EAST LIMESTONE ISLAND FIELD STATION:
REPORT ON THE 2008 FIELD SEASON

SUMMARY

Laskeek Bay Conservation Society's 19th field season ran from 3 May to 18 July and brought 26 volunteers and eight visitor groups (4 schools, 2 tours) to the island. Ancient Murrelet funnel work continued and the number of chicks counted was the lowest recorded to date. We monitored Black Oystercatcher breeding activity in Laskeek Bay and in sections of Gwaii Haanas where we found, respectively, 19 and 58 territories containing eggs or chicks. During our surveys we re-sighted 14 banded adult oystercatchers, the oldest of which was 14 years old. Glaucous-winged gull numbers were similar to previous years with 290 counted from four colonies in Laskeek Bay. Pigeon Guillemots continue to breed in the nest boxes on Limestone, and Fork-tailed Storm Petrel activity appears to be on the rise. Our peak count of Marbled Murrelets from sea surveys was 164 on 29 June. More Humpback whales were reported than in recent years, and groups of Killer whales were followed on three occasions. We monitored fourteen Wildlife Trees containing fifteen nests: one Brown Creeper, two Hairy Woodpecker, two Chestnut-backed Chickadee and ten Red-breasted Sapsuckers. On Limestone we also confirmed nesting by Common Ravens, Northwestern Crows, Bald Eagles and we suspect Peregrine Falcons are nesting in the area as well. One of the island's rare plants, *Menzies' Pipsissewa* was found blooming for the first time in several years.

Overall 2008 marked another terrific season on ELI. We are concerned with the continued decline in Ancient Murrelet numbers, and predation surveys suggest that predators, both native and introduced, may be an important factor affecting this small breeding colony. We will continue to minimize the potential negative impacts that human activity may be having on the Ancient Murrelet population; however, it is also important to note that researchers on ELI are likely the only defense that burrow nesters on Limestone have against the ongoing threat of raccoons.

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INTRODUCTION

Laskeek Bay Conservation Society offers unique opportunities for the public to become involved with research, monitoring and conservation in the coastal forest and marine environments of Haida Gwaii. We emphasize the importance of describing long-term trends among wildlife populations in efforts to better understand natural fluctuations, especially for long-lived species. Wildlife population dynamics need to be understood in order to protect them from the many pressures imposed by human activities. On Haida Gwaii, wildlife are potentially threatened by contamination from pollutants such as oil, predation by introduced species such as raccoons, and habitat destruction caused by direct and indirect effects associated with developments such as wind turbines and logging. We need to raise awareness through education and we need to promote the value of keeping these populations intact. LBCS is working hard to achieve this and 2008 celebrates nineteen years of effort!

EDUCATION AND INTERPRETATION PROGRAM

LBCS continues its commitment to raising public awareness of local conservation issues on Haida Gwaii and in providing members of the public, young and old alike, the opportunity to participate in field research. With this goal in mind, the society runs programs that allow volunteers, students and tourists to visit East Limestone Island (ELI) and learn about our research.

Project Limestone

This was the 18th year of Project Limestone, a program that brings students from island communities to ELI participate in Ancient Murrelet work. Upon arrival, students were led on an interpretive tour which introduced them to the island, the research and camp life. Students then assisted with the nighttime capture of Ancient Murrelet chicks from 10:30 pm to 2:30 am, before spending the remainder of the night in the visitor interpretation centre. Students then returned to their camp at nearby Vertical Point in the morning. The program is very popular among students, and many return year after year.

A critical analysis of our outdoor education program involving surveys, questionnaires and interviews with students, teachers, past employees and LBCS board members was completed this winter and as a result, a few changes were made to this summer's program. For example, to welcome Project Limestone participants to ELI this year, students and staff were invited to dinner as guests of LBCS. A few groups took advantage of a longer day-time visit to ELI which included a hike to Lookout Point and an overnight stay in the Visitor's cabin.

Six groups from four schools visited the island this year, representing 44 students and 12 chaperones. G.M. Dawson (Masset) was our first group, visiting on 15 May. Living and Learning School (Queen Charlotte) visited on 18 May. Queen Charlotte Secondary brought 2 groups this year: the junior group visited on 21 May and the seniors on 23 May. Anges L. Mathers School (Sandspit) also brought 2 groups to the island 26 and 27 May. Since Project Limestone began in 1991, 517 students have visited the island.

Volunteers

Since our first season in 1990, volunteers have played an important role in the operation of the East Limestone Island (ELI) field camp. Volunteers work alongside field staff and contribute time and energy to the many tasks that keep camp running smoothly, while at the same time participating in research activities and learning about ELI and the surrounding area. This is a unique opportunity for members of the public, as there are few other research camps on the west coast of North America that accept volunteers. The generous contribution of time and energy by the volunteers continues to be a very important part of our monitoring programs on the island.

Twenty-six volunteers visited the island this year and contributed a total of 164 volunteer days to projects, both on island and in the surrounding area. Sixteen volunteers were new to the island and 10 had previously spent time on the island. All volunteers this year stayed for a week, with the exception of 5 members of the set-up crew who were on the island for 3 days. This season saw volunteers from diverse backgrounds visit the island; thirteen volunteers hailed from Haida Gwaii, four from other places in BC, and the others from Ontario, Washington, Belgium, France, Germany and Australia.

