

EAST LIMESTONE ISLAND FIELD STATION
FIELD SEASON REPORT 2011



SUMMARY

This was Laskeek Bay Conservation Society's 22nd Field season on East Limestone Island, Laskeek Bay, Haida Gwaii. Major blow-down events over the past winter severely impacted approximately half the island, but left the camp intact. The 2011 season ran from 29 April to 8 July, bringing 2 student interns, 13 volunteers, 2 school groups (QCSS), and 69 visitors to the island. Ancient Murrelet chicks were captured at Cabin Cove and numbers declined slightly from last season. No raccoons were detected on the island this season. Two 5-day oystercatcher surveys were completed in Gwaii Haanas, but we did not complete surveys or band chicks in Laskeek Bay in 2011. We censused Glaucous-winged Gull colonies in Laskeek Bay and found 333 active nests at three different colonies - above the long term average. Pigeon Guillemots used all 10 original nest boxes at Lookout Point, and 7 of the 18 new boxes installed in 2010 were active. Eight Cassin's Auklet nest boxes were active, all with healthy chicks. Three near-shore sea surveys and two Hecate Strait sea surveys were completed. The 16 June near-shore survey recorded a total of 356 Marbled Murrelets; much higher than last year. Humpback whale sightings increased this year and we also recorded Dall's porpoise, Minke whale, and Grey whale all of which are seen infrequently. There were 8 sightings of Killer whale groups in Laskeek Bay and 1 sighting in Gwaii Haanas. Fourteen wildlife trees were active, and contained nests of 12 Red-breasted Sapsuckers, 2 Chestnut-backed Chickadees, and 1 Brown Creeper. Two Bald Eagle nests were active, the Peregrine Falcons had three young and the Common Ravens fledged two young.

Prepared by Jake Pattison
Reviewed and Edited by Laskeek Bay Conservation Society
Box 867, Queen Charlotte, BC, V0T 1S0

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INTRODUCTION

Laskeek Bay Conservation Society (LBCS) is non-profit organization committed to increasing the appreciation and understanding of the natural environment through biological research, interpretive programs and public involvement. The field station at East Limestone Island has been in operation for 22 years and over this period LBCS has developed diverse long-term monitoring projects in Laskeek Bay. Volunteers assist researchers with data collection in order to study the abundance, distribution, life history and population dynamics of wildlife in Laskeek Bay. This information helps us understand the fluctuations in marine and terrestrial ecosystems and gives a baseline against which we can describe changes in the future due to introduced species, marine pollution, global climate change, extreme weather events, and other threats to coastal ecosystems.

EDUCATION AND INTERPRETATION PROGRAM

LBCS continues to involve the public in educational and interpretive programs with the goal of raising awareness of local conservation issues and the natural history of Laskeek Bay. Students, volunteers and visitors are invited to visit our research camp on Limestone Island, learn about our research projects and to assist in some of the monitoring work.

Project Limestone

For 21 years Project Limestone has brought local students to Limestone Island to participate in Ancient Murrelet research. The students are led on an interpretive walk across the island and are given an introduction to the projects that we run. A walk to Lookout Point allows the students to

learn more about the natural history and geography of the area, and ends with a panoramic view of Laskeek Bay. The group then assists with the Ancient Murrelet work from 10:30 pm to 2:30 am, which involves capturing chicks and weighing them before releasing them near the ocean. The group then spends the remainder of the night in the Visitor's cabin before heading back to their camp at Vertical Point the next morning.

Only two groups, both from Queen Charlotte Secondary School, visited the island this year, bringing a total of 13 students and 3 teachers/chaperones. Visits were on the 18 and 20 of May. Since 1991, 603 students have visited the island as part of this program.

Volunteers

Volunteers play an integral role in the operation of the field camp on Limestone Island. Volunteers generally stay for one week and work alongside field staff, contributing their time and energy to the many different tasks that are required throughout the season. These tasks include both research oriented work as well as general camp maintenance and chores. This is a unique opportunity for the public to get involved in long-term monitoring work while living in a remote field camp on Haida Gwaii.

A total of 13 volunteers visited the island this year contributing 92 volunteer days to projects, both on Limestone, on surrounding islands, and within Gwaii Haanas. Five of the volunteers had been to the island in previous years. Most volunteers stayed for one week, with one staying for 4 days, and another for one day. Volunteers came from a variety of places: five were from Haida Gwaii, 3 from other parts of BC, 3 from Alberta, 1 from Quebec, and 1 from N.W. Territories. There were no international volunteers this year, unlike many years in the past.

Visitors

The LBCS visitor program provides opportunities for tourist groups to visit Limestone Island, participate in an interpretive tour and learn about the research that we are involved in. Through this program, LBCS aims to raise public awareness and appreciation of local conservation issues. Most visitor groups that visit Limestone are part of ecotourism excursions in Gwaii Haanas.

There were several tours booked in 2011. *Maple Leaf* visited the island with three groups on 9 and 23 May and 1 June and *Island Roamer* brought in 2 groups on 16 May and 10 June. Jeremie Hyatt, Luke Hyatt, and Miray Campbell visited the island on 8 May. In total there were 69 visitors to the island this season, not including frequent visits by the crew from Reef Island.

Staff

LBCS Staff this year consisted of Alan Moore (Office Manager), Jake Pattison (Camp Supervisor / Biologist), and Ainsley Brown (Assistant Biologist / Interpreter).

Both 6 week student Intern Positions were filled this season. This season's interns were Selina Dhanani (Burnaby) weeks 1-6, and Marcus Stein (Vancouver) weeks 6-11. Overall, the interns contributed 84 days to projects on the island and in the surrounding area, including Gwaii Haanas.

The Research Group on Introduced Species (RGIS) crew was in the Laskeek Bay area beginning in Mid March. 2011 was the first year of project BAMBI, a four year project focused on understanding deer behaviour and how it changes in response to predation risk. The crew will be working in Laskeek Bay until the fall of 2011, and more field work is planned for spring 2012.

