*, Greater

Scaup *Aythya marila*, and Bufflehead *Bucephala albeola*. From the five Hecate Strait surveys, eighteen species of birds were identified (Table 5). Interesting birds in the Strait, included Parasitic Jaeger *Stercorarius parasiticus*, and Bonaparte's Gulls *Larus philadelphia* and Sabine's Gulls *Xema sabini*. The Jaeger was observed chasing a Black-legged Kittiwake *Rissa tridactyla*. During the Hecate Strait survey on 19 May we saw thousands of Sooty Shearwaters *Puffinus griseus*.

Unlike last year, Black-legged Kittiwakes were seen on a regular basis during the seabird surveys. The highest count was during the April 17 Hecate Strait survey when 106 birds were seen. After that, observed numbers dropped slightly and Kittiwakes were seen for the last time on the 4 June Hecate Strait survey.



**Harbour seal with pup, Low Island (photo A.J. Gaston)**



**Table 4**  
**Bird species observed during the at-sea surveys in 2003 (\* = Hecate Strait only)**

Common Name	Scientific Name	Nearshore surveys			Hecate Strait survey		
		Surveys Recorded	Max. Count		Surveys Recorded	Max. Count	
			Number	Date		Number	Date
Ancient Murrelet	<i>Synthliboramphus antiquus</i>	3	79	21-Apr	5	566	19-May
Black Scoter	<i>Melanitta nigra</i>	1	12	10-Jun	0	-	-
Black-legged Kittiwake	<i>Rissa tridactyla</i>	1	52	10-May	3	106	17-Apr
Bonaparte's Gull*	<i>Larus philadelphia</i>	0	-	-	1	16	19-May
Bufflehead	<i>Bucephala albeola</i>	1	12	21-Apr	0	-	-
Cassin's Auklet	<i>Ptychoramphus aleuticus</i>	2	8	10-May	5	40	17-Apr
Common Loon	<i>Gavia immer</i>	3	3	21-Apr	2	7	19-May
Common Murre	<i>Uria aalge</i>	2	1	26-May, 10-Jun	4	49	19-May
D-crested Cormorant	<i>Phalacrocorax auritus</i>	3	12	21-Apr	0	-	-
Glaucous-winged Gull	<i>Larus glaucescens</i>	5	33	10-May	5	7	4-Jun
Greater Scaup	<i>Aythya marila</i>	1	30	10-May	0	-	-
Harlequin Duck	<i>Histrionicus histrionicus</i>	2	3	1-Jul	0	-	-
Herring Gull	<i>Larus argentatus</i>	2	159	10-May	2	17	17-Apr
Mallard	<i>Anas platyrhynchos</i>	1	16	21-Apr	0	-	-
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	4	125	10-Jun	3	15	4-Jun
Northern Fulmar	<i>Fulmarus glacialis</i>	1	1	10-May	0	-	-
Pacific Loon	<i>Gavia pacifica</i>	4	40	10-May	2	7	4-Jun
Parasitic Jaeger*	<i>Stercorarius parasiticus</i>	0	-	-	1	1	4-Jun
Pelagic Cormorant	<i>Phalacrocorax pelagicus</i>	5	195	26-May	3	50	4-Jun
Pigeon Guillemot	<i>Cepphus columba</i>	5	178	1-Jul	5	95	17-Apr
Rhinoceros Auklet	<i>Cerorhinca monocerata</i>	5	50	21-Apr	4	131	4-Jun
Sabine's Gull*	<i>Xema sabini</i>	0	-	-	1	1	4-Jun
Sooty Shearwater*	<i>Puffinus griseus</i>	0	-	-	3	~5300	19-May
Thayer's Gull	<i>Larus thayeri</i>	2	13	10-May	2	4	17-Apr
Horned Puffin*	<i>Fratercula corniculata</i>	0	-	-	1	1	19-May
White-winged Scoter	<i>Melanitta fusca</i>	1	4	21-Apr	0	-	-

## Marine Mammals

Information on marine mammals is collected during sea surveys and at Lookout Point during sea watches, as well as opportunistically whenever sightings are made (e.g. from the cabin). Volunteers and staff spent 33 h at Lookout Point this year. Using spotting scopes and binoculars, they sat for at least one hour at a time, monitoring Laskeek Bay from Skedans Village to Kunga Island. The view was divided into 3 equal sectors and the number and behaviour of each species of marine mammals seen in each sector was recorded. Observations are shared with researchers throughout North America. This year, Graeme Ellis of the Institute of Ocean Sciences, loaned us a new camera to take high-resolution detailed identification photographs of whales we encountered in Laskeek Bay. These photos were sent to Graeme and contribute to an extensive photo identification database on whales, which he and others are compiling.

The number of sighting events of marine mammals increased again in 2003 to 129 (compared to 101 in 2002), with nine species encountered. This increase was mainly due to the daily presence of humpback whales in Laskeek Bay from 3 April to the end of May. Humpbacks were spotted frequently approximately 4 km east of Low Island and later in the season, on the south side of Reef Island. They foraged and fed with extensive displays of breaching, lunge feeding, lateral rolls and tail lobbing. Counts of 20 - 50 individuals were recorded. Often the humpbacks were accompanied by Ancient Murrelets, Cassin's Auklets, Sooty Shearwaters and Rhinoceros Auklets *Cerorhinca monocerata*.

**Table 4**

**Number of days on which marine mammals were recorded, or maximum one-day count (harbour seal, sea lion) from marine surveys, haul-out counts, and sea-watches from Limestone Island over the past five years**

Species (common name)	1999	2000	2001	2002	2003
Dall's porpoise <i>Phocoenoides dalli</i>	0	0	0	29	0
N. elephant seal <i>Mirounga angustirostris</i>	1	0	2	0	1
Fin whale <i>Balaenoptera physalis</i>	1	0	1	0	1
Grey whale <i>Eschrichtius robustus</i>	4	2	0	1	2
Harbour porpoise <i>Phocoena phocoena</i>	5	5	8	11	3
Harbour seal <i>Phoca vitulina</i>	257	494	105	316	635
Humpback whale <i>Megaptera novaeangliae</i>	16	14	26	19	26
Killer whale <i>Orcinus orca</i>	2	1	3	3	5
Minke whale <i>Balaenoptera acutorostrata</i>	0	1	2	0	0
Pacific white-sided dolphin <i>Lagenorhynchus obliquidens</i>	6	1	6	3	2
Steller sea lion <i>Eumetopias jubatus</i> (maximum count)	511	410	700	888	410
TOTALS (cetaceans)	34	24	46	66	39

Orcas were encountered five times on 24 and 28 May and 16, 21 and 30 June for a total of 21 animals. Identification photos were taken and sent to Graeme Ellis. Twice they were sighted from shore on East Limestone I. On June 21, a pod of seven transients was observed and filmed as they killed a Steller sea lion near Reef Island. A newborn calf was with this group. A fin whale was spotted from Lookout Point on May 18 and an elephant seal was sighted during an offshore sea survey on 19 May.

### *Pinnipeds*

Since 1986, a census of Steller sea lions at their haul-outs on the east end of Reef Island and at Skedans Islets has been conducted, originally by the Canadian Wildlife Service group from Reef Island and since 1990, by the crew on East Limestone Island. These counts were taken during the same time of year (April to July) at the same haul-outs. This data set is important to current research into the declining numbers of Steller sea lions in the North Pacific, as the records constitute the longest continuous running annual census records available for Haida Gwaii. This year, surveys for Steller sea lions were done on 3 and 17 April, 5, 10, 19 and 26 May, 2 and 10 June and 1 July; the highest count was on 3 April, with 410 animals on Reef rocks and 120 animals on Skedans. This number is considerably lower than the peak of 700 animals recorded at the Reef Island haul-out in 2002. Branded sea lions were spotted on 4 occasions, all at the Reef Island haul-out: F-2015 (seen twice, once in April and on 2 June), F-1229 (seen once), and F-2090 (seen once on 1 July). These animals were branded on rookeries in Southeast Alaska.

### **Wildlife Trees**

There are numerous standing dead trees (snags) on Limestone Island that provide habitat for several species of cavity nesting birds. This year, 59 of these wildlife trees were monitored, 20 of which were used by 4 species of birds: Red-breasted Sapsuckers *Sphyrapicus rubra* (14), Hairy Woodpeckers *Dendrocopos villosus* (2), Chestnut-backed Chickadees *Poecile rufescens* (3) and Brown Creepers *Certhia americana* (1). Eight of these trees were new wildlife trees this year (#88-95). Tree diameter (DBH), nest height, tree height, tree species, decay code, and percent of bark remaining were recorded for each new tree. Tree species used by the cavity nesters were Sitka spruce *Picea sitchensis* (75%) and western hemlock *Tsuga heterophylla* (25%). All 5 Western Hemlocks were used by Red-breasted Sapsuckers and were 100% covered with bark (Table 6). Trees were narrowed down to those active by 14 May, after which all were checked every 2 d to determine hatching and fledging dates. Red-breasted Sapsucker chicks from monitored trees began to hatch on 27 May and the first fledging date was 2 June (Table 6). The Sapsuckers were the last to fledge and all Sapsucker chicks had fledged by 23 June.

**Table 5**  
**Wildlife trees: species, nest height and fledge dates. Ss=Sitka Spruce; Hw=Western Hemlock**

Tree #	Tree Species	Nest hole height (m)	Fledge date
7	Ss	11.5	14 June
12	Ss	23.5	19 June
17	Ss	18.0	17 June
45	Ss	25.5	13 June
56	Hw	12.9	14 June
73	Hw	9.7	13 June
78	Ss	11.4	17 June
85	Ss	6.7	23 June
86	Hw	27.5	2 June
90	Ss	16.1	16 June
91	Ss	14.3	21 June
92	Ss	25.4	21 June
94	Hw	32.2	23 June
95	Hw	24.8	13 June

**Table 6**  
**Individual colour code band combinations of Red-breasted Sapsuckers nesting in known wildlife trees**

Tree #	Band Combination	Year Banded	Banded as
78	Yellow/Red – Blue/Metal	1996	Adult
85	Red/Red – Red/Metal	2001	Adult
90	White/Red – Blue/Metal	2003	Adult
91	Yellow/Yellow – Metal/Red	1997	Adult
92	Green/White – Metal/Orange	2003	Chick

There were many sightings of banded Sapsuckers this year, and thanks to their individual colour codes, we were able to identify which wildlife tree each was nesting in (Table 7). For the 3<sup>rd</sup> year in a row, the bird banded Yellow/Red – Blue/Metal was nesting in wildlife tree #78. On June 8, this bird's partner was seen feeding chicks with a broken leg and, despite the injury, continued feeding until the chicks fledged on June 17!

### Songbird Banding

This season marks the sixth year that the staff at Limestone Island has participated in a songbird banding program in conjunction with the Research Group on Introduced Species (RGIS). From 8 June - 8 July, sessions from 0700 to 1200 were run at banding stations on East Limestone Island (ELI), West Skedans Island (WSK), Low Island (LOW), and Reef Island (REEF13). In 2003, only the station on the north side of Reef was used. Each station was sampled four times, with three to nine days between banding sessions at a given station. Data are used for two distinct studies: an ongoing songbird recruitment monitoring project for RGIS and a genetic assessment of Haida Gwaii songbirds for Queen's University.

Banding sessions at all four stations netted a total of 203 birds (hummingbirds excluded). Of these, 44 were retraps from previous years. In addition, birds that were banded in 2003 were recaptured on 47 subsequent occasions. This number includes individuals caught multiple times after being banded. The number of species sampled on each island differed - LOW (5), ELI (10), REEF13 (11) and WSK (12). In all, sixteen species were represented (table 8), with the Orange-crown Warbler as the most commonly sampled species (35 individuals). With all stations combined, other frequently sampled species included: Winter Wren *Troglodytes troglodytes* (33), Swainson's Thrush *Catharus ustulatus* (27), Fox Sparrow *Passerella iliaca* (26), Hermit Thrush *Catharus guttatus* (25), Golden-crowned Kinglet *Regulus satrapa* (15), Chestnut-backed Chickadee (12) and Townsend's Warbler *Dendroica townsendi* (11). Less frequently sampled species included: Red-breasted Sapsucker (5), Song Sparrow *Melospiza melodia* (5), Brown Creeper (3), Pacific-slope Flycatcher *Empidonax difficilis* (2), Varied Thrush *Ixoreus naevius* (2), American Robin *Turdus migratorius* (1) and Hairy Woodpecker (1). Rufous Hummingbirds *Selasphorus rufus* were caught on 25 occasions, however, the actual number of individuals caught may have been lower. Rufous Hummingbirds were not banded, thus rendering individual identification impossible.

Various data were collected from all captured birds (if an individual was caught more than once in 2003 it was released without repeating measurements). Wing chord, bill length, tarsus length, weight, age, plumage and breeding status were recorded for all species except hummingbirds. Additional bill measurements and a small blood sample were obtained for species included in the genetics study. The blood will be used for DNA analyses.

In collaboration with Limestone staff, researchers from Queen's University, Ontario concluded the fieldwork portion of a two-year genetic comparison of selected songbirds. Nine species of resident and

migratory birds found in Haida Gwaii (eight of which are found on islands in Laskeek Bay) will be compared to their coastal counterparts in Alaska, Northern and Southern B.C., Vancouver Island, Washington and Oregon. The study aims to determine the extent of genetic isolation of Haida Gwaii populations and map it onto geological time. In addition to regular banding sessions, additional sessions were conducted on Limestone and Reef islands, some using species-specific song playback to draw in the target species. They were not restricted to the established net lanes. An additional thirty target individuals were captured using this method (table 9). Data from these birds were not used in the RGIS songbird monitoring project.

The primary focus of the songbird banding sessions is to better understand the relationship between introduced species and songbird recruitment rates. Over the past six years, the RGIS songbird project has monitored the ratio of adult to hatch-year birds on islands with and without squirrels and/or deer. These ratios are indicative of the breeding success on islands differing in area, vegetation cover and presence/absence of introduced species, among other factors. In 2003, the ratios of adults to hatch-years were 26:10 on LOW (2.60), 48:19 on WSK (2.53), 26:22 on ELI (1.18) and 24:28 on REEF13 (0.86).

All but two retraps were caught on the same island on which they were banded. The first unusual recapture was a male Swainson's Thrush banded as an adult in 2002 at REEF16 (south shore of Reef Island) and recaptured on LOW. The second was a hatch-year Hermit Thrush initially banded on Reef Island and recaptured on Low Island two weeks later!

**Table 8**  
**Species caught at each station, including adult and hatch year birds and retraps from previous years**

Species	ELI	LOW	REEF13	WSK	Totals
American Robin	0	0	0	1	1
Brown Creeper	2	0	0	1	3
Chestnut-backed Chickadee	11	0	1	0	12
Fox Sparrow	0	9	1	16	26
Golden-crowned Kinglet	8	1	3	3	15
Hairy Woodpecker	1	0	0	0	1
Hermit Thrush	7	0	11	7	25
Orange-crowned Warbler	2	11	10	12	35
Pacific-slope Flycatcher	0	0	0	2	2
Red-breasted Sapsucker	3	0	1	1	5
Rufous Hummingbird*	3	12	2	8	25
Song Sparrow	0	0	4	1	5
Swainson's Thrush	2	7	7	11	27
Townsend's Warbler	4	0	4	3	11
Varied Thrush	0	0	2	0	2
Winter Wren	8	8	8	9	33

\*Actual Rufous Hummingbird numbers may have been lower because individuals were not banded and may have been caught on multiple occasions.

**Table 9**  
**Target species caught at target banding sessions in 2003 used for the genetics study. Numbers include adult and hatch year birds as well as recaptures from previous years**

Species	ELI	REEF13	Totals
Brown Creeper	1	0	1
Chestnut-backed Chickadee	9	1	10
Golden-crowned Kinglet	5	2	7
Orange-crowned Warbler	2	1	3
Pacific-slope Flycatcher	1	0	1
Red-breasted Sapsucker	7	0	7
Varied Thrush	1	0	1

## NATURAL HISTORY

### Daily Bird Checklist

A total of 76 species of birds were seen or heard throughout Laskeek Bay this season, an all time high. The highest daily count was 40 species, recorded on 4 June. Species recorded more or less daily included Blue Grouse *Dendragapus obscurus* which was heard on Limestone from 2 April 2 - 25 June. Many flocks of Brant and Canada Geese (*Branta bernicla*, *B. canadensis*) flew past the Limestone Island cabin in the last two weeks of April and we also saw 2 flocks of approximately 20 Northern Pintails *Anas acuta*. In early May, 23 Whimbrels flew through our scopes during a Sea-watch Survey from Lookout Point. Also in the first week of May, a flock of 200 Green-winged Teals *Anas strepera* were seen in Skedans Bay. Pacific Loons started showing up in large numbers in late April with peaks of 30 and 36 in front of the cabin on 27 and 28 April, respectively. Also seen in front of the cabin in April were 28 Black Turnstones; a Dunlin *Calidris alpina* was spotted later on in June in the intertidal at South Low during an Oystercatcher survey.

### Birds of Prey

In 2001, the first-ever located Northern Saw-Whet Owl nest on Haida Gwaii was found in Wildlife tree #1 near our cabin on Limestone Island and this season we have again been fortunate to work with this fascinating species. With the expertise of Carmen Holschuh, a graduate student at University of Northern BC and a Limestone Island volunteer, we were able not only to establish that there was a pair of Saw-Whet Owls on the island, but even got the opportunity to band one! On the night of April 30, we set up a mist net in Crow Valley and with the use of Ms. Holschuh's Saw-Whet playback recordings, caught an owl in only 4 minutes! While we were banding what proved to be the female, the male began calling from nearby. A brief attempt was made to catch the male as well, but was then abandoned so as not to further disturb the pair in one evening.

In total, there were 6 sightings of an owl, during one of which it was sleeping on a branch beside the main trail. On May 17, an owl was briefly heard calling in Crow Valley, southwest of the Ridge trail, past the Crow Valley trail. When the owl had stopped calling for several minutes, the playback recording was used and within 10 seconds, an owl flew overhead, landed on a branch directly above and began calling for 10 minutes. It was suspected that if the birds were breeding on the island that the nest was in Crow Valley. Attempts were made to locate a nest by visiting all the snags in Crow Valley and using the playback,

however no signs were found. An owl was heard calling on numerous occasions throughout April, May and June and its call was last heard on June 29.

Five Bald Eagle nests were monitored this year (#1,2,3,4 & 6). Bald Eagle nest #5 that was last active in 2001 was completely blown down by May this year. On a few occasions adults were seen on trees #2 and #3, as well as in nest #6, confirming last year's suspicions of it being used by Bald Eagles. No Eaglets were ever seen or heard in any of these 3 nests, nor was there any activity in trees #1 & #4.

No Common Raven nests were found this year, nor any belonging to Sharp-shinned Hawks. A Sharp-shinned was heard calling for several minutes on the West side of boat cove, however no sign of nesting was found. There were two sightings of Peregrine Falcons this year, one in mid-April when an immature was seen and heard calling in North Cove and an adult was seen exactly one month later. There were also 2 Red-Tailed Hawk sightings, the first in early May when the same individual was seen from various locations on Limestone, the second in early June when one was seen taking off from a branch by the exclosures, near wildlife tree #73. A Merlin was also seen this season on June 23 in Cabin Cove.

### **Plants**

The timing of the bloom was early this year, possibly due to a mild winter and three weeks of sun in late April and early May. *Lycopodium clavatum*, running clubmoss, was found for the first time on E. Limestone by Rob Cameron on June 13 and a specimen collected. Surveys were done during May and early June to check on the status of the rare and uncommon plants. *Geranium richardsonii* (Richardson's geranium) were blooming by May 22, with five specimens located in five sites. Richardson's geranium is not known to occur elsewhere in coastal B.C. and these specimens are the only remaining plants known on Haida Gwaii. Other rare and uncommon plants of E. Limestone observed in bloom were: showy Jacob's ladder, Unalaska paintbrush, cut-leaf anemone, northern rice-root, few-flowered shooting star and kinnikinnick. Even though these species are common elsewhere in British Columbia, on E. Limestone Island they only survive in deer-free sites like niches, ledges and crevices of cliff faces.

### **Introduced Species**

Introduced deer and squirrel remain on Limestone Island. No presence of raccoons was detected and no burrow diggings were attributed to raccoons. Squirrel surveys resumed this year were and were conducted weekly from late April to early June. It appears that squirrels continue to use Ancient Murrelet nest boxes as a repository for spruce cones. No formal survey of deer numbers was done. However, on 7 June, a survey of most of the island was conducted and 15 individuals were counted, including the collared male. Introduced thistle is spreading to more areas and becoming more abundant along the shoreline from Crow Valley to North Cove.