Visitors

The LBCS visitor program provides opportunities for tour groups to visit a seabird colony, participate in an interpretive tour and learn about the research. Through this program, LBCS

aims to raise public awareness and appreciation of local conservation issues. The majority of visitors are visitors to Haida Gwaii and are on ecotourism trips in Gwaii Haanas. They are enthusiastic about the chance to learn more about the island's ecology and about the Ancient Murrelets. In 2007, we suspended all night-time visits to the ancient murrelet colony but we have continued to offer day-time visits

Two groups, representing 25 guests (4 crew) visited the island this season. Both groups were from *s/v Island Roamer* and visits occurred 23 and 25 May. The first group included a film crew from Global TV who were filming for a series on Haida Gwaii.

The CWS/RGIS research camp on nearby Reef Island was up and running again this year (April-June). Akiko Shoji, with Motomi Yoneda, Kyle Elliot, and Kerry Woo continued work on Akiko's Master's project on Ancient Murrelets which began in 2007.

Staff

LBSC Staff this year consisted of Jen Rock (Camp Supervisor / Biologist), Jake Pattison (Assistant Biologist / Interpreter) and Lisa McKnight-Yeates (Executive Director).

RESEARCH AND MONITORING PROGRAMS

Ancient Murrelets *Synthliboramphus antiquus*

Monitoring activities

In order to minimize our impact on the breeding population, our Ancient Murrelet monitoring has been scaled back compared to the research conducted in earlier years. As in 2007 there was no adult capture work, no chick banding, North Cove was off-limits, and night time visits were limited to school groups in Cabin Cove. In 2008 our monitoring activities consisted of chick capture work, gathering ground counts, point counts and predation transects. By adopting a less intrusive approach to monitoring, LBCS hopes to continue to collect important information concerning population changes, breeding success and the overall condition of birds while reducing the possible impacts of our presence as much as possible.

Chick capture work

Beginning 7 May we monitored four funnels (number 5 to 8) at Cabin Cove to record information on chick departures. For each chick that arrived at a funnel we recorded the date of departure, time of departure, funnel number and chick mass. Similar to previous years we carried out funnel work between 22.30h and 2.30h, adjusting start times after 19 May to 23.00h to accommodate for longer day length. Chicks first arrived at our funnels the night of 12 May and following the usual protocol, chick work continued until the second consecutive night when no chicks arrived, which occurred on 3 June (Fig. 1). A total of 125 chicks arrived at funnels 5 to 8 and compared to the last two years that these funnels have been in use, the number of chick departing the ELI colony this year was low (Table 1). Funnels 7 and 8 were added in 2006.

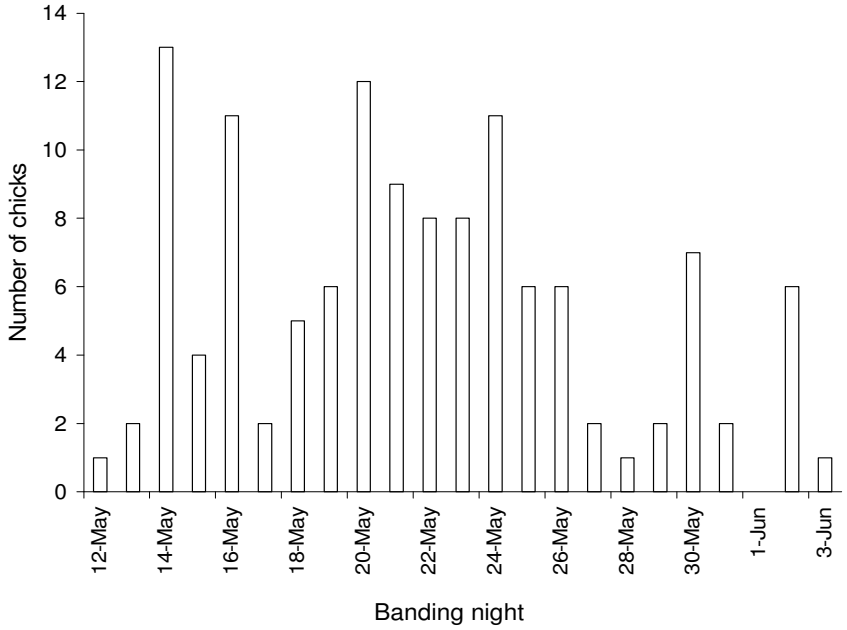

Figure 1. Nightly chick numbers caught at funnels 5 to 8 on East Limestone Island , 12 May to 3 June 2008.

Table 1. Summary of chick departures, peak nights and totals from funnels 5 to 8 on East Limestone Island 2006 to 2008.

Year	***First night with chicks***	***Peak night***	***Peak count***	***Last night***	***Total days***	***Total chicks***
2006	10-May	21-May	24	30-May	21	197
2007	15-May	4-Jun	16	12-Jun	29	166
2008	12-May	14-May	13	3-Jun	23	125

Funnels 5 and 6 have been monitored since chick capture work was initiated in 1990. This season the total of 92 chicks marked the lowest number of chicks from funnels 5 and 6 (Fig. 2). Compared to previous years, 2008 demonstrated similar timing in terms of the first night with chicks and the peak night. Peak counts and total days with chicks were comparatively low this year and the end date was relatively early (Table 2). The decline in chick departures, now evident since 2000 after a period of relatively stable numbers, is of concern to the Society. We have implemented some work to try and identify the causes, particularly related to predation rates, and we continue to take steps to try and minimize any potential impacts of our presence.