RESEARCH AND MONITORING PROGRAMS

2010 Blow-down Event

There was major blow-down on Limestone Island during the winter of 2010. Approximately half of the island area (20-25 hectares) was affected, particularly the stands of large trees in the centre of the island extending to the shoreline of North Cove. Virtually all of the ANMU colony in North Cove was completely blown down. The slope behind camp was also hard hit, but the camp was left intact. The extent of the blow-down was first recognized in early March and the trails were cleared in early April by two fallers working with the RGIS crew. There was also very extensive blow-down on Reef Island, destroying the camp, and on nearby Vertical Point, a popular camp site. Several different storm events appear to have been involved in the blow-down. Most of the trees in the interior of Limestone were blown down from the SW, while the area behind camp was primarily hit from the NE. Counting the rings on 17 mature trees near camp, and along the main trail yielded an average age of 147 (range 114-210). Many trees were of very similar in age perhaps pointing to a similar natural disturbance event approximately 150 years ago. The perimeter of the blown-down areas was traced with GPS points and maps are being produced.

Ancient Murrelets *Synthliboramphus antiquus*

Monitoring Program

The blow-down event of the past winter resulted in the complete loss of North Cove chick capture funnels 1-4. The colony area and funnel lines in this location are buried under fallen trees and as a result it was not possible to carry out any monitoring work in the area. Given the severity of the damage, it is unlikely that work will be conducted again in this area. Staff spent 2 nights at the shoreline in North Cove during the chick migration period and detected no ANMU activity in North Cove. Chick capture funnels 5-8 at Cabin Cove required only minor repairs, however the colony area behind funnels 5 and 7 has experienced heavy impact. It is unknown to what extent the blow-down will impact Ancient Murrelet breeding activity on the island in future years.

Chick capture work

Four chick-capture funnels (numbers 5-8) were monitored in Cabin Cove beginning on 7 May. Funnels were checked at a regular interval (15 minutes) and we recorded date, time, location (funnel number) and mass for each departing chick. Funnel protocol is kept constant across years so that the number of chicks departing gives a consistent index of the overall breeding population. Funnels were closed nightly from 22:30-2:30 for the period of 7-19 May and 11:00-2:30 after 19 May to compensate for increasing day length. Capture work ends after two consecutive nights with no chick captures in any of the funnels. This season the first chicks arrived the night of 11 May and the last on 9 June. A total of 106 chicks were captured in funnels 5 to 8 (Fig. 1). Peak night of departures (11 chicks captured) occurred on 15 May. Chick numbers recorded this season in funnels 5-8 were fewer than recorded in 2010 and are the second lowest ever (Table 1).

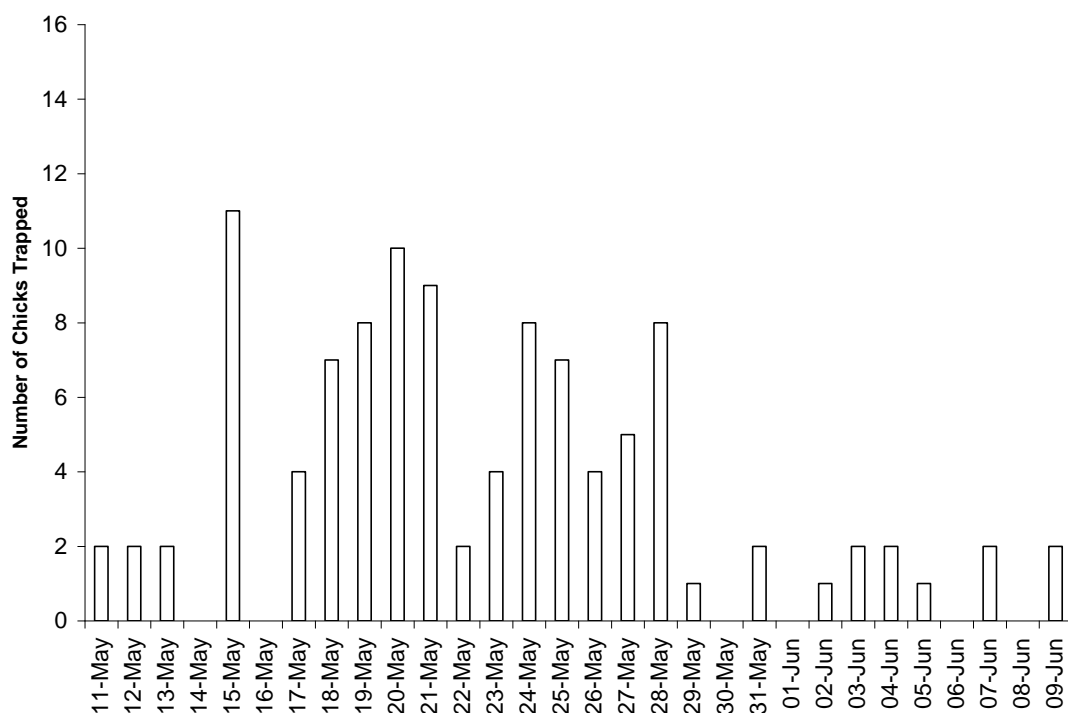


Figure 1. Nightly chick captures, Funnels 5-8, East Limestone Island, 11 May – 9 June 2011.

Table 1. Summary of chick departures, peak nights and totals for funnels 5 to 8 on East Limestone Island 2006 to 2011.

<i>Year</i>	<i>First night with chicks</i>	<i>Peak night</i>	<i>Peak count</i>	<i>Last night</i>	<i>Total days</i>	<i>Total chicks</i>
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
2009	10-May	18-May	16	29-May	20	104
2010	8-May	21-May	19	2-June	26	121
2011	11-May	15-May	11	9-June	30	106

Funnels 5 & 6

As of this season, funnels 5 and 6 have been monitored continuously for 22 years, and are our primary means of assessing the long term population trend in the Cabin Cove colony area. The location of the funnels has not changed during this period and therefore represents the same geographic area of the colony year to year. Funnels 7 and 8 were installed in 2006 flanking funnels 5 and 6 to see if the colony area had shifted, resulting in decline. Comparison of chick numbers between funnels 5 and 6 and funnels 7 and 8 do not suggest a shift in the colony area. The blow-down event of 2010 had a large impact on the colony area feeding into funnel 5 and a lesser impact on funnel 6.