## **CONCLUSIONS**

The 2003 season saw a continuation of several trends that we have noted in recent years: numbers of Ancient Murrelets visiting East Limestone Island during May and June were lower than in the 1990s, although numbers of chicks departing have remained stable since 1999. The lack of post-breeding visitors, combined with low gathering ground counts and few visits to nest boxes, suggest that few birds are attempting to recruit on East Limestone Island. This will ultimately lead to a decline in the population, if the situation does not improve. In recognition of the potential for population changes at East Limestone Island, the 2004 program will probably omit the use of flight nets to capture adults, to minimize disturbance to potential recruits. On the positive side, Cassin's Auklets appear to have made a comeback at East Limestone Island, after being almost eliminated by raccoons in 1991.

Black Oystercatchers appear to have had a good season for reproduction, after the near-complete failure in 2003. The number of banded birds sighted was high and included two 2-year-olds, banded as chicks in 2001, so there is a good prospect that our locally-reared birds will continue to recruit into the population. Information on Oystercatchers will provide an important baseline against which to measure the effects of offshore hydrocarbon developments, should these go ahead in Hecate Strait.

Numbers of Humpback Whales feeding in Laskeek Bay, especially in May, continue to increase and numbers of Steller Sea Lions visiting the local haul-outs remain high. However, this was the third year running in which no Minke Whales, a regular visitor in earlier years, were not sighted. Numbers of Marbled Murrelets counted during at-sea surveys were relatively low, again consistent with recent trends.

We now have a sufficient series of observations to be able to detect trends with some confidence. As the information grows, we hope to be able to put our data sets to good use in improving understanding of changes taking place in local ecosystems, whether natural or human-induced. Such information is important if we are to do a better job of managing natural resources in the twenty-first century than we did in the twentieth.



## **EAST LIMESTONE ISLAND FIELD STATION: REPORT ON THE 2004 FIELD SEASON**

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<sup>1</sup>*Current address:*

### **SUMMARY**

The Laskeek Bay Conservation Society's 15<sup>th</sup> field season ran from 30 April – 23 July 2004, opening and closing a few weeks later than in recent past years. Three field staff, one in-town staff, eight Directors, 26 weekly volunteers, many local students and teachers, 86 other visitors and 44 students along with 19 teachers from three local schools visited the field site during the season and shared in the work. The number of ancient murrelet chicks banded this year (445) was the lowest and breeding was the earliest on record, with the peak of 45 chicks departing on 16 May. The Ancient Murrelet program was reduced this year, with no trapping of adult birds. However, the Black Oystercatcher program was expanded to include surveys as far south as Ramsay Island. All sites in Laskeek Bay were monitored as usual. Twenty-three sites were active and 10 chicks were banded. The remains of prey items fed to chicks were collected to study how reproductive success varies with diet. Two surveys in Juan Perez Sound found at least 43 active sites and 21 chicks were banded. A total of 236 Glaucous-winged Gull nests were found with eggs this year, 80% of which were on the Lost Islands. Four Pigeon Guillemot nestboxes were occupied, the highest total so far. There appeared to be an increase in Cassin's Auklet activity on Cassin's Tower and the North Shore. Of, forty-two burrows and 5 nestboxes marked and numbered, half showed signs of use. One Cassin's Auklet chick was banded at Cassin's Tower. There were 16 active Wildlife Trees, 10 of which were used by Red-breasted Sapsuckers and one by Red-breasted Nuthatches, the first time such species has been found in a Wildlife Tree on Limestone Island. A Northern Saw-whet Owl pair in tree #81 reared at least one successfully fledged chick. A new Bald Eagle nest was found and chicks were heard in July. Fewer marine mammals were seen this season as no dolphins and fewer humpbacks whales were recorded than in 2003.

### **INTRODUCTION**

The long-term monitoring efforts of the Laskeek Bay Conservation Society are becoming increasingly valuable, given current pressures from introduced species, offshore oil exploration and wind farms in the Hecate Strait. They are designed to provide essential scientific background information to enable the evaluation of changes in the local ecosystem and the effects of human disturbance. The education program is an integral part of the scientific research, working in concert to gather data and provide a unique experience for volunteers and visitors from Haida Gwaii communities, from across Canada and from around the world. The Limestone Island Field Camp was open for 12 weeks in 2004 from April 30 to July 23. This year's field staffers were: Suzanne Charest (Camp Supervisor/Biologist), Ceitlynn Epnors (Biologist/Interpreter) and Charlotte Tarver (Interpreter/Naturalist, May 18-21).

## EDUCATION PROGRAMME

### **Project Limestone**

This was the 14<sup>th</sup> year of Project Limestone- a program whereby local students and teachers learn about seabird biology and the natural history of Limestone Island by participating in research activities. Two groups from Queen Charlotte Secondary School, two groups from the Living and Learning School and one group from George M. Dawson Secondary School participated this year. A total of 44 students and 19 teachers and leaders visited Limestone Island.

### **Volunteers**

Twenty-six volunteers took part in the Volunteer Program this year: ten were returnees and 16 participated for the first time. Most volunteers stayed for 1 week, but 2 stayed for 2 weeks and a few only for several days. Two students completed their high school Work Experience Program while on Limestone Island. Sixteen volunteers were local, 3 from elsewhere in British Columbia, 3 from Alberta, 2 from Sweden and 2 from Tasmania, Australia. Together, they put in 176 volunteer-days this year.

### **Visitor Interpretation Program**

Limestone Island offers a unique program for visitors that includes a daytime orientation tour of the island and a return visit at night to assist with the banding of Ancient Murrelet chicks during the banding season. It is the only program in Canada that allows visitors hands-on experience with the seabirds during banding. Most visitors are sailboat tour groups on their way to/from Gwaii Haanas National Park Reserve/Haida Heritage Site.

The first visitor group to Limestone Island this year was a kayak group of 10 undergraduates from the Outdoor Recreation Department at Lakehead University, Thunder Bay, Ontario who came for an afternoon tour and also returned at night to assist with banding. They undertook their 3-week kayaking trip to create awareness about environmental, social and historical issues in Haida Gwaii and saw their visit to Limestone Island as a stepping stone to achieving their goal.

The *s/v Maple Leaf* visited on May 18 and 22 with a group of 12 each time and the *s/v Island Roamer* visited on May 23 and 25 and June 5 with groups of 12, 10 and 12 people respectively. Visitors in May were given the usual afternoon orientation tours and returned at night to assist with banding. Visitors in June, however, were only given an afternoon tour, as Ancient Murrelet banding was finished for the season. Total tour group days, including the Lakehead students, was 68 days.

Dr. Tony Gaston ran a 2-week field course for Ontario University students on Reef Island this year from May 21 to June 3. He and the six students involved visited Limestone Island for a daytime interpretation tour on May 27.

### **Haida Gwaii Watchmen**

Skedans village was visited several times. Visits were also made to Hotsprings Island during the Black Oystercatcher surveys, as there was a nesting pair on the island. We had the opportunity to discuss the monitoring and banding project with the Watchmen who also shared their observations on local oystercatchers with us.

## RESEARCH & MONITORING PROGRAM

### **Ancient Murrelet** *Synthliboramphus antiquus*

In 2004, there was no adult banding, or burrow and nestbox monitoring, to give the birds respite from the physical disturbances caused by these activities in case they are affecting the recruitment of new breeders to Limestone Island. However, adults were caught opportunistically if found on the ground during chick banding. If banded, band number was recorded and presence/size of brood patch noted when possible. Birds were then immediately released. All unbanded birds were released immediately. Only 2 banded birds were captured: one, with a brood patch of 20mm, at funnel 6, was banded in 1996 as an adult at the Spring Valley flight net; the second, caught at funnel 4, was banded as a chick in 2001 at funnel 5.

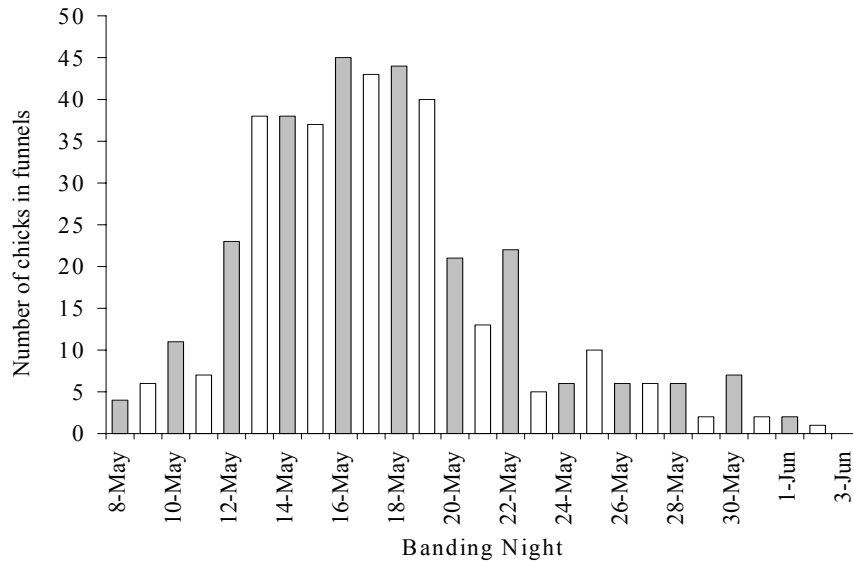
### Chick Banding

The usual 6 plastic funnels were erected again this year to capture chicks departing their burrows. New stakes were made for funnels 5 and 6. Funnels were closed and monitored for chicks from May 8 to June 3, with first chicks banded on May 8 from funnels 5 and 6 and the last chick from funnel 4 on June 2 (Table 1). Using the adjusted time protocol from 2001, funnel gates were closed from 2230-0230 for May 8-19 and from 2300-0230 from May 20 to the end of banding.

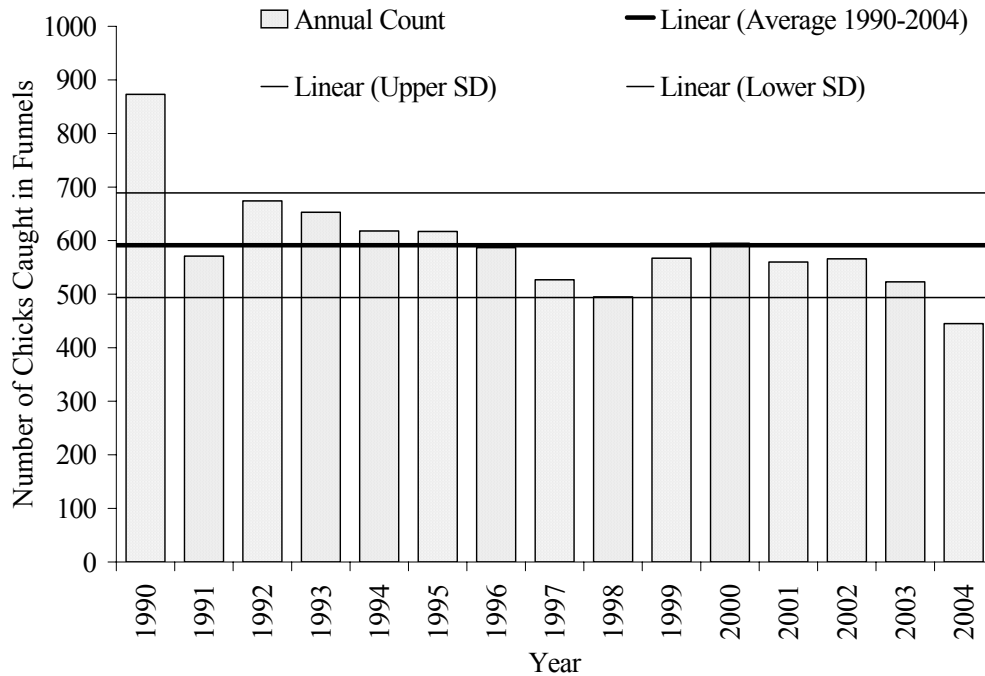
A total of 445 chicks were banded from the funnels before 0230, and 26 from outside the funnels or after 0230 for a total of 471 chicks banded in 2004. An additional 4 chicks from the funnels went unbanded. This is the lowest number of chicks caught in the funnels since 1990 and is 1.5 standard deviations from the long-term average (Fig. 1).

**Table 1**  
**Summary of chick departures, peak nights and totals from funnels for Ancient Murrelet chick banding on Limestone Island, 1990-2004**

<b>Year</b>	<b>Opening night</b>	<b>First night</b>	<b>Last night</b>	<b>Peak night</b>	<b>Peak count</b>	<b>Total days</b>	<b>Total chicks</b>
1990	12 May	12 May	15 June	22 May	65	35	873
1991	8 May	8 May	6 June	26 May	48	30	561
1992	12 May	12 May	3 June	21 May	73	23	674
1993	9 May	10 May	15 June	18 May	70	37	653
1994	7 May	7 May	8 June	22 May	52	33	618
1995	7 May	10 May	11 June	22 May	64	33	617
1996	10 May	11 May	9 June	19 May	48	29	588
1997	8 May	11 May	11 June	24 May	41	31	527
1998	7 May	11 May	22 June	20 May	55	43	495
1999	9 May	11 May	11 June	21 May	54	31	567
2000	11 May	11 May	11 June	20 May	62	31	595
2001	8 May	10 May	15 June	18 May	54	37	560
2002	7 May	9 May	3 June	21 May	65	26	566
2003	10 May	11 May	7 June	21 May	52	28	523
2004	8 May	8 May	2 June	16 May	45	26	445



**Figure 1**  
**Annual counts of Ancient Murrelets chicks caught in funnels on East Limestone Island 1990-2004.**  
**The solid line is the long-term mean for 1990-2003 and the fine lines are one standard deviation from the mean.**



**Figure 2**  
**Number of Ancient Murrelet chicks caught in funnels per night from 8 May - 3 June on East Limestone Island**

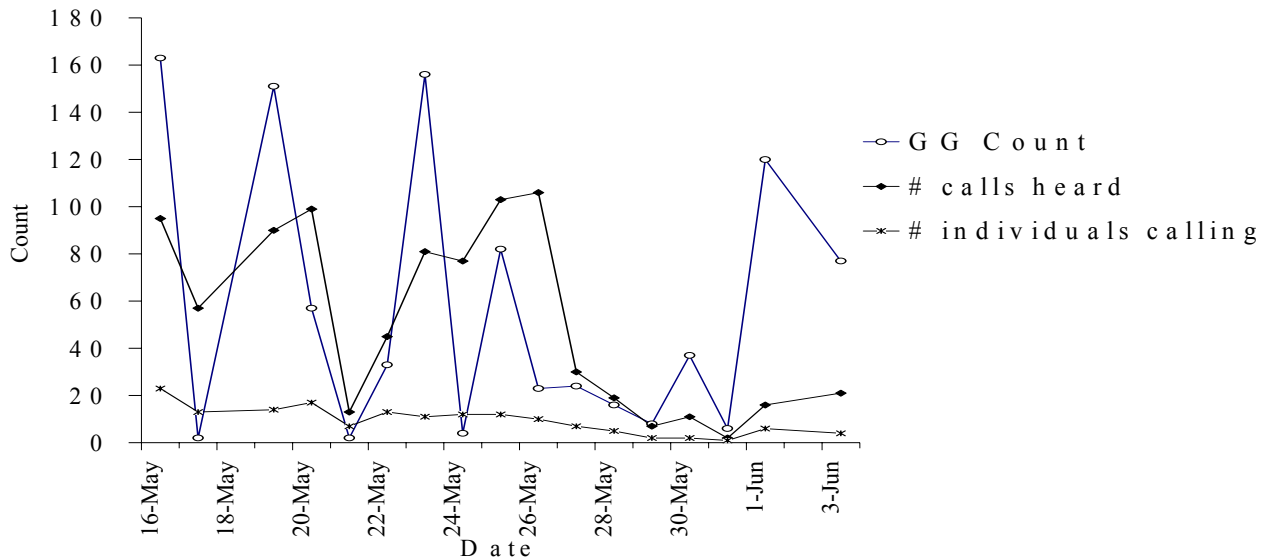
No chicks were banded from burrows, as burrows were not monitored this year. The peak number of chicks occurred on May 16 with 45 chicks banded from within the funnels and 7 from outside the funnels or after 0230 (Table 1 & Fig. 2). This is the earliest peak date at Limestone Island since 1990 and is 5 days earlier than the average of peak nights from past years. Apart from 1997 when 41 chicks were banded from funnels, this is the lowest peak funnel count since 1990. The mean ( $\pm$  SD) weight of chicks from the funnels was comparable to past years at  $26.6 \pm 3.4$  g. No chicks were found with ticks this season.

### Gathering Grounds

Adult Ancient Murrelets were counted on the gathering ground to the west of Low Island each night from May 2 to June 20 at approximately 2 hours before sunset. Poor weather and visibility prevented counts on 2 nights in June and counts were not done from June 14-16 while all camp members were in Juan Perez Sound for the Black Oystercatcher survey. The peak count occurred on May 16, the same night that the peak number of chicks were banded, with 163 birds recorded (Figure 3). The peak count for June was 87 birds on June 1 (Figure 3).

### Point Counts

The number of non-breeders heard calling at night was again estimated through point counts this year from May 16, the date that flight nets would normally have been opened for the first night of post-laying banding, to June 3. Adaptations were made to the protocol developed in 2003. Counts were still made at 0200 at the cabin flight net area, however a second count site was added this year at trail marker N-56 at North Cove, between funnels 2 & 3. The number of calls heard and the number of individuals thought to be making those calls in a 5-minute period was estimated at each site every night during chick banding. Birds assumed to be on the water drawing chicks out were not counted. A comparison was made between point count totals (both sites combined) and gathering ground counts (Figure 3). Although gathering ground counts noticeably fluctuated, there was still a general decreasing trend for all three counts throughout the count period.



**Figure 3**  
**Comparison of Gathering Ground counts to Point Counts from 16 May – 3 June, not including 18 May and 2 June**

## Predation

Predation levels on Ancient Murrelets, represented by the number of wings and feather piles found were not unusual compared to past years. This season, several feather piles and 38 wings were found in various locations around the island. Of interest, however, is that 11 of the wings were found in a 5m-radius area behind the bird blind and are suspected Raven predations as a Raven family was often seen and heard close-by. Three headless carcasses were found this year in mid-June near Bald eagle nests #2, 4 & 7. We suspected that river otters were responsible for the predations, as a small burrow digging (too small for a raccoon) was found in the same area. No bands were found this year.

## Black Oystercatcher *Haematopus bachmani*

British Columbia supports 1/3 of the global population of the Black Oystercatchers, 37% of which are found in Haida Gwaii. This year, 23 sites were found to be active in Laskeek Bay (i.e. were found with eggs and/or chicks at some point in the season. Fifty-one eggs were laid at these sites, with one pair laying a replacement clutch of 2 eggs. Eggs were measured for length and breadth and weighed. Twenty chicks were found during the season. However, by late July, 14 nests had failed, leaving 9 successful nests with 14 chicks in total. Hence, 39% of the nests were successful in that at least one egg hatched, but only 27% of eggs hatched. Ten of the chicks were banded, all with the combination White (left leg) – Orange/Metal (right leg). Chicks were also weighed and culmen and tarsus measurements taken. Banded Adults were seen eleven times this season in Laskeek Bay, however due to illegible aluminum alpha-numeric bands or bands having fallen off, it was impossible to determine when/where many of these birds were banded (Table 2). One adult seen at South Low, however, was identifiable as being banded in 1994 as a chick.

**Table 2**  
**Banded Adult Black Oystercatchers seen in Laskeek Bay in 2004**

<b>Band Combination*</b>	<b>Location seen (nest site)</b>	<b>Year Banded (Location if known)</b>	<b>Banded as (if known)</b>
UB – M	Cumshewa Is. (CUM-3)	Unknown	Unknown
UB – M	Kingsway Rock (KNG-2)	Unknown	Unknown
UB – Bk	Lost Is. (LOS-4)	Unknown	Unknown
Aluminum – Bk/M	Reef Is. (REE-1)	Unknown	Adult
Bk/M – W	Reef Is. (REE-8)	2000?	Chick?
Aluminum – Bk/M	Skedans Is. (SKE-6)	Unknown	Adult
W – M	Skedans Is. (SKE-6)	Unknown	Chick
Bk/M – W	Skedans Is. (SKE-6)	2000?	Chick?
M – Bk	Skedans Is. (SKE-6)	Unknown	Unknown
UB – Bk/M	South Low (SLW-5)	Unknown	Unknown
W – W/M	South Low (SLW-8)	1994	Chick

\* (left leg) – (right leg); UB = leg unbanded; M = Metal; Bk = Black; W = White; Aluminum = Blue Alpha-Numeric.

Data also were collected this season to compare nestling diet between Black Oystercatcher sites and how reproductive success varies with diet. When sites were known to have chicks, they were visited every 5-11 days, depending on weather and opportunity in order to collect feed samples. The shells of prey items fed to chicks were collected and measured 3 times during the season from 9 sites on 5 different islands: Cumshewa Is. (CUM-1), Kingsway Rk (KNG-1, KNG-2, KNG-3), Low Is. (LOW-1, LOW-2), Reef Is. (REE-4) and Skedans Is. (SKE-1, SKE-4). The majority of prey items found were limpets, mussels, chitons and crabs.