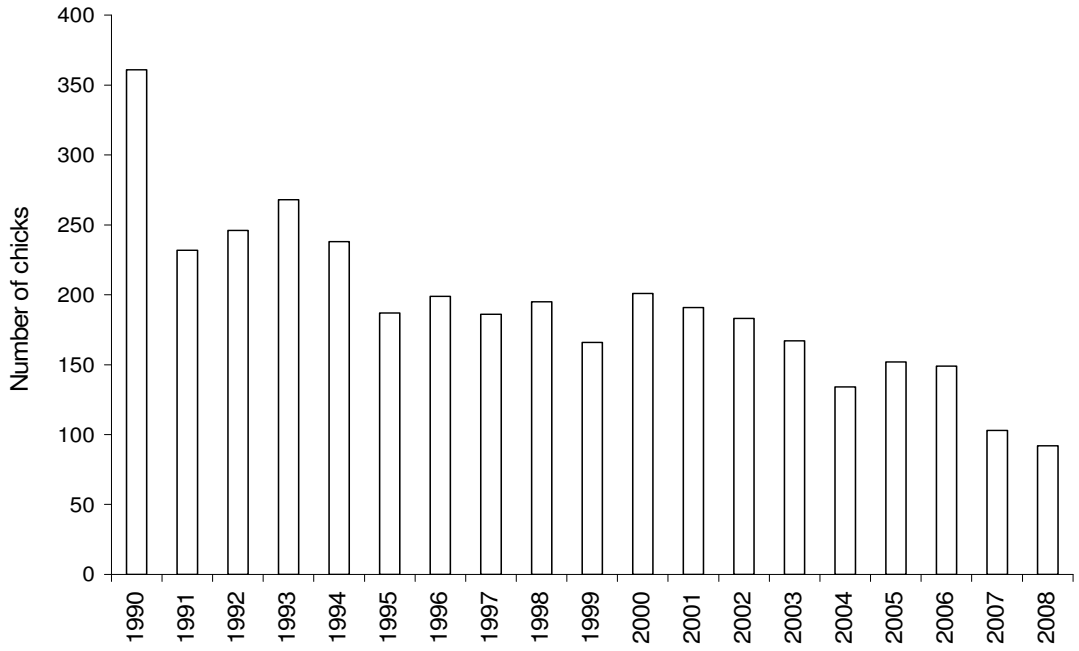

Figure 2. Number of Ancient Murrelet chicks caught at funnels 5 and 6 on ELI from 1990 to 2008.

Table 2. Summary of chick departures, peak nights and totals from funnels 5 and 6 on ELI 1990 to 2008.

Year	1st night with chicks	Peak night	Peak count	Last night	Total days	Total chicks
1990	13-May	20-May	28	15-Jun	33	361
1991	10-May	25-May	22	05-Jun	26	232
1992	14-May	22-May	29	02-Jun	19	246
1993	12-May	18-May	39	04-Jun	23	268
1994	08-May	20-May	29	06-Jun	29	238
1995	11-May	23-May	18	12-Jun	32	187
1996	11-May	18-May	17	07-Jun	27	199
1997	13-May	28-May	22	05-Jun	23	186
1998	11-May	20-May	23	20-Jun	40	195
1999	11-May	21-May	22	09-Jun	29	166
2000	11-May	21-May	22	06-Jun	26	201
2001	11-May	19-May	21	15-Jun	35	191
2002	09-May	21-May	33	01-Jun	23	183
2003	11-May	21-May	19	03-Jun	23	167
2004	08-May	16,17-May	15	01-Jun	24	134
2005	07-May	19, 23-May	12	05-Jun	29	152
2006	10-May	21-May	20	31-May	21	149
2007	15-May	04-Jun	16	12-Jun	28	103
2008	13-May	20,22,23-May	8	03-Jun	21	92
Average ± SD	11-May ± 2.1days	21-May ± 4.1days	22 ± 7 chicks	7-Jun ± 5.6 days	27 ± 5 days	192 ± 61 chicks

Gathering grounds

Before flying in to the colony at night, Ancient Murrelets aggregate at areas on the water known as 'gathering grounds,' which are located near their breeding sites. To monitor daily attendance at the Limestone I. gathering ground we conducted 10-minute counts of birds gathering each evening from 6 May to 20 June on the waters west of Low I., opposite the East Limestone colony. The number of Ancient Murrelets attending the gathering grounds peaked on 15 May when 241 birds were counted. On average (± SD) we counted 53.4 ± 59.7 birds on the water each night with numbers tapering off significantly by early June.

Point counts

To monitor nightly adult attendance in the colony we conducted point counts after funnel work (at approximately 2.30h) and recorded the number of birds calling and the number of calls made over a five-minute period from 21 May to 5 June. The minimum number of birds that we heard calling was five, counted on the nights of 25 May and 3 June while the maximum number of calls heard was 92, counted on 27 May.

Point count and gathering ground count data can be used as a measure of colony attendance and in turn that these data will help us to interpret annual changes in chick departure numbers.

Recaptured birds
We discontinued adult capture work in 2003. However, on occasion adult Ancient Murrelets land in front of staff during funnel work and when this happens we check the adult for bands. This year we opportunistically caught three banded birds, all of which had been banded on Limestone as adults, in 2000, 1999 and 1994. These birds were at least 10, 11 and 16 years old, respectively.

Recovered bands
Throughout the season we make a point to look for bands among the remains of dead Ancient Murrelets left by predators throughout the forest. In 2008 we recovered one band from a dead bird that was originally banded as an adult on ELI in 2002, so this bird was at least eight years old.

