

EAST LIMESTONE ISLAND FIELD STATION: REPORT ON THE 2007 FIELD SEASON

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Photo courtesy of Jen Rock, LBCS

SUMMARY

Our 18th field season brought 27 volunteers and thirteen visiting groups to Limestone Island. In response to the Ancient Murrelet population decline at Limestone we limited our monitoring activities to conducting chick work at Cabin Cove and we did not carry out any banding. Between 15 May and 14 June we weighed all 166 chicks that passed our four funnels. Breeding season was late this year, with 2007 marking the latest start and peak dates for chick departures on Limestone since 1990. The chick total from funnels 5 to 8 marked a 15% decrease from last year's number and comparing totals from funnel 5 and 6 across years, 2007 produced the fewest chicks since 1990. A raccoon was present on the island throughout the breeding season and it was responsible for excavating burrows, preying on eggs, chicks and adults. Raccoon predation could explain the decline in numbers that we observed this year although it is not clear whether additional factors are contributing to the population decline. Despite continuous efforts to capture the raccoon it was not removed until 20 June. This experience has highlighted the need for LBCS to adopt an early detection approach for raccoons, ideally starting before birds arrive at the colony.

We identified 36 Black Oystercatcher breeding territories in Laskeek Bay, 29 of which produced eggs or chicks. Based on 1358 prey remains that we collected at 17 different territories, chick diets contained three types of invertebrates: 67% limpets, 21% mussels and 12% chitons. A Glaucous-winged gull colony census revealed a total of 276 nests in Laskeek Bay with 86% counted at the Lost I. Pigeon Guillemot nest boxes located at Lookout Point on Limestone had the highest occupancy rate to date with eight out of ten boxes containing chicks or eggs. We installed 64 Cassin's Auklet nest boxes at three different sites on Limestone. This year was a productive year for marine mammal encounters with frequent sightings of Humpback whales (203 sightings), successful ID photos taken of Orcas and a few reports of California Sea Lions in the area. We identified 13 active wildlife trees containing 14 nests belonging to three species of cavity nesting birds including Red-breasted Sapsuckers, Chestnut-backed Chickadees and Hairy Woodpeckers. It was another busy year on Limestone!

EDUCATION AND INTERPRETATION PROGRAM

Changes in 2007

The Ancient Murrelet program on Limestone underwent some major changes in 2007 and this has in turn affected the education and interpretation program. As of this season, chick capture work at North Cove funnels was terminated. Night visits by students now take place at the cabin funnels and maximum group size has been reduced to 10. Following night work, groups now spend the remainder of the night in the visitor interpretation centre, instead of walking across the island at night, as was done in the past. As well, night time visits by tour boats are being phased out this year in a move to further reduce the impact of night work within the colony.

Project Limestone

This was the 18th year of Project Limestone, a program that brings local students to the island to participate in Ancient Murrelet work. An afternoon interpretive tour (usually lasting 1-2 hours), introduces the students to the island and provides them with an overview of our research and activities. The group then assists in capturing Ancient Murrelet chicks at night, typically from 10:30 pm to 2:30 am. Due to the new location this year there were fewer opportunities for students to capture and handle chicks. However, they were still thrilled with the experience and gave very positive feedback. Smaller group sizes meant that the students had more opportunity to interact with staff and ask questions. The students love being able to participate and it is common for students to return several years in a row. So despite changes, this continues to be a very important and powerful experience for the students, as it makes them more aware and appreciative of the environment in which they live.

This season saw a total of 10 groups of students visit the island representing 5 different schools. The number of students participating continues to increase, 66 (19 teachers/ chaperones) this season as compared to 50 (13) in 2006. This reflects the continuing popularity of the program as well as the reduced group size and the reduction in night-time visits by tour boats. Four local schools visited the island this year: GM Dawson Secondary School, 11 May; Living and Learning School, 20 & 21 May; Queen Charlotte Secondary School, 23-25 May; and Agnes L. Mathers School, 28 & 29 May. Northwest Community College (Prince Rupert) also visited for the first time this year as part of their coastal ecology course. They brought 2 groups on island, 15 & 16 May. A total of 473 students have now participated in the program since it started in 1991.

Volunteers

From the beginning, LBCS has been committed to having volunteers in camp working alongside field staff, and this is an integral part of the operation of the field camp. In this way, members of the public have the unique opportunity of working in a field camp and participating in a variety of research projects on and around Limestone Island. This is one of the few places in the province where the public are invited to be a part of research. Their generous contribution of time and energy each season continues to be invaluable to operations on the island.

A total of 27 volunteers visited the island this year, contributing 237 volunteer days to various projects throughout the season. Of these volunteers, six had been on the island in previous years, and 21 were new to the island. LBCS director Keith Moore and executive director Lisa McKnight-Yeates

both visited on two separate occasions. Eleven volunteers were on island for less than a week, eight for one week, seven for two weeks and one for three weeks. As in past years, volunteers hailed from diverse places: ten were from Haida Gwaii, eight from other areas of BC and the remainder from Saskatchewan, Ontario, Washington, France and Hawaii.

Visitors

The visitor program on Limestone provides opportunities for tour groups to stop on the island and learn about our research. As with student groups, this is an activity provided by the society at no cost, with the aim of raising public awareness and interest in local conservation issues on the island. Most guests are not local and are very excited to learn about the island's ecosystem, and the Ancient Murrelets in particular.