This year, in collaboration with Gwaii Haanas National Park Reserve/Haida Heritage Site, LBCS expanded their Black Oystercatcher monitoring area to the islands off of the east coast of Lyell Island and down to the north end of Juan Perez Sound, as far as Ramsay Island. This work will help to provide a baseline against which to detect changes in intertidal ecosystem structure or productivity in the Park as the diet and habitat specializations of Oystercatchers make them unique among the birds of Haida Gwaii. Also, the ease with which the species can be studied makes them an ideal focus for monitoring ecosystem health.

Surveys were conducted in Juan Perez Sound for 2 3-day periods, the first from June 14-17 and the second from July 3-6. All overnights on both surveys were spent at the Gwaii Haanas Park's camp in the Bischof Islands. The first survey attempted to locate all active BLOY nest sites from Titul Is. down to the south side of Ramsay Is., including Richardson Inlet and Darwin Sound. All adult Black Oystercatchers seen from the water were noted and the section of shoreline on which they were seen checked for signs of breeding. Approximately 120 nm (215 km) of shoreline was surveyed. A total of 58 sites were checked, 43 of these were found to be active. A total of 58 eggs (presumed to be alive), 8 predated eggs, 23 live chicks, and 2 dead chicks were found. Also, 37 adult BLOYs were counted with no nests that could be found.

The primary purpose of returning for a second survey in July was to band chicks. A total of 49 sites were checked, 27 of which were considered still active, i.e. eggs and/or chicks were found. Four new active sites were found during the second survey that were not found during the first (Shuttle Is. [1], Murchison Is. [3]). All eggs found were measured using calipers and weighed. Eggs were not measured if pipped and chicks peeping. Chicks weighing <100g were not banded. Chicks weighing >100g were banded with a colour band on the left leg denoting locality banded, and a colour band denoting banded as a chick in 2004 over a stainless steel band on the right leg. Tarsus, culmen, and wing cord were also measured on all banded chicks. When chicks were found, prey items surrounding the scrape were counted and categorized into the prey type categories of mussels, limpets, chitons, crabs, abalone etc. GPS co-ordinates were also taken at the scrape at each site checked.

There were 16 sites where eggs/chicks were found during the first survey in June but none were found in July. A total of 21 chicks from 13 sites on 8 islands were banded, with 9 chicks from 5 sites being too small to band. There were 3 sites with dead chicks, 1 chick at each site. A total of 10 nests still contained eggs (5 with 2 eggs, 5 with 1 egg) and 3 nests contained new clutches of 2 eggs each. Table 3 provides the band combinations used.

**Table 3**  
**2004 Black Oystercatcher Chick band combinations by location**

<i>Group</i>	<b>Location</b>	<b>Islands</b>	<b>Band Combination**</b>
1	Laskeek Bay	Cumshewa Is., Skedans Is., East Limestone Is., West Limestone Is., Low Is., South Low Is., Reef Is., Kingsway Rock, Titul Is., Kunga Is	W – Or/M
2	East of Lyell Is.	Tar Is., Kawas Is., Agglomerate Is	None banded
3	Juan Perez Sound	Faraday Is., Murchison Is., House Is., Hotsprings Is., Ramsay Rock, Ramsay Is	DB-Or/M; DB – R/M
4	Juan Perez Sound	Bischof Is	DB-Or/M; DB – R/M
5	Darwin Sound/ Richardson Inlet	Topping Is., Shuttle Is., Lyell Pt., Richardson Passage, Dog Is., Stanslung Is	Or/M-Y; Y-Or/M; Y – R/M

\*\* (left leg) – (right leg); W = White; Or = Orange; DB = Dark Blue; R = Red; Y = Yellow; M = Metal

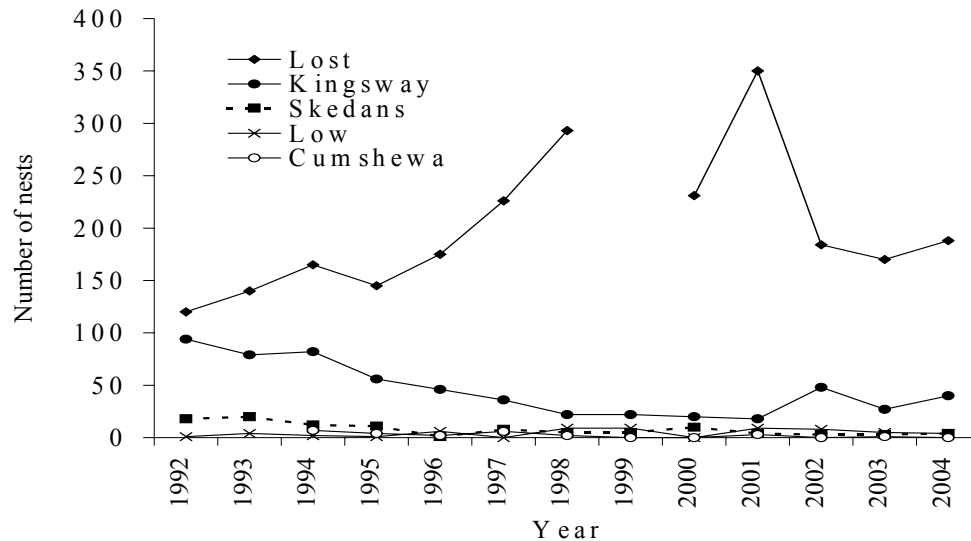
#### **Glaucous-winged Gull *Larus glaucescens***

Kingsway Rock was visited on May 20 to check the Glaucous-winged Gull colony for timing of laying. Laying had not begun as no eggs were found, only empty nests. One month later, 5 Glaucous-winged Gull colonies in Laskeek Bay were censused for adult presence and nest contents: Kingsway Rock and Lost Islands on June 20, Cumshewa, Low and East Skedans Islands on June 21. The following was found at each colony: Kingsway – 122 adults, 40 nests with eggs, 27 empty nests; Lost – 551 adults, 188 nests with eggs, 14 empty nests; Cumshewa – 0 adults, 0 nests; Low – 14 adults, 4 nests with eggs, 3 empty nests; East Skedans – 7 adults, 4 nests with eggs, 1 empty nest (Figure 4). No juveniles were recorded at any of the colonies during these visits. All eggs appeared to have hatched by June 29 as no eggs, only small chicks were seen when colonies were visited for surveys of other species. Although the colonies at Lost and Kingsway were noticeably increasing and decreasing respectfully from 1992 – 2001, the number of nests with eggs appears to be leveling out since 2001, despite there be being fewer adults recorded at Lost Island this year (Figure 4).

#### **Pigeon Guillemot *Cephus columba***

For the third year in a row, Pigeon Guillemots have been found using the nestboxes at Lookout Point. This year, the boxes were checked for signs of use on July 19. Four out of the 10 boxes were used this year, the highest occupancy to date (1 used in 2002, 2 used in 2003). Nestboxes #3, 8 and 9 each had 1 egg while nestbox #4 had 2 eggs. None of the nestboxes had chicks. None of the eggs showed signs of hatching and it is speculated that these may be replacement clutches as several broken eggshells were found around the boxes and other PIGU chicks that had been seen in Laskeek Bay looked at least several weeks old.





**Figure 4**  
**Number of Glaucous-winged Gull nests with eggs in Laskeek Bay 1992-2004**

**Cassin’s Auklet *Ptychoramphus aleuticus***

Cassin’s Auklet burrows were again monitored this season on East Limestone Island. On 9 May, 35 burrows and 5 nestboxes were marked, numbered and mapped out on Cassin’s Tower, as well as 7 burrows on the North Shore, near the rope-rock. Knockdown sticks were first set up in burrow and nestbox entrances and were checked for knockdowns every 3 days from 22 May – 21 July. There appeared to be more burrows on the east-facing slope of Cassin’s Tower this year than in previous years (A.J. Gaston pers. comm.). The majority of the burrows were very long, going deep under ground, as they are on a slope. Consequently, nest cups could not be reached, nor hatches dug without disturbing the entire slope. Three nestboxes and 26 burrows consistently gave off the telltale odour of Cassin’s Auklet. One Cassin’s Auklet chick was banded on 27 May in a burrow on Cassin’s Tower to which the entrance could not be located. When burrows and nestboxes were checked for knockdowns and sign of chicks for the last time on 21 July, eggshell was found in 1 burrow and grey and white feathers were found in 15 burrows and 2 nestboxes. There were fewer knockdowns in July than earlier and the burrow entrances ceased to smell by 21 July. It appears that the auklets had all departed by then.

**Fork-tailed Storm Petrel *Oceanodroma furcata***

Fork-tailed Storm Petrels were heard calling north of the cabin and at North Cove on most nights from May 6-25. This year, one was found incubating in a burrow at Cassin’s Tower on May 27. The burrow was checked again on June 28 and a very small chick was found, its eyes still closed therefore no measurements were taken. The chick was then found dead in the burrow on July 21 just before camp closure.

**Sea Surveys**

In 2004, four nearshore sea surveys (6 and 20 May, 26 June and 13 July) and four Hecate Strait sea surveys (13 and 27 May 13, 19 June and 8 July) were conducted. Nearshore surveys were aborted twice just after they had begun due to fog and seas conditions and were restarted on subsequent days. Apart from those 2 days, weather during surveys was calm.

The primary purpose of conducting the sea surveys is to monitor the Marbled Murrelets in Laskeek Bay as these birds are listed as threatened in BC and federally endangered. Marbled Murrelets were recorded on every sea survey conducted in 2004 with counts as follows for the nearshore surveys: 6 May – 48, 20 May – 24, 26 June – 50 and 13 July – 57. The peak count of 57 on 13 July was considerably lower than in previous years (10 June 2003 – 125; 3 July 2002 – 503; 23 June 2001 – 165) and occurred later in the season.

A total of 20 species were recorded this season on nearshore surveys, with several notables such as a Horned Grebe, 17 Long-tailed Ducks and 12 Green-winged Teals seen on 6 May (Table 4). A total of 18 species were recorded on the Hecate Strait surveys, including a Parasitic Jaeger, a Horned Puffin and Sooty Shearwaters (Table 4). Fewer shearwaters were recorded this year than in past years. Black-legged Kittiwakes were seen only once this season: 16 adults on 13 May (Table 4). This contrasts with 2003, when Kittiwakes were seen regularly.

**Table 4**  
**Number of occasions on which bird species were recorded on nearshore and Hecate Strait surveys and dates of maximum counts**

Common Name	Scientific Name	Nearshore Surveys	Max Count	Day of Max Count	Hecate Surv.	Max Count	Day of Max Count
Ancient Murrelet	<i>Synthliboramphus antiquus</i>	2	107	6 May	4	415	13 May
Bald Eagle	<i>Haliaeetus leucocephalus</i>	2	2	20 May, 26 Jun	1	1	8 Jul
Black Oystercatcher	<i>Haematopus bachmani</i>	1	7	26 Jun	0	-	-
Black Scoter	<i>Melanitta nigra</i>	1	7	26 Jun	0	-	-
Black-legged Kittiwake	<i>Rissa tridactyla</i>	0	-	-	1	16	13 May
Cassin's Auklet	<i>Ptychoramphus aleuticus</i>	1	1	20 May	2	8	27 May
Common Loon	<i>Gavia immer</i>	1	6	6 May	0	-	-
Common Murre	<i>Uria aalge</i>	0	-	-	3	7	13 May
Common Raven	<i>Corvus corax</i>	1	1	13 Jul	0	-	-
Glaucous-winged Gull	<i>Larus glaucescens</i>	4	97	6 May	4	28	8 Jul
Green-winged Teal	<i>Anas crecca</i>	1	12	6 May	0	-	-
Harlequin Duck	<i>Histrionicus histrionicus</i>	2	3	20 May	0	-	-
Herring Gull	<i>Larus argentatus</i>	0	-	-	4	3	7 May, 8 Jul
Horned Grebe	<i>Podiceps auritus</i>	1	1	6 May	0	-	-
Long-tailed Duck	<i>Clangula hyemalis</i>	1	17	6 May	0	-	-
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	4	57	13-Jul	4	13	1 May
Northwestern Crow	<i>Corvus caurinus</i>	3	1	6,20 May, 26 Jun	0	-	-
Pacific Loon	<i>Gavia pacifica</i>	3	10	6 May	3	3	19 Jun
Parasitic Jaeger	<i>Stercorarius parasiticus</i>	0	-	-	1	1	27 May
Pelagic Cormorant	<i>Phalacrocorax pelagicus</i>	4	50	26 Jun	2	2	13 May
Pigeon Guillemot	<i>Cephus columba</i>	4	241	20 May	4	105	8 Jul
Rhinoceros Auklet	<i>Cerorhinca monocerata</i>	4	89	26 Jun	4	72	13 May
Sooty Shearwater	<i>Puffinus griseus</i>	0	-	-	4	132	13 May
Thayer's Gull	<i>Larus thayeri</i>	0	-	-	2	3	13 May
Tree Swallow	<i>Tachycineta bicolor</i>	1	3	26 Jun	1	1	27 May
Horned Puffin	<i>Fratercula corniculata</i>	0	-	-	1	1	8 Jul
White-winged Scoter	<i>Melanitta fusca</i>	3	26	6 May	2	52	13 May

## Marine Mammals

The number of marine mammal sighting events in 2004 was similar to past years, with 124 sightings of 8 species of marine mammals. However, the majority of these were of seals and sea lions (Table 5). Of particular interest is the seeming scarcity of humpback whales in the Laskeek Bay area this season. Only 19 were seen, which is low when compared to recent years (Table 5). Discussions with other visitors to the area (tour boats, sailboats etc.) revealed that they too noted fewer whales this season. Also of interest, was the absence of Pacific white-sided dolphin sightings.

Thirteen Orcas were seen this year: 1 bull seen from Lookout Point, 1 seen during a Hecate sea survey, 6 passing Cabin Cove and 3, including 1 bull, spotted swimming past North Cove just before midnight, while chick banding was in progress. All sightings were brief, consequently no individual identification photos were taken this year.

Seal and sea lion haul-outs in Laskeek Bay were surveyed during all sea surveys and opportunistically throughout the season. The highest count of Steller sea lions at the Reef Island Rocks was 450 on 6 May. This count is comparable to last year's high count of 410, but occurred 1 month later this year. No branded animals were seen this season. Of interest is that one California sea lion was heard barking on Reef Island Rocks on 13 July, but the animal could not be identified amongst the many Steller sea lions.

**Table 5**  
**Total counts of individual marine mammals from marine surveys, haul-out counts, and sea-watches from East Limestone Island for 1997, 1998 and 2001-2004**

Species (common name)	Scientific name	2004	2003	2002	2001
Dall's porpoise	<i>Phocoenoides dalli</i>	0	0	29	0
Northern elephant seal	<i>Mirounga angustirostris</i>	0	1	0	2
Fin whale	<i>Balaenoptera physalis</i>	0	1	0	4
Grey whale	<i>Eschrichtius robustus</i>	1	3	2	0
Harbour porpoise	<i>Phocoena phocoena</i>	12	5	21	19
Harbour seal	<i>Phoca vitulina</i>	1177	635	316	105
Humpback whale	<i>Megaptera novaeangliae</i>	19	152	49	140
Killer whale	<i>Orcinus orca</i>	13	21	29	16
Minke whale	<i>Balaenoptera acutorostrata</i>	2	0	0	0
Pacific white-sided dolphin	<i>Lagenorhynchus obliquidens</i>	0	325	22	93
California Sea Lion	<i>Zalophus californianus</i>	1	0	0	0
Steller sea lion	<i>Eumetopias jubatus</i>	2987	3107	2577	1633
TOTALS		4212	4250	3060	2016

### Sea-Watch Surveys

There were 13 sea-watch surveys conducted this year from Lookout Point for a total of 13.5 survey hours, approximately half the seasonal goal of 30 h. Very few marine mammals were seen, except for 1 and 2 harbour porpoises spotted on 6 and 26 June, respectively, and 1 male orca on 12 July. However, on the latter date, hundreds of Marbled Murrelets were seen on the water between Lookout Point and South Low Island.

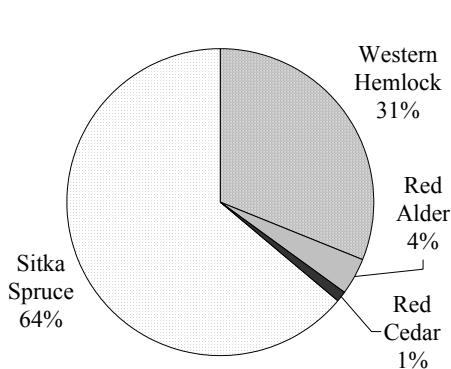
### Wildlife Trees

In May and June 2004, 51 standing snags (dead trees) were monitored for use by cavity nesting birds. A large storm on Christmas Eve may have been responsible for the many fallen trees on the island, including 5 Wildlife Trees. Of the 51 trees monitored, 16 were active, of which six were new this year (#96-101) (Table 6). The active trees were used by 5 species: Red-breasted Sapsucker (10), Hairy Woodpecker (2), Chestnut-backed Chickadee (2), Red-breasted Nuthatch (1) and Northern Saw-whet Owl (1). This is the first year that Red-breasted Nuthatches have been found using a numbered Wildlife Tree (Tree #45). An adult sapsucker banded last year with the band combination White/Green-Orange/Metal used Tree #34 this year and was seen with its 2 successfully fledged chicks.

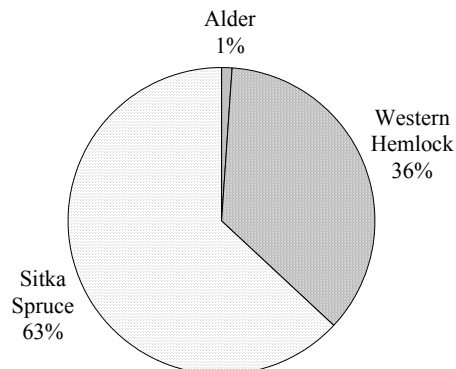
**Table 6**  
**Wildlife Trees active in 2004**

Nesting species	Tree #	Tree species	Nest hole height (m)	Fledge date
Red-breasted Sapsucker	12	Spruce	20.4	13 June
Red-breasted Sapsucker	17	Spruce	17.3	12 June
Red-breasted Sapsucker	33	Spruce	13.6	9 June
Red-breasted Sapsucker	34	Spruce	17.9	18 June
Red-breasted Sapsucker	91	Spruce	13.0	15 June
Red-breasted Sapsucker	100	Spruce	7.5	19 June
Red-breasted Sapsucker	101	Spruce	16.9	15 June
Red-breasted Sapsucker	83	Hemlock	44.9	8 June
Red-breasted Sapsucker	96	Hemlock	23.0	8 June
Red-breasted Sapsucker	99	Hemlock	9.9	15 June
Hairy Woodpecker	97	Spruce	7.5	29 May
Hairy Woodpecker	98	Spruce	9.8	1 June
Chestnut-backed Chickadee	58	Spruce	14.8	24 May
Chestnut-backed Chickadee	79	Spruce	6.4	27 May
Red-breasted Nuthach	45	Spruce	23.0	15 June
N. Saw-whet Owl	81	Spruce	9.18	2 June

To date, we have recorded information (tree species, height, diameter at breast height, percent of bark coverage and snag code) for 101 trees that have been used by cavity nesters on East Limestone Island. We were interested to test whether cavity nesters, mainly Red-breasted Sapsuckers, are choosing specific types of trees for breeding. To determine whether the Wildlife Trees differ from other trees on the island, we set out to measure a sample of random snags. Transects perpendicular to the trail were walked at 50m increments along the Main and Ridge trails, in order to cover the island as evenly as possible. We recorded the same measurements that are recorded for Wildlife Trees for the nearest standing snag every 20m along the 100m-long transects. One hundred random snags were surveyed, of which 64% were Sitka Spruce, 31% Western Hemlock, 4% Red Alder and 1% Red Cedar (Fig. 5). As trees were chosen at random and transects evenly covered the island, we assumed that this sample was representative of tree species on Limestone Island. These proportions were very similar to those of trees used by Red-breasted Sapsuckers on Limestone from 1992-2004 (Figure 6). However, the random snags were found to have an average height of  $12.1 \pm 11.1$  m and an average diameter at breast height (DBH) of  $0.63 \pm 0.46$  m. This is noticeably shorter and smaller than those trees used by Red-breasted Sapsuckers from 1992-2004, for which nest trees averaged  $22.2 \pm 10.7$  m in height and  $1.12 \pm 0.43$  m DBH. This suggests that Red-breasted Sapsuckers on East Limestone Island do not necessarily favour one species of nest tree over another, but that they do tend to choose larger, taller snags.



