

EAST LIMESTONE ISLAND FIELD STATION: REPORT ON THE 2006 FIELD SEASON

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SUMMARY

This season marks 17 years for the Limestone Island field camp. In 2006 our education and research programs involved 32 volunteers, six groups from four local schools, and three groups from sail boats totaling 268 volunteer and 105 visitor days. For a third consecutive year, Ancient Murrelet field work was restricted to chick capture work which ran from 10 May to 1 June and peaked on 17 May. We caught 446 chicks at funnels 1-6 in addition to 68 chicks caught either after hours, outside of the funnels or at the two new funnel set-ups. This year's chick total marks the fewest chicks recorded apart from 2004, and 2006 was the shortest chick season to date. From the end of May through to camp close we monitored Black Oystercatcher breeding territories extending from Laskeek Bay south to Juan Perez Sound. We located 95 territories occupied by adults, 81 of which had eggs or chicks at some point in the season and in total we banded 29 chicks. We identified 2438 prey remains at 27 Black Oystercatcher nests and limpets, mussels and chitons made up 99% of identified prey. We counted 283 Glaucous-winged Gull nests in Laskeek Bay and 89% were located at the Lost Islands colony. For a second consecutive year we found eggs and chicks in our Pigeon Guillemot nest boxes from which banded four chicks. We followed Cassin's Auklet and Fork-tailed Storm Petrel breeding activity N. Shore and Cassin's Tower sites by monitoring 108 burrows from which one Cassin's Auklet chick was banded. There were 103 marine mammal sightings of 8 different species this season, including 91 Humpback whales. We also identified 14 active wildlife trees with 15 nests: Red-breasted Sapsuckers (8), Chestnut-backed Chickadees (3), Hairy Woodpeckers (2), Northern Flicker (1), and Brown Creeper (1). One Bald Eagle nest was active on Limestone this year and the chick was flying by mid July.

INTRODUCTION

Our research and education programs offer a unique opportunity for participants to learn about the marine and terrestrial ecosystems of Haida Gwaii. In particular, we stress the importance of long-term monitoring to develop a better understanding of long lived species and their natural fluctuations. Consider for example that the oldest Ancient Murrelet we've recorded is at least 17 years old and that Black Oystercatchers banded as chicks in 1994 are currently breeding in Laskeek Bay.

A better understanding the life history of each of these birds will help to evaluate changes across time which is especially important given pressures from of introduced threats such as predation by non-native species, contamination from pollutants such as oil and recent concerns related to wind turbine developments. We hope that by promoting a better understanding and appreciation for wildlife we can help protect the marine and terrestrial ecosystems of Haida Gwaii and beyond. This field season marks 17 years of education and research in Laskeek Bay!

EDUCATION AND INTERPRETATION PROGRAM

A central mandate of LBCS is to raise awareness of local conservation issues through environmental education and to provide opportunities for members of the public to participate in hands-on research in the field. To this end LBCS runs several different programs aimed at public involvement, creating opportunities for local youth and adults, as well as visitors, to participate in the research activities on the island.

New on Limestone this year is the Visitor Interpretation Centre. Constructed during March of 2006 this new cabin provides a place where visitors can access the Limestone Island library and explore other interpretive materials. The space serves a dual role of providing a new 'office' space and has helped to reduce congestion in the old cabin. In addition it provides another heated space for volunteers to read, write or simply relax - a valuable addition to the camp!

Project Limestone

This year was the 16th season that Project Limestone has brought local students to participate in the Ancient Murrelet banding program. Students Participate in a tour during the day which introduces them to the island and gives an overview of the research carried out by LBCS with a focus on the Ancient Murrelet banding program. Students then return at night to help with chick banding and assist in capturing chicks from the funnels, bringing them to the banding shelter and releasing them. Students also have the opportunity to weigh the chicks, assist in recording data and observe the banding process. This is a unique opportunity for the students and they are always quick to say that it is one of the things they look forward to in the school year.

Six groups from four local schools visited the island, representing a total of 50 students and 13 chaperones/teachers. Our first group of the year was from GM Dawson Secondary School on May 19. The Living and Learning School brought two groups to the island this year, visiting on the nights of May 20 and May 22. Two groups from Queen Charlotte Secondary School visited on the nights of May 24 and 26. The last group of the season was from Anges L. Mathers School on May 31. The number of students participating this year was somewhat higher this year in comparison to previous years, highlighting the continued and growing popularity of the program among the island youth. Many students have visited in the past and are on their second or third visit to the island. Since 1991 there have been a total of 407 students that have participated in the program.