A total of 77 chicks were captured this season in funnels 5 and 6 which is less than the number captured in 2010 but higher than 2009 (Fig. 2). First chicks arrived on 11-May this season and peak night (9 chicks) occurred on 21 May, the mean date for peak departures (Table 2). Chick captures continued until the 9-June this season for a total of 30 days with chicks (Table 2).

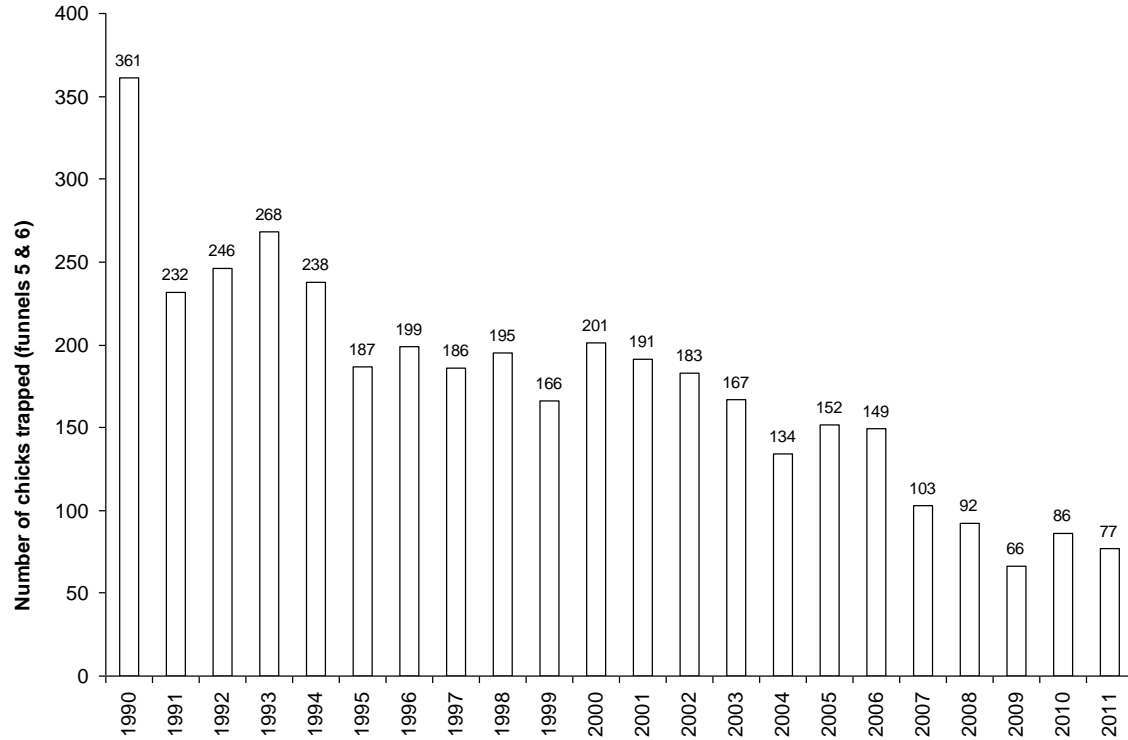


Figure 2. Total Ancient Murrelet chick captures at funnels 5 and 6 East Limestone Island, 1990-2011.

Table 2. Summary of chick departures, peak nights and totals from funnels 5 and 6 on East Limestone Island, 1990 to 2011.

Year	1st night with chicks	Peak night	Peak count	Last night	Total days	Total chicks
1990	13-May	20-May	28	15-Jun	34	361
1991	10-May	25-May	22	05-Jun	27	232
1992	14-May	22-May	29	02-Jun	20	246
1993	12-May	18-May	39	04-Jun	24	268
1994	08-May	20-May	29	06-Jun	30	238
1995	11-May	23-May	18	12-Jun	33	187
1996	11-May	18-May	17	07-Jun	28	199
1997	13-May	28-May	22	05-Jun	24	186
1998	11-May	20-May	23	20-Jun	41	195
1999	11-May	21-May	22	09-Jun	30	166
2000	11-May	21-May	22	06-Jun	27	201
2001	11-May	19-May	21	15-Jun	36	191

2002	09-May	21-May	33	01-Jun	24	183
2003	11-May	21-May	19	03-Jun	24	167
2004	08-May	16,17-May	15	01-Jun	25	134
2005	07-May	19, 23-May	12	05-Jun	30	152
2006	10-May	21-May	20	31-May	22	149
2007	15-May	04-Jun	16	12-Jun	29	103
2008	13-May	20,22,23-May	8	03-Jun	22	92
2009	12-May	18,19-May	10	29-May	20	66
2010	8-May	21-May	16	2-June	25	86
2011	11-May	21-May	9	9-June	30	77
Average ± SD	10-May ± 2.0 days	21-May ± 4.0 days	20 ± 7.8 chicks	6-Jun ± 5.5 days	28 ± 5.3 days	176 ± 70 chicks

Gathering grounds

Ancient Murrelets enter and leave the breeding colony at night and in late afternoon and evening the birds gather on the water in areas called gathering grounds, where they wait until it is sufficiently dark before entering the colony. Both breeding and non-breeding birds are thought to gather in these areas and important social interactions also take place during this time. The Limestone Island gathering ground is located between Low Island and Limestone and this season, as in the past, we conducted standardized 10 minute counts of birds on the gathering grounds between 2 May and 20 June. The highest count occurred on 17 May, with a total of 121 birds observed. Counts averaged (\pm SD) 43.7 ± 36.2 this season, an increase from last season.

Point counts

We conducted point counts in the colony area to monitor the activity of adult birds. Five minute counts were made at approximately 2:30 each night for the period of 21 May to 2 June. Counts were conducted in Cabin Cove but not at North Cove due to the blow-down. The maximum count, (16 birds 124 calls) occurred on 24 May.

Band Recoveries & Recaptures

Recapture of adult birds was phased out in 2003. However, we still opportunistically capture adult bird that are trapped in funnels or are otherwise easily captured as we check funnels. We also scan feather piles, raven pellets and other predation remains looking for bands. There were no band recoveries or recaptures in 2011.