**Figure 5**  
Species representation of random snags surveyed on East Limestone Island, 2004. N=100



**Figure 6**  
Wildlife Tree species used by Red-breasted Sapsuckers on East Limestone Island, 1992-2004. N=81

## NATURAL HISTORY

### Daily Bird Checklist

The sighting of all birds encountered in Laskeek Bay was recorded each day throughout the season. A total of 75 species were recorded this year, 1 less than last year's all-time record of 76 species. The maximum number of species recorded for one day was 34, on 13 May, likely due to the fact that a sea survey was conducted that day. Sightings of interest include a Horned Grebe and 17 Long-tailed Ducks seen during a nearshore survey on 6 May, 5 Northern Shovelers seen flying past Cabin Cove on 8 May, a single Horned Puffin spotted below the Cormorant rocks at

East Skedans, and a Parasitic Jaeger in Hecate Strait. Also noteworthy was the fact that no Double-crested Cormorants were recorded this season, likely because of the later start-up. The trips down to Juan Perez Sound also afforded us several interesting sightings including a Mew Gull feeding at the north end of Shuttle Is., a Whimbrel at the Tar Islands and numerous Great-blue Herons and Least Sandpipers spotted in various locations throughout the Sound. A Blue Grouse was again heard on Limestone everyday from 30 April to 20 May and then occasionally until 9 June. The unmistakable calls of Fork-tailed Storm Petrels and Cassin's Auklets were also heard almost around midnight every night in May, north of the Cabin.

### **Birds of Prey**

Four Bald eagle nests were monitored this year, #1, #3, #4 and #7, the latter a new nest this season. The tree that held site #2 (Wildlife Tree #78) fell during the winter and disappointingly, no remnants of the nest could be found. The new nest, #7, was located only 20 m from where #2 once stood and appears to have been started this year, as it is relatively thin. It is possible that it was constructed due to the loss of #2. Nest #7 was the only nest found to be active this year and was first identified as such on 5 May. Two adults were often seen in and around the nest throughout May and June. Chicks were first heard in mid-July and several times subsequently but could not be seen, as the nest was too high.

2004 was an exciting year for Wildlife Tree #81! It was home to a Northern Saw-whet Owl pair, the second such nest ever found on Limestone Island! The owls were first discovered on 4 May, when one poked its head out of the nest hole while volunteers were completing the first round of Wildlife Tree checks. The nest hole was excavated by a Red-breasted Sapsucker in 2001, is only 9.6m up, faces the cliff in Crow Valley and is therefore easily observable from eye level if one walks up the edge of the slope. An individual was seen looking out of the nest hole or sleeping in the sun with its head resting outside the hole several times throughout May.

On 11 May, at 2300, while checking funnels during Ancient Murrelet chick banding, an adult owl was seen perched on a stake at the mouth of funnel #5. It was observed for only 10 seconds before it silently flew off into the trees. There was only one other occasion on which an owl was seen apart from at Tree #81 and that occurred on 23 May, when an adult was spotted perched on a snag near the beach near funnel #4 at North Cove. On 31 May, we watched a juvenile for 30 minutes as it poked its head out the nest hole and continuously shifted side-to-side, possibly getting ready to fledge. That was the last time any activity was noted in the tree, despite many visits.

Peregrine Falcons were seen flying by Boat Cove and Cabin Cove several times in May and June, but no nest was found on Limestone Island. The bird blind was visited on 26 May, but no sign of nesting was found on surrounding cliffs. Red-tailed Hawks were seen and heard from various locations around the island 9 times in May and twice in June. However, no signs of nesting or nesting behaviour were seen. There were no Common Raven nests found this year, although several families were seen and heard in the forest throughout the season. There was also no sign of Sharp-shinned Hawks this year on Limestone Island.

### **Plants**

This May and June, East Limestone Island was a delight to behold with *Calypso bulbosa occidentalis* (fairy slipper), *Aquilegia formosa* (red columbine), *Moneses uniflora retialata* (single delight) and many other flowering plants in full bloom. Several surveys were carried out in late May and early June to document the presence, location and blooming dates of rare and uncommon plants. The presence of other plants was noted when observed. The total number of

plant species recorded for East Limestone Island remains at 120 with no new additions this year. Five *Geranium richardsonii* (Richardson's geranium) specimens were found blooming as early as 20 May in three separate locations. One was a new plant in a new and different location. This is of particular note as Richardson's geranium is not known to occur elsewhere in coastal B.C. *Anemone multifida* (cut leaf anemone), *Minuartia tenella* (slender sandwort), *Sisyrinchium pulcherrimum* (shore blue-eyed grass), *Polemonium pulcherrimum* (showy jacob's ladder), *Fritillaria camschatcensis occidentalis* (northern rice-root) and *Dodecatheon pulchellum* (few-flowered shooting stars), all rare plants on East Limestone Island, were observed in bloom as early as 19 May. These plants all survive on ledges, cliffs and crevices where deer cannot reach them. Mosses were inventoried by volunteer Jocie Ingram in early May and many ferns and lichens were inventoried throughout the season.

### **Introduced Species**

Raccoon surveys were conducted twice this year, using a spotlight to scan the intertidal area around the entire perimeter of East and West Limestone Islands and on Louise Island from Vertical Point north to the point just south of Skedans Bay. The first survey was conducted on 16 May 16, when 4 raccoons were spotted on Louise Island: one opposite of West Limestone, two on the rocks in the bay north of Vertical Point, and one just north of Vertical Point. The second survey was conducted on 31 May 31: 6 raccoons were spotted again on Louise Island, 2 of these individuals being at Vertical Point. No raccoons were seen on either of the Limestone Islands during either survey or throughout the rest of the season.

There was no attempt to census the Sitka black-tailed deer on East Limestone Island this year. However, we suspected that there may have been fewer than usual this year, as vegetation, such as huckleberry shrubs, showed less signs of browsing. Two fawns were seen at various locations around the island in late June and July. One of these was sighted at North Cove suckling near funnel #2. There were no sightings of the collared deer this year. The red squirrel census was not conducted this year, however based on the experience of returning staff and visitors, squirrels appeared to be more prominent than last year.

### **Other Species**

River Otters were seen occasionally from late May onward, in various locations including one on the rocks just east of Boat Cove, seven eating fish on the rocks at North Cove and one scrambling over the beach at Cabin Cove. Another interesting sighting occurred on 12 June, when one otter was watched as it moved across the slope at North Cove and appeared to be foraging inland. We suspected that river otters were responsible for some digging and for 3 headless Ancient Murrelet carcasses just east of North Cove.

## **CONCLUSIONS**

The most striking feature of the 2004 season was the decline in numbers of Ancient Murrelet chicks captured and the lack of evidence for prospecting activity by adult birds. Compared to recent years, sightings of humpback whales were reduced. Otherwise, observations of marine animals suggested a normal year, with gulls and Black Oystercatchers breeding normally and a possible increase in numbers of Cassin's Auklets breeding on East Limestone Island. We need to continue monitoring Ancient Murrelet biology very closely to better understand the apparent reduction in recruitment at East Limestone Island. This is the kind of challenge that our monitoring operations are designed to detect and interpret.





# SURVEYS OF PERMANENT SEABIRD MONITORING PLOTS ON RAMSAY ISLAND, GWAII HAANAS IN JUNE 2002

**J. Mark Hipfner**

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## SUMMARY

We revisited permanent monitoring plots set up in 1984 at Ramsay Island to monitor changes in numbers of breeding Ancient Murrelets and Cassin's Auklets. Numbers of Ancient Murrelet burrows had increased, but the estimated number occupied had remained stable. Numbers of Cassin's Auklet burrows and proportion occupied also appeared to have remained stable since 1984. Breeding of Cassin's Auklets in 2002 was later than usual.

## INTRODUCTION

In 1984, the Canadian Wildlife Service set up a series of permanent monitoring plots on select seabird colonies in British Columbia as a means to determine trends in population sizes. As part of this program, twelve 20\*20 m plots were established within the Ancient Murrelet *Synthliboramphus antiquus* colony on Ramsay Island, as were eight 15\*15 m and one 20\*24 m plot within the Cassin's Auklet colony. All but one of the Ancient Murrelet plots and three of the Cassin's Auklet *Ptychoramphus aleuticus* plots were resurveyed in 1992 or 1993; results indicated that the number of murrelet burrows had increased slightly since 1984, while the number of auklet burrows had remained fairly stable. Following the monitoring schedule outlined in The Management Plan for Seabird Conservation, Pacific and Yukon Region, a team from the Canadian Wildlife Service visited Ramsay Island from 8-25 June 2002, to resurvey the permanent plots using standardized methods. This report constitutes a preliminary analysis of results of that resurvey.

## RESULTS

### **Ancient Murrelet**

The number of Ancient Murrelet burrows counted on the twelve monitoring plots increased by 58% over the period 1984-2002, extending the 22% increase observed between 1984 and 1992 (Table 1). We measured occupancy rates after the departure of most or all Ancient Murrelets from the colony, in two areas on the north side of Ramsay Island (in the areas of ANMU-1 to ANMU-3 [12 burrows], and ANMU-4 to ANMU-6 [18 burrows]). Overall occupancy was estimated at 40%: 10 of 30 burrows contained eggshells from the current year, one contained a whole egg, and one contained remains of a chick (likely predated and then partially eaten by a *Peromyscus*). Eighteen burrows were confirmed empty. By way of comparison, occupancy was estimated to be 64.5% in 1984 ( $n = 31$ ). Comparing occupied burrows (total burrows x occupancy rate), numbers appear to have changed little between 1984 (140 occupied) and 2002 (138 occupied).

### **Cassin's Auklet**

Overall, the number of Cassin's Auklet burrows counted on the 9 monitoring plots increased by 10% over the period 1984-2002, extending the very slight increase observed between 1984 and 1992 (Table 1). We

checked occupancy rates on the north side of Ramsay Island (near CAAU-4 and CAAU-5). Occupancy was estimated at 63% in 2002: 4 of 24 burrows contained an egg, one contained eggshells from the current year, three contained chicks (none more than 3-4 days old; measurements were taken on 2 of these chicks, see Table 1), and seven contained well-used latrines. Nine burrows were confirmed empty. For comparison, occupancy was estimated at 71.4% in 1984 ( $n = 21$ ).

**Table 1**  
**Results of burrow counts in Ancient Murrelet and Cassin's Auklet permanent plots, Ramsay I., Gwaii Haanas**

Species	Year	Plot	2	3	4	5	6	7	8	9	10	11	12	Total
		# 1												
ANMU	1984	20	7	11	35	22	28	7	24	12	14	24	14	<b>218</b>
	1992/93	21	10	13	42	29	30	8	34	---	23	33	9	
	2002	23	16	11	45	34	40	14	46	15	35	49	17	<b>345</b>
CAAU	1984	40	45	34	40	58	28	18	26	57				<b>346</b>
	1992/93	43	48	37	43	53	---	---	25	---				
	2002	40	59	34	42	61	44	27	28	45				<b>380</b>

**Table 2**  
**Measurements of Cassin's Auklet chicks pulled from burrows on Ramsay Island, 20 June 2002**

Number	Mass (g)	Tarsus (mm)	Culmen (mm)	Bill depth (mm)	Wing (mm)
1	23	16.6	9.6	5.9	16.5
2	33	18.5	10.0	5.6	17.0

## DISCUSSION

Islands along the east coast of Moresby Island, most of them situated within Gwaii Haanas National Park Reserve, support an estimated 44% of the Ancient Murrelet population of British Columbia. Because British Columbia in turn supports about half of the world population, the biological significance of the region is readily apparent. Ancient Murrelet recruits appear to be reluctant to use existing burrows (Gaston 1992), so that the marked increase in the number of burrows on the series of permanent monitoring plots on Ramsay Island may be indicative of a high level of recruitment. On the whole, it appears that populations are faring well there. Previous surveys showed that the number of burrows on permanent plots on George Island also increased between 1985 and 1996, while there was little indication of a trend on Rankine Island between 1984 and 2000. Throughout Haida Gwaii, recent trends in Ancient Murrelet populations have been driven mainly by presence or absence of introduced predators (rats and raccoons; summarized in Lemon and Gaston 1999). It is therefore not surprising to find that populations

on islands without introduced predators are doing well. The Ancient Murrelet colony on George Island is scheduled to be resurveyed again in 2003.

The islands of Gwaii Haanas also support small, but important, populations of Cassin's Auklets. Because Cassin's Auklet recruits readily use existing burrows, results of the 2002 survey at Ramsay Island suggest that populations there probably are relatively stable. Interestingly, timing of breeding appeared to be somewhat later in 2002 than in 1984, when hatching began early in May (Rodway et al. 1990), but at present we have no basis on which to speculate on causes or consequences of the late breeding. Previous surveys documented a large decline in the number of burrows on plots on Rankine Island between 1984 and 2000; East Copper Island was resurveyed in 2003 and the population there appears to have been stable since 1985 (M. Lemon, unpublished report).

### **ACKNOWLEDGMENTS**

Field work in 2002 was carried out by Valerie Labrecque, Bob Milko, and MH between 8-13 June (ANMU-7 to ANMU-12; CAAU-1 to CAAU-3, and CAAU-6 to CAAU-9), and by VL and MH between 14-16 June (ANMU-1 to ANMU-6; CAAU-4 and CAAU-5). VL and MH checked occupancy in Ancient Murrelet burrows on 18 June, and were joined by Denny Chretien and Brent MacDougall (Parks Canada), to check occupancy in Cassin's Auklet burrows on 20 June. Moira Lemon provided top-notch logistical support. We are deeply indebted to staff of Parks Canada for supporting our efforts: in particular, we thank Doug Burles for issuing research permits to work in Gwaii Haanas National Park, Scott Parker for making arrangements for our transportation in the Park, and Brent MacDougall for assistance with field work. We owe special thanks to Denny Chretien, who assisted us tirelessly, allowed us to accompany him on his whale photographing ventures, and always kept us well fed and entertained.

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### Appendix 1

#### Locations of bearing points and associated Ancient Murrelet plots on Ramsay Island, Gwaii Haanas

<u>Bearing point Identifier</u>	<u>Location</u>	<u>Marker</u>	<u>Plot Identifier</u>	<u>Directions to plot</u>
RAMS-A	N 52°34' 00.3'' W 131°25' 00.5''	On cedar tree	ANMU-1	124° from RAMS-A, 35 m from shore
			ANMU-2	124° from ANMU-1, 105 m from shore
			ANMU-3	124° from ANMU-2, 195 m from shore
RAMS-B	N 52°33' 54.3'' W 131°25' 48.5''	On spruce tree	ANMU-4	At RAMS-B, at the shore
			ANMU-5	134° from RAMS-B, 50 m from shore
RAMS-C	N 52°33' 51.2'' W 131°25' 53.5''	On spruce tree	ANMU-6	124° from RAMS-C, 50 m from shore
RAMS-D	N 52°33' 18.5'' W 131°26' 03.1''	On spruce tree	ANMU-7	50° from RAMS-D, 30 m from shore
RAMS-E	N 52°33' 04.9'' W 131°25' 26.3''	On diseased spruce tree	ANMU-8	39° from RAMS-E, 75 m from shore
RAMS-F	N 52°32' 02.7'' W 131°25' 05.5''	On alder tree	ANMU-9	350° from RAMS-F, 45 m from shore
RAMS-G	N 52°33' 06.1'' W 131°24' 25.9''	On spruce tree	ANMU-10	150 m at 221° from RAMS-G
			ANMU-11	55 m at 190° from RAMS-G
RAMS-H	N 52°32' 38.8'' W 131°23' 35.9''	On spruce tree	ANMU-12	64° from RAMS-H, 110 m from shore

**Appendix 2**  
**Locations of Cassin's Auklet monitoring plots on Ramsay Island, Gwaii Haanas**

<b>Plot</b>	<b>Location</b>
CAAU-1	N 52° 34' 35.1'' W 131° 21' 53.2''
CAAU-2	N 52° 34' 52.5'' W 131° 22' 08.5''
CAAU-3	N 52° 35' 07.7'' W 131° 22' 23.0''
CAAU-4	N 52° 34' 57.3'' W 131° 22' 58.2''
CAAU-5	N 52° 34' 39.1'' W 131° 23' 08.7''
CAAU-6	N 52° 33' 08.4'' W 131° 25' 33.2''
CAAU-7	N 52° 33' 01.6'' W 131° 24' 49.7''
CAAU-8	N 52° 32' 38.8'' W 131° 23' 35.9''
CAAU-9	N 52° 32' 37.7'' W 131° 22' 30.4''



# RESULTS FROM DAILY BIRD CHECKLIST RECORDS FOR LASKEEK BAY 1990-2003

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## ABSTRACT

Daily checklists of birds recorded at East Limestone Island and adjacent waters of Laskeek Bay were kept by Laskeek Bay Conservation Society staff and volunteers throughout the field seasons of 1990-2003. In most years this covered the period from April – mid July. Occurrence was expressed in terms of the numbers of days on which a species was recorded as a percentage of all days for which checklist records were available. These data were combined by ten-day periods. When data for all years were combined, this gave a picture of average patterns of occurrence for each species. Summer visitors mostly arrived April or early May, except for Swainson's Thrush, which arrived in early June. Winter visitors had mainly left Laskeek Bay by mid-May. Passage migrants, mainly geese, shorebirds, gulls and the Pacific Loon, passed through in May, with return passage for shorebirds occurring in July.

## INTRODUCTION

From the start of the Laskeek Bay Conservation Society camp at East Limestone Island in 1990, a daily checklist of birds observed has been kept by camp personnel. For the most part, the presence of species is simply recorded without any notes on numbers. However, additional notes for unusual sightings, including numbers of birds seen, or interesting natural history notes, are recorded in the daily camp log. Effort has varied from day to day with weather conditions, the demands of work and the particular interests of the camp supervisors and volunteers. The presence in camp of keen birders has generally been associated with an increase in the number of species recorded daily and sometimes with the identification of unusual species. However, a comparison of inter-year variation (see below) suggests that the composition of the camp had little effect after the first year of activities.

Because information on numbers is generally lacking, I have analysed the data on the basis of the mean numbers of species recorded daily and the proportion of days on which each species was recorded in relation to year and date. I address the following questions:

- (1) How many species have been recorded in Laskeek Bay?
- (2) How does the number of species recorded vary among years and with date?
- (3) How does the presence of different species in Laskeek Bay vary with time of year over the period when the camp has been occupied?
- (4) Do species vary in their occurrence from year to year?

These results are compared with accounts in *The Birds of British Columbia* (Campbell et al. 1990-2001) and *The Birds of North America* (Gill & Poole, various dates), as well as with the status given in *A Checklist of the Birds of Haida Gwaii* (Morris 2001).

## STUDY AREA AND METHODS

Most bird sightings recorded in the daily checklist were made on or from East Limestone Island. Some additional sightings made from boats in the vicinity of the island were also included. All sightings should have been visible from the island, even if not made from the island. Most records involved birds identified to species, but occasionally only genera were recorded (e.g. Scoter spp., Jaeger spp., Loon spp.). The latter have been omitted from analyses presented here.

Records for 1990-2003 were included in this analysis. The lengths of field seasons in each year varied from 46 d in 1990 to 127 d in 1997, being >90 d in all years after 1991 (Table 1).

**Table 1**  
**Start and end of field seasons and total number of days when personnel were present on East Limestone Island in 1990-2003**

Year	Start	End	Duration (d)
1990	1 May	15 June	46
1991	29 March	14 June	78
1992	3 April	2 July	91
1993	9 April	15 July	98
1994	5 April	15 July	102
1995	26 March	14 July	111
1996	26 March	8 July	105
1997	20 March	24 July	127
1998	22 March	9 July	110
1999	3 April	14 July	103
2000	1 April	18 July	109
2001	2 April	25 July	115
2002	29 March	6 July	100
2003	29 March	4 July	98

Data were extracted by counting the number of days on which each species was recorded for each 10 d period (1-10 April, 11-20 April, etc.). These frequencies were summed over all periods to obtain annual totals of days seen. For inter-year comparisons, only the period during which the camp was occupied in every year was used (1 May – 10 June). Years were summed by 10 d periods to provide numbers of days that each species was seen in each 10 d period. The latter counts were expressed as percentages of all days in the period during which the camp was occupied, to give an index of changes in occurrence with season (% occurrence by period).



## RESULTS AND DISCUSSION

### Numbers of species seen

We recorded 112 species on or near East Limestone Island during the field seasons of 1990-2003. A further eight species were recorded in the 1980s by the Canadian Wildlife Service camp at Reef Island, making the total of 120 species reported from Laskeek Bay to date (Appendix 1). Most of those seen from Reef Island, but not from East Limestone Island, were offshore species such as shearwaters and other tubenoses that generally remain in the open waters of Hecate Strait.

Excluding the short season of 1990, annual species totals ranged from 59 in 1992 to 75 in 1998. The mean number of species recorded daily during the 1 May – 10 June period ranged from 14 in 1990 to 28 in 1994, but did not fall below 21 after 1991. Fifteen species were recorded on >75% of days, a further six species on >50% of days and a further 15 on >25% of days. The remaining 76 species were recorded on less than one quarter of the days for which the camp was occupied. Sixteen species were recorded on only one day. Thirty-five species were recorded on less than five dates and therefore are regarded as occasional visitors: these included 1 species of swan, 1 goose, 5 ducks, 1 loon, 1 storm-petrel, 1 fulmar, 6 shorebirds, 2 jaegers, 6 gulls, 1 auk, 1 crane, 4 birds of prey, 1 hummingbird, 1 woodpecker and 3 songbirds.