After banding finishes at 3:00 am school groups spend the remainder of the night on a specially built sleeping platform near Boat Cove on the West side of the island. In 2006, staff and volunteers constructed a new out-house at this site prior to the arrival of the first school group. When not on Limestone Island, school groups spend several days at nearby Vertical Point. Another out-house was constructed here in July after reports that the old one was in disrepair.

Volunteers

The volunteer program is a cornerstone of operations on Limestone Island: The enthusiasm and energy contributed by our volunteers goes a long way in accomplishing the many tasks necessary to keep camp running. This year saw a diverse range of volunteers visit the island to participate in research and partake in camp life. We had volunteers during every week and in total 32 volunteers contributed an outstanding 268

volunteer days over the course of the season. Of the volunteers this year, 23 were new to the island and 9 had volunteered in the past. Most volunteers spent a week on the island, however our most die-hard volunteer this season, Jen Smith (U.K.), contributed a full 6 weeks! Seventeen of this year's volunteers were from Haida Gwaii, 5 from other areas in BC, and the remainder from Italy, U.K., Japan, Texas, Nova Scotia and Alberta. Several people volunteered twice during the year, among them director Keith Moore and Barbara and Charlie Mack from Queen Charlotte. Work experience student Steve Botel (Sandspit) was on the island 14-21 July.

Moira Lemon (Canadian Wildlife Service, Pacific and Yukon Region) was on island 17-23 June and very much appreciated the help of volunteers Les Lowen and Michiko Nishimura in completing a census of the Ancient Murrelet colony. During 7-10 July Mike Cheney completed a plant survey of Limestone, looking in particular at the distribution of invasive species.

Visitors

Similar to Project Limestone, guests from tour boats visit the island during chick banding season to participate in an interpretive tour and subsequent night work. This service is provided by the society free of charge and serves to raise public awareness of the society's research and the importance of long-term monitoring. Most guests are not local and are, for the most part, on ecotourism excursions within Gwaii Hanaas. All are very keen to learn about the island ecosystem and the Ancient Murrelets in particular. Many guests say that visiting Limestone is one of the highlights of the trip.

Three boats visited the island this year bringing a total of 30 guests and 4 resource people. S/v Maple Leaf visited on 15 May and then again on 18 May followed by a group from s/v Anvil Cove, 24 May, and then by s/v Island Roamer on 29 May. Unfortunately, due to poor weather the group from the Island Roamer were given a tour of the island but were unable to stay for banding.

Reef Island camp was up and running from 17 May through 9 June. Dr. Tony Gaston with crew Melanie Farquar, Sophia Colantino, Siobhan MacPherson, Tim Lash and Gwenda Wells stopped by Limestone several times during this period. Limestone staff and volunteers had dinner with the Reef camp on two occasions and their good company was much appreciated. Siobhan also volunteered at Limestone on two separate occasions during the season: 28 May to 2 June and 9-17 June.

Other visitors were Laura Pattison (Jake's sister and a guide with Moresby Explorers) who stopped by for a visit on 17 May. As well, Moresby Explorers stopped by with a group of 7 people to view the deer exclosures on 30 June.

Field Staff

In 2006 the East Limestone field camp opened on 29 April and closed 21 July, making a 97 day season. Staff this year were: Jen Rock (camp supervisor / biologist – 9 weeks), Jake Pattison (assistant biologist / interpreter) and Laura Cowen (camp supervisor / biologist – 3 weeks).

RESEARCH AND MONITORING PROGRAMS

Ancient Murrelets

Adult Banding and Burrow Monitoring

For a third, consecutive year there was no Ancient Murrelet *Synthliboramphus antiquus* adult capture work or burrow monitoring at East Limestone. By suspending this work we hope to address whether previous adult capture work has deterred prospecting birds resulting in reduced recruitment and low chick numbers.

Chick Banding

Each night from 5 May to 2 June we monitored funnels at North Cove and Cabin Cove for Ancient Murrelet chicks. Chick trapping took place between 22.30h and 02.30h and after 19 May, in response to longer daylight hours the schedule was adjusted to begin trapping at 23.00h. Two new funnels were added to the Cabin Cove

area totalling eight funnels, four at each trapping location. Chicks first arrived at funnels on 10 May and following the usual protocol banding continued until the first night when no chicks arrived at any of the eight funnels (Fig. 1). All chicks that passed through our funnels were weighed and banded and in total we caught 446 chicks in the six traditional funnel set-ups in addition to 48 chicks caught at the new funnels and 20 chicks caught after 02.30h or outside of the funnels (Table 1).