Predation transects

In previous years we checked for predation remains along 5 fixed, 20m wide transects. These transects were heavily impacted by blow-down and not monitored in 2011. In general, very few predation remains were seen on the island this season. There were essentially no Ancient Murrelet remains below the Common Raven nest, and very few feather piles were observed along the trails.

Population Trends & Social Attraction Experiment

The breeding population of Ancient Murrelets has been declining over time (Fig 2), and this trend has become more pronounced since 2006 when the last survey of the colony estimated \pm SE 509 ± 132 breeding pairs compared to the estimate of 1273 ± 254 in 1995. The number of departing chicks in funnels 5&6 declined by a further 56% between 2006 and 2009, likely due to the

presence of raccoons in 2007 and 2009. Chick numbers rebounded in 2010, and decreased again in 2011, likely related, in part, to the blow-down events of the previous winter (Fig 2). It is assumed that the colony area at North Cove, and other areas hard hit by the blow-down have experienced a decline in breeding activity due to the loss of established burrows and creation of numerous obstructions to the movement of adults and chicks.

In 2011 we initiated a project aimed at increasing the recruitment of Ancient Murrelets to the ELI colony. Megaphones (TOA model ER-2230W) were placed in two different locations (Station 1: N52.90889, W131.61024; Station 2: N52.90760, W131.61069) and used to broadcast murrelet colony sounds to attract the attention of prospecting birds. By artificially increasing the amount of colony noise we hope to attract young birds to the colony and by doing so increase the breeding population over time. Megaphones were played between 0:00 and 2:30 on 17 nights between 7 May and 3 June. Megaphones were not played on nights with high winds or heavy rain. The megaphones appeared to be successful in attracting birds (birds were seen sitting next to the megaphone on several occasions), but we did not detect increased prospecting activity in burrows near to the megaphone stations. Further details appear in a separate report titled “Ancient Murrelet Social Attraction Experiment on East Limestone Island 2011”.

Black Oystercatchers *Haematopus bachmani*

Background

LBCS has been monitoring the breeding population of Black Oystercatchers in Laskeek Bay since 1992. Oystercatchers are large, conspicuous shorebirds that are easily studied because of the relative ease with which nesting sites can be located. Because they are entirely dependent on the intertidal system, these birds are also thought to be a good indicator species for this ecosystem. Surveys were conducted yearly between 1992 and 2010. Surveys were not conducted in Laskeek Bay in 2011, as there was insufficient time in the field season to complete a full survey of the Laskeek Bay area, although a number of territories were visited opportunistically. A complete survey of Laskeek Bay will be completed in 2012.

LBCS was again contracted in 2011 to complete two 5 day oystercatcher surveys within Gwaii Haanas. The first survey was conducted 4-8 June and the second survey 25-29 June. Details appear in a separate report titled “2011 Black Oystercatcher survey in Gwaii Haanas”.

Banding and re-sighted birds

Birds banded in previous years have a combination of one metal band on the right leg that carries a unique number and a colour band combination that indicates the year of banding as well as the area where the bird was banded. Metal bands are permanent, while the plastic bands tend to be lost over time. All oystercatchers seen during the course of the season were checked for bands as this gives us information on the age and dispersal of these birds. Birds re-sighted in Laskeek Bay are summarized in Table 3. Banded birds were also re-sighted in Gwaii Haanas and these are summarized in Table 4. The oldest bird sighted this year was banded as an adult in 2000. The band number was read in 2010 and it is assumed to be the same individual this year, still occupying the same territory on Reef where it was banded 11 years ago. There were 3 sightings of banded birds in Laskeek Bay and 11 sightings in Gwaii Haanas this season.

Table 3. Banded Black Oystercatchers re-sighted in Laskeek Bay in 2011.

Band combination (Left - Right) ¹	Location seen / Nest site	Year Banded	Banded as Adult or Chick
UB-DB/M	LOW-3	2006	Chick
W-W/M	Lookout Pt, ELI. In a group of 3 birds.	2009	Chick
UB-M	REE-1	2000	Likely as Adult, REE-1

¹Band codes: UB = unbanded (birds can lose bands), M = metal, Or = orange, W = white, LG = Light Green, R = Red, Bk = Black, Br = Brown, Y = Yellow, DB = dark blue.

Table 4. Banded Black Oystercatchers re-sighted in Gwaii Haanas, 2011.

Survey	Band combination (Left - Right) ¹	Location seen / Nest site	Year Banded	Banded as Adult or Chick
1	UB-DB/M	560-3-1, near scrape with 2 eggs but not alarmed.	2006	Chick
1	UB-OR/M	470-6-2, one member of pair banded.	2004	Chick
1	W-LG/M	Kunga shoreline, in a group of 11 non-territorial birds.	2008	Chick
1	W-W/M	Kunga shoreline, in a group of 11 non-territorial birds.	2009	Chick
1	UB-OR/M	LOS-11. New Territory. One member of pair banded.	2004	Chick
2	UB-DB/M	N. end Tuft Islets, one member of a non-territorial pair.	2006	Chick
2	DB-DB/M	560-4-3, one member of pair banded.	2006	Chick
2	UB-OR/M	470-6-2, one member of pair banded. Likely same individual sighted at same location on first survey.	2004	Chick
2	DB-DB/M	530-6-1, one member of pair banded.	2006	Chick
2	DB-DB/M	480-1-2, one member of pair banded.	2006	Chick
2	UB-OR/M	LOS-11, one member of pair banded. Likely same individual sighted at same location on first survey.	2004	Chick

¹Band codes: UB = unbanded (birds can lose bands), M = metal, OR = orange, DB = dark blue, W = white, LG = light green.