Taking the years from 1993 onwards, when numbers of species seen daily did not differ greatly among years, the average number of species seen daily rose from 19 in early April to a peak of 28 in mid-May, falling slightly thereafter. The peak in mid-May probably reflects the passage of a number of migrant species through the area. However, compared to other areas, the numbers seen daily are very stable.

### Species occurrence in relation to time of year

Because the period of the camp cuts across the period when winter visitors are leaving, summer visitors arriving and passage migrants passing through, many species showed substantial within-season variation in the frequency with which they were recorded.

#### *Winter visitors*

Loons, grebes and sea-ducks were mainly winter visitors to Laskeek Bay. Most of these species declined after April (Figs 1, 2). The least common, the Western Grebe, was seen on only six dates, all before 11 May. This is despite the fact that it occurs in the adjacent inlets (Sewell Inlet, Selwyn Inlet) sometimes in flocks of >100 birds. The Horned Grebe, recorded on only 33 days, was not seen after 29 April. The Pacific Loon was an exception, being rare in April, but common throughout May and early June (Fig. 1), when it was presumably on passage to Alaska. Common Loons occurred on most days from late March through 10 May, becoming less common thereafter, but being recorded in all 10-day periods. The Harlequin which was common in April, almost disappeared by mid-May, but became common again from 21 June onwards. This pattern may reflect failed breeders returning to the coast from breeding grounds in the interior.

The commonest sea ducks in Laskeek Bay in April were the Harlequin and White-winged Scoter, the latter far outnumbering Surf Scoter, which dominates the numbers of sea ducks in Skidegate Inlet at the same season. Black Scoter, never recorded on more than 10% of days, was the least common scoter. Long-tailed Duck, very abundant in April off Sandspit, was seen on only 27 days and Greater Scaup, common in Skidegate Inlet, was seen only four times

### Loons, Grebe

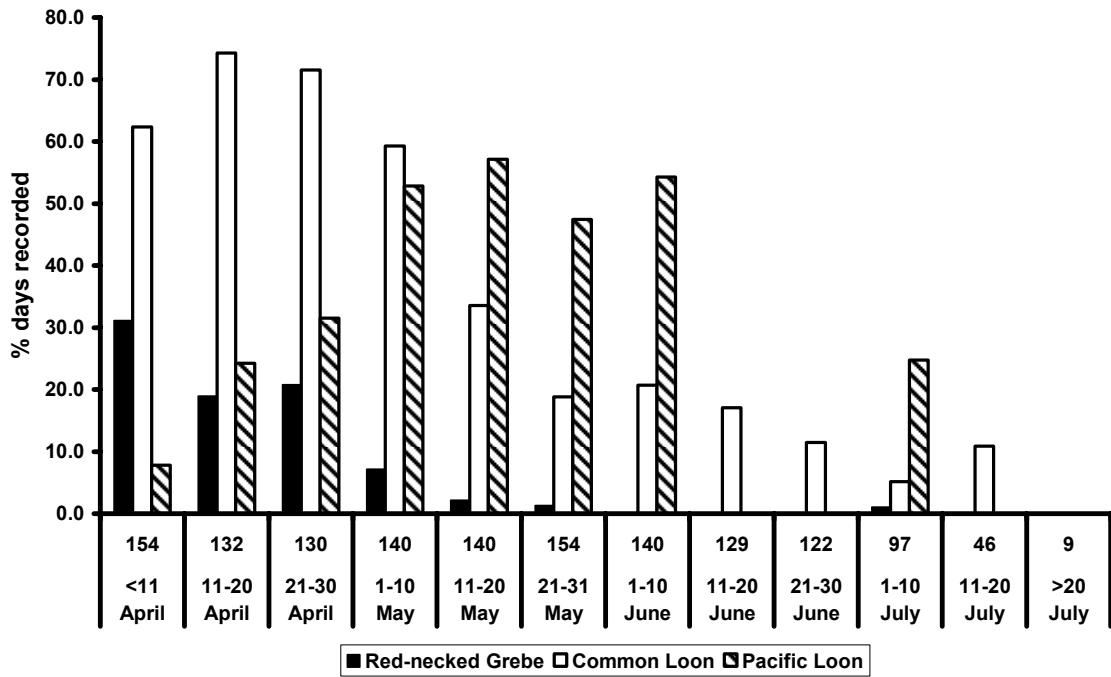


Figure 1

### Sea Ducks

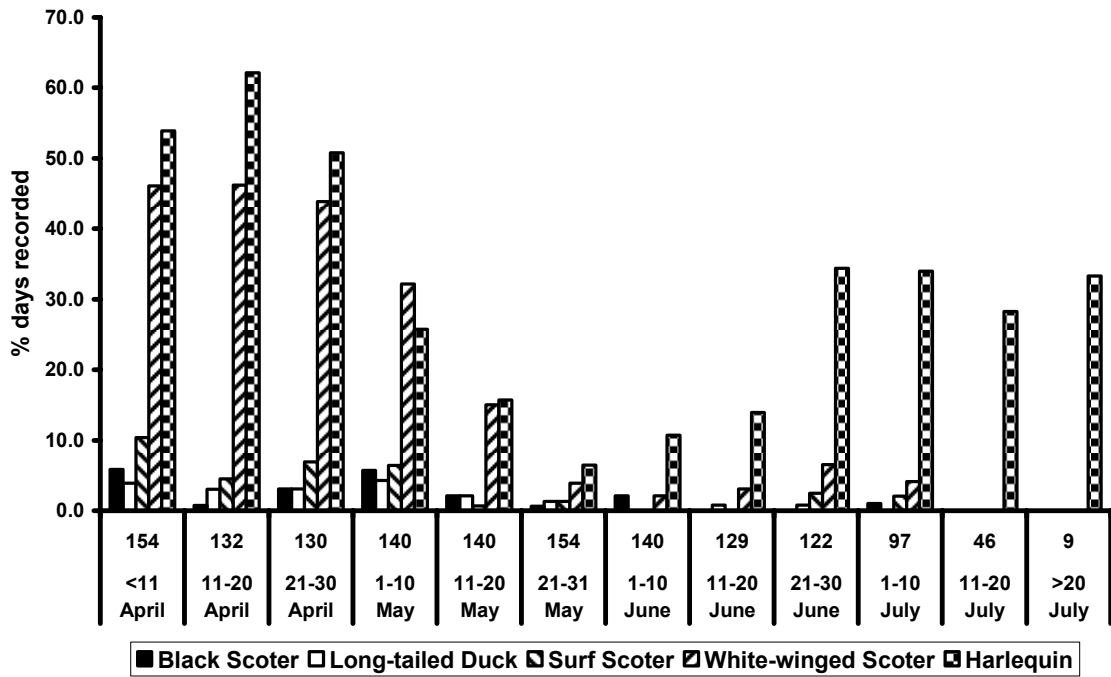


Figure 2

The Double-crested and Brandt's cormorants were both most common in April, more or less disappearing after mid-May, although infrequent observations continued through June. Double-Crested Cormorant was described as "uncommon non-breeding resident" and Brandt's Cormorant as "vagrant" in Haida Gwaii by Campbell *et al.* (1990). However, in Laskeek Bay they both appear to be mainly winter visitors, with the former outnumbering the latter by about 10:1. Double-crested Cormorants wintering in Laskeek Bay possibly originate from Alaska. The Pelagic Cormorant, a resident in Haida Gwaii, remained common throughout the season (Fig. 3).

#### *Summer visitors*

Several small songbirds are summer visitors to Laskeek Bay. The earliest to arrive is the Hermit Thrush, about 10 April, followed by Townsend's Warbler, which starts to be recorded frequently in mid-April (Fig. 4). Orange-crowned Warbler is slightly later, becoming common in late April. Campbell *et al.* (2001) suggest that the main arrival of Townsend's Warbler in Haida Gwaii is in the first week of May: our records suggest a somewhat earlier date. Interestingly, they note that Orange-crowned Warbler arrives before Townsend's Warbler in southern BC, the reverse of the case in Laskeek Bay.

Pacific Slope Flycatcher generally arrives in early May, while records of Swainson's Thrush do not become common until early June. The difference in timing between Hermit Thrush, a relatively short-range migrant to the south-western US, and the very similar-looking Swainson's Thrush, which travels to South America, is striking, with the former arriving almost two months in advance of the latter. Wilson's Warbler, which has been recorded on only 13 days, was not sighted earlier than 2 May – most records were in late May and June. Rufous Hummingbird occurred in small numbers from late March, but became frequent only after mid-April.

Among seabirds, both the Marbled Murrelet and Rhinoceros Auklet, although recorded in small numbers throughout the period of observations, became more common after mid-April, the former being most frequent in late June and early July, about the time that young birds should be fledging (Fig. 5). The increase in Marbled Murrelet sightings during April appears to reflect a shift at that season from the inlets to the outer coast, as the species is common in Cumshewa Inlet in March (LBCS unpublished observations). Tufted Puffin, which was very infrequent, was not seen in April.

#### *Passage migrants*

The main passage migrants recorded at East Limestone Island were geese and shorebirds. Both Canada Goose and Brant were recorded fairly frequently from mid-April to mid-May, with a peak during 21-30 April (Fig. 6). Brant appeared to be a little later and a little less synchronized than Canada Goose, being seen on >30% of days from 11 April – 10 May. Both species were seen mainly in flocks of up to 200 flying northward over the sea.

Among shorebirds, Black Turnstone was a winter visitor to Haida Gwaii and was present from the start of the season. The species was infrequent after the end of April, but began to re-appear in late June and was regular in small numbers in July (Fig. 7). Both Whimbrel and Wandering Tattler were seen in small numbers in May, with the latter re-appearing in July. The reappearance of Black Turnstone and Wandering Tattler in July presumably represents a return passage of failed breeders. Whimbrels were recorded in flocks of up to 85, some of which roosted on rocky foreshore areas before resuming migration. Wandering Tattlers were normally solitary, and fed exclusively on rocks in the inter-tidal zone. The peak passage dates for all shorebirds coincided closely with those given by Campbell *et al.* (1990).

