

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

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SUMMARY

The Laskeek Bay Conservation Society's 15th 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 14th 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

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	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

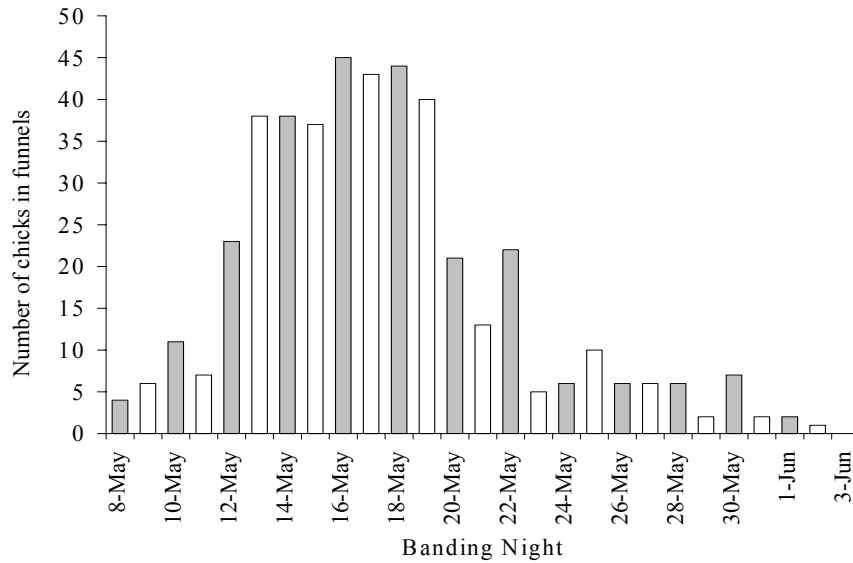


Figure 1
Annual counts of Ancient Murrelets chicks caught in funnels on East Limestone Island 1990-2004.
 The solid line is the long-term mean for 1990-2003 and the fine lines are one standard deviation from the mean.

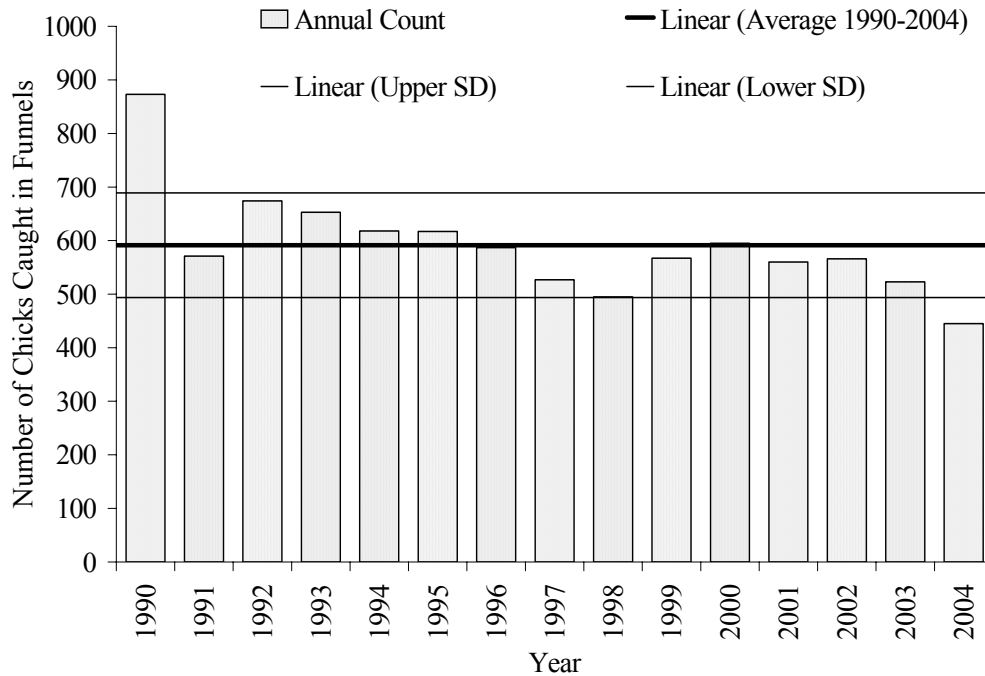


Figure 2
Number of Ancient Murrelet chicks caught in funnels per night from 8 May - 3 June on East Limestone Island

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 ± 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.