Although night time visits by tour groups have been phased out this season, groups are still being welcomed for day-time interpretive tours, and in total 36 guests from two vessels visited the island this year: *S/v Island Roamer* stopped on two separate occasions (17 & 31 of May), and *s/v Island*

Odyssey on one occasion (22 May). One group (4 guests) was allowed to participate in night-work (17 May), by prior arrangement. As well, a group from Langara College (7 students, 1 teacher) was given a tour of the island on 8 June.

The camp on nearby Reef Island was very active this year (30 March to 21 June). Both Tony Gaston (Environment Canada) and Jean-Louis Martin (Research Group on Introduced Species) were on the island, along with Akiko Shoji, Jennifer Provencher, Thibaut Vergoz, Tim Lash, Sophia Colantino, Steve Stockton and others. Thibaut also spent three weeks as a volunteer on Limestone Island (23 June to 13 July).

Staff

This year's field staff comprised Jen Rock (camp supervisor / biologist) and Jake Pattison (assistant biologist / interpreter). The field season on Limestone Island spanned 11 weeks, from 28 April to 13 July, a total of 76 days. At the office in Queen Charlotte, Lisa McKnight-Yeates has replaced Greg Martin as LBCS executive director in 2007.

RESEARCH AND MONITORING PROGRAMS

Ancient Murrelets *Synthliboramphus antiquus*

Monitoring activities

In response to the declining in Ancient Murrelet population on Limestone Island, in 2007 LBCS adopted further measures to reduce the potential for negative interactions between birds and our research activities. In the fall of 2006 researchers and directors decided that a series of precautionary measures be adopted including:

- There would continue to be no adult capture work or burrow monitoring

at East Limestone (this marks a 4th consecutive year).

- All disturbances to the North Cove area during the Ancient Murrelet breeding season would be eliminated (ie. off-limits to all, for any activity).
- Night-time visits by tour boats would be terminated.
- Visiting school groups would now visit the Cabin Cove area and further measures to reduce use of lights in the colony at night would be adopted.

- Predation transects would be reinstated (to monitor predation pressure on Ancient Murrelets).

Through these changes LBCS hopes to minimize our impact on the breeding colony and to gain insights in to what factors are causing the Ancient Murrelet population decline on Limestone.

Recaptures

Although there was no directed effort to capture adults, individuals that we opportunistically come across (ie: that fly in to staff or are sitting on the trails) are checked for bands. This year we encountered four adults previously banded on Limestone: three were banded as adults (1999, 2000, 2002) and one was banded as a chick (2006).

Researchers at neighbouring Reef Island conducted adult capture work this season. Among their recaptured birds was one banded as an adult in 1987, meaning that this bird was at least 22 years old, the oldest Ancient Murrelet known to date. They also captured two birds originally banded on Limestone Island, both as chicks, one in 1996, the other in 2002.

Band recoveries

Because predation is a fact of life at seabird colonies we are always on the lookout for banded legs among the remains of dead Ancient Murrelets that we come across. This year we recovered five bands from birds that were originally banded on Limestone: three birds were banded as adults (one in 2002, two in 2003) and two were banded as chicks (2004, 2005).

Recapture data and band recoveries can teach us about the life history of species: for example, how long these birds live and whether they return to their natal colony to breed. This type of information is key to understanding the dynamics of breeding

populations and in turn, helps researchers identify measures that will effectively protect them.

Chick capture work

Each night from 7 May to 14 June we monitored Ancient Murrelet chicks arriving at four funnels (funnels 5 to 8) located at Cabin Cove. Following the usual protocol we closed funnels between 22.30h and 02.30h and after 19 May we pushed the start time back to 23.00h to take account of longer daylight hours. Chicks first arrived at our funnels on 15 May and funnel work continued until the first two consecutive nights when no chicks arrived at any of the four funnels (Fig. 1).

We weighed all 166 chicks that passed through our funnels and seven chicks caught after 02.30h or outside of the funnels (Table 1). The distribution of chick departures this season was different from most previous years, which typically showed a distinct, single peak surrounded by a shoulder period on either side. In contrast, this year's chick activity came in two waves of departures (Fig. 1). The 2007 chick total from funnels 5 to 8 was 15% less than last year's total of 197 chicks (Table 1).

Trends in chick departures across years from funnels 5 and 6 (funnels 7 and 8 were new in 2006) show that this year's total was the lowest since 1990 (Fig.2). Compared to last season, there were 31% fewer chicks at funnels 5 and 6 (Table 2).

The timing of chick departures in 2007 indicated a generally late breeding season with later than average dates for first departure and peak count (Table 2). Concurrent research at Reef showed that the timing of breeding for Ancient Murrelets at that colony was also late this year, indicating that this behaviour was not particular to Limestone birds.