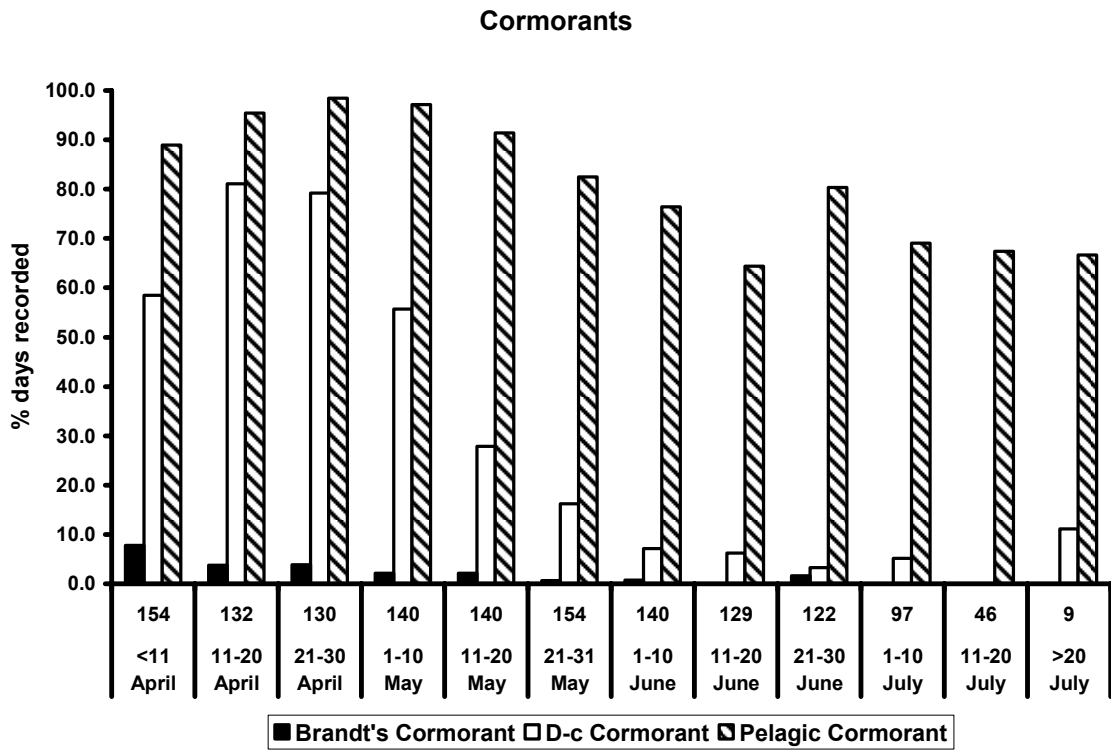


Figure 3

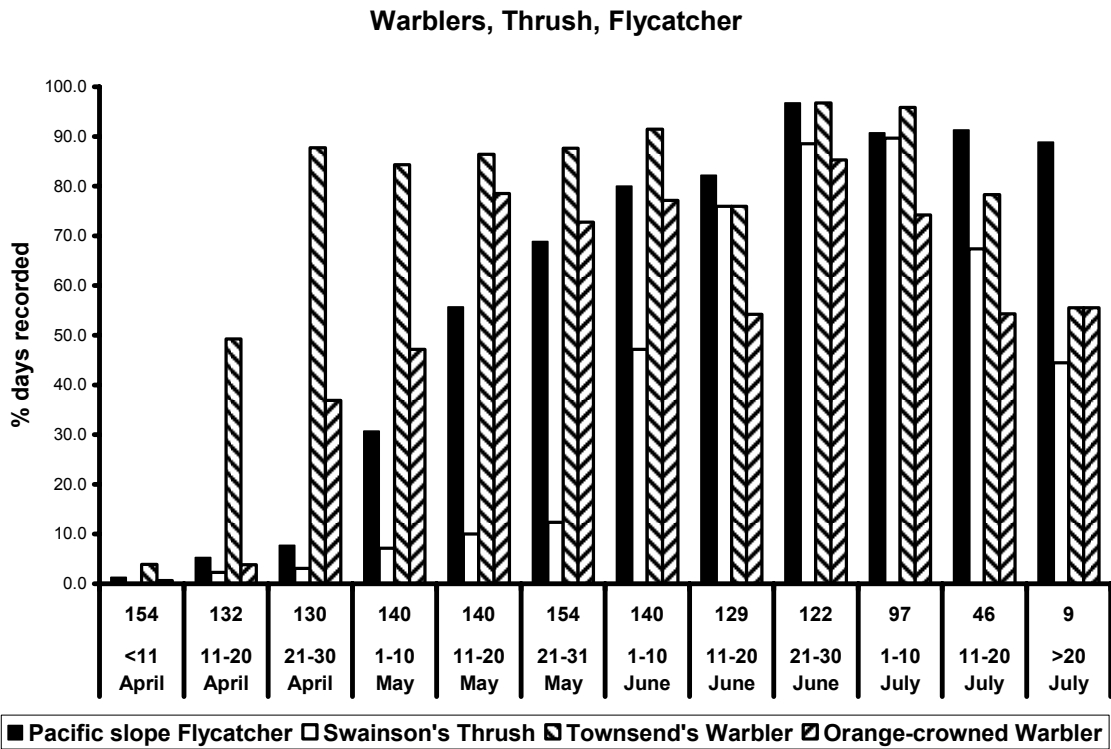


Figure 4

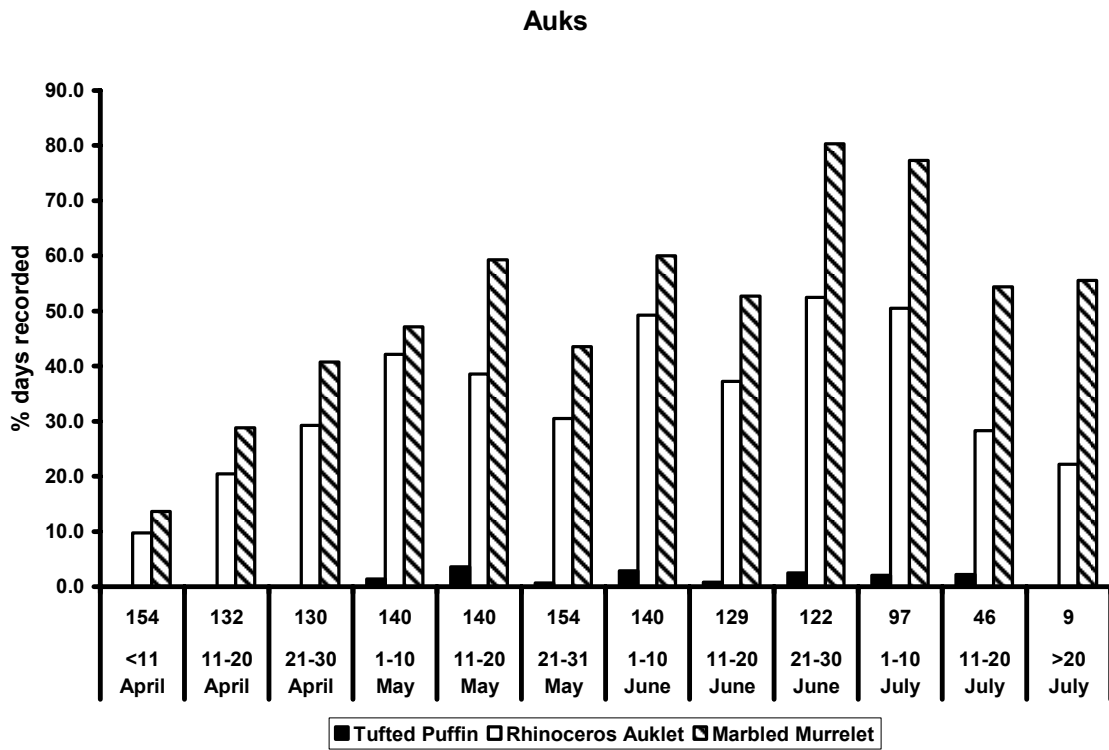


Figure 5

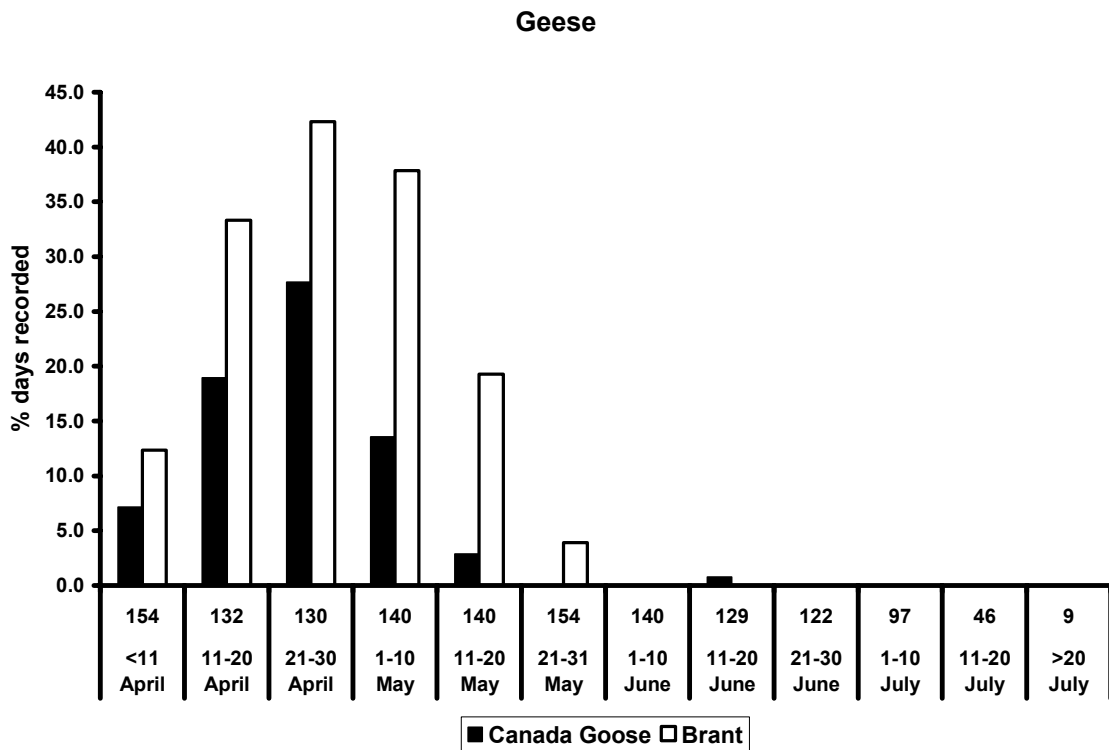


Figure 6

## Shorebirds

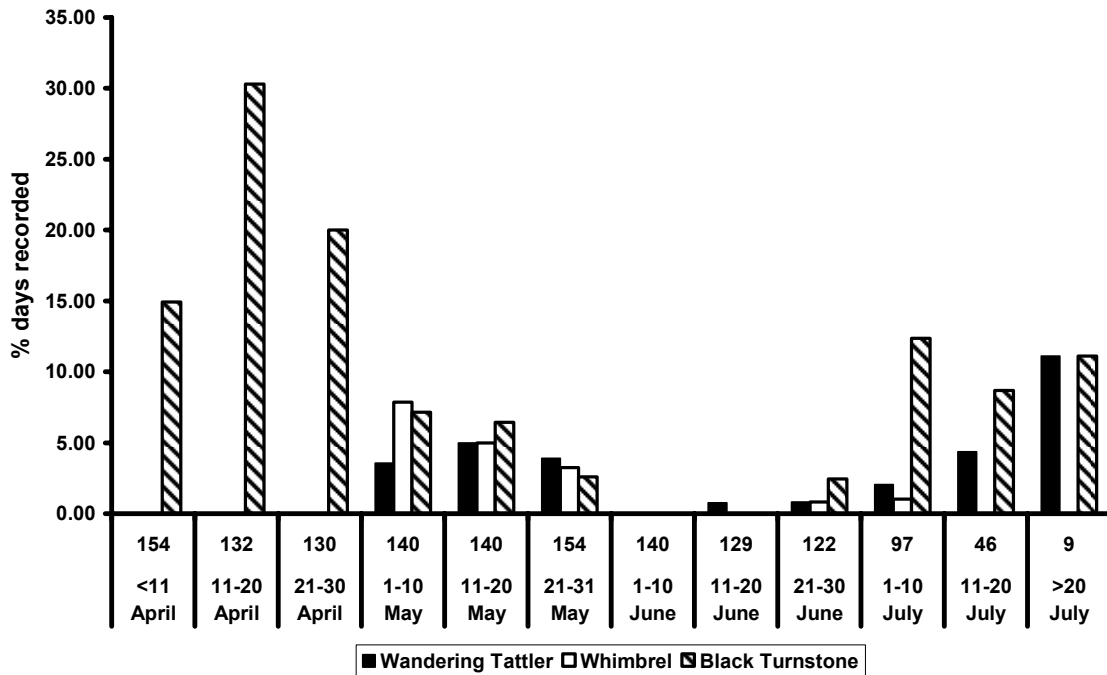
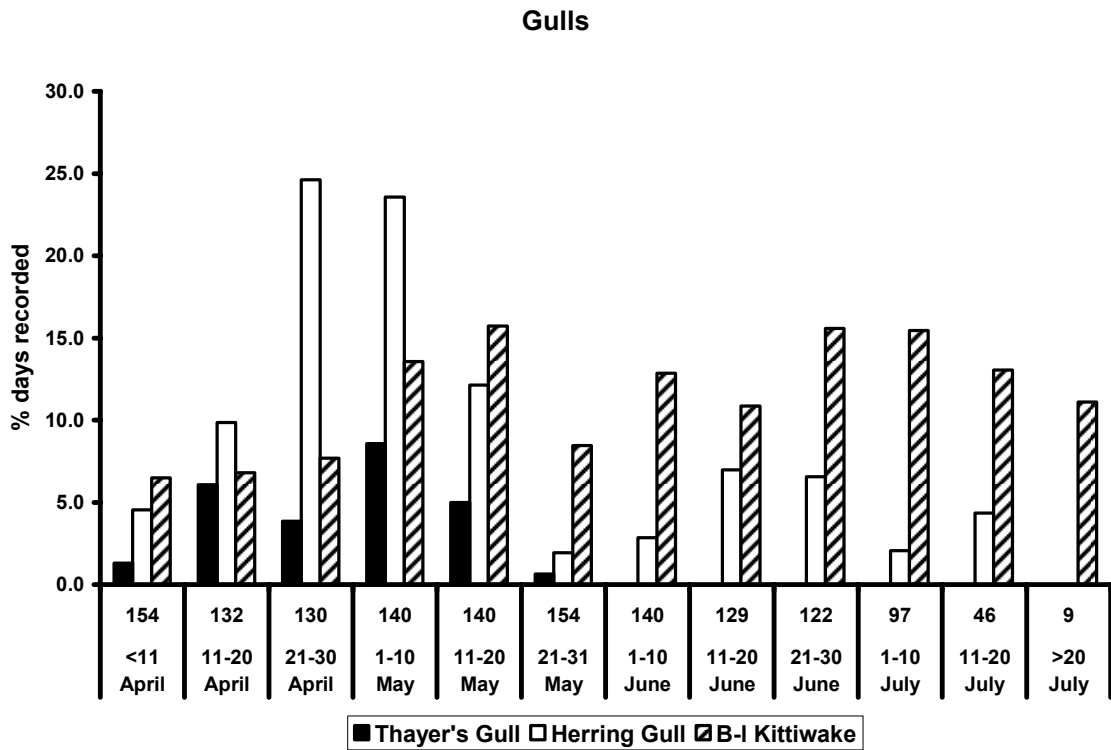


Figure 7

Although usually regarded as winter visitors in Haida Gwaii (Campbell et al. 1990), records of both Herring Gull and Thayer's Gull suggested that these species are also passage migrants through the region. Records of both species increased during April, peaking in late April (Herring Gull) or early May (Thayer's Gull) (Fig. 8). Herring Gull continued to be seen in small numbers throughout the season, but Thayer's Gull was not recorded after May.

The Black-legged Kittiwake, another nominal winter visitor, occurred throughout the season in some years, especially 1993 and 2001, when it was frequent in June. Herring Gull was also frequent in June 1993, suggesting some common factor in its occurrence. Kittiwakes were not recorded at all in four years, supporting the previous observations of Gaston and Jones (1990) that the species occurrence in Hecate Strait exhibits high inter-year variation.

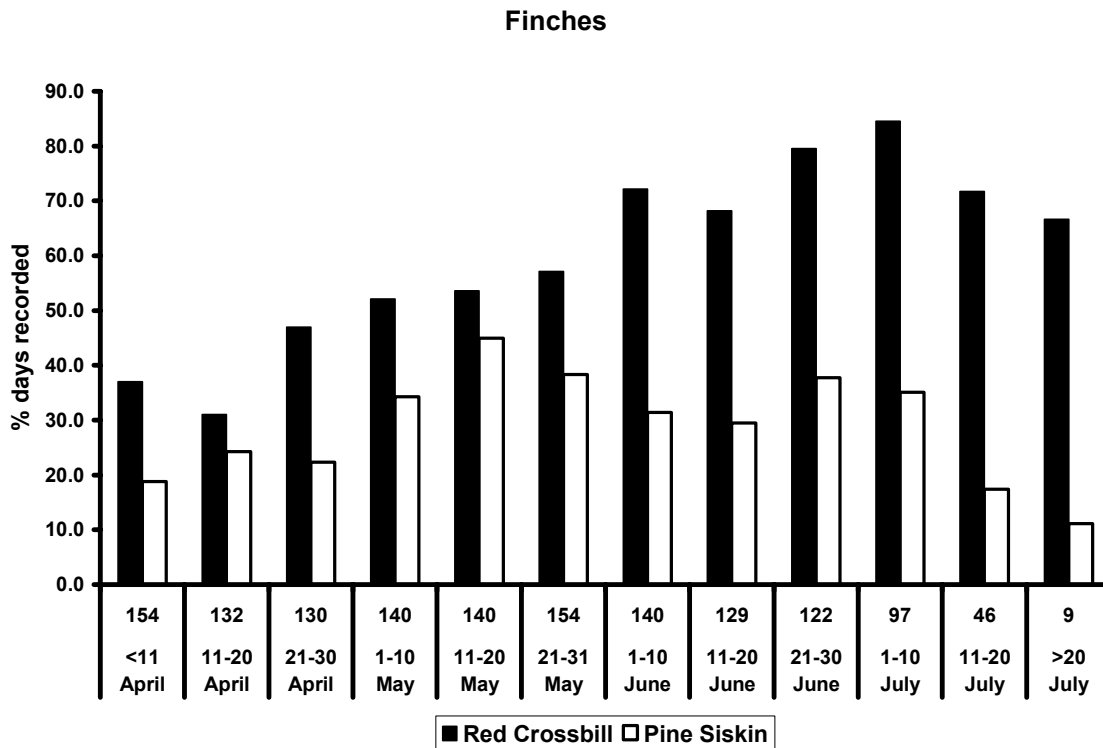


**Figure 8**

*Residents*

Most resident species necessarily showed no seasonal trend. However, the two finches that specialize on tree seeds, Pine Siskin and Red Crossbill, both appeared more frequently in May and June than in April. When data from all years were combined, Red Crossbill sightings increased steadily through the season to a peak in early July (Fig. 9). However, this pattern was not seen in every year. In 1997 and 2002 crossbills were seen almost daily to 20 June, but much less frequently thereafter. Conversely, in 2000 and 2001 they were uncommon in April and May, but seen more or less daily in June and July.

Pine Siskin was the most irregular species. It was recorded on approximately one day in three when all years were combined, but recorded on only a few dates in 1991 and 2000. In other years, it was usually most frequent in May, but in 1993 and 2001 it was irregular before 11 June and in 2002 it was uncommon after 20 April. Both Pine Siskin and Red Crossbill are known to be nomadic in response to fluctuations in seed crops and their occurrence at East Limestone Island may be determined by population changes on the adjacent larger islands.



**Figure 9**

## DISCUSSION

The data accumulated in the daily checklists kept at East Limestone Island throughout the season over 14 years demonstrate the value of systematic record keeping even when the observations are casual or irregular. The observations indicate clearly the date of arrival of summer visitors and passage migrants and, perhaps more importantly, because less often noted, the date of departure of winter visitors. For relatively uncommon species, such as Brandt's Cormorant, Thayer's Gull or Wandering Tattler, patterns can only emerge when data is combined over several years. Our data clarifies the pattern of occurrence of these birds in Laskeek Bay.

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- Gaston, A.J. & Jones, I.L. 1991. Observations of seabirds and marine mammals in western Hecate Strait in spring and early summer 1984-1989. *Canadian Field-Naturalist* 105: 550-560.
- Morris, M. 2001. Checklist of the birds of Haida Gwaii. Laskeek Bay Conservation Society, Queen Charlotte City, BC.



**Appendix 1**  
**Number of days recorded for all species observed at East Limestone Island during 1990-2003**

Year	Days recorded														Totals
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	
<b>Days of observations</b>	46	78	91	98	102	111	105	127	110	103	109	115	100	98	1347
<b>Species</b>	<b>Scientific name</b>														
Trumpeter Swan	<i>Cygnus buccinator</i>														
Great W-fronted Goose	<i>Anser albifrons</i>														
Canada Goose	<i>Branta canadensis</i>														
Brant	<i>Branta canadensis</i>														
Mallard	<i>Anas platyrhynchos</i>														
Northern Shoveler	<i>Anas platyrhynchos</i>														
Northern Pintail	<i>Anas platyrhynchos</i>														
Green-winged Teal	<i>Anas platyrhynchos</i>														
Greater Scaup	<i>Aythya marila</i>														
Lesser Scaup	<i>Aythya marila</i>														
Harlequin Duck	<i>Histrionicus histrionicus</i>														
Surf Scoter	<i>Melanitta perspicillata</i>														
White-winged Scoter	<i>Melanitta fusca</i>														
Black Scoter	<i>Melanitta nigra</i>														
Long-tailed Duck	<i>Clangula hyemalis</i>														
Bufflehead	<i>Bucephala albeola</i>														
Common Goldeneye	<i>Bucephala clangula</i>														
Barrow's Goldeneye	<i>Bucephala islandica</i>														
Common Merganser	<i>Mergus merganser</i>														
Red-breasted Merganser	<i>Mergus serrator</i>														
Blue Grouse	<i>Dendragapus obscurus</i>														
Red-throated Loon	<i>Gavia stellata</i>														
Pacific Loon	<i>Gavia pacifica</i>														
Common Loon	<i>Gavia immer</i>														
Yellow-billed Loon	<i>Gavia adamsii</i>														

Horned Grebe	<i>Podiceps auritus</i>	0	6	0	1	1	0	4	3	10	4	3	0	2	0	34
Red-necked Grebe	<i>Podiceps grisegena</i>	0	2	1	1	3	14	16	16	11	14	9	8	19	3	117
Western Grebe	<i>Aechmophorus occidentalis</i>	0	0	0	2	1	0	0	0	0	3	0	0	0	0	6
Northern Fulmar	<i>Fulmarus glacialis</i>	0	0	0	0	0	0	0	0	0	0	0	1	1	1	3
Sooty Shearwater	<i>Puffinus griseus</i>	0	2	2	19	11	3	3	3	8	2	2	9	5	3	72
Fork-tailed Storm-Petrel	<i>Oceanodroma furcata</i>	3	12	5	0	8	13	5	6	9	11	2	3	20	12	109
Leach's Storm-Petrel	<i>Oceanodroma leucorhoa</i>	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2
Brandt's Cormorant	<i>Phalacrocorax penicillatus</i>	0	2	1	4	5	0	6	1	2	2	3	2	0	4	32
D-crested Cormorant	<i>Phalacrocorax auritus</i>	1	16	15	43	37	40	40	32	39	36	40	45	47	39	470
Pelagic Cormorant	<i>Phalacrocorax pelagicus</i>	23	63	79	93	99	100	92	80	82	87	83	110	90	93	1174
Great Blue Heron	<i>Ardea herodias</i>	0	0	0	0	0	2	0	0	0	0	2	0	1	0	5
Northern Harrier	<i>Circus cyaneus</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Osprey	<i>Pandion haliaetus</i>	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Bald Eagle	<i>Haliaeetus leucocephalus</i>	44	75	82	95	102	109	99	108	104	101	105	115	99	97	1335
Coopers Hawk	<i>Accipiter cooperii</i>	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Sharp-shinned Hawk	<i>Accipiter striatus</i>	0	0	1	1	3	0	1	31	20	5	3	21	1	5	92
Red-tailed Hawk	<i>Buteo jamaicensis</i>	1	6	0	1	2	0	1	0	2	3	0	7	0	2	25
Merlin	<i>Falco columbarius</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Peregrine Falcon	<i>Falco peregrinus</i>	15	20	10	56	67	35	45	14	31	15	2	7	6	3	326
Sandhill Crane	<i>Grus canadensis</i>	0	1	0	0	1	0	0	0	2	0	0	0	0	0	4
Semipalmated Plover	<i>Charadrius semipalmatus</i>	0	0	0	0	0	0	1	0	3	0	0	0	0	0	4
Black Oystercatcher	<i>Haematopus bachmani</i>	44	74	84	98	102	109	100	107	103	102	108	115	100	95	1341
Wandering Tattler	<i>Heteroscelus incanus</i>	1	0	3	1	0	3	2	4	2	0	0	7	1	0	24
Whimbrel	<i>Numenius phaeopus</i>	1	2	0	2	3	0	8	3	1	1	0	2	1	1	25
Black Turnstone	<i>Arenaria melanocephala</i>	1	5	4	6	6	4	7	9	12	13	28	23	10	4	132
Spotted Sandpiper	<i>Actitis macularia</i>	0	0	0	2	0	0	0	0	1	0	0	0	2	0	5
Surfbird	<i>Aphriza virgata</i>	0	0	0	0	4	0	0	0	2	0	0	0	0	0	6
Dunlin	<i>Calidris alpina</i>	0	0	0	0	0	0	0	0	1	0	0	0	0	1	2
Western Sandpiper	<i>Calidris mauri</i>	0	0	0	0	1	0	0	1	0	0	0	0	0	0	2
Lesser Yellowlegs	<i>Tringa flavipes</i>	0	1	0	0	0	1	2	0	0	0	0	0	0	0	4
Common Snipe	<i>Gallinago gallinago</i>	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2
Red-necked Phalarope	<i>Phalaropus lobatus</i>	0	1	0	0	0	0	0	0	1	0	0	0	1	0	3
Pomarine Jaeger	<i>Stercorarius pomarinus</i>	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1

Parasitic Jaeger	<i>Stercorarius parasiticus</i>	0	0	0	11	0	0	0	0	0	0	0	0	0	1	12
Long-tailed Jaeger	<i>Stercorarius longicaudus</i>	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Bonaparte's Gull	<i>Larus philadelphia</i>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Mew Gull	<i>Larus canus</i>	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2
California Gull	<i>Larus californicus</i>	0	0	0	2	0	0	0	0	0	2	0	0	0	0	4
Herring Gull	<i>Larus argentatus</i>	1	8	2	25	9	2	12	5	13	20	8	6	1	19	131
Thayer's Gull	<i>Larus thayeri</i>	0	1	0	0	0	0	0	0	0	9	3	0	0	22	35
Western Gull	<i>Larus occidentalis</i>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1
Glaucous-winged Gull	<i>Larus glaucescens</i>	41	58	73	97	86	110	100	106	99	101	108	115	100	95	1289
Glaucous Gull	<i>Larus hyperboreus</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	3	3
Sabine's Gull	<i>Xema sabini</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
Black-legged Kittiwake	<i>Rissa tridactyla</i>	0	3	0	54	4	4	4	1	3	31	2	51	0	13	170
Arctic Tern	<i>Sterna paradisaea</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Common Murre	<i>Uria aalge</i>	0	0	0	32	8	3	0	6	12	4	6	2	4	17	94
Pigeon Guillemot	<i>Cephus columba</i>	46	65	66	91	98	108	93	103	94	96	104	112	91	89	1256
	<i>Brachyramphus</i>															
Marbled Murrelet	<i>marmoratus</i>	18	19	35	56	47	79	81	48	74	24	28	86	57	31	683
Ancient Murrelet	<i>Synthliboramphus antiquus</i>	39	71	70	79	72	83	83	73	95	81	77	85	88	86	1082
Cassin's Auklet	<i>Ptychoramphus aleuticus</i>	5	15	14	32	39	42	33	22	32	26	5	34	30	42	371
Rhinoceros Auklet	<i>Cerorhinca monocerata</i>	7	6	15	64	52	34	32	26	25	31	47	67	48	31	485
Horned Puffin	<i>Fratercula corniculata</i>	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
Tufted Puffin	<i>Fratercula cirrhata</i>	1	0	1	5	5	3	0	0	0	2	0	0	2	1	20
Northern Saw-whet Owl	<i>Aegolius acadicus</i>	17	4	7	25	15	28	42	14	17	5	69	72	57	27	399
Rufous Hummingbird	<i>Selasphorus rufus</i>	18	45	48	87	83	81	61	50	67	66	82	56	54	63	861
Anna's Hummingbird	<i>Calypte anna</i>	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
Belted Kingfisher	<i>Ceryle alcyon</i>	0	2	15	40	67	41	24	60	79	51	27	47	27	20	500
Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>	39	71	85	92	96	108	99	100	102	99	108	102	100	90	1291
Lewis's Woodpecker	<i>Melanerpes lewis</i>	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Hairy Woodpecker	<i>Picoides villosus</i>	6	18	36	59	54	86	75	66	73	74	63	80	58	72	820
Northern Flicker	<i>Colaptes auratus</i>	6	20	68	6	11	12	37	42	73	32	34	18	44	3	406
Pacific-slope Flycatcher	<i>Empidonax difficilis</i>	0	15	43	46	72	66	54	78	66	63	64	66	41	46	720
Northwestern Crow	<i>Corvus caurinus</i>	41	72	85	94	101	109	99	120	107	101	108	105	100	96	1338
Common Raven	<i>Corvus corax</i>	40	66	76	96	102	109	99	115	106	101	108	105	99	84	1306
Tree Swallow	<i>Tachycineta bicolor</i>	0	0	0	2	0	1	0	0	6	3	3	6	4	9	34

Violet-green Swallow	<i>Tachycineta thalassina</i>	1	0	0	0	0	0	1	0	0	0	0	0	0	10	12
C-backed Chickadee	<i>Poecile rufescens</i>	9	43	76	91	94	82	83	64	81	94	107	85	97	84	1090
Red-breasted Nuthatch	<i>Sitta canadensis</i>	0	4	8	50	42	14	9	31	18	17	3	13	13	9	231
Brown Creeper	<i>Certhia americana</i>	2	25	41	65	32	19	33	47	65	66	67	32	16	54	564
Winter Wren	<i>Troglodytes troglodytes</i>	32	72	76	92	100	107	93	122	110	102	107	104	97	95	1309
American Dipper	<i>Cinclus mexicanus</i>	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
Golden-crowned Kinglet	<i>Regulus satrapa</i>	4	32	60	87	80	72	84	79	103	92	103	87	90	86	1059
Ruby Crowned Kinglet	<i>Regulus calendula</i>	0	0	0	0	0	0	1	0	0	0	1	0	0	0	2
Swainson's Thrush	<i>Catharus ustulatus</i>	5	2	20	37	18	45	34	42	35	27	70	46	22	41	444
Hermit Thrush	<i>Catharus guttatus</i>	39	47	75	80	89	85	75	99	96	84	97	95	95	82	1138
American Robin	<i>Turdus migratorius</i>	0	0	1	1	4	0	0	0	15	5	7	0	0	8	41
Varied Thrush	<i>Ixoreus naevius</i>	20	72	81	83	89	104	10	70	104	81	101	93	98	96	1102
Orange-crowned Warbler	<i>Vermivora celata</i>	0	33	43	48	75	33	63	47	56	63	53	68	55	66	703
Townsend's Warbler	<i>Dendroica townsendi</i>	6	52	71	83	86	88	76	92	88	86	92	92	74	80	1066
Wilson's Warbler	<i>Wilsonia pusilla</i>	1	0	1	0	0	0	0	0	0	0	3	3	2	2	12
Savannah Sparrow	<i>Passerculus sandwichensis</i>	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Fox Sparrow	<i>Passerella iliaca</i>	4	3	28	21	7	6	1	8	2	2	28	19	5	19	153
Song Sparrow	<i>Melospiza melodia</i>	11	64	63	65	50	37	18	55	53	83	70	60	38	19	686
Dark-eyed Junco	<i>Junco hyemalis</i>	1	32	59	70	94	94	58	44	49	60	48	63	65	35	772
Pine Grosbeak	<i>Pinicola enucleator</i>	0	0	0	1	1	0	0	0	0	0	0	0	3	0	5
Red Crossbill	<i>Loxia curvirostra</i>	3	39	32	70	86	90	55	83	66	66	56	55	52	49	802
Pine Siskin	<i>Carduelis pinus</i>	2	8	25	31	62	48	58	41	28	33	3	14	27	51	431

# RESULTS OF CETACEAN OBSERVATIONS IN LASKEEK BAY, 1990-2003

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## ABSTRACT

Sightings of whales in Laskeek Bay by members of the Laskeek Bay Conservation Society have been recorded annually since 1990. In order to assess seasonal trends and inter-year variation, we tabulated the number of days on which each species was recorded in each year, by 10-day periods. Results were then expressed as the percentage of days in each period when the species was recorded, based on the number of days when camp was active on each date. The most frequently recorded species were humpback whales, seen on 125 days, followed by harbour porpoises (87 days), killer whales (56 days) and Pacific white-sided dolphins (49 days). Gray and minke whales and Dall's porpoises were all seen on 10 or more days. Gray whales were seen mainly in April, while humpback whales were seen most frequently from 1 May – 10 June. Sightings of harbour porpoises and killer whales increased throughout the season, peaking in July. Only the humpback whale showed a significant change in annual numbers over the course of the study, becoming much more frequent after 1998 than earlier.