Recapture and band recovery data provide valuable insights into population parameters and life history. For example, last year on Reef I. researchers recaptured a bird that was 22 years old. So far, this is the oldest Ancient Murrelet known.

Predation transects
To generate an estimate of the number of Ancient Murrelets killed by predators, we counted the remains of birds located along five 20m wide strip-transects once per week. We cleared the transect area of remains on 7 May and followed up with five weekly surveys counting new additions of carcasses and feather piles. From these totals we determined that the minimum number of depredated Ancient Murrelet adults at ELI was 259 [extrapolating our estimates from the transect area (1.6 ha) to the colony area (12.55 ha)]. This number is slightly higher than in 2007 when 220 adult predations were estimated[†]. Bald Eagles *Haliaeetus leucocephalus*, Common Ravens *Corvus corax*, Peregrine Falcons *Falco peregrinus peale*i and river otters *Lutra canadensis* are all natural predators that breed on ELI and likely contribute to the predations we recorded. We found no evidence to suggest that raccoons were on the island this year.

Population trends
The number of Ancient Murrelet chicks departing the Limestone colony continues to decline (Fig. 2). This trend is consistent with the 2006 colony census that estimated ± (SE) 509 ± 132 breeding pairs compared to 1273 ± 254 in 1995 (see Moira Lemon paper Laskeek Bay Research:15). LBCS is very concerned about this downward population trend and we are hoping to gain a better understanding of what factors may be contributing to this decline. Census reports from neighbouring colonies indicate that the number of breeding birds at other sites is stable or increasing (see Moira Lemon paper Laskeek Bay Research: 15) so it appears that the issue is specific to ELI.

One factor that could explain this trend is predation. The rates of predation were very similar for 2006 and 1995 although the population had declined by more than 50% during that period, indicating that the rate of predation on the remaining birds was actually higher in 2006 than in 1995. (see Moira Lemon paper Laskeek Bay Research:15). Based on our predation transects we estimated that between 2007 and 2008 at least 479 adult Ancient Murrelets were depredated at the ELI colony. Early studies in Laskeek Bay show that birds killed by predators include a

[†] The 2007 predation estimate reported in 'Laskeek Bay Research:15' is different than what is reported here because in 2007 predation results were calculated by including not only feather piles and carcasses but also the number of wings found along transects. However, using both wings and carcasses as a measure to count individual birds could result in overestimating mortality associated with predation, considering that feather piles and wings could belong to the same bird. Including only feather piles (and not wings) is thought to be a more accurate estimate

proportionately higher number of prospecting birds than breeders (Laskeek Bay Research: 3). This makes it likely that predation is playing an important role in shaping the age structure at this small colony and reducing the recruitment of new breeders into the population.

Black Oystercatchers *Haematopus bachmani*

Occupancy and reproductive success

LBCS has been monitoring breeding activity of Black Oystercatchers in Laskeek Bay since 1992. Beginning in early June we regularly visit known breeding territories and scan for new active sites, looking for occupied nests to count and measure eggs and chicks. We survey from Cumshewa I. to the Lost Islands in Gwaii Haanas and in 2008 we found 36 sites occupied by adult birds. Of these, 19 were active with either eggs or chicks at some point in the season. There were ten sites with chicks for a total of 14 chicks, nine of which we banded.

In 2008 we again extended our surveys to include the northeast portion of Gwaii Haanas National Park Reserve and Haida Heritage Site (Gwaii Haanas). These surveys were initiated in 2004 and carried out for three consecutive years (2004-2006) to establish baseline data for the region. Surveys are now scheduled to be conducted every two years. As in previous years we visited BLOY breeding sites extending from the south end of Laskeek Bay through to Ramsay I. in Juan Perez Sound. We visited breeding sites in mid June (14 to 17 June) and again in early / mid July (9, and 12 to 14 July). We found 64 sites occupied by adult birds and of these, 58 were active with either eggs or chicks at some point in the season. There were 32 sites with chicks which produced a total of 46 chicks. Chick banding no longer takes place within Gwaii Haanas.

Birds that we banded in past years received a combination of bands including a uniquely numbered metal band and two colour bands that indicate either the year the bird was banded or the general area of the nest site from which the bird was caught. We always scan shorelines for banded adult birds because banding information gives us important information about the dispersal and life history of these birds. This season we re-sighted 14 banded birds (Table 3) one of which was banded as a chick in 1994, meaning it was 14 years old.

Table 3. Banded Black Oystercatchers re-sighted in Laskeek Bay in 2008.

Band Combination (left – right)	**Location seen / Nest site**	**Year Banded**	**Banded as Adult or Chick**
UB-BK/M	Reef I. / REE-1	2006	chick
W-DB/M	Reef I. / REE-1*	2006	chick
UB-M	Skedans I. / SKE-6	unknown	-
AL-BK/M	Skedans I. / SKE-6	2000	adult
UB-BK/M	South Low I. / SLW-1	2000	Chick or adult
UB-W/M	South Low I./ SLW-4	1994	chick
UB-R/M	South Low I./ SLW-5	2003 or 2004	chick
UB-OR/M	Lost I. / LOS-2	2004	chick
W-Y/M	Reef I., group of 8 birds		
UB-R/M	Reef I., group of 8 birds	2003 or 2004	chick
UB-M	Reef I., group of 8 birds	unknown	-
UB-M	Kingsway Rk., group of 12 birds	unknown	-
UB-M	Tar I. / EM-560-4-2	unknown	-
UB-Or/M	Ramsay Islets,	2004	chick

Band codes: UB = unbanded (birds can lose bands), BK = black, M = metal, W = white, AL = aluminum, R = red, OR = orange, Y = yellow.* seen after territory was abandoned.