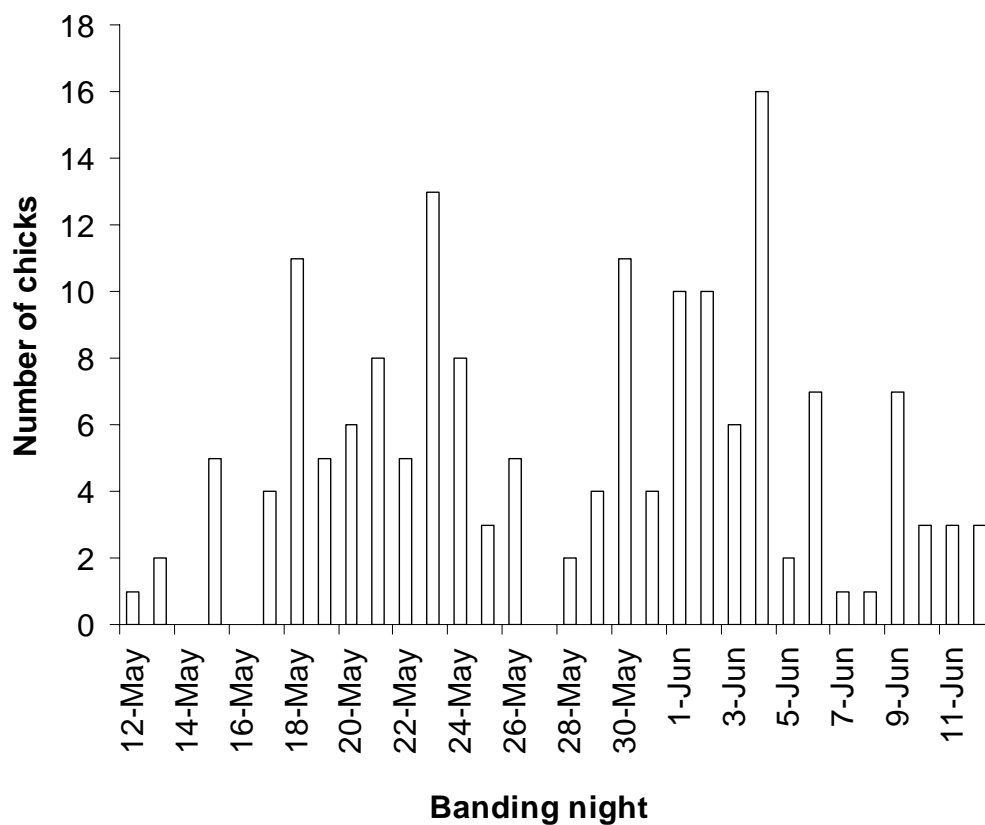


Figure 1
 Number of chicks per night caught at funnels 5 to 8 on Limestone Island, 12 May to 12 June 2007

Table 1
 Summary of chick departures, peak nights and totals from Cabin Cove funnels 5 to 8 on Limestone Island 2006 to 2007

Year	Opening night	First night with chicks	Last night	Peak night	Peak count	Total days	Total chicks
2006	5-May	10-May	30-May	21-May	24	21	197
2007	7-May	15-May	12-Jun	4-June	16	29	166

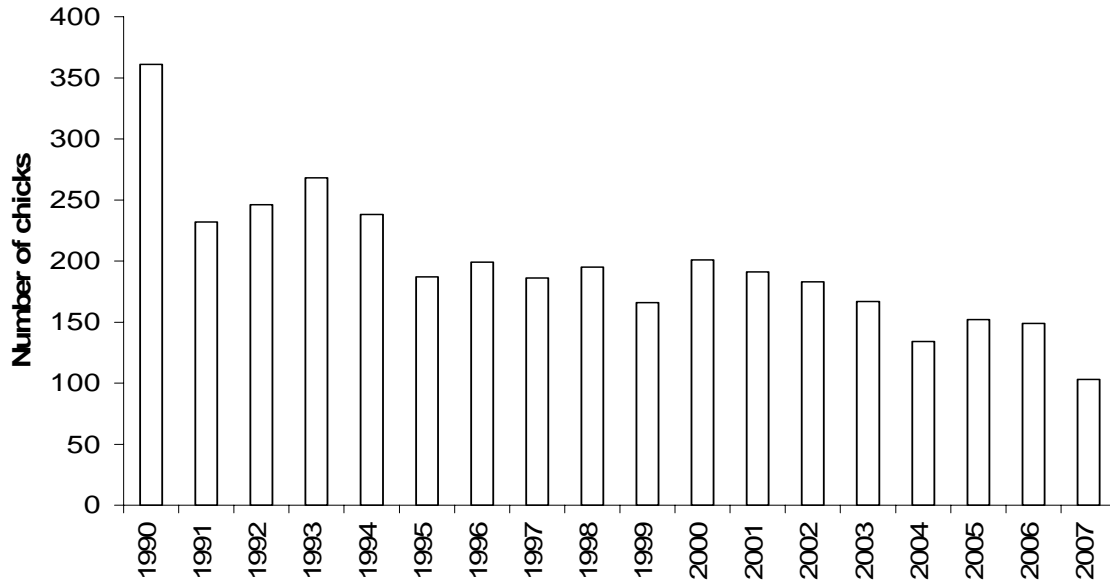


Figure 2
Total number of Ancient Murrelet chicks caught at funnels 5 and 6 on Limestone Island from 1990 to 2007

Gathering Grounds

Before coming in to the colony at night Ancient Murrelets congregate at a site just west of Low Island, known as the ‘gathering grounds’. From 30 April to 20 June, we conducted five minute counts of birds on the gathering grounds approximately two hours before sunset. The peak count was 239 birds on 14 May. Poor weather conditions prevented counts on 15 days and an additional five days were missed because of reduced visibility or because the crew was absent during gathering ground hours.