## INTRODUCTION AND METHODS

All sightings of whales in Laskeek Bay have been recorded by the Limestone Island field crew since the start of the East Limestone Island field camp, in 1990. Dates of camp operations for the period are listed in Gaston (2004, this volume). Observations of whales were made from a lookout during timed sea-watches and also serendipitously, in the course of other work. Lookout watches were initiated in 1994 and were generally made for 1 h daily during fine weather, from a promontory on the southeast side of East Limestone Island.

Some whale sightings were made during surveys for seabirds conducted from an inflatable or aluminum boat on a fixed transect pattern twice monthly throughout the season. A few surveys each year (maximum 3) were made offshore into Hecate Strait, up to 7 km east of Reef Island, in May or early June. Records from these boat surveys are included with land-based sightings.

Because many whale sightings involved more than one animal, and because we could not distinguish whether the same individuals were seen more than once in the same day, we analysed the data in terms of "sighting-days" (days on which a given species was recorded, irrespective of numbers) as a percentage of the number of days in each 10 day period when the East Limestone Island camp was active. This method tends to minimize seasonal and inter-year variation and hence is rather conservative in detecting patterns and trends.

## RESULTS

### **Gray Whale (*Eschrichtius robustus*)**

Gray whales were an infrequent visitor to Laskeek Bay, only seen during 1.5% (N=1420) of days. The maximum frequency occurred in March and there were no records after 10 June (Fig. 1) despite occupation in the camp for another month in most years.

### **Minke Whale (*Balaenoptera acutorostrata*)**

Minke whales were seen on 2.2% of days. They occurred throughout the season, but with very few records in April (one sighting), and more frequent observations after 10 June (5% of days, Fig. 1). Since 1999, only three sightings have been recorded, suggesting that the species may have become rarer in Laskeek Bay.

### **Humpback Whale (*Megaptera novaengliae*)**

This species was the most frequently recorded of all cetaceans, being seen on 8.8% of days. Records were most frequent during 1 May – 10 June, when humpbacks were seen on 15% (N=574) of days. There were no records in March and only one after 10 July (Fig. 1). This was the only species to show a significant change in the frequency of sightings over the period of the study, being much more frequent after 1998 than in the preceding years (Fig. 2). In addition to the increase in numbers of days on which humpbacks were sighted, the number of individuals seen each day has also been higher in recent years.

### **Fin Whale (*Balaenoptera physalus*)**

There were three records of this species, but all coincided with periods when humpbacks were numerous. Reliable sightings of Fin Whales have been reported in Hecate Strait, but misidentifications are hard to completely rule out.

### **Killer Whale (*Orcinus orca*)**

Killer whales were seen on 3.9% of days. They were rarely seen in March and April, when there were only five records, but appeared more frequently thereafter, with a peak in July, when they were seen on >10% (N=160) of days (Fig. 3).

### **Harbour Porpoise (*Phocoena phocoena*)**

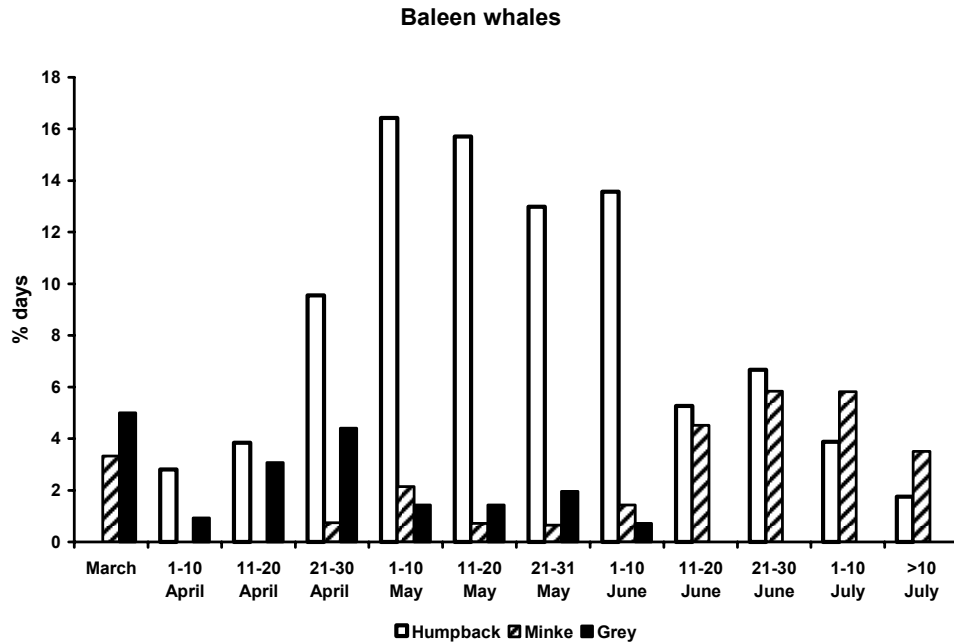
Harbour porpoises were seen on 6.1% of days. They were seen throughout the season, but sightings became more frequent later in the year, with a peak after 10 July, when they were recorded on 19% (N=57) of days (Fig. 4).

### **Pacific White-sided Dolphin (*Lagenorhynchus obliquidens*)**

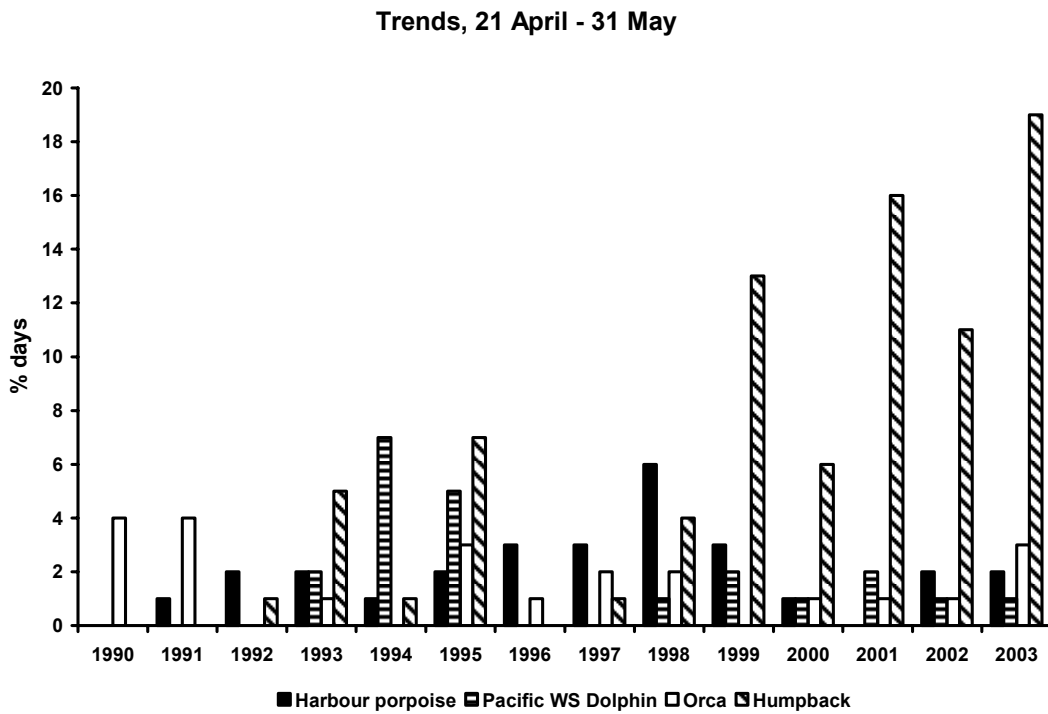
Pacific white-sided dolphins were recorded on 3.5% of days. They were not seen in March, but recorded thereafter throughout the season (Fig. 4). Although this species may occur in large groups (> 100, Heise et al. 2003) most records in Laskeek Bay were of groups of <10 animals.

### **Dall's Porpoise (*Phocoenoides dalli*)**

This was the least frequent cetacean in Laskeek Bay, being seen on only 0.7% of days. All ten sightings of the species occurred in May and June (Fig. 4).

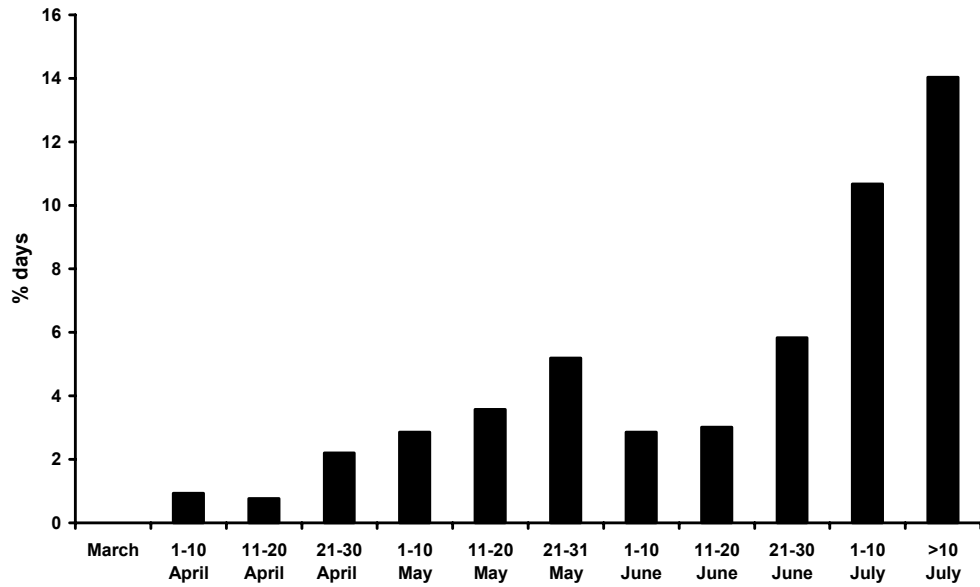


**Fig 1**  
Records of baleen whales in Laskeek Bay during 1990-2003, in relation to time of year



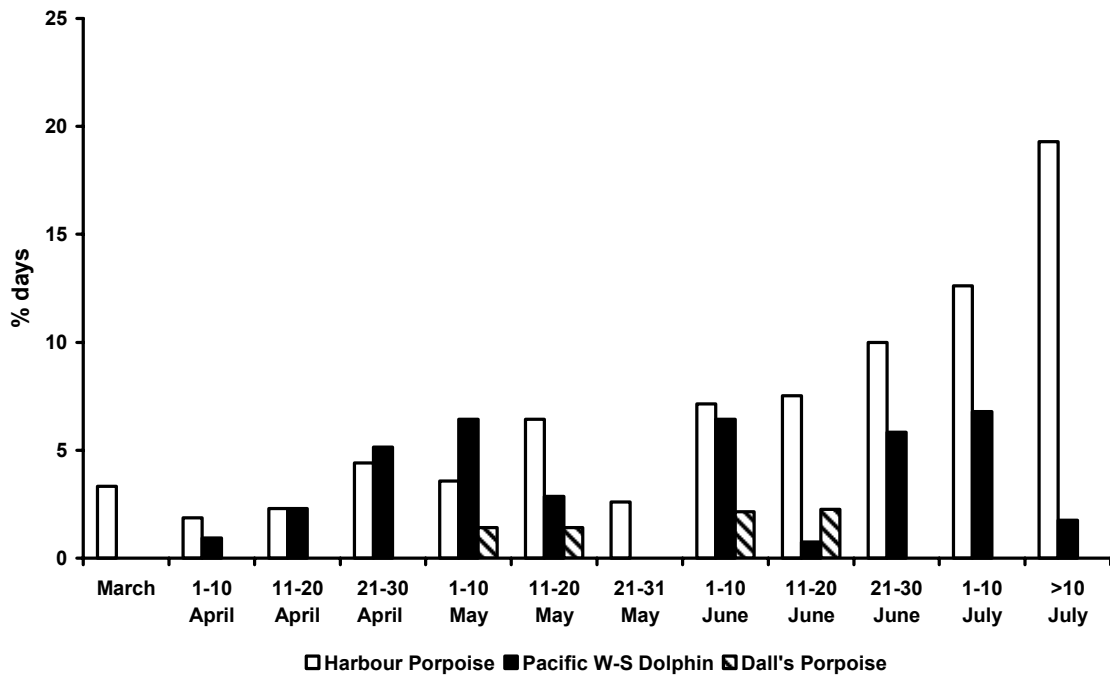
**Fig. 2**  
Proportion of days on which species were sighted during 21 April – 31 May of 1990-2003

### Orca



**Fig. 3**  
Frequency of killer whale sightings in relation to time of year

### Dolphins and porpoises



**Fig. 4**  
Frequency of sightings of harbour porpoise, Pacific white-sided dolphin and Dall's porpoise in relation to time of year



## DISCUSSION

Sightings of whales in Laskeek Bay were generally more frequent from May onwards than during April. Apart from the strong movement of humpback whales through the area in May and early June, sightings of killer whales, minke whales and harbour porpoises all increased in frequency during the season. Only the Gray whale, an infrequent visitor to Laskeek Bay, was most often seen in the first half of the field season. This period coincides with the peak migration of Gray whales from Baja California to Alaska (Pike and MacAskie 1969).

Humpback whales seen in Laskeek Bay appeared to be passing through Hecate Strait, en route from wintering grounds in Hawaii to summering areas off Alaska (Calambokidis et al. 2001). Probably many more passed through the area than were actually seen, because many sightings were made on infrequent trips offshore into Hecate Strait. The proportion of animals passing through Hecate Strait that enter Laskeek Bay and hence come within sight of East Limestone Island, is probably fairly small. The abrupt increase in sightings of humpback whales after 1998 was the most striking change over the period considered. The abrupt increase in 1999 coincided with a change in the state of the Pacific Decadal Oscillation, from a warm phase during the 1980s and 1990s, to a cooler phase after 1997 (<http://jisao.washington.edu/pdo/PDO.latest>).

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**Appendix 1**  
**Days on which whale species were recorded by the East Limestone Island field camp**

Year	11-20 Mar	21-31 Mar	1-10 Apr	11-20 Apr	21-30 Apr	1-10 May	11-20 May	21-31 May	1-10 Jun	11-20 Jun	21-30 Jun	1-10 Jul	11-20 Jul	21-31 Jul	Total
<b>Gray whale</b>															
1990															0
1991															0
1992															0
1993					1		1	2	1						5
1994			1												1
1995		1					1								2
1996		1		1	1										3
1997					1	1									2
1998															0
1999				2	2										4
2000						1		1							2
2001															0
2002				1											1
2003		1			1										2
<b>Total</b>	0	3	1	4	6	2	2	3	1	0	0	0	0	0	22
<b>Humpback whale</b>															
1990															0
1991															0
1992									1						1
1993						2	2		1	1					6
1994						0	0		1						1
1995					3	5			2	1					11
1996											1				1
1997									1						1
1998						1	2	1							4
1999					2	2	4	3	4	1					16
2000			2		2	2	2	1	1	2	1	1			14
2001				2	2	3	2	7	4	2	1	1		1	25
2002				1		1	3	5	2		5	2			19
2003			1	2	4	7	7	3	2						26
<b>Total</b>	0	0	3	5	13	23	22	20	19	7	8	4	0	1	125

Year	11-20 Mar.	21-31 Mar.	1-10 April	11-20 April	21-30 April	1-10 May	11-20 May	21-31 May	1-10 June	11-20 June	21-30 June	1-10 July	11-20 July	21-31 July	Total
<b>Minke whale</b>															
1990															0
1991															0
1992	1										1				2
1993						1			1	4	2	1	1		10
1994						1				2	1				4
1995													1		1
1996						1						3			4
1997	1						1		1		2				5
1998					1			1							2
1999															0
2000											1				1
2001												2			2
2002															0
2003															0
Total	2	0	0	0	1	3	1	1	2	6	7	6	2	0	31
<b>Killer whale</b>															
1990							1	2	1	1					5
1991							1	1	2						4
1992															0
1993						1					1	2	2		6
1994					1							1	2		4
1995				1			1	1	1		1	3	2		10
1996					1	1					2	2			6
1997						1	1			1		1	1		5
1998								2							2
1999					1						1				2
2000						1									1
2001										1		1	1		3
2002			1				1					1			3
2003								2		1	2				5
Total	0	0	1	1	3	4	5	8	4	4	7	11	8	0	56

Year	11-20 Mar.	21-31 Mar.	1-10 April	11-20 April	21-30 April	1-10 May	11-20 May	21-31 May	1-10 June	11-20 June	21-30 June	1-10 July	11-20 Jul	>20 Jul	Total
<b>Harbour porpoise</b>															
1990															0
1991							1								1
1992							1	1							2
1993								1	1	1	2	2	1		8
1994					1				1	1	1	2	3		9
1995					1	1	1			1	2	5			11
1996		1				2	1					2			6
1997		1	1				3				2		1		8
1998					1		2	1	3	2	1				10
1999					1				3				1		5
2000			1	1					1	1	1				5
2001											2	1	4	1	8
2002				2	2	1		1		4		1			11
2003						1			1		1				3
Total	0	2	2	3	6	5	9	4	10	10	12	13	10	1	87
<b>Pacific white-sided dolphin</b>															
1990															0
1991															0
1992															0
1993					1	2					2	2			7
1994					3	5	1		1			3			13
1995						1	1		3	1	2	1			9
1996												1			1
1997															0
1998									1						1
1999				1	1				2		2				6
2000						1									1
2001				1	2		1		1					1	6
2002				1			1				1				3
2003			1						1						2
Total	0	0	1	3	7	9	4	0	9	1	7	7	0	1	49

Year	11-20 Mar.	21-31 Mar.	1-10 April	11-20 April	21-30 April	1-10 May	11-20 May	21-31 May	1-10 June	11-20 June	21-30 June	1-10 July	11-20 Jul	>20 Jul	Total
<b>Dall's porpoise</b>															
1990															0
1991															0
1992															0
1993						1			1	1					3
1994							1								1
1995															0
1996															0
1997									2	1					3
1998															0
1999															0
2000															0
2001															0
2002						1	1			1					3
2003															0
Total	0	0	0	0	0	2	2	0	3	3	0	0	0	0	10

## **ANALYSIS OF KILLER WHALE IDENTIFICATION PHOTOS TAKEN BY LASKEEK BAY CONSERVATION SOCIETY IN 1994-2003**

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Three unique populations of killer whales *Orcinus orca* inhabit the waters of British Columbia, *residents*, *transients* and *offshores*. Resident killer whales eat fish, vocalize frequently, and travel in large groups. Transients tend to travel silently in small groups, and hunt marine mammals exclusively. The study of offshore killer whales is much more recent and they are not as well understood as residents or transients. Offshore killer whales travel in large vocal groups of 30 to 60 whales, and eat fish, although they may also hunt marine mammals. All 3 populations of killer whales have been identified in the waters of Haida Gwaii, although encounters with transients are the most common.