Glaucous-winged Gulls *Larus glaucescens*

Since 1992, LBCS has been censusing gull colonies within Laskeek Bay (Fig. 3). We visited locations where gulls were found nesting in the past and also kept an eye out for signs of new activity. Between 14 and 23 June we visited occupied colonies and counted the number of active

nests (those containing either eggs or chicks). Lost Island, the largest colony in the area had a total of 236 active nests (14 June), followed by Kingsway Rock with 92 nests (23 June) and Low Island with 5 nests (19 June). In total we counted 333 nests on these three colonies containing either 1 egg (5% of nests), 2 eggs (16%), 3 eggs (79 %). Only one nest (Kingsway Rock) was found with hatched chicks. We did not check Skedans Islands or Cumshewa on foot, because no adult gulls were present at either location. The total number of nests counted this season was well above the long-term average (\pm SD) of 258 ± 70 .

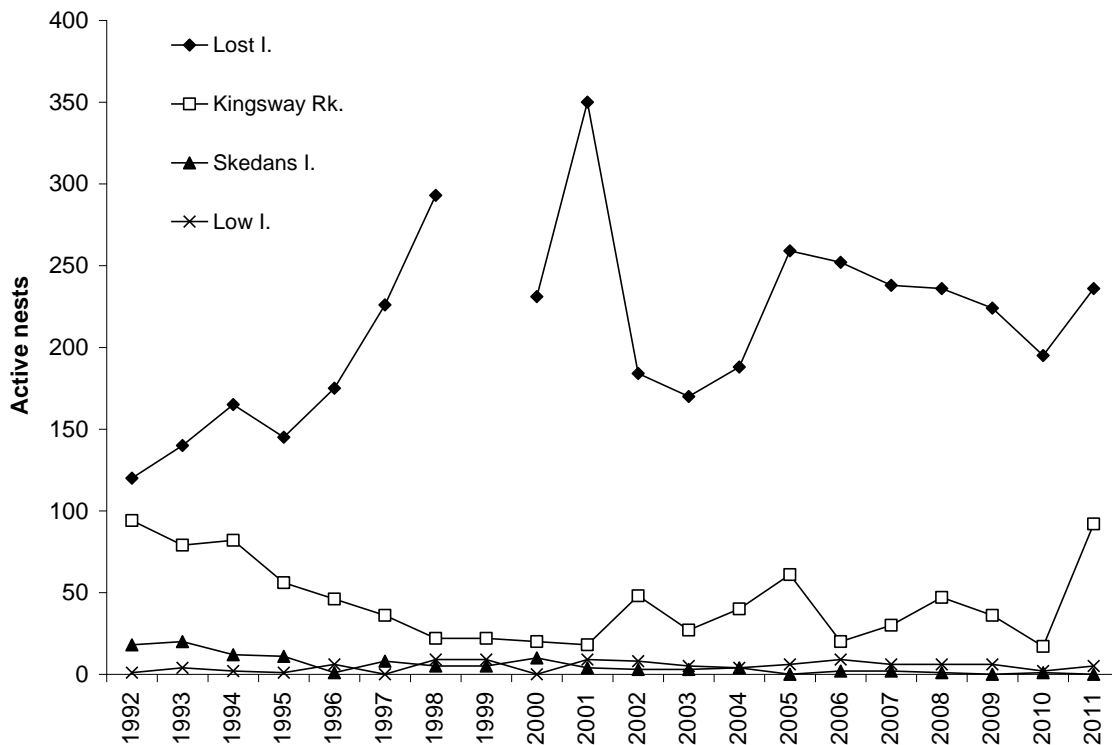


Figure 3. Glaucous-winged Gull nests containing eggs or chicks at four colonies in Laskeek Bay, 1992-2011.

Pigeon Guillemots *Cepphus columba*

Ten nest boxes (#1-10) for Pigeon Guillemots were installed at Lookout Point on Limestone Island in 2001. Use of the boxes increased steadily until 2007 and there has been a high level of occupancy since then (Fig. 4). We checked the boxes in early May to make sure that the boxes were intact and contained enough gravel. Boxes were checked again at the end of the season (7 July), and we found all 10 boxes active, containing either chicks (7 boxes) or eggs (3 boxes). Of the 13 chicks present, 8 were large enough to band.

Eighteen new nest boxes (#11-28) were installed last season to the South of the existing boxes. These boxes were checked on 7 July and seven (39%) of them were found to be active: 3 with chicks and 4 with eggs. All five chicks were banded. It took 4 years for this level of occupancy to be reached in the original boxes, suggesting that use of nest boxes occurs more rapidly once birds are familiar with them.

In order to address concerns that nest boxes may get too warm during hot weather resulting in chick mortality, we placed plywood shades on boxes 1-10 in an attempt to reduce the maximum temperatures. Temperature loggers (I-buttons) were placed in two of these shaded boxes as well as two of the new boxes that don't currently have shades. When loggers are downloaded later this year they will give an indication of the effectiveness of this approach to reducing nest box temperatures.

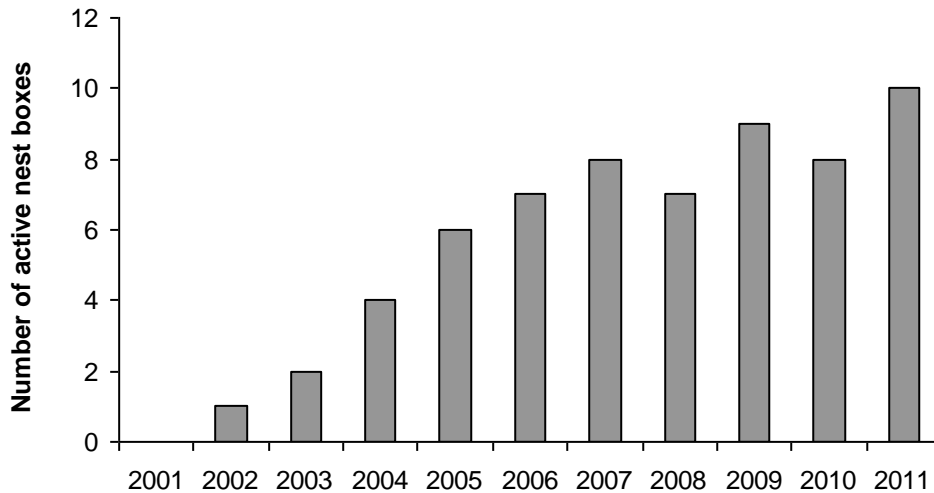


Figure 4. Use of nest boxes by Pigeon Guillemots, Lookout Point, East Limestone Island, 2001-2011.