Point Counts

At 2.30h we carried out point counts to determine the number of birds heard calling and the number of calls made over a single, five minute period. We conducted point counts from 21 May to 2 June at a site located behind the cabin. The maximum number of birds heard calling was eight individuals on 9 May and the maximum number of calls heard was 79 calls on 6 June. By conducting both gathering ground counts and point counts we hope to examine

whether these measures can be used to monitor colony attendance.

Squirrel Surveys

Squirrels were introduced to Haida Gwaii by the BC Forest Service in the late 1940s as a means to facilitate cone gathering for the forestry industry. The introduction these non-native species has negatively impacted Haida Gwaii’s ecosystem both directly and indirectly (<http://www.rgisbc.com/squirrel.htm>).

However, the consequences of squirrel introduction are only partially understood and the interactions between introduced squirrels and burrow nesting birds have yet to be explored.

Because of the declining Ancient Murrelet population at Limestone we are interested in examining potential interactions between squirrels and burrow nesting birds. This year we re-instated squirrel surveys to monitor squirrel population changes across years and thus provide a baseline from which to evaluate the relationship between seabirds and non-native squirrels.

Table 2
Summary of chick departures, peak nights and totals from funnels 5 and 6 on Limestone Island 1990 to 2007

Year	Opening night	First night with chicks	Last night [†]	Peak night	Peak count	Total days	Total chicks
1990	12-May	13-May	15-Jun	20-May	28	33	361
1991	08-May	10-May	05-Jun	25-May	22	26	232
1992	12-May	14-May	02-Jun	22-May	29	19	246
1993	09-May	12-May	04-Jun	18-May	39	23	268
1994	07-May	08-May	06-Jun	20-May	29	29	238
1995	07-May	11-May	12-Jun	23-May	18	32	187
1996	10-May	11-May	07-Jun	18-May	17	27	199
1997	08-May	13-May	05-Jun	28-May	22	23	186
1998	07-May	11-May	20-Jun	20-May	23	40	195
1999	09-May	11-May	09-Jun	21-May	22	29	166
2000	11-May	11-May	06-Jun	21-May	22	26	201
2001	08-May	11-May	15-Jun	19-May	21	35	191
2002	07-May	09-May	01-Jun	21-May	33	23	183
2003	10-May	11-May	03-Jun	21-May	19	23	167
2004	08-May	08-May	01-Jun	16,17-May	15	24	134
2005	07-May	07-May	05-Jun	19,23-May	12	29	152
2006	05-May	10-May	31-May	21-May	20	21	149
2007	07-May	15-May	12-Jun	04-Jun	16	28	103
Average (± SD)	8-May ± 2d	10 May ± 2d	7-Jun ± 6d	22 May ± 4d	23 ± 7 chicks	27 ± 5 chicks	198 ± 58 chicks

[†]Last night of chick work was determined differently depending on year. From 1990 to 2006 the date of 'last night' was determined by the first night when no chicks arrived at funnels 1 to 6. In 2007 the date of 'last night' was determined by the first two consecutive nights with no chicks at funnels 5 to 8.

Predation Transects

Last years population census of the Ancient Murrelet colony revealed that although the number of occupied burrows on Limestone had declined over time, predation levels (measured concurrently) had not decreased. These data suggest that predation on Ancient Murrelets may be an important factor contributing to the population decline at Limestone and in response to this, predation transects were reinstated in order to measure and examine changes in predation pressure across years (last surveyed in 1995).

Once per week, during the Ancient Murrelet breeding season we counted the number of carcasses, feather piles, wings, and dug-up burrows located along five, 20m wide transects. Counts were started at first light in order to find any evidence of predation before scavengers altered or removed evidence.

On our second survey, on 19 May, we found a handful of dug-up burrows and six headless adult Ancient Murrelet carcasses located in two separate areas. River otters *Lutra canadensis* that live on Limestone will depredate adult birds and may dig up

burrows. However, previous experience with raccoons *Procyon lotor* at this colony suggested that the decapitated and otherwise intact state of the murrelets indicated that a raccoon was responsible. Despite concerted efforts to locate and remove the raccoon from the colony, it was not until 20 June that the raccoon was caught, after the majority of Ancient Murrelets had left the colony.

Black Oystercatchers *Haematopus bachmani*

Occupancy and Reproductive Success

LBCS has been monitoring Black Oystercatcher breeding activity in Laskeek Bay since 1992. Each season we search coastal areas extending from Cumshewa Island to the Lost Islands in Gwaii Haanas National Park/ Haida Heritage Site to

identify breeding pairs and to measure eggs and chicks. This year we identified 36 territories that were occupied by pairs and 29 of these sites were active with eggs or chicks at some point of the season. We banded 14 chicks from nine breeding territories: eight at Reef Island, five at Kingsway Rock and one at Low Island. Banded chicks received a uniquely numbered metal band in addition to a colour band combination that indicated where chicks were banded (ie: Laskeek Bay) and the year they were banded. In 2007 we re-sighted 12 banded birds, ten of which occupied breeding territories that we were monitoring and two were spotted among groups of birds loafing on islands in Laskeek Bay (Table 3).