Diet

Black Oystercatcher chicks feed on invertebrates, and the shell remains of their prey can be found within the breeding territory. We collected and counted invertebrate remains found at breeding sites to determine chick diet composition for nests located in Laskeek Bay. The average chick diet determined from five nest sites was comprised of 54% limpets, 17% mussels and 12% chitons. These results are similar to chick diet composition described in previous years (Fig.3).

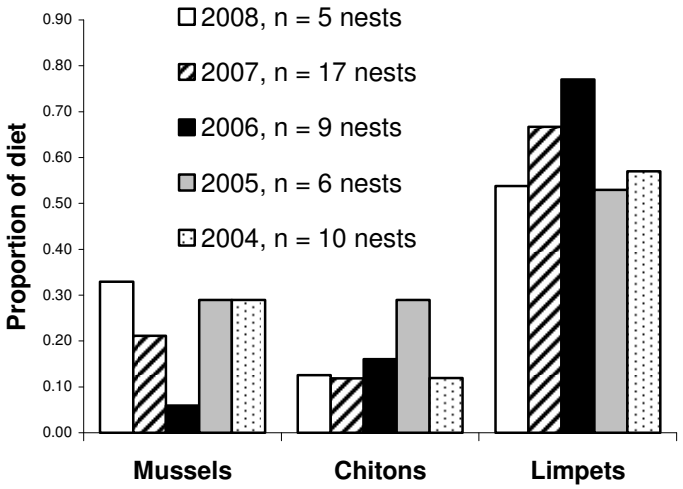

Figure 3. Invertebrate prey remains identified at Black Oystercatcher nest sites in Laskeek Bay, 2004 to 2008.

Glaucous-winged Gulls *Larus glaucescens*

LBCS has been censusing gull colonies in Laskeek Bay since 1992. Between 22 and 29 June we counted the number of active nests (containing either eggs or chicks) on islands in Laskeek Bay, where Glaucous-winged gulls have historically nested. As in previous years, Lost Is. supported the largest number of breeding pairs with 236 active nests, followed by Kingsway with 47 active nests. We counted six nests at Low I. and one nest at Skedans Is. All together 290 nests were found in Laskeek Bay. This is above the average of (± SD) 255.2 ± 72.5 nests counted across all years.

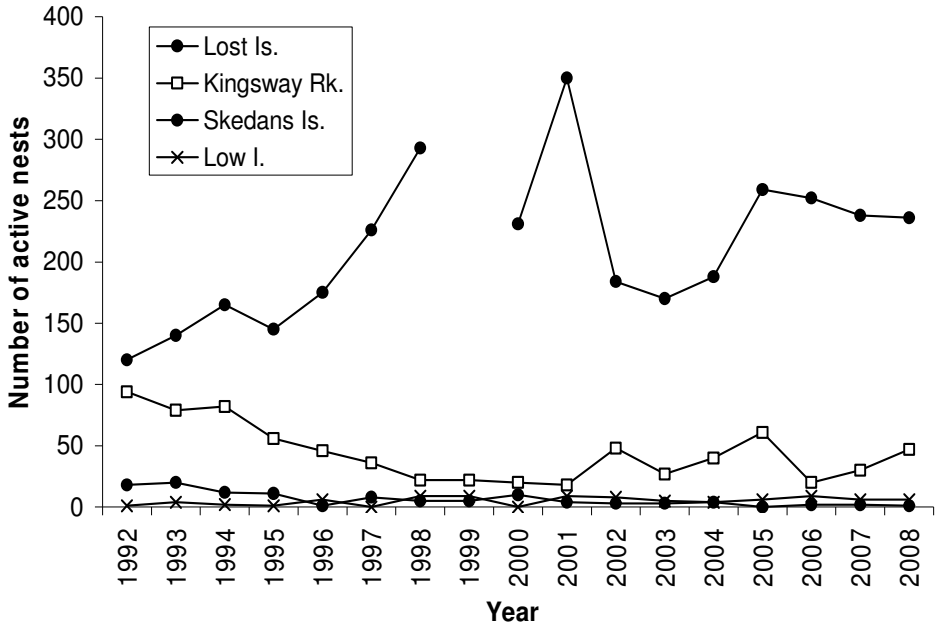

Figure 4. Number of active Glaucous-winged Gull nests (containing chicks or eggs) at four colonies located in Laskeek Bay, 1992 to 2008.

Pigeon Guillemots *Cepphus columba*

Ten wooden Pigeon Guillemot nest boxes were set up at Lookout Point on ELI in 2001, and at the end of each season we check their contents to determine occupancy rates, to measure eggs and to band chicks. This year seven of the nest boxes were occupied (Fig 5.), five contained chicks (total: seven chicks banded), and 2 contained eggs (total: three eggs measured).