Cassin's Auklets and Fork-tailed Storm Petrels

Ptychoramphus aleuticus and *Oceanodroma furcata*

Small populations of Cassin's Auklets and Fork-tailed Storm Petrels breed on Limestone Island. Like Murrelets, these species are nocturnal burrow nesters and are only active in the colony at night. Breeding activity on the island has fluctuated over the years, partly attributed to predation by introduced raccoons. Each season we monitor several locations on the island for breeding activity in order to obtain an index of the breeding population.

This season we monitored Cassin's Auklet breeding activity at Lookout Point and at the East Coast plots. Knock-down sticks were placed at the entrances of all known burrows (natural nest cavities) and nest boxes (artificial nest cavities) early in the season and we returned regularly to monitor activity. At the East Coast plots (North and South) we monitored a total of 46 nest boxes: 44 boxes installed in 2007 and 2 old boxes. At Lookout Point we monitored 25 boxes, also installed in 2007. There were chicks present in 8 boxes this season: four in North Plot (#19, 21, 30, 31), three in South Plot (#1, 4, 5), and one at Lookout Point (#7). Chicks were weighed at 4 day intervals and we banded 6 chicks on 6 July. The chicks in box #1 and box #31 fledged between 1-4 July and were not banded.

Burrows were monitored at the East Coast site and at Lookout Point using knockdown sticks. There were a total of 26 active burrows at the East Coast site, and 4 active at Lookout Point. No monitoring of Cassin's Auklet burrows took place at Cassin's Tower this season.

The amount of Storm petrel activity this season was similar to the average, based on the number of days the species was recorded in the daily bird checklist (2011 = 30, 2010 = 36, 2009 = 31, 2008 = 28, 2007 = 34). Petrels were heard frequently at night during the murrelet season, particularly in the area NE of funnel 6 and near Lookout Point.

Sea Surveys

Boat surveys are conducted throughout the season to monitor the distribution and abundance of marine birds and mammals encountered along pre-determined 100m wide strip-transects in Laskeek Bay. The objective of the surveys is to develop a strong baseline data-set for marine wildlife in the Laskeek Bay area as well as to specifically monitor the abundance and distribution of Marbled Murrelets (*Brachyramphus marmoratus*), a forest canopy nesting seabird that is provincially red listed and designated as threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). These surveys have been conducted since 1991 and represent a very important dataset within the province.

Near-shore surveys

These surveys cover the inshore waters as far North as Cumshewa Island and South to Haswell Island. We completed 3 surveys on 9 May, 22 May and 16 June. On these three surveys we counted 18 species: Marbled Murrelets, Pigeon Guillemots, White-winged Scoters, Pelagic Cormorants, Red-necked Grebes, Common Loons, Ancient Murrelets, Herring Gulls, Rhinoceros Auklets, Common Murres, Glaucous-winged Gulls, Harlequin Ducks, Black Oystercatchers, Pacific Loons, Black-legged Kittiwakes, Belted Kingfishers, Brant and Cassin's Auklets. A total of 224, 291 and 356 Marbled Murrelets were counted on the 9 May, 22 May, and 16 June surveys, respectively.

Hecate Strait surveys

This survey takes us approximately 5 nautical miles into Hecate Strait, and allows us to see species that tend to stay farther from shore. We completed surveys on 18 May and 19 June in 2011. Large flocks of Red-necked Phalaropes (1230 estimated), and a flock of approx 100 Whimbrel were seen migrating North on the first survey. Sooty Shearwaters, not commonly seen in near-shore waters were seen on both surveys.

Marine Mammals

We kept a daily record of all marine mammal sightings, with the exception of Harbour seals (*Phoca vitulina*) and Stellar sea lions (*Eumetopias jubatus*). These species are counted at specific haulouts during sea surveys in order to keep an index of population trends. The results of this season's sightings are summarized in Table 5.

Table 5. Total counts of marine mammals from sea surveys, sea watches and other sightings, 2006-2011[†].

Species (common name)	Scientific name	2011	2010	2009	2008	2007	2006
Dall's porpoise	<i>Phocoenoides dalli</i>	8	0	0	0	0	0
Grey whale	<i>Eschrichtius robustus</i>	1	0	0	0	0	1
Harbour porpoise	<i>Phocoena phocoena</i>	19	0	10	0	1	4

Humpback whale	Megaptera novaeangliae	193	86	102	261	203	91
Killer whale	Orcinus orca	49	11	14	18	26	4
	Balaenoptera						
Minke whale	acutorostrata	1	0	0	1	3	1
Pacific white-sided dolphin	Lagenorhynchus obliquidens	0	46	334	0	81	365
California sea Lion	Zalophus californianus	1	1	0	0	4	0

†Harbour seal *Phoca vitulina* and Steller sea lion *Eumetopias jubatus* sightings are not reported here. Sightings do not necessarily reflect number of individuals, as individuals may be recorded more than once.

Humpback whales

We recorded more humpback sightings this season than in the last two years. Humpbacks were frequently seen in the vicinity of Reef Island through May, before they moved on in early June. On 25 May we saw a large group of approximately 20-30 humpbacks feeding between Reef and Hemming Head. The last Humpback sighting was on 11 June.

Killer whales

There were 9 sightings of Killer whale groups this season, and we were able to take ID photographs of 6 of the groups. Identification of individuals from these photos helps contribute to the Killer whale database at the Pacific Biological Station in Nanaimo. Eight of the sightings were in the Laskeek Bay area and the other sighting was of two large males seen off the west end of Faraday Island during the BLOY survey on 5 June. The number of Killer whale sightings this season was higher than in previous years.

Steller's sea lions

There are several sea lion haulouts in Laskeek Bay. The largest of these is on the East end of Reef Island and there are smaller haulouts on the Skedans Islands, Cumshewa Rocks and Helmet Island. We regularly count the number of individuals on the Reef and Skedans haulouts. The maximum number counted this season was 649 individuals at Reef (18 May) and 65 at Skedans Islands (9 May). Occasionally we sight branded sea lions that have been individually marked by researchers in Alaska. No marked individuals were seen this season. At least one California sea lion was present at the Reef haulout this season.