Table 3
Banded Black Oystercatchers re-sighted in Laskeek Bay 2007

Band Combination*	Location seen (Territory site)	Year Banded	Banded as Adult or Chick
AL – BK / M	Reef I. (REE-1)	2000	adult
UB – R / M	Reef I. (REE-2)	2003 or 2004	chick
UB – BK / M	Reef I. (REE-2)	2000	unknown
UB - M	Low I. (LOW-3)	unknown	unknown
W- R/M	E. Limestone I. (ELI-2)	2003	chick
W-M	Skedans I. (SKE-6)	unknown	unknown
W-BK/M	Skedans I. (SKE-6)	2000	chick
UB-BK / M	S. Low (SLW-1)	2000	unknown
UB – W	S. Low (SLW-8)	1994	chick
UB- M	Kingsway Rk. (KNG-3)	unknown	unknown
UB – DB / M	W. Limestone I.	2006	chick
UB – R / M	Islet off Louise, SW of Skedans Village	2003 or 2004	chick

W = white, M = metal, BK = black, R = red, DB = dark blue, UB = unbanded.

Diet

For a fourth consecutive year we collected information on Black Oystercatcher chick diets. Adults provision chicks with marine invertebrates at the breeding territory until the chicks fledge (approx. 40 d.) making it possible to infer chick diet composition

based on prey remains recovered at the breeding territory.

We collected 1358 prey remains from 17 nest sites [mean number of prey (\pm) SD per territory = 79.9 \pm 49.5] that we later identified and measured. Based on the mean

proportion of prey remains collected from each breeding territory, limpets were the

most common type of prey fed to chicks followed by mussels and chitons (Figure 3).

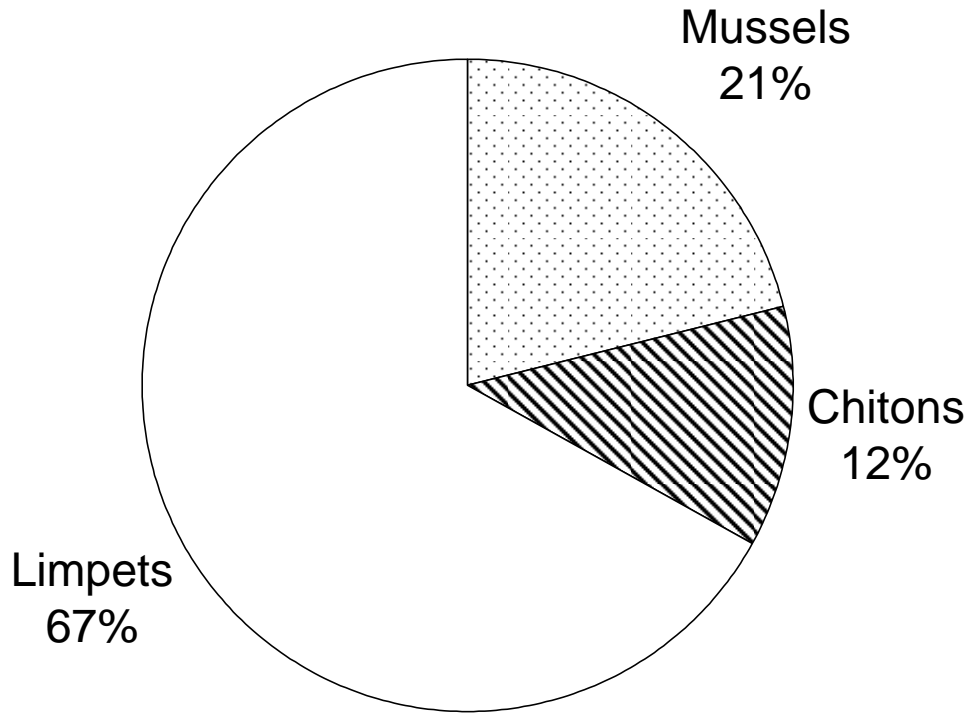


Figure 3
Average composition of Black Oystercatcher chick diets determined from prey remains collected at nest sites in Laskeek Bay (n = 1358 prey from 17 nests)

Glaucous-winged Gulls *Larus glaucescens*

Glaucous-winged Gull colonies in Laskeek Bay have been censused since 1992. Between 14 and 19 June we counted the number of adults, nests and eggs at Kingsway Rock, Lost I., Low I., Skedans I. and Cumshewa I. As usual the largest colony was Lost I. with 238 active nests

followed by Kingsway Rock with 30 nests. We counted two breeding pairs at Skedans I., six at Low I., and zero at Cumshewa I. (Fig. 4). Overall, the total number of nests counted in Laskeek Bay this year (N = 276 nests) was consistent with the average counted across years [mean number of nests (\pm) SD per year = 253 \pm 74].