The number of chicks trapped at funnels 1 to 6 was lower this year than in any year apart from 2003 when we counted one less (Fig. 2). Chick departures peaked on 17 May which is a few days earlier than the average peak of 20 May \pm 2.5d (SD). This year's chick banding season was the shortest to date (Table 1).

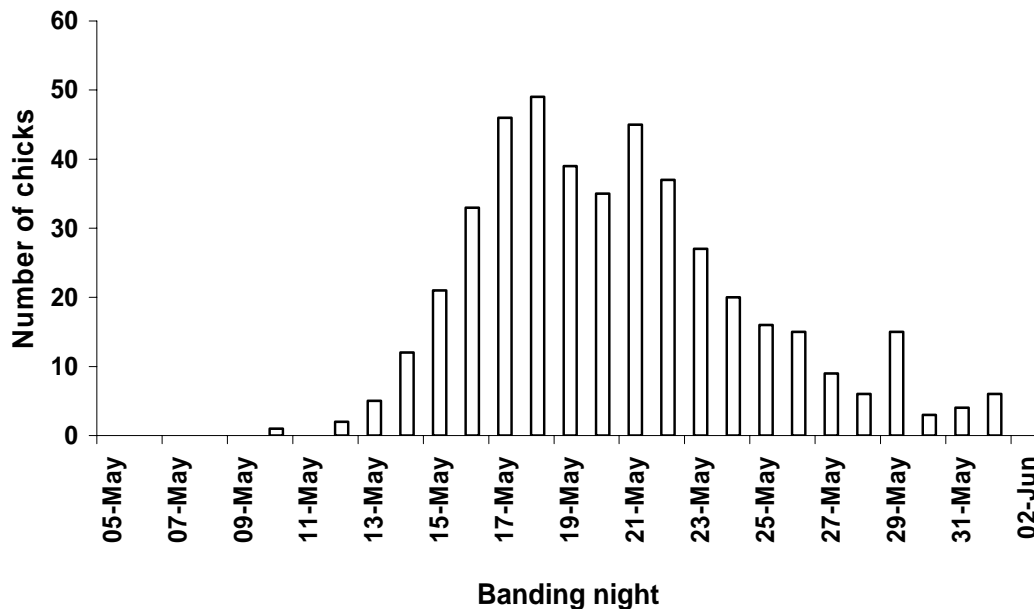


Figure 1
Nightly chick numbers caught at funnels 1-6 on Limestone Island, 5 May to 2 June 2006

Table 1
Summary of chick departures, peak nights and totals from funnels 1 to 6 on Limestone Island
1990-2006

Year	Opening night	First night with chicks	Last night	Peak night	Peak count	Total days	Total chicks
1990	12-May	12-May	15-Jun	22-May	65	35	873
1991	08-May	08-May	06-Jun	26-May	48	30	571
1992	12-May	12-May	03-Jun	21-May	73	23	674
1993	09-May	10-May	15-Jun	18-May	70	37	653
1994	07-May	07-May	08-Jun	22-May	52	33	618
1995	07-May	10-May	11-Jun	22-May	64	33	617
1996	10-May	11-May	09-Jun	19-May	48	30	587
1997	08-May	11-May	11-Jun	24-May	41	32	527
1998	07-May	11-May	22-Jun	20-May	55	43	495
1999	09-May	11-May	11-Jun	21-May	54	32	567
2000	11-May	11-May	11-Jun	20-May	62	32	595
2001	08-May	10-May	15-Jun	18-May	54	37	560
2002	07-May	09-May	03-Jun	21-May	65	26	566
2003	10-May	11-May	03-Jun	21-May	52	24	512
2004	08-May	08-May	02-Jun	16-May	45	26	445
2005	07-May	07-May	06-Jun	23-May	38	31	462
2006	05-May	10-May	01-Jun	17-May	49	23	446

Gathering Grounds

We counted Ancient Murrelets gathering west of Low Island daily from 30 April to 20 June 2006. Each day, we conducted five minute counts approximately two hours before sunset however, poor weather conditions prevented counts on 11 days and an additional five days were missed because the crew was absent during gathering ground hours. The peak count of Ancient Murrelets gathering west of Low I. was 123 birds on 14 May). On average, we counted 50.5 ± 40.0 (range: 3-123) birds on the gathering grounds in May and 23.1 ± 23.1 (range: 4-69) birds in June.