Other species

There were sightings this season of several infrequently seen species. We encountered a group of 8 Dall's porpoises between Reef and Lost Islands on 14 June. The last sighting occurred in 2005. A Grey whale was seen near Dodge Pt on Lyell Island on 25 June during the BLOY survey. The last sighting of a Grey whale was in 2006. Harbour Porpoises were seen on a number of occasions and a lone Minke whale was seen on 18 June between ELI and Low Island.

Wildlife Trees

LBCS has been monitoring cavity nesting birds on Limestone Island since 1990. Wildlife trees (dead standing snags used by cavity nesting birds) were monitored opportunistically from 1990-94, and since 1995 there has been a systematic effort each year to cover the island thoroughly looking for active trees. Through this monitoring program, LBCS has amassed a long term data set on tree use across many years, showing the importance of these trees as habitat for cavity nesting species. A total of 136 wildlife trees have been identified over the past 22 field seasons. The nest history of five of the longest active trees is presented in Table 6. Tree 45 fell in 2010,

and Trees 16 and 33 fell as a result of the blow-down in winter 2010-2011. Tree 10 was reduced in height and 17 was intact in 2011, but neither were active.

Table 6. History of activity by cavity nesting bird species[†] at wildlife trees #10, #16, #17, #33 and #45 on East Limestone Island.

Year	Wildlife Tree #				
	10	16	17	33	45
1992	RBSA				
1993		RBSA	RBSA		
1994					
1995				RBSA	
1996		HAWO	RBSA	RBSA	RBSA
1997			CBCH	RBSA	
1998				NOFL	
1999			RBSA	RBSA & HAWO	
2000		RBSA	RBSA	RBSA	RBSA
2001	RBSA			RBSA	RBSA
2002	CBCH	RBSA	RBSA		RBSA
2003	CBCH		RBSA		RBSA
2004			RBSA	RBSA	RBNU
2005	RBSA		RBSA		CBCH
2006	RBSA		NOFL		RBSA
2007	RBSA				RBSA
2008			RBSA	RBSA	RBSA
2009	CBCH	RBSA	RBSA	RBSA	RBSA
2010		RBSA	RBSA		Fallen
2011		Fallen		Fallen	

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

This season, beginning in early May, we inventoried known wildlife trees to determine which had survived the blow-down of the past winter. Once this was complete, we began to visit the intact trees looking for signs of activity. Finding and accessing trees became more complicated this year because of the difficulty presented by the blow-down. We had a total of 14 active trees this season, 6 of which were newly identified this year. Twelve nests were occupied by Red-breasted Sapsuckers, 2 by Chestnut-backed Chickadees and one by Brown Creepers (Table 7). One tree (#66) was used by both RBSA and BRCCR in 2011.

Table 7. Wildlife tree activity on East Limestone Island in 2011.[†]

Tree #	Cavity Nester	Tree Species	Fledge Date*
12	RBSA	Ss	15-20 June
51	RBSA	Ss	-
66	RBSA/BRCCR	Hw	-
109	RBSA	Ss	-
113	RBSA	Hw	11-15 June

115	CBCH	Hw	-
116	CBCH	Ss	-
129	RBSA	Hw	15-18 June
131	RBSA	Hw	-
132	RBSA	Ss	-
133	RBSA	Hw	19 June
134	RBSA	Hw	11-15 June
135	RBSA	Hw	20-23 June
136	RBSA	Ss	-

[†]RBSA = Red-breasted Sapsucker, CBCH = Chestnut-backed Chickadee, BRCR = Brown Creeper, Ss = Sitka spruce, Hw = Western hemlock.

*Fledge dates not determined for many of the trees. For dates given as a range, fledging may have occurred on any day between the dates given.

NATURAL HISTORY

Daily Bird Checklist

We keep a daily record of all the bird species seen or heard within Laskeek Bay. This season's peak count was 42 species on 9 May. A total of 64 species were seen this season. Bald Eagles, Common Ravens, Black Oystercatchers, Glaucous-winged Gulls, Pigeon Guillemots and Northwestern Crows were recorded most frequently. The less frequently sighted species this season included Black Scoter, Red-necked Phalarope, Greater White-fronted Goose, Common Goldeneye, Snipe, Snow Goose, Greater Scaup and Eurasian Collared Dove.

Raptors & Corvids

Like cavity nesting birds, we make a concerted effort through the season to keep track of other nesting birds including Bald Eagles, Peregrine Falcons, Common Ravens and Northwestern Crows.

Two pairs of Bald Eagles were confirmed nesting this season on Limestone Island. Eagles were seen sitting on the nests at both BAEA-3 and BAEA-7.

Peregrine Falcons raised three chicks on the cliff located at the South side of the island. The nest ledge was observed on 11 June at which point an adult peregrine was observed feeding three large chicks. At this point the chicks already had many of their adult feathers, and likely fledged by mid to late June.

The Common Raven nest near the deer exclosures was destroyed by blow-down, however the pair built a new nest in a smaller spruce tree approximately 100m to the south. Young could be heard in the nest upon arrival on the island in early May. The chicks were observed hopping between branches near the nest on 26 May and fledged shortly afterwards. The area below the nest was checked for predation remains shortly after the chicks fledged. There were no murrelet wings found and only several pellets containing murrelet feathers. Unlike last season there were no abalone shells found under the nest.

Plants

There are relatively few wildflowers and berry bushes left on Limestone Island as a result of heavy browsing by introduced deer. Most flowering plants are now found restricted to cliff areas where the deer cannot reach them. Through the season we kept a record of the dates on which particular species were first observed in bloom. Anecdotal observations suggest that plants bloom much earlier on islands such as S. Low where deer are absent. A number of rare plants are present on Limestone due to the unique limestone geology which is uncommon on the rest of the islands. These plants are Showy Jacob's Ladder (*Polemonium pulcherrimum*), Few-flowered Shootingstar (*Dodecatheon pulchellum*), Richardson's Geranium (*Geranium richardsonii*), Tufted Saxifrage (*Saxifraga cespitosa*) and Cut-leafed Anemone (*Anemone multifida*). Only Showy Jacob's Ladder and Few-flowered Shootingstar were recorded blooming this year, and it appears that the one known clump of Tufted Saxifrage was washed away by storm waves last winter.