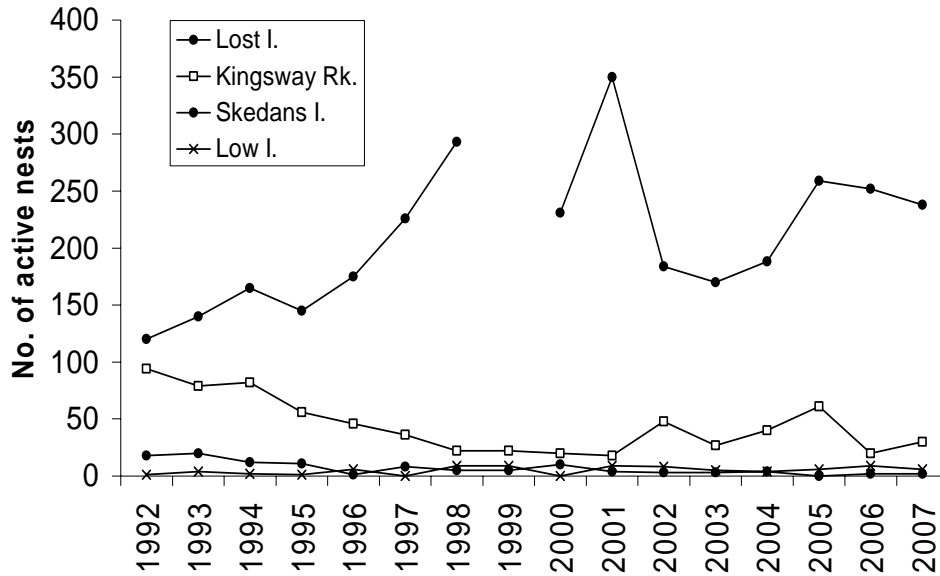


Figure 4
Number of active Glaucous-winged Gull nests in Laskeek Bay 1992-2007

Pigeon Guillemots *Cephus columba*

At the end of each field season we check the contents of each of the ten wooden Pigeon Guillemot nest boxes installed at Lookout Point in 2001. We check boxes to determine occupancy rates and reproductive success.

On 12 July we found eight active nest boxes: seven contained one or two chicks (eleven chicks total) and one contained a single egg, marking the highest occupancy rate to date (Fig 5).

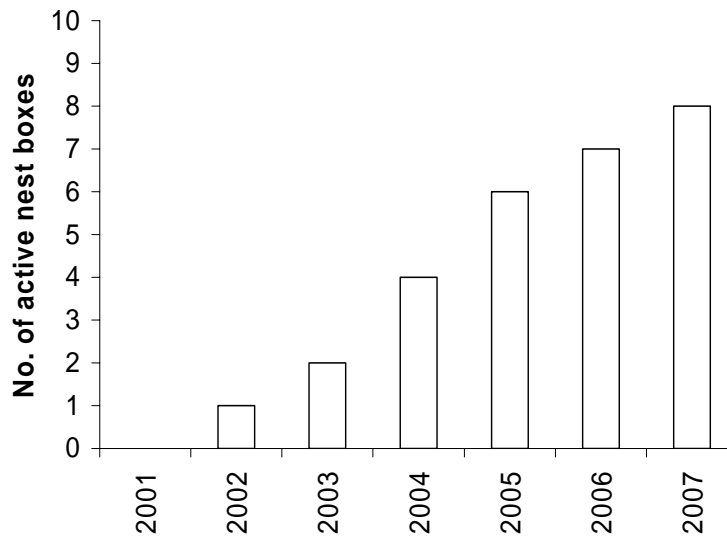


Figure 5
Number of Pigeon Guillemot nest boxes on East Limestone Island with either eggs or chicks

Cassin's Auklets and Fork-tailed Storm Petrels *Ptychoramphus aleuticus* and *Oceanodroma furcata*

To monitor Cassin's Auklet breeding activity we conducted weekly checks for knockdowns at burrow and nest box entrances at the site formerly called the 'North Shore' (this site was more appropriately renamed the 'East Coast' in 2007). Out of 25 burrows we identified 15 that were active (more than two records of knockdowns or having distinct tell-tale odors). None of the 24 nest boxes were active and we felt that this could be because the boxes were relatively exposed. In an effort to increase the appeal of nest boxes to breeding birds we re-installed all of the 24 nest boxes by embedding them in to the ground and covering them with soil and moss. Fifteen more nest boxes were installed in the same way just south of this site, in an area where a few Cassin's Auklet pairs were already nesting. In addition, we installed 25 nest boxes at the Lookout, another area where Cassin's Auklets are known to be breeding.

Birds that eventually occupy these nest boxes will provide good opportunities for researchers to monitor reproductive success and chick growth rates.

This year we scaled back monitoring efforts at burrows that were located on Cassin's Tower in order to limit disturbance to a pair of Bald Eagles that were nesting on top of the Tower. Based on knockdowns and characteristic smells we determined that at least 26 burrows were active with Cassin's Auklets and 11 were active with Fork-tailed Storm Petrels.

At-Sea Surveys

To describe the abundance and distribution of different marine birds across seasons and years we carry out regular boat based surveys that follow a series of transects located throughout Laskeek Bay.

Nearshore surveys

In 2007 we conducted five nearshore surveys on 8-9 May, 22 May, 6 June, 24 June and 6 July. During the five surveys we counted 16 different marine bird species including: Ancient Murrelets, Marbled Murrelets *Brachyrhynchus marmoratus*, Rhinoceros Auklets *Cerorhinca monocerata*, Pigeon Guillemots, Pelagic Phacrocorax *pelagicus*, Pacific Loons *Gavia pacifica*, Glaucous-winged Gulls, White-winged Scoters *Melanitta fusca*, Long-tailed *Clangula hyemalis* and Harlequin Ducks *Histrionicus histrionicus*, Common Loons *Gavia immer*, Herring gulls Black-legged Kittiwakes *Rissa tridactyla*, Red-necked Grebes *Podiceps grisegena*, Common Murres *Uria aalge*, and Black Oystercatchers.