Point Counts

From 21 May to 2 June we conducted daily point counts for Ancient Murrelets following chick trapping sessions (at approximately 02.30h). We counted the number of calls heard and the number of individuals calling for five minute periods at both North Cove and Cabin Cove. Summing data collected from both locations, the peak numbers were 106 calls on 25 May and 13 individuals calling on 24 May.

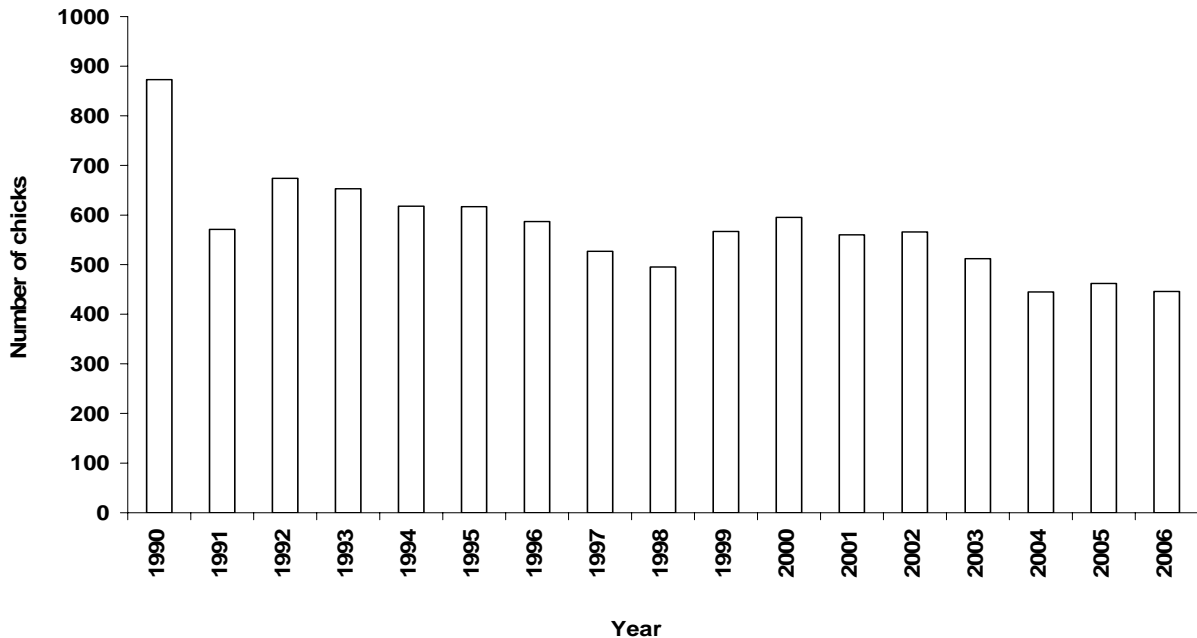


Figure 2
Trend in numbers of Ancient Murrelet chicks caught at funnels 1 to 6 on East Limestone Island

Population trends

We used similar protocols (plots were 7 x 7 m squares placed at 20 m intervals along transects) to those used in previous censuses on East Limestone (1983, 1989, 1995). Based on 13 of the 14 transects surveyed, the number of burrows we counted represented approximately 63% of those recorded in 1995 and in terms of occupancy, less than 50% of the burrows held evidence of current years breeding effort compared to 61% in 1995. There was no indication that the colony has shifted to other areas on the island so that the transect results are consistent with the decline in chick numbers observed at funnels and suggest that the number of breeding birds on Limestone is, as suspected, lower than in earlier years.

Black Oystercatchers

Occupancy and Reproductive Success

Since 1992 we have been monitoring Black Oystercatchers *Haematopus bachmani* in the Laskeek Bay area from Cumshewa Island to Lost Islands in Gwaii Haanas

National Park/ Haida Heritage Site. In 2006 we visited Black Oystercatcher territories in Laskeek Bay to determine reproductive success by counting the number of breeding pairs and measuring eggs and chicks. This year we found 35 territories occupied by adults and at 26 of these we found either eggs or chicks at some point in the season. A total of 13 chicks hatched at nine territories (range: 1-2 chicks per nest) and eight chicks were big enough to band (we band chicks that exceed 100g in weight).