Each killer whale is individually recognizable from the shape of its dorsal fin and markings on the grey saddle patch at the base of the fin. Those that have been identified to date have been named using an alpha-numeric code (e.g. G11, T007, etc.). Over 200 transients, 300 residents and 200 offshore killer whales have been identified in the waters of British Columbia, Washington and Alaska. General summaries of the ecology of resident and transient killer whales, as well as identification photographs of each individual, are available in Ford and Ellis (1999), and Ford et al. (2000).

Since 1993, members of LBCS have had 23 encounters with identifiable killer whales and have contributed identification photographs to Graeme Ellis (PBS, DFO, Nanaimo). These photographs provide valuable information to researchers as there are relatively few observations of killer whales north of Vancouver Island. This paucity of data reflects the lack of observers, and not necessarily a lack of killer whales. Photographs collected by LBCS revealed that the majority of killer whale encounters (19 of 23) in the area were with mammal-eating transients. The other four encounters were with northern residents. Group size of transients ranged from 2 to 7 whales, and 40 different individuals were identified in the area. Some of these individuals are most commonly seen in Haida Gwaii and have been resighted repeatedly over the years (such as T070, T118 and T121). Other individuals, such as T007 and T010, travel widely and have been seen throughout BC waters over the past 30 years. In Laskeek Bay, transients have been recorded killing both harbour seals *Phoca vitulina* and Steller sea lions *Eumetopias jubatus*.

There are 2 subpopulations of resident killer whales in British Columbia, the northern and the southern residents. While their distribution along the west coast of Vancouver Island is not well known, the northern residents are typically seen from Alaska to Campbell River, and the southern residents are seen from Campbell River south to California. Northern resident killer whales are best understood from encounters in Johnstone Strait that take place during the summer months. However their movements during other times of the year are not well known. The 4 encounters with northern resident killer whales by LBCS provide some useful information on the winter/spring movements of this group of whales at a time of year when they are not often seen: all took place between February and June.



**T7, off Cape St. James, 2003 (photo Brian Gisborne)**



**T7A, off Cape St. James, 2003 (photo Brian Gisborne)**

Resident killer whales appear to be unique among mammals in that there is no dispersal from the natal group. Mothers travel with their offspring, and 2-3 and sometimes 4 generations of whales can be seen travelling together. These *matrilineal groups* form the basic social unit for resident killer whales and are named using the mother's alpha-numeric code. Matrilineal groups often travel with other matrilineal groups, but these associations are not stable over time. Eight matrilineal groups have been identified in Laskeek Bay over 4 encounters (H06, I11, I15, I17, I20, I31, G17 and G18), but only one matrilineal group was seen more than once (G18).

The Laskeek Bay area is probably very attractive to these transients, with its abundance of seals and a predictable Steller sealion haulout at Reef Island. Transient killer whales roam over tremendous distances, as documented by animals seen in Glacier Bay, Alaska and later re-sighted off Monterey California (Goley and Straley 1994). Some of the animals photographed in the Laskeek Bay area have been sighted from Glacier Bay, AK to the south end of Vancouver Island. In the case of two of these animals T007 and T010, there is a thirty year history of sighting records (G. Ellis, unpublished data?).

Monitoring movements and population trends for such a long-lived and widely dispersed species as killer whales is challenging. Although they have been studied for over 30 years, many questions remain, such as where do they go in winter and what do they feed on? Contributions such as those made by the Laskeek Bay Conservation Society will help us to better understand these fascinating animals.

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**Killer whales breaching (photo by Russ Fleming)**



# NUMBERS OF STELLER'S SEA LIONS USING HAUL-OUTS IN LASKEEK BAY DURING 1990-2003

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## ABSTRACT

Numbers of Steller's sea lions *Eumetopias jubatus* hauled out on regular haul-out sites in Laskeek Bay were counted irregularly during April – July during 1990-2003. Numbers generally showed no trend during April and May, when 200-900 animals were present on the Reef Island haul-out islets and 0-180 on the eastern tip of the Skedans Islands. Numbers generally declined in June and July, with the maximum numbers counted at both haul-outs combined not exceeding 550 animals. The Skedans Island haul-out, mainly a winter haul-out site, was rarely occupied after the end of May. A few animals branded at Forrester Island, Alaska were recorded in 1997 and 2000. Single male California sea lions *Zalophus californianus* were recorded at Reef Island occasionally from 1993 onwards. The 1993 record was the first for Haida Gwaii. Although variation among counts was considerable, we found no evidence of any change in overall numbers over the period of the study.

## INTRODUCTION

Steller's sea lions haul out regularly at two sites in Laskeek Bay: (1) rocks at the south-east corner of Reef Island and (2) the easternmost tip of East Skedans Island (Heise et al. 2003). The number of rocks used for hauling out at the Reef Island site varies from 1-5, but the most frequently used are those furthest from the main island. In addition, sea lions occasionally haul out on other small islets, including Cumshewa Rocks and Lost Islands. However, these latter are comparatively rarely used. Members of the Laskeek Bay Conservation Society have counted sea lions on these haul-outs at least once, and usually several times, each year since 1990. This paper analyses changes in numbers over the course of the spring and summer and assesses the likelihood of any change in numbers of animals using the area for hauling out over the past 14 years.

## METHODS

Counts were made at irregular intervals from late March to early July. At the Skedans haul-out, 66 counts were made, of which 29 counts were in April and 33 in May. It is likely that the site was inspected more frequently in June than the three records suggest, but that the haul out was unoccupied and hence the observation went unrecorded. At the Reef Island rocks, 58 counts were made, of which 4 were in March, 13 in April, 18 in May, 20 in June and 3 in July. At least one count was made annually at both sites.

Sea lions were counted through binoculars while drifting offshore from the haul-out islands in a small inflatable or aluminum boat. All sea lions hauled out on land were counted and an estimate was made of numbers in the water, for which an exact count was generally impossible. In some cases, where sea lions were piled densely together, an estimate had to be made of part of the haul-out. Counts were made without reference to time of day or state of tide. The boat was kept more than 100 m from the rocks to prevent

scaring animals into the water. In recent years, special attention was paid to checking for branded animals marked in Alaska and for California sea lions.

## RESULTS

Sea lions were present at the Reef Island haul-out on all occasions when the site was visited (Appendix 1). The minimum count was 159, on 1 July 1996, and the maximum count 888, on 10 April 2002. When all years were combined, numbers were generally highest in April and the first half of May, declining thereafter (Fig. 1). There was no evidence that counts were affected by time of day ( $R^2 = -0.02$ ,  $P = 0.9$ ). After date was taken into account, there was no significant trend with year, or significant inter-year variation (date,  $F_{1,43} = 7.90$ ,  $P = 0.007$ ; year,  $F_{13,43} = 1.50$ ,  $P = 0.16$ ).

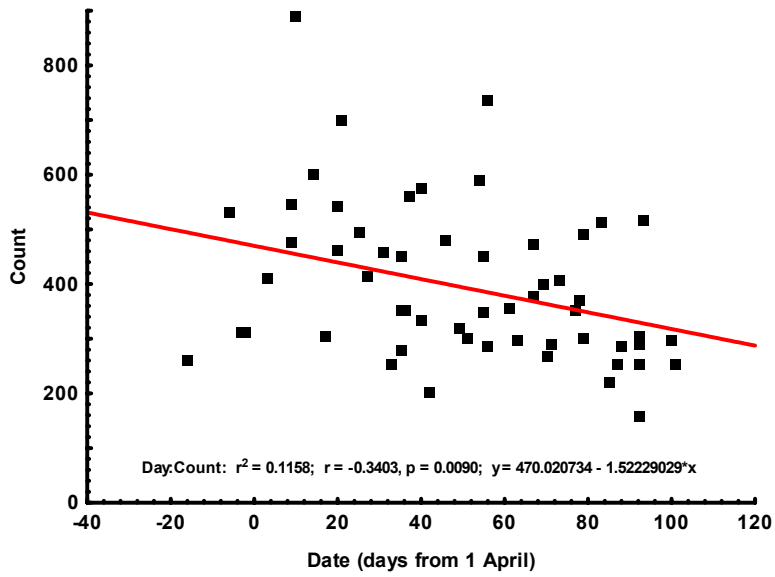
During the period up to 1997, there was a strong tendency for numbers counted at Reef Island to remain fairly stable during April and to decrease thereafter (Fig. 2,  $R^2 = 0.30$ ,  $F_{2,28} = 7.55$ ,  $P = 0.002$ ). However, from 1998, no such tendency was noticeable ( $F_{1,25} = 2.34$ ,  $P > 0.1$ ), although numbers in June still tended to be lower than in April-May.

Unlike the Reef Island haul-out, the Skedans haul-out was not always occupied when visited (Appendix 2). However, visits when no animals were seen were not generally recorded, so we can only infer that many visits made in June, when the Skedans Islands were monitored regularly for breeding Black Oystercatchers *Haematopus bachmanni*, yielded no sightings. Numbers recorded were highest in April, with a maximum count of 173 on 10 April 2002. Thereafter, numbers diminished sharply and the highest count after May was 12, on 18 June 1998 (Fig. 3).

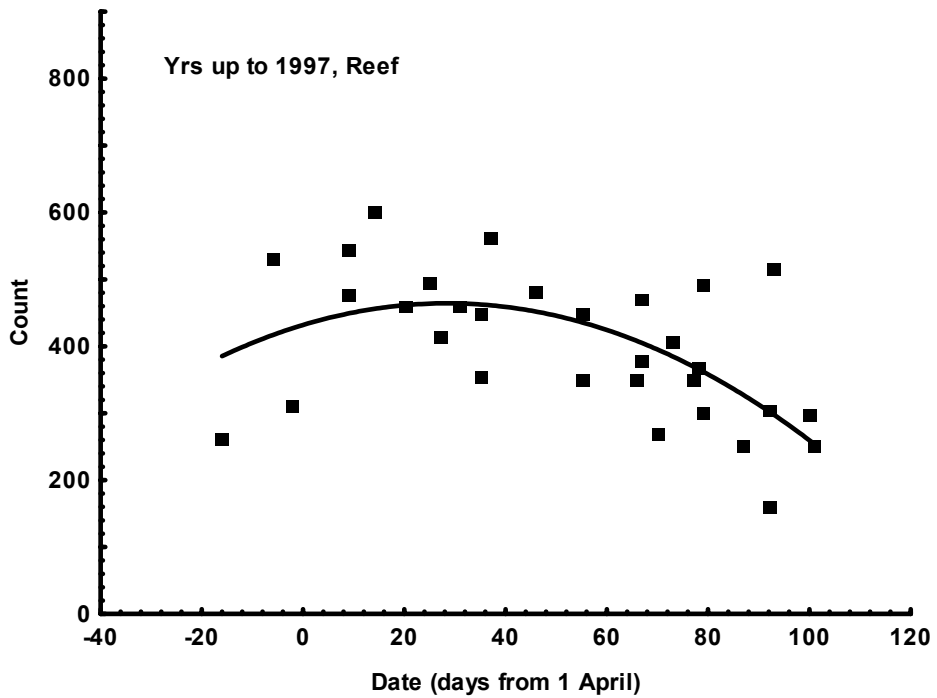
At Skedans, counts in April were lower in 1997-99 than in other years, with the highest count being 61 (Fig. 4,  $R^2 = 0.40$ ,  $F_{2,27} = 10.80$ ,  $P < 0.001$ ). This pattern did not show up in May counts, which showed only a small and insignificant decline with year.

Combining trends with date for all years and both sites, suggests an average of approximately 580 animals present in early May, of which 500 were on Reef Island rocks and 80 on Skedans, falling to 420 by the end of May, and 360 by the end of June, all of them at Reef Island rocks. There is no compelling evidence for any trend in overall numbers, although the Skedans haul-out seems to have been less used during 1997-1999 than before, or since.

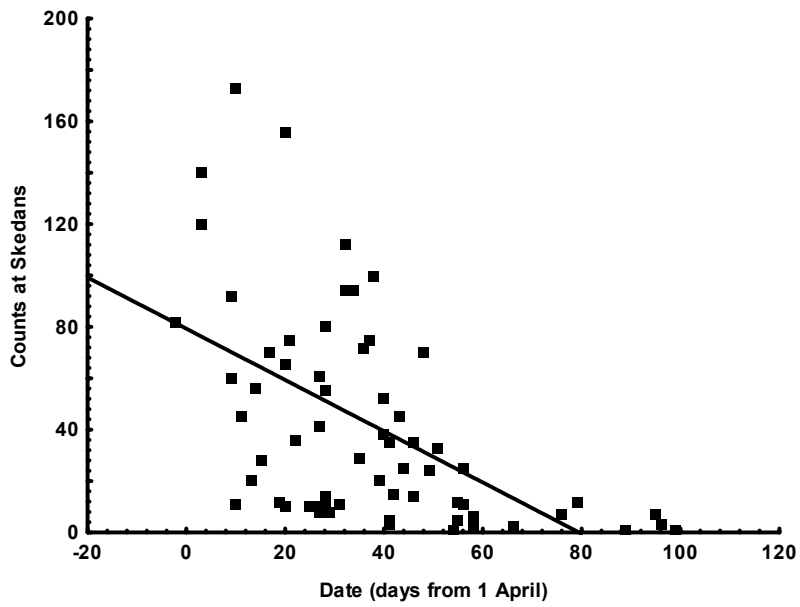
Two sightings of 3 and 2 sea lions were made at Cumshewa Rocks in May and June 1998 and 9 animals were hauled out at Low Island on 15 April 2000. Single male California sea lions *Zalophus californianus* were observed at the Reef Island haul-out on several dates in 1993-1996 and once in 1999. The 1993 sighting was the first record for Haida Gwaii (Heise et al. 2003). Branded animals were seen in 1997 (F220, F512 and F996) and 2000 (F1229 and F2015). These were branded on Forrester Island, Alaska.



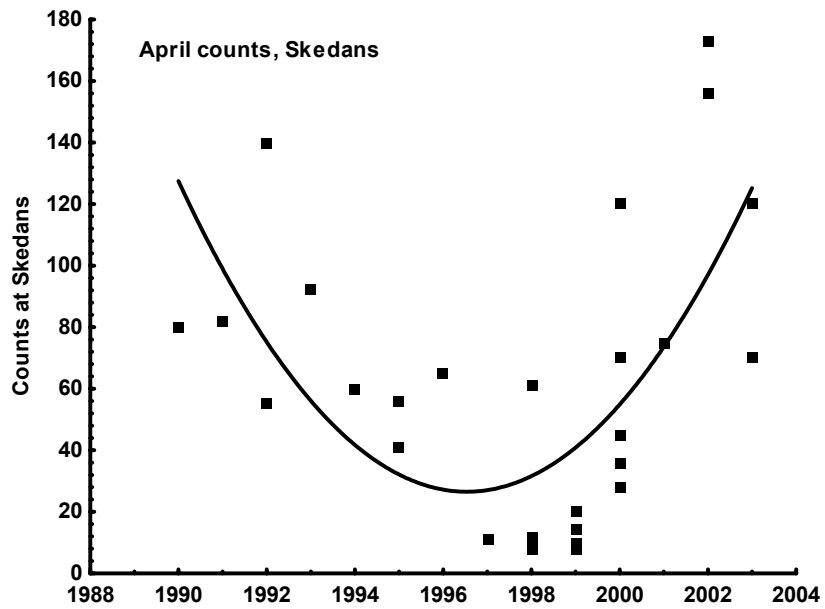
**Fig 1**  
Counts on the Reef Island haul-out in relation to time of year



**Fig. 2**  
Counts at Reef Island haul-out in relation to time of year, for years up to 1997



**Fig 3**  
Counts at Skedans haul-out in relation to time of year



**Figure 4**  
April counts at the Skedans haul-out from 1990-2003

## DISCUSSION

Steller's sea lions do not give birth on the Laskeek Bay haul-outs and small pups are seldom seen. Consequently, this aggregation appears to be solely a social phenomenon. Moreover, large bulls are not always spaced out on the haul-out, but several may be in close proximity, suggesting that rivalry associated with breeding is absent. Haul-out sites can be divided into year-round haul-outs and winter haul-outs. The Skedans haul-out, is clearly a winter site, as most animals have deserted it by the end of May. Reef Island rocks are a year-round haul-out.

It is not obvious why the Reef Island rocks are so consistently used, as there are many other isolated rocks in the Laskeek Bay area. The fact that sea lions were found hauling out at two other sites in Laskeek Bay demonstrates that their behaviour can be somewhat flexible. However, these temporary haul-outs seem to be of only short duration. Both Cumshewa Rocks and Low Island were visited several times each year to survey Black Oystercatchers, but sea lions were recorded at each of those sites in only one year.

The lack of change in numbers at of animals counted at Reef Island over the period of the study is surprising in view of the fact that the population of British Columbia is thought to be increasing by 3% annually (Olesiuk et al. 1993, Heise et al. 2003). The very low numbers of se lions recorded at Skedans during 1997 and 1998 coincided with a very strong El Niño/Southern Oscillation event that brought high seas surface temperatures to the waters around Haida Gwaii and led to reduced breeding success for seabirds in Laskeek Bay (Gaston and Smith 2001).

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**Appendix 1**  
**Details of haul-out counts made at the Reef Island islets**

<b>Year</b>	<b>Date</b>	<b>Time</b>	<b>Count</b>
1990	06-Jun		350
1990	16-Jun		350
1991	29-Mar		310
1992	15-Mar		260
1992	05-May		450
1992	25-May		450
1992	09-May		544
1993	25-May	830	348
1993	26-Jun		252
1993	01-Jul		305
1993	10-Jul		251
1993	12-Jun		405
1994	09-Apr		475
1994	25-Apr		495
1994	05-May	755	353
1994	16-May	1420	479
1994	06-Jun		471
1994	09-Jul		269
1995	14-Apr		600
1995	27-Apr	1049	414
1995	07-May	1220	560
1995	06-Jun		377
1995	18-Jun		490
1995	02-Jul		517
1996	25-Mar		530
1996	20-Apr		460
1996	01-May		459
1996	17-Jun		368
1996	01-Jul		159
1997	18-Jun	1300	300
1997	09-Jul	1332	298
1998	10-May	705	574
1998	26-May	750	735
1998	31-May	850	355
1998	27-Jun	700	285
1999	03-May	1525	253
1999	08-Jun	1545	399
1999	22-Jun	1641	511
2000	03-Apr		410
2000	17-Apr		303
2000	24-Jun	1700	220
2001	28-Mar	1400	310
2001	21-Apr	930	700
2001	21-May	1115	300

<b>Year</b>	<b>Date</b>	<b>Time</b>	<b>Count</b>
2002	10-Apr	1555	888
2002	20-Apr	1127	542
2002	12-May	1315	200
2002	24-May	1300	590
2002	01-Jul	2000	288
2003	03-Apr	1400	410
2003	17-Apr	1000	303
2003	05-May	930	279
2003	10-May	830	332
2003	19-May	800	319
2003	26-May	730	285
2003	02-Jun	1410	297
2003	10-Jun		288
2003	01-Jul	830	254

**Appendix 2**  
**Details of the haul-out counts made at Skedans Islands**

<b>Year</b>	<b>Date</b>	<b>Time</b>	<b>Count</b>
1990	28-Apr		80
1991	29-Mar		82
1991	18-May		70
1992	03-Apr		140
1992	28-Apr		55
1992	28-May		6
1992	28-Jun		1
1993	09-Apr		92
1993	02-May	1200	94
1993	11-May		35
1993	25-May		12
1993	28-May	1025	2
1994	09-Apr		60
1994	04-May	1800	94
1994	16-May	1330	35
1995	14-Apr	1355	56
1995	27-Apr	1520	41
1995	07.May-95	1519	75
1996	20-Apr		65
1996	08-May		100
1996	04-Jul		3
1996	07-Jul		1
1997	10-Apr	1305	11
1997	13-May	1115	45
1997	14-May	1500	25
1997	15-Jun	1245	7

<b>Year</b>	<b>Date</b>	<b>Time</b>	<b>Count</b>
1998	18-Apr		12
1998	19-Apr	1414	12
1998	20-Apr	911	10
1998	26-Apr	1225	10
1998	27-Apr	920	61
1998	28-Apr	1059	11
1998	29-Apr	1155	8
1998	06-May	916	72
1998	10-May	810	38
1998	19-May	900	24
1998	26-May	905	11
1999	13-Apr	1755	20
1999	25-Apr	1645	10
1999	27-Apr	1345	8
1999	28-Apr	1530	14
1999	02-May	1130	112
1999	11-May	1547	5
1999	16-May	1657	14
1999	25-May	1600	5
1999	05-Jun	1610	2
1999	04-Jul	1550	7
2000	03-Apr		120
2000	11-Apr	1450	45
2000	15-Apr	1530	28
2000	17-Apr		70
2000	22-Apr	1340	36
2000	11-May	1450	3
2001	21-Apr	1100	75
2001	01-May	1000	11
2001	21-May	1200	33
2002	10-Apr	1550	173
2002	20-Apr	1215	156
2002	12-May	1421	15
2002	24-May	1520	1
2003	03-Apr	1320	120
2003	17-Apr	1200	70
2003	05-May	1146	29
2003	09-May	1445	20
2003	10-May	1010	52
2003	26-May	830	25