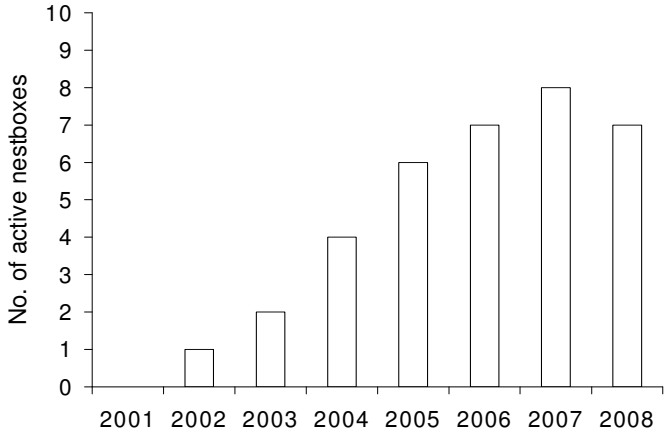

Figure 5. Number of active Pigeon Guillemot nest boxes (containing either chicks or eggs) at East Limestone, 2001 to 2008.

Cassin's Auklets and Fork-tailed Storm Petrels

Ptychoramphus aleuticus and *Oceanodroma furcata*

Cassin's Auklets and Fork-tailed Storm Petrels are burrow-nesting seabirds that visit their breeding colonies at night. Small populations of both species have historically nested on ELI, but the number of breeding pairs has fluctuated across years, in part due to predation by introduced raccoons. LBCS is interested in the status of the breeding populations of these birds on ELI and each year we attempt to obtain some index of breeding effort on the island.

We monitored Cassin's Auklet breeding activity at two sites on ELI in 2008 including the East Coast plots and the Lookout Pt. We conducted regular checks for knockdowns at burrow and nest box entrances in an effort to identify which cavities were being used regularly. At the East Coast plots (north and south) we monitored 24 natural burrows in addition to 44 nest boxes that were installed in 2007, plus 2 older boxes that were already in place. At the Lookout Pt. area we monitored 25 nest boxes that were installed last year. Typically it takes several years before seabirds will nest in new nest boxes and this year none of our nest boxes were active. Out of the 24 natural burrows that we checked regularly, 18 had knockdown activity at least twice during the season and most burrows contained tell-tale signs of breeding activity such as fresh droppings or feathers at the entrance.

Early in the season we counted 53 active burrows on Cassin's Tower, likely occupied by Cassin's Auklets or Fork-tailed Storm Petrels. After that, however, we did not conduct any regular visits to these burrows in an attempt to reduce our disturbance to the Bald Eagles nesting there.

Storm petrel activity on ELI appears to be on the increase. Birds were heard almost every night during Ancient Murrelet chick work and there was notably more activity in Cabin Cove than in previous years.

At-Sea Surveys

To examine the abundance and distribution of marine birds and mammals in Laskeek Bay we conduct regular boat surveys that follow a series of 100m wide strip transects. Unfortunately, rough boating conditions in 2008 limited us to only two nearshore surveys and one Hecate Strait survey.

Nearshore surveys

The primary aim of these surveys is to record the locations of Marbled Murrelet *Brachyramphus marmoratus* because they are red listed by the province and designated threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). The peak number of Marbled Murrelets that we counted was 164 on 29 June. Numbers of Marbled Murrelets seemed to increase across the season, apparently peaking in July when, unfortunately, we were not able to complete a survey. Marbled Murrelets were especially numerous in Breaker Bay. Apart from Marbled Murrelets we counted ten other bird species including Pigeon Guillemots, Pelagic Cormorants *Phalacrocorax pelagicus*, Pacific Loons *Gavia pacifica*, Rhinoceros Auklets *Cerorhinca monocerata*, Harlequin Ducks *Histrionicus histrionicus*, Black Oystercatchers, Ancient Murrelets, Glaucous-winged Gulls, Long-tailed Ducks *Clangula hyemalis* and White-winged Scoters *Melanitta fusca*.

Hecate Strait surveys

We require especially calm conditions to conduct offshore surveys, which take us several miles out into the Hecate Strait. This survey provides an opportunity to spot species that are typically pelagic and consequently less often seen near the coast. During our sole trip into the Hecate Strait this season we spotted six different species of birds including Sooty Shearwaters *Puffinus griseus*, Cassin's Auklets, Rhinoceros Auklets, Common Murres *Uria aalge*, Ancient Murrelets and Black Turnstones *Arenaria melanocephala.*

Marine Mammals

Each day we record all marine mammal sightings (Table 4) that result from sea watches, sea surveys or opportunistic encounters. We did not report very many different types of marine mammals this year, compared to the last five years (Table 4). This may be explained by consistently rough sea conditions throughout the field season that may have reduced the chance of sightings.

Table 4. Total counts of marine mammals reported by ELI crew from sea surveys, sea watches and opportunistic encounters, 2004 to 2008†.

Species (common name)	***Scientific name***	***2008***	***2007***	***2006***	***2005***	***2004***
Dall's porpoise	*Phocoenoides dalli*	0	0	0	1	0
Northern elephant seal	*Mirounga angustirostris*	0	0	0	0	0
Fin whale	*Balaenoptera physalis*	0	0	0	0	0
Grey whale	*Eschrichtius robustus*	0	0	1	1	1
Harbour porpoise	*Phocoena phocoena*	0	1	4	3	12
Humpback whale	*Megaptera novaeangliae*	261	203	91	15	19
Killer whale	*Orcinus orca*	18	26	4	11	13
Minke whale	*Balaenoptera acutorostrata*	1	3	1	0	2
Pacific white-sided dolphin	*Lagenorhynchus obliquidens*	0	81	365	8	0
California sea lion	*Zalophus californianus*	0	4	0	1	1

†Harbour seal *Phoca vitulina* and Steller sea lion *Eumetopias jubatus* sightings are not reported here.