For a third consecutive year we extended our Black Oystercatcher monitoring to include additional sites in Gwaii Haanas National Park/ Haida Heritage Site. Not including sites in the Lost Island group, we identified 60 territories occupied by adults and at 55 of these we found either eggs or chicks. Thirty-eight chicks hatched at 26 territories (range: 1-3 chicks) and 21 chicks were big enough to band.

We band chicks with a uniquely numbered metal band in addition to colour band combinations indicative of where chicks were banded and the year they were banded. These band combinations allow researchers to examine dispersal and various life history

aspects and as a result we are always keeping an eye out for banded adults. This year we re-sighted 12 banded Black Oystercatcher adults at 11 different sites (Table 2).

Table 2
Banded Black Oystercatchers re-sighted in Laskeek Bay 2006, * note that birds can lose colour bands (UB = unbanded)

Band Combination	Location seen / Nest site	Year Banded	Banded as Adult or Chick
UB – W/M	South Low (SLW-8)	1994	Chick
UB – BK/M	Reef I. (REE-2)	2000	Chick or Adult
AL – BK/M	Reef I. (REE-1)	2000	Adult
UB – BK/M	Lost I. (LOS-4)	2000	Chick or Adult
UB – BK/M	South Low (SLW-5)	2000	Chick or Adult
UB – BK/M	South Low (SLW-1)	2000	Chick or Adult
UB – M	Kingsway Rk. (KNG-2)	unknown	unknown
W – R/M	East Limestone I. (ELI-3)	2003	Chick (not breeding)
WH – BK/M	Skedans I. (SKE-6)	2000	Chick
UB – M	Cumshewa	unknown	unknown
UB – R/M,	Both at Reef I., in a flock of	2003	Chick
UB – BK/M	seven birds	2000	Chick or Adult

Diet

Chick diets comprised primarily marine invertebrates brought to chicks on the breeding territory until fledging (approx. 40 d.). Chick diet composition can be inferred from prey remains found within the breeding territory and we described chick diet composition and prey size by counting and measuring food remains in the vicinity of nest sites with chicks.

In Laskeek Bay we collected, identified and measured 2432 prey remains from nine nests. In Gwaii Haanas we identified 1263 prey remains from 18 nests but we did not measure these due to time constraints. Based on the mean proportion of prey remains at each nest site, limpets, mussels and chitons together made up 99% of the prey remains identified (Figure 3)



Figure 3
Invertebrate prey remains identified at Black Oystercatcher nest sites in Laskeek Bay and Gwaii Haanas in 2006 (n = 3795 prey from 27 nests)

Glaucous-winged Gulls

Since 1992 we have been censusing Glaucous-winged Gull *Larus glaucescens* colonies in Laskeek Bay. In 2006 we counted adults, nests and the number of eggs at Kingsway Rock, Lost, Low, Skedans and Cumshewa islands. We visited most sites between 25 and 26 June with the exception of the Lost Islands which we visited late this year (2 July) because of scheduling and weather. As usual, the largest colonies were Lost Island, with 252 active nests and Kingsway Rock, with 20 nests. Only a few additional breeding pairs were found at Skedans, Low and Cumshewa islands, where two, nine and zero nests were found respectively (Fig. 4). Because of the late date of the survey at Lost Island, more than half of the nests contained chicks with some chicks estimated to be 14d. old.

Pigeon Guillemots

Ten wooden Pigeon Guillemot *Cephus columba* nest boxes were set up at Lookout Point in 2001. They are checked for nesting activity at the end of each season. We

inspected the boxes on 18 July and seven nest boxes were active containing: one egg (n = 2 nests), one chick (n = 2 nests) and two chicks (n= 3 nests). Four chicks were banded with metal bands while the remaining four were just a few days old and too small to band.

Cassin's Auklets and Fork-tailed Storm Petrels

We monitored breeding activity at 74 burrows located at North Shore and Cassin's Tower sites by conducting weekly checks for knockdowns at burrow entrances. At the North Shore we monitored 25 burrows and at 18 of these we recorded activity (more than two records of knockdowns). Cassin's Auklets *Ptychoramphus aleuticus* were definitely active in this area, as telltale droppings and strong characteristic smells were noted at several of the burrows entrances. Nesting habitat in this area is very rocky making the majority of burrows inaccessible. However, this year we installed twenty four nest boxes at this site hopefully providing future opportunities for banding and monitoring chick growth.