There are a number of invasive plants that have become established on Limestone Island including bull thistle (*Cirsium vulgare*), Canada thistle (*Cirsium arvense*), prickly Sow-thistle (*Sonchus asper*), and wall lettuce (*Lactuca muralis*). We did not complete any invasive plant control work this season; however, we did remove the black plastic sheeting that was put down over a large patch of Canada thistle last season in an attempt to smother its growth. This treatment did not prove to be effective. The site was too steep and exposed resulting in winter storms blowing the plastic off the area it was intended to cover.

Introduced Species

Sitka Black-tailed Deer *Odocoileus hemionus*

Deer were intentionally introduced to Haida Gwaii in 1878 and in several years between 1911 and 1925 to provide game meat for local people. Because they have no major predators on the islands, the deer population has reached very high density and has dramatically impacted plant communities, particularly in the forest understory. LBCS is a partner in the Research Group on Introduced Species (RGIS, www.rgisbc.com) which has carried out extensive research on this topic in Laskeek Bay as well as the rest of Haida Gwaii. On Limestone Island, we had three 20m x 20m deer exclosures to demonstrate the impact of deer browsing on native vegetation. Exclosures 1 and 2 were completely destroyed by blow-down in the past winter. Exclosure #3 was also badly damaged but we were able to complete repairs, although it was made slightly smaller in the process. The huckleberry, salal, ferns, and young trees in the interior of exclosure #3 had been browsed by deer over the winter, but showed substantial recovery by the end of the season. This type of understory vegetation is almost entirely absent from areas that deer can access, and the exclosures provided a dramatic demonstration of how quickly the understory can recover in the absence of deer. The huckleberry exclosure installed near the main trail in 2009 was also destroyed by blow-down.

Raccoons *Procyon lotor*

Raccoons were introduced in the early 1940s to provide local trappers with a source of employment. Raccoons (as well as rats) are one of the largest threats to ground and burrow nesting seabirds on Haida Gwaii. With few defenses against mammalian predators, birds such as Ancient Murrelets, Cassin's Auklets and Fork-tailed Storm Petrels are very vulnerable to raccoon predation and are likely to experience rapid decline where these predators become established on colonies.

Raccoon predation is an ongoing concern on Limestone Island. During 1990 and 1991 there was considerable raccoon presence on the island and very high rates of predation. Based on predation rates observed during earlier visits to the island, it is reasonable to assume high levels of predation for the period of 1983-1989 as well (see LBCS Science Report #3 for further discussion). Raccoons were removed from the colony in 1992 and predation rates dropped dramatically. Raccoons were again present in 1993, 1994 and were suspected in 1995 and 2001. More recently a raccoon was removed from the island in 2007, and raccoon presence was confirmed again in 2009.

Due to the large raccoon population on Louise Island it seems likely that raccoons will continue to disperse to Limestone Island in future years. It is therefore very important to initiate spring surveys for raccoons to eliminate them on the breeding colony before birds begin breeding in early April. By the time field camp opens in early May raccoons, if present, can already have had considerable impact.

There were no spring-time surveys or culls completed on Limestone or Louise Island this season, however the RGIS crew was based on Limestone in the first half of April and did not see any evidence of raccoons. Baited cameras were being used on the island during deer capture work and no raccoons were seen in any of the photos. Experience from testing these cameras in Skidegate Inlet in winter 2010 indicated that raccoons were very attracted to the apples which were being used as bait. Based on this evidence we were confident that there were no raccoons present on Limestone in the early part of the season. Baited cameras were also present in May and no evidence of raccoons was detected.

Red Squirrels *Sciurus vulgaris*

Squirrels were introduced to Haida Gwaii in 1950, perhaps to aid in cone gathering for the forest industry. Squirrels may have been introduced to Limestone directly at this time. In any case, squirrels are well established on Limestone and are known to be a nest predator on various songbird species (see www.rgisbc.com). Since 2007 we have been completing squirrel surveys on Limestone Island to measure the annual abundance of squirrels on the island. Over time we hope to describe population cycles of this introduced species and gain a better understanding of the consequences of squirrel presence. General observations this season suggested that the population of squirrels was particularly high, likely due to an abundance of cones.

CONCLUSION

This season was our 22nd year of research, monitoring, and environmental education in Laskeek Bay. Since 1990, LBCS has focused on developing baselines and long-term data sets for the marine and terrestrial ecosystems of Laskeek Bay, as well as allowing volunteers, students and visitors the chance to visit our research camp. The society remains dedicated to long-term monitoring and engaging the public in addressing local conservation issues.

Major challenges were faced this season due to the extensive blow-down that occurred over the past winter. The murrelet colony area has been severely disrupted, particularly in North Cove. It is hard to assess what the long-term consequences will be for the population. Large areas of the island are now difficult to access and this will have implications for wildlife tree monitoring and other island based activities. Despite the challenges, this natural disturbance event may open up new opportunities to study forest recovery. LBCS will welcome any opportunity to collaborate with individuals or organizations interested in the monitoring of rejuvenation and recovery following this large natural disturbance in our coastal temperate rainforest.

Social attraction was used for the first time in 2011 in an attempt to increase the murrelet breeding population of Limestone Island. The disturbance to the colony area will make it somewhat difficult to assess if the approach is effective, however it is felt that there is enough evidence from other studies to warrant the continuation of the project in future years.

The continued viability of the murrelet colony on Limestone depends on the absence of introduced predators, and therefore the importance of raccoon eradication on Limestone Island and the adjacent shorelines of Louise Island, particularly early in the season, cannot be overstated. The lessons that we learn on Limestone Island will be of great importance when considering the prospects of other colonies threatened by introduced raccoons and rats as they continue to disperse throughout the many islands of Haida Gwaii.

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- Fisheries and Oceans Canada
- Environment Canada – Canadian Wildlife Service, Pacific Region
- Environment Canada EcoAction
- NSERC Promo-Science
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