We are particularly interested in counts of Marbled Murrelets because this bird is provincially red listed and is designated as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Our peak count of Marbled Murrelets during the nearshore surveys was 85 birds on 22 May.

Hecate Strait surveys

We carried out two Hecate Strait surveys on 12 May and 7 July. These 'offshore' surveys are less frequent because they require especially calm conditions. We counted thirteen different marine bird species during the two offshore surveys including: Ancient Murrelets, Marbled Murrelets, Rhinoceros Auklets, Pigeon Guillemots, Glaucous-winged Gulls, Sooty Shearwaters *Puffinus griseus*, Tufted Puffins *Fratercula cirrhata*, Herring Gulls, White-winged Scoters, Cassin's Auklet, Black Turnstones, Common Murres.

Marine Mammals

Throughout the field season we keep track of any marine mammal encounters (Table 4) that result from observations made during

sea surveys, sea watches or opportunistically.

This season the crew was treated to some incredible Humpback whale *Megaptera novaeangliae* encounters. Humpbacks were common throughout the spring and there were numerous sightings of groups of whales feeding, displaying and on a few occasions the sounds of humpbacks could be heard echoing throughout Laskeek Bay! Our records show that we counted 203 humpback whales over the course of the field season however encounters may have been under reported because the crew became so accustomed to their presence. We were not able to get any photos of tail flukes for individual Id because whales either did not cooperate or sightings occurred from a distance, from land or during poor weather conditions.

We had four encounters with Killer whales *Orcinus orca* this season. On two occasions we spotted groups as they travelled by Limestone (four and seven individuals). Our last two encounters were boat based and provided excellent opportunities to take pictures of dorsal fins and saddle patches for individual Id.

The first boat encounter took place on 27 June when we followed two whales, one large male and one smaller individual. Towards the end of the encounter the large male was at the surface, apparently shaking as the smaller individual circled the large male. As the two whales then travelled away from the area, the crew noticed what appeared to be a rope looped around the male's dorsal fin. Once the two whales

disappeared the remains of a Harbour seal floated to the surface and it then became clear that the 'rope' caught on the male's fin had in fact been a portion of the seals' intestines! Our photos identified T054 and T058, two known transient whales.

The following day on 28 June, we encountered a group of 13 Orcas that included a large bull, several smaller individuals and two juveniles. Our photos identified the group as transients: the bull was T162 and the others were T023, T023C, T023C1 (folded over dorsal fin), T023C2, T023D, T059, T059A, T059A1?, T060, T060C, T060D and T002B. Interestingly, we watched this group of mammal eating whales travel past the sea lion haul-out at Reef I. Many of the Steller sea lions *Eumetopias jubatus* became quite vocal as the whales passed by the haul-out and a number even slid in to the water and began posturing and vocalizing. The whales travelled past without incident.

Steller sea lions are commonly hauled out at Skedans and Reef I. Our highest count at Skedans was 132 individuals on 8 May and at Reef, 482 individuals on same day. We spotted one branded Steller sea lion at the Reef I. haul-out: 'F3000' branded at Forrester Island in SE Alaska.

We spotted four California sea lions *Zalophus californianus* in Laskeek Bay this season however, no more than two individuals were encountered at any given time. Sightings of California sea lions in Haida Gwaii are of interest because typically, this species is more common to our south.

Table 4

Total counts of marine mammals based on sightings in Laskeek Bay, 2002-2006. Observations were made during sea surveys, sea watches and opportunistically (note: totals do not include Harbour seals *Phoca vitulina* and Steller sea lions *Eumetopias jubatus*)

Species (common name)	Scientific name	2007	2006	2005	2004	2003
Dall's porpoise	<i>Phocoenoides dalli</i>	0	0	1	0	0
Northern elephant seal	<i>Mirounga angustirostris</i>	0	0	0	0	1
Fin whale	<i>Balaenoptera physalis</i>	0	0	0	0	1
Grey whale	<i>Eschrichtius robustus</i>	0	1	1	1	3
Harbour porpoise	<i>Phocoena phocoena</i>	1	4	3	12	5
Humpback whale	<i>Megaptera novaeangliae</i>	203	91	15	19	152
Killer whale	<i>Orcinus orca</i>	26	4	11	13	21
Minke whale	<i>Balaenoptera acutorostrata</i>	3	1	0	2	0
Pacific white-sided dolphin	<i>Lagenorhynchus obliquidens</i>	81	365	8	0	325
California sea lion	<i>Zalophus californianus</i>	4	0	1	1	0

Wildlife Trees

Snags are decaying, standing trees that provide habitat for cavity nesting birds and each season we survey Limestone for snags with active nests (wildlife trees). We monitored 42 formerly active wildlife trees and eventually determined that eight were active (Table 6). In addition, we found five new wildlife trees for a total of 13 active

trees with 14 nests, occupied by three bird species including: Red-breasted Sapsuckers *Sphyrapicus rubra* (9 nests), Chestnut-backed Chickadees *Poecile rufescens* (3 nests) Hairy Woodpeckers *Dendrocopus villosus* (2 nests). This year we did not locate any nests for Northern Flickers *Colaptes auratus* or Brown Creepers *Certhia americana*.