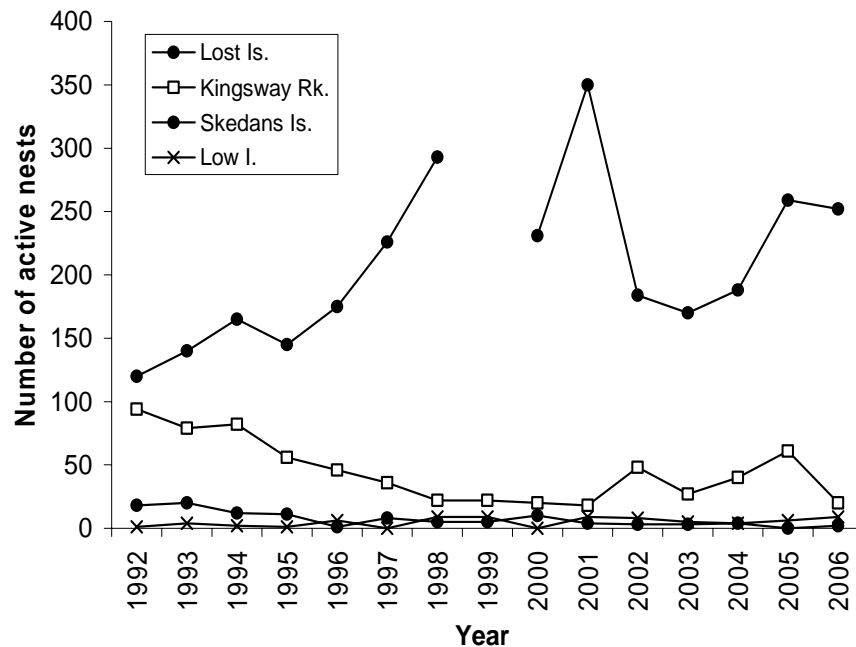


Figure 4
Number of active Glaucous-winged Gull nests in Laskeek Bay 1992-2006.

At Cassin’s Tower we monitored 44 burrows and at 43 of these we recorded activity. We also monitored knockdown activity at one nest box and were able to use the hatch to access the Cassin’s Auklet chick inside, which we later banded. Burrows in this area are occupied by Cassin’s Auklets and Fork-tailed Storm Petrels *Oceanodroma furcata*.

We know this because some burrows possess distinct Cassin’s Auklet attributes (see above) whereas others in contrast, have smaller openings, are characteristically ‘musty’ in smell and in one we found a Petrel egg.

At-Sea Surveys

To determine the abundance and distribution of different marine birds in Laskeek Bay we use boat transects, conducted regularly throughout each season and following the same routes each year.

Nearshore surveys

We conducted four nearshore surveys on 9-11 May, 4 June, 25 June and 15 July. During the four surveys, we counted 11 different marine bird species including: Ancient Murrelets, Marbled Murrelets *Brachyrhynchus marmoratus*, Rhinoceros Auklets *Cerorhinca monocerata*, Pigeon Guillemots, Pelagic and Double Crested Cormorants *Phacrocorax pelagicus* and *auritus*, Pacific Loons *Gavia pacifica*, Glaucous-winged Gulls, White-winged Scoters *Melanitta fusca*, Long-tailed Clangula *hyemalis* and Harlequin Ducks *Histrionicus histrionicus*. We also commonly observed Bald Eagles *Haliaeetus albicilla* and Black Oystercatchers. Marbled Murrelet encounters are of particular interest 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 nearshore surveys was 182 birds on 15 July,

these birds were counted on the water or flying within our transects.

Hecate Strait surveys

Especially calm conditions are required for the 'offshore' / Hecate Strait surveys making it difficult to schedule regular trips and in 2006 we conducted 'offshore' surveys on 9 June and 16 July. We counted ten different marine bird species during the two offshore surveys including: Ancient Murrelets, Marbled Murrelets, Rhinoceros Auklets, Pigeon Guillemots, Pelagic Cormorants, Common Loons *Gavia immer*, Glaucous-winged Gulls, Sooty Shearwaters *Puffinus griseus*, Red-necked Phalaropes *Phalaropus lobatus*, and a Tufted Puffin *Fratercula cirrhata*.