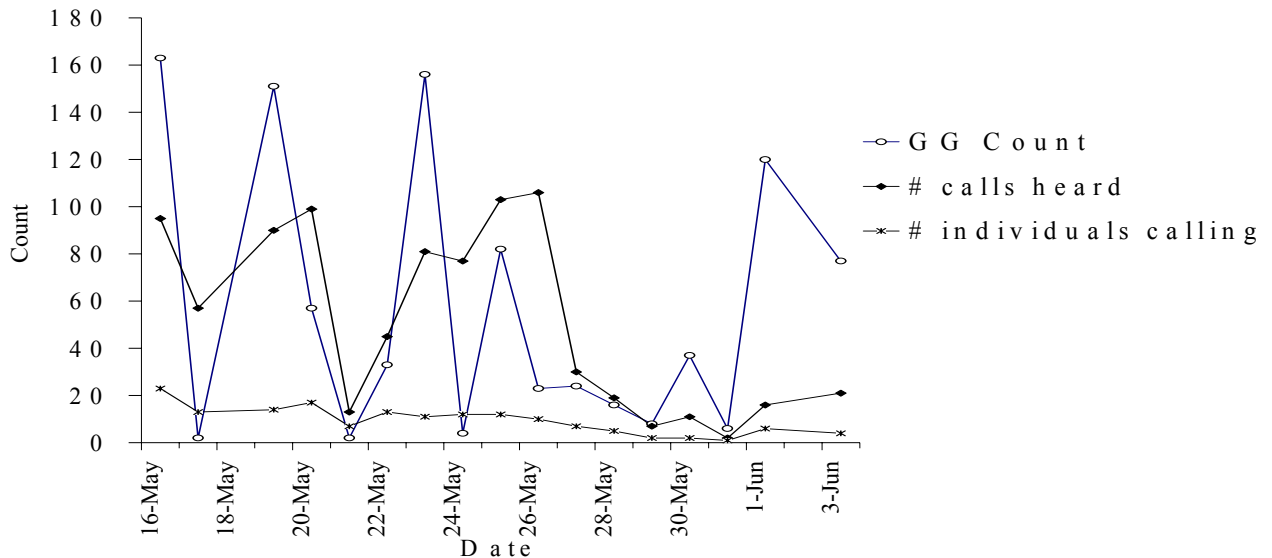


Figure 3
Comparison of Gathering Ground counts to Point Counts from 16 May – 3 June, not including 18 May and 2 June

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

Band Combination*	Location seen (nest site)	Year Banded (Location if known)	Banded as (if known)
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>	Location	Islands	Band Combination**
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.

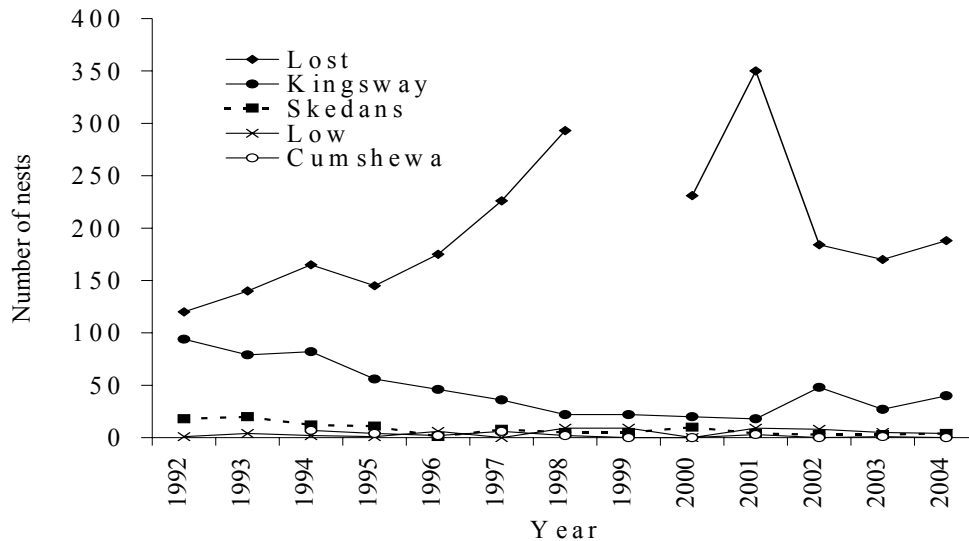


Figure 4
Number of Glaucous-winged Gull nests with eggs in Laskeek Bay 1992-2004

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 Nuthatch	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 ± 11.1 m and an average diameter at breast height (DBH) of 0.63 ± 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 ± 10.7 m in height and 1.12 ± 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.

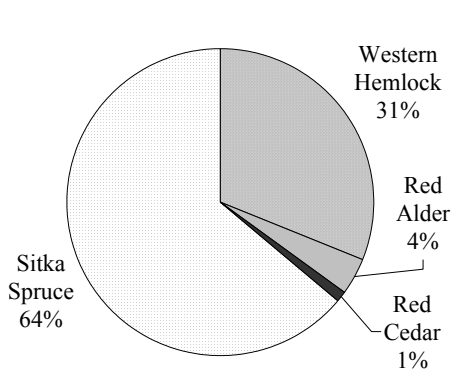


Figure 5
Species representation of random snags surveyed on East Limestone Island, 2004. N=100

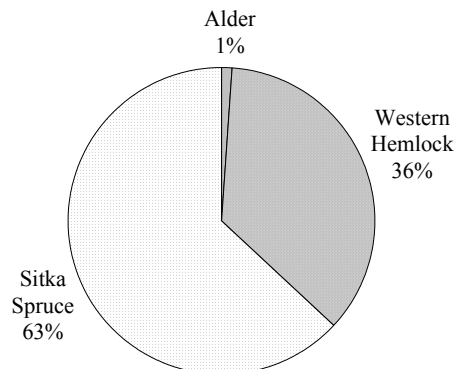


Figure 6
Wildlife Tree species used by Red-breasted Sapsuckers on East Limestone Island, 1992-2004. N=81

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* (fairyslipper), *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.