Table 6

Wildlife tree use in 2007. (RBSA = Red-breasted Sapsucker, CBCH = Chestnut-backed Chickadee, HAWO = Hairy Woodpecker, Ss = Sitka spruce, Hw = Western hemlock)

Tree #	Cavity Nester	Tree Species	Fledge Date
10	RBSA	Ss	16-jun
45	RBSA	Ss	26-jun
79	CBCH	Ss	4-Jun
96	CBCH	Hw	6-jun
98	RBSA	Ss	18-Jun
99	RBSA	Hw	14-Jun
106	RBSA	Ss	16-Jun
107	CBCH	Ss	16-Jun
107	RBSA	Ss	18-Jun
112	RBSA	Hw	20-Jun
113	HAWO	Ss	22-Jun
114	HAWO	Ss	10-Jun
115	RBSA	Hw	12-Jun
116	RBSA	Ss	24-Jun

NATURAL HISTORY

Bears

For the first time since LBCS has operated a field camp on Limestone, a black bear *Ursus americanus carlottae* was spotted on the island. Luckily the bear's visit to the island was brief and uneventful. After having encountered an unsuspecting volunteer at Lookout Point the bear ran away and was not seen again.

Daily Bird Checklist

We keep a daily record of birds seen or heard in the Laskeek Bay area. This year we recorded 64 different bird species and the daily maximum count was 36 species on 7 July. Some of our less common records included Green-winged Teal *Anas crecca*, Mallard *Anas platyrhynchos*, Black Scoter *Melanitta nigra*, Red-breasted Merganser *Mergus serrator*, Lesser Yellowlegs *Tringa flavipes*, Thayers Gull *Larus thayeri*, Western Gull *L. occidentalis*, Western Sandpiper *Calidris mauri*, Least Sandpiper *C. minutilla* and an American Pipit *Anthus rubescens*.

Birds of Prey

Peregrine Falcons were back on Limestone this year after a ten year hiatus. A pair of birds was active in the vicinity of the old nest site from 1 May to 4 July. However, it was difficult to confirm whether any chicks were produced because the cliff where the birds were suspected to be nesting was not easily observed.

Limestone was also home to two breeding pairs of Bald Eagles. Nest #5 located at Cassin's Tower was active for a second consecutive year and nest #7 located just east of North Cove was active for the 3rd time in four years. Activity at nest #5 was easily monitored from the ridge trail that provided open views of the growing chick which was first spotted on 23 June. In

contrast, activity at nest #7 was not as easily determined and was initially inferred from alarming adults and fresh guano at base of tree. Later in the season a whole salmon (small) was found at the base of the tree and the chick was heard on 11 July. At camp shut-down on 13 July, both pairs were busy raising a single chick.

Common Ravens *Corvis corax* nested in the same tree as last year. The ravens produced two chicks that fledged on 26 May, fledging one day later than the chicks produced in 2006. We suspect that Northwestern Crows *C. caurinus* also nested on the island but we did not find any nests. Early in the season crows were active in the inaccessible cliff area adjacent to the Ridge Trail.

Plants

We keep track of bloom dates of flowering plants on Limestone by conducting regular visits to areas where flowers can persist because they are inaccessible to deer browse. We also take the opportunity to enjoy the blooms that carpet the handful of deer free islands located in Laskeek Bay, as deer free islands are a rarity in the archipelago.

Introduced Species

Black tailed deer Odocoileus hemionus

This year marked ten years since deer exclosures (20 m x 20 m) were erected at sites throughout the archipelago, including three on E.Limestone. These structures provide an interesting opportunity for visitors and volunteers to compare the difference between areas with and without deer browse and in turn, to learn about the significant impact that non-native species have on the forest understory. Researcher Steve Stockton from the Research Group on Introduced Species (RGIS) visited Limestone this season to examine how the

vegetation in the enclosures has responded after ten years.

Raccoons

Raccoons can have devastating impacts on seabird colonies that have evolved no natural defense against introduced predators that target adults, chicks and eggs. This

season a single raccoon was at large on Limestone throughout the Ancient Murrelet breeding season. The raccoon was responsible for digging up burrows, destroying adults, chicks and eggs causing much concern for the future of this small, peripheral colony.

CONCLUSIONS

LBCS completed our 18th field season in Laskeek Bay and thanks to all of the directors, staff, volunteers and visitors we continue to build on our unique, long-term data set initiated in 1990. In 2007 we made some significant adjustments to the visitor program and overall the changes were well received by volunteers and visiting groups. Raccoon predation could explain the decline in Ancient Murrelet numbers that we observed this year however LBCS has yet to determine whether other factors may be contributing to the downward population trend. This year's raccoon experience has highlighted the need to adopt a more preventative approach to predator control on the island. Unfortunately, the proximity of the colony to adjacent islands with raccoons means that this introduced species will continue to pose a threat to burrow nesting

seabirds on Limestone. There is need for predator control to be conducted before birds arrive at the colony as well as while birds are incubating. By the time the field crew arrives at the end of April (once eggs are near hatching) raccoons that are present on the island will already have had serious impacts on prospecting birds, breeding adults and developing eggs. Ancient Murrelets are 'blue listed' by the province of British Columbia and are considered of 'special concern' by COSEWIC. The reason for these designations is because Ancient Murrelets are especially vulnerable to threats posed by introduced species, such as raccoons. Our hope is that LBCS and the province can work together to develop a plan that will ensure safe breeding habitat for burrow nesting seabirds within this Provincial Wildlife management area.

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