Marine Mammals

In 2006 we recorded 103 marine mammal sightings of eight species (Table 3). Reports of marine mammals are a combination of observations made during sea surveys, sea watches and opportunistic observations made during other work.

Humpback whales *Megaptera novaeangliae* were a common sight in the spring and we counted 91 in total. Despite these frequent reports, we had only one opportunity to take photos of tail flukes for individual ID because most of our whale sightings occurred from a distance, from land, and/or during poor weather conditions.

We have one Killer whale *Orcinus orca* encounter to report this year. On 21 June at 17.00h a group of four individuals travelled through Cabin Cove. Members of the group included one bull, two smaller individuals and a juvenile. We watched the whales for approximately 20 minutes as they traveled towards Low I. En route the whales put on a fantastic acrobatic show complete with spy hopping, tail lobbing and breaching.

Although sightings of Pacific white-sided Dolphins *Lagemorhynchus obliquidens* were not a common occurrence this year, there were three notable encounters. On both the 12 and 19 May large groups (>150 individuals) were spotted beyond Low I. and as they travelled across Laskeek Bay, dolphins lined the horizon. On 3 July we spotted 15 Pacific white-sided dolphins on the SE side of Lyell I. This was a unique encounter because the dolphins were foraging around and under our boat providing excellent close-up views.

Steller's sea lions *Eumetopias jubatus* are commonly hauled out at sites on Skedans and Reef Islands. Our highest count at Skedans Islands was 60 individuals on 11 May and at Reef Island rocks 386 individuals on 4 June. During our 4 June visit we spotted two branded Steller's sea lions at the Reef haul-out: 'F1026' and '75Y' and that same day, the Reef I. crew reported seeing a third branded individual 'F1020'. It is likely that the 'F' individuals were branded at Forrester Island in Alaska.

Table 3
Total counts of marine mammal sightings by Laskeek Bay Conservation Society based on observations made during sea surveys, sea watches and opportunistically, 2002-2006. (note: Harbour seals *Phoca vitulina* and Steller's sea lion counts are not included)

Species (common name)	Scientific name	2006	2005	2004	2003	2002
Minke whale	<i>Balaenoptera acutorostrata</i>	1	0	2	0	0
Fin whale	<i>Balaenoptera physalis</i>	0	0	0	1	0
Grey whale	<i>Eschrichtius robustus</i>	1	1	1	3	2
Humpback whale	<i>Megaptera novaeangliae</i>	91	15	19	152	49
Killer whale	<i>Orcinus orca</i>	4	11	13	21	29
Harbour porpoise	<i>Phocoena phocoena</i>	4	3	12	5	21
Dall's porpoise	<i>Phocoenoides dalli</i>	0	1	0	0	29
Pacific white-sided dolphin	<i>Lagenorhynchus obliquidens</i>	365	8	0	325	22
Northern elephant seal	<i>Mirounga angustirostris</i>	0	0	0	1	0
California sea Lion	<i>Zalophus californianus</i>	0	1	1	0	0

Wildlife Trees

This year we monitored 44 snags for cavity nesting birds and after three, 30 min visits to each tree we determined nine of these trees to contain active nests (Table 5). In addition we found five new wildlife trees for a total of 14 active trees containing 15 nests that were occupied by five species of birds: Red-breasted Sapsucker *Sphyrapicus rubra*

(8 nests), Chestnut-backed Chickadee *Poecile rufescens* (3 nests) Hairy Woodpecker *Dendrocopos villosus* (2 nests), Northern Flicker *Colaptes auratus* (1 nest) and Brown Creeper *Certhia americana* (1 nest). On average, cavity nesters' chicks fledged on 17 June \pm 9.8d (Table 5) with Hairy woodpeckers averaging the earliest fledging (6 Jun \pm 6.4 d) and Red-breasted Sapsuckers the latest (18 Jun \pm 6.0 d).

NATURAL HISTORY

Daily Bird Checklist

We recorded 59 bird species seen or heard in the Laskeek Bay area during the 2006 season and our daily maximum count was 32 species on 9 July. Some of the less common sightings included four Red-necked Phalaropes seen during an offshore survey, and Western and Least Sandpipers *Calidris*

mauri and *minutilla* spotted at Kingsway Rock on 16 July. Other species of note that we saw or heard during visits south of Laskeek Bay included Northern Saw-whet Owl *Aegoliua acadicus*, California Gull *Larus californicus*, Great blue Herons *Ardea herodias* and Blue Grouse *Dendragapus obscurus*.