Humpback whales

This season marks an all time high in terms of the number of humpbacks recorded in Laskeek Bay compared to the previous five years (Table 4). As in 2007, the month of May brought daily reports of humpbacks, and during one sea watch from Lookout Pt we counted 63 individuals. Most days whales could be heard blowing, tail lobbing and even vocalizing as they fed.

Killer whales

We encountered Killer whales three times this season and each time we followed the groups to take photos of dorsal fins and saddle patches for individual ID. Graeme Ellis at the Pacific Biological Station in Nanaimo has compared our photos to their catalog of known animals and reports back that on 7 June we encountered five transients: T146, T146A, T146B, T146C, and a new calf T146D. On 8 July we encountered another five transients T002B, T060, T060C, T060D, and a new calf T060E. This group was later joined or at least followed by another three Killer whales: T070, T118 and possibly T121A. On 12 July we ran in to the same transients T002B, T060, T060C, T060D, T060E. Through these positive identifications we are helping to build a better understanding of killer whale biology including life history and animal movement.

Steller's sea lions

We regularly count sea lions that haul out at both Reef I. and Skedans Is. This year the earliest visit to the haulouts was 17 May, when we recorded the maximum numbers of individuals at both haul-outs, with 537 animals at Reef Is. and 98 at Skedans Is. Typically our highest counts occur during the early part of our field season (April or May).

Researchers in Alaska sometimes brand Steller's sea lions to mark individuals for identification. This year we spotted one branded individual: F1229 on 29 June located at the Skedans haul-out. This same sea lion was spotted at Reef Is. in 2000.

Wildlife Trees

Cavity nesting birds rely on dead, standing trees for breeding sites and this year on Limestone we located fourteen snags that contained fifteen nests. Four of these were used for the first time this year. We found fourteen trees with nests: one with Brown Creeper *Certhia americana*, two with Hairy Woodpecker *Dendrocopus villosus*, two with Chestnut-backed Chickadee *Poecile rufescens* and ten with Red-breasted Sapsucker *Sphyrapicus rubra* nests (Table 5). One tree (#107) contained two nests, one occupied by a pair of Chestnut-backed Chickadees and the other by Red-breasted Sapsuckers.

Table 5. Wildlife tree activity on East Limestone Island in 2008.[†]

Tree #	Cavity Nester	Tree Species	Fledge Date
17	RBSA	Ss	18-June
33	RBSA	Ss	20-June
45	RBSA	Ss	11-June
113	RBSA	Hw	18-June
112	RBSA	Hw	18-June
72	RBSA	Ss	20-June
111	RBSA	Hw	18-June
86	RBSA	Hw	14-June
118	RBSA	Ss	22-June
107	RBSA	Ss	14-June
107	CBCH	Ss	18-June
120	CBCH	Ss	18-June
119	BRCR	Cedar	18-June
117	HAWO	Ss	06-June
103	HAWO	Hw	18-June

[†]RBSA = Red-breasted Sapsucker, CBCH = Chestnut-backed Chickadee, NOFL = Northern Flicker, HAWO = Hairy Woodpecker, BRCR = Brown Creeper, Ss = Sitka spruce, Hw = Western hemlock

LBCS first started monitoring cavity nesters in 1990, on a fairly opportunistic basis. Since 1995 the crew has been collecting data more systematically and putting a concerted effort towards locating all active trees each season. This long-term data set offers information about tree use across years and allows us to determine how often particular snags are used by cavity nesters. For example, our three 'oldest' trees that were active this season were first recorded as active in 1993, 1995 and 1996 respectively (Table 6). Each of these trees has been home to at least three different bird species over the years (Table 6), highlighting the importance of these snags as breeding habitat for a variety of bird species.

Table 6. History of cavity nesting activity by bird species† at wildlife trees #17, #33 and #45 on East Limestone Island.

	Wildlife Tree #		
Year	**17**	**33**	**45**
1993	RBSA		
1994			
1995		RBSA	
1996	RBSA	RBSA	RBSA
1997	CBCH	RBSA	
1998		NOFL	
1999	RBSA	RBSA & HAWO	
2000	RBSA	RBSA	RBSA
2001		RBSA	RBSA
2002	RBSA		RBSA
2003	RBSA		RBSA
2004	RBSA	RBSA	RBNU
2005	RBSA		CBCH
2006	NOFL		RBSA
2007			RBSA
2008	RBSA	RBSA	RBSA

†RBSA = Red-breasted Sapsucker, CBCH = Chestnut-backed Chickadee, NOFL = Northern Flicker, HAWO = Hairy Woodpecker

NATURAL HISTORY

Daily Bird Checklist

Throughout the field season we keep a daily record of all birds heard or seen. This season we noted 58 different species with peak counts of 35 species recorded on 17 May and 11 July. Among the less common species reported were Red-necked Grebe *Podiceps grisegena*, Sooty Shearwater, Red-breasted Merganser *Mergus serrator*, Whimbrel *Numenius phaeopus*, Northern Flicker, Western Sandpiper *Calidris mauri* and Short-billed Dowitcher *Limnodromus griseus.*

Birds of Prey

In 2008 ELI supported successful nests belonging to Common Ravens, Northwestern Crows *Corvus caurinus*, Bald Eagles and, we suspect, Peregrine Falcons.