Table 5

Wildlife tree use on East Limestone Island, 2006. (RBSA = Red-breasted Sapsucker, NOFL = Northern Flicker, CBCH = Chestnut-backed Chickadee, HAWO = Hairy Woodpecker, BRRCR = Brown Creeper, Ss = Sitka spruce, Hw = Western hemlock)

Tree #	Cavity Nester	Tree Species	Fledge Date
10	RBSA	Ss	19-Jun
17	NOFL	Ss	30-Jun
45	CBCH	Ss	7-Jun
72	RBSA	Ss	20-Jun
90	RBSA	Ss	21-Jun
96	CBCH	Hw	6-Jun
96	RBSA	Hw	21-Jun
99	RBSA	Hw	11-Jun
103	HAWO	Hw	2-Jun
106	RBSA	Ss	19-Jun
107	HAWO	Ss	11-Jun
108	BRRCR	Ss	11-Jun
109	RBSA	Ss	19-Jun
110	CBCH	Ss	5-Jul
111	RBSA	Hw	3-Jul

Birds of Prey

Our only active Bald Eagle nest on East Limestone Island this season was in tree #5 located at Cassin's Tower. The pair was observed at the nest regularly from 9 May and a chick was first spotted on 7 June. The ridge adjacent to Cassin's Tower provided an excellent perch from which to watch the nest and view the chick. On two occasions around 10 July the large chick was absent from the nest but following each of these watches the chick was seen back in the nest suggesting that by mid July the chick was flying. At camp shut-down on 21 July the chick was still in the nest.

Most years we have regular reports of Saw-whet owls calling in addition to the occasional nighttime sightings during Ancient Murrelet chick banding season.

However, in 2006 there was no sign of Saw-whet Owls on Limestone.

Common Ravens *Corvus corax* nested on Limestone Island again this year and by 26 May the young had fledged. We suspect that Northwestern Crows *C. caurinus* also nested on the island because we found a handful of nests in Crow Valley and noted the presence of Crows in the area. We did not observe activity at any the nests, but they were discovered late in May and chicks may already have fledged.

Plants

We continue to inventory plants and bloom dates on Limestone throughout the field season and in early July, Mike Cheney visited Limestone to re-survey the plant community on the island. Of particular interest was the distribution of rare and

invasive species. Several plant species that occur on Limestone are uncommon or occur nowhere else in the Archipelago while others are aggressive, non-natives that potentially threaten to compete with native species.

Introduced Species

In Haida Gwaii, non-native species such as Sitka Black-tailed deer *Odocoileus hemionus sitkensis* and Raccoons *Procyon lotor* have had a considerable impact on the island's ecosystem. For example, Sitka Black-tailed deer mark their presence on Limestone by browsing heavily on the forest understorey. Our three deer exclosures provide visitors and volunteers with a chance to compare the difference between areas with and without deer browse. The effects of deer browse are especially highlighted when we visit the few deer-free islands in Laskeek Bay. These

deer-free sites are often carpeted with wildflowers and dense underbrush, features uncharacteristic of islands with deer.

Raccoons have had devastating effects on seabird colonies that have no natural defense against these introduced predators that target adults, chicks and eggs. This year, poor weather prevented raccoon surveys by boat on most days with appropriate tide conditions and as a result we completed only one boat survey (6 June) to search for raccoons on Louise and Limestone Islands. Despite this reduced effort to scan for raccoons by boat, we surveyed East Limestone regularly by foot keeping an eye out for signs of diggings, predation and tell-tale latrines. No signs of raccoon activity on East Limestone Island were recorded in 2006.

CONCLUSIONS

Ancient Murrelet chick numbers remain low compared to early years suggesting that the overall number of breeding birds has declined over time. Results from this year's population census are consistent with this trend (Lemon, this volume) and it does not appear that the colony has shifted to other areas on the island. What has caused the decline in Ancient Murrelets on Limestone? The paper by Gaston (this issue) addresses some possible explanations.

In terms of the other research activities, this year saw the completion of a three-year contract with Parks Canada to conduct Black Oystercatcher work south of Laskeek Bay. Overall, this project was very successful in collecting baseline data for the region and there is discussion that Parks Canada would like LBCS to continue this work by re-surveying territories every other year.