Common Ravens nested in the same tree as last year and by 31 May at least two chicks were thought to have fledged from this nest. A good view of the nest was nearly impossible because it was located high up, among dense branches.

Northwestern Crows were not discovered nesting, however two young fledglings were spotted in late June on the SW side of the island. We suspect that the nest was located somewhere along the Ridge Trail area, not necessarily visible because of the cliffs.

Bald Eagles were back up on Cassin's Tower this season (BAEA nest #5). On 25 May we spotted two downy chicks in the nest and by July 11 the two young birds were feathering in and looking healthy.

Peregrine Falcons were heard and seen regularly throughout the field season, almost exclusively near the cliffs on the SW side of ELI. We suspect the birds were breeding at this traditional eyrie site but we were unable to locate their nest among the dense vegetation.

Plants

Flowering plants on ELI are restricted to areas where browsing deer cannot reach them. Throughout the field season we keep a lookout for first bloom dates of the various wildflowers on the island. We also try to keep track of the rare plant species that occur on ELI, the presence of which is attributed to the limestone substrate that is relatively uncommon in the archipelago. This year we were especially excited to find blooming plants of Showy-Jacob's ladder *Polemonium pulcherrimum* and Menzies' Pipsissewa *Chimaphila menziesii*. These two rare plant species are known to occur on ELI, but they have not necessarily been located each year.

River Otters

In most years the ELI crew has reported regular sightings of river otters on the island. This year was no different and reports of single adult otters were relatively common. On 25 June however, Jake and Jen spotted seven adults cruising the SW side of the island and a juvenile otter could be heard nearby. To our knowledge seven is the largest number of adult otters noted on the island at any one time.

Introduced Species

Sitka Black-tailed Deer *Odocoileus hemionus*

Humans introduced deer to Haida Gwaii in 1878 to provide a new source of food. Because deer have virtually no predators in the archipelago their population is robust and their subsequent browsing pressure is having significant effects on the local vegetation, effectively altering the forest community (see: http://www.rgisbc.com – Research Group on Introduced Species). We are able to illustrate this effect to people by maintaining the three 20m x 20m deer exclosures present on ELI. Inside the exclosures we find plants that otherwise are consumed by deer and are mostly absent from the forest understory outside the exclosures, including cedar, sword fern, young huckleberry, salal, salmonberry and lady fern. Deer have reached almost all of the islands in the archipelago and can travel relatively easily by swimming. This season we watched three deer make their way from neighbouring Louise I. to ELI.

Raccoons *Procyon lotor*

Raccoons were introduced to Haida Gwaii in the early 1940s to provide a supply of furs for trappers. Today, raccoons are considered one of the principal threats to ground-nesting birds in Haida Gwaii. Raccoons prey on seabird adults, chicks and eggs. Nesting seabirds are particularly vulnerable to raccoons because most have evolved without mammalian predators and subsequently have no natural defense.

Conservation officers visited the ELI area in March to look for raccoons on the Limestone Islands and adjacent areas on nearby Louise Island. Several raccoons were shot in this visit on the shores of Louise Island., but none were observed on ELI. It is critical that these early efforts to control raccoons are continued, as Ancient Murrelets first arrive at their breeding colonies in March and

by the time the ELI crew arrives in late April or early May, raccoons present on the island would likely already have seriously impacted the colony.

Throughout the Ancient Murrelet breeding season we survey ELI by foot to look for signs of raccoon activity. When tides and weather permit we also conduct nighttime boat surveys around the East and West Limestone coastlines, extending to the shore on opposite Louise I. This year we completed one boat survey on 30 May and saw 5 raccoons on the shore of Louise Island, but none on ELI. There was no compelling evidence to suggest that raccoons were active on Limestone this season. Dug up burrows were found throughout the season, but this type of behaviour is not necessarily evidence of raccoon presence and we suspect that river otters and perhaps even ravens may be responsible.

Red Squirrels *Sciurus vulgaris*
Squirrels were introduced to Haida Gwaii in 1950, possibly to facilitate cone gathering for spruce seed for the forestry industry, and may have been introduced directly to ELI at that time. Squirrels have known negative effects on terrestrial birds and consume eggs and nestlings (see: http://www.rgisbc.com – Research Group on Introduced Species). In 2007 we re-instated squirrel surveys on ELI to measure the annual abundance of squirrels on the island. We are interested in describing annual fluctuations in squirrel populations on ELI, which may help us to understand direct and indirect consequences of this introduced species.

CONCLUSIONS

This year marked LBCS' 19th season on ELI and was a success thanks to the dedication of our directors, staff, volunteers and visiting groups. We leave the season with ongoing concerns about the decline in the number of Ancient Murrelets breeding on ELI and with questions regarding what factors are contributing to this decline. Predation could explain the downward population trend underway on ELI, although it is not clear what role each predator group plays. Ancient Murrelets are preyed on by nesting birds of prey and river otters and it is possible that the raccoon predation in previous years may be having lasting effects. We have not ruled out the possibility that our monitoring practices may affect breeding birds. We have implemented changes in our programs to reduce this possibility and we will continue to weigh our decisions carefully between protecting the birds and carrying on with our long-term studies. It is important to note, however, that the human presence on ELI is likely the sole defense that this small breeding population has against predation by introduced raccoons.

As far as our other monitoring programs, 2008 marked a very successful year in which we continued to build on our long-term data sets, establish baselines and describe annual trends. The work we carry out is important to improving knowledge of wildlife in the area and to promoting environmental education and conservation.

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