

EAST LIMESTONE ISLAND FIELD CAMP: REPORT ON THE 2001 FIELD SEASON

Joanna Smith, Charlotte Tarver and Joelle Fournier

Laskeek Bay Conservation Society, Box 867, Queen Charlotte BC, V0T 1S0

SUMMARY

With over 300 visitor and volunteer days in 2001, the interpretation and research program on Limestone Island was a strong success. Three local schools participated in Project Limestone, with children as young as 10 years old seeing an Ancient Murrelet for the first time. We hosted visitors from Gwaii Haanas National Park Reserve, Haida Fisheries, the Research Group on Introduced Species, Island Roamer, Maple Leaf and local residents. We began an outreach program with the Haida Gwaii Watchmen and look forward to more involvement next year. On the island and offshore, our long-term study of the Laskeek Bay ecosystem revealed several interesting results. Thirteen of the monitored Ancient Murrelet burrows (the lowest ever) were occupied and nine were successful. There were lots of murrelets on the water during sea surveys and in June, more than 400 murrelets were observed in Laskeek By. We banded 560 chicks in funnels and caught 181 adults in nets, including adults banded in 1989 and 1990. Ancient Murrelet breeding was disturbed by the presence of at least one predator. Throughout the island, 41 burrows were excavated but the source of the diggings was not found. We installed 100 wooden Ancient Murrelet nest boxes and an additional 10 boxes for Pigeon Guillemots. The first Northern Saw-whet Owl nest (subspecies *brooksi*) was found on Limestone Island and the owls successfully fledged at least one chick. Bald Eagles nested and raised one chick and a Sharp-shinned Hawk pair fledged one chick, the second record for this species. Twenty-five wildlife trees were active with five different species occupying the nests. Offshore, 85 sightings of nine species of marine mammals were made, including the rare Fin and Sei whales. Two collared deer were frequently sighted on the island and the plants in the deer exclosures are showing signs of recovery. It was exciting to discover new information as a result of the continuous long-term research projects and to share this with others through their participation on East Limestone Island. Each year we learn more about the ecology and conservation of the Laskeek Bay ecosystem.

EDUCATION PROGRAMS

This year, 28 students (ages 9 to 18), accompanied by nine teachers, came to Limestone Island. The 37 people came from the Queen Charlotte Junior / Secondary School, G.M. Dawson, and Living in Learning School. During their day visits, Charlotte Tarver demonstrated the techniques used to gather data and explained the various projects we were doing in 2001. Returning before nightfall, the students made their way to the north cove Ancient Murrelet chick catching funnels and were shown how to gently pick up the chicks and put them in chick bags. During the night, the students helped out by accurately recording measurements, weights, and band numbers of the chicks into notebooks. Now in its eleventh year, Project Limestone has brought more than 400 students and 120 teachers to Limestone Island.

Limestone Island is one of the only places in Canada where people can visit a seabird colony with an active research program, and as a result, our program is very popular and highly regarded. Most of the visitors come via tour groups who are also visiting Gwaii Haanas National Park. A daytime orientation to our research projects is offered by staff, and during the Ancient Murrelet chick departure season, a night visit is provided to those who wish to come ashore and assist with chick, and occasionally, adult banding. In 2001, the Island Roamer called in five times (May 8, 17, June 1, 20 and 28), with a total of 66 visitors; the Maple Leaf visited twice (May 23 and 28) with 25 people. Nine people came ashore with Whitney-Smith Kayak Tours on June 15 for an afternoon tour of our songbird and introduced species projects. Total person days of tour groups: 131 (of which 100 were visitors).

Two Gwaii Haanas National Park Reserve staff made a brief, overnight stop on Limestone Island on their way to the Park in May. We gave them an orientation to our projects and they helped us with chick and adult banding. Researchers from the Haida Fisheries, studying the abundance of Northern abalone (*Haliotis kamtschatkana*), a threatened species, stopped by five times in July (12-13, 15, 17-18). Also in the same month, a group from Haida Forestry came to look at the effects of deer on the vegetation. Total person days of these visitors: 16.

On June 27, seven people representing local government organizations came to learn about the five-year study on introduced deer. Dr. Jean-Louis Martin (RGIS), assisted by LBCS staff, guided the group to compare the vegetation on islands with (e.g. Limestone and Reef Islands) and without deer (e.g. Low Island). The group was served lunch on Reef Island and presented with the study results to date. On July 2 and 3, we took part in a Search and Rescue for an overdue kayaker. We provided overnight shelter and food to a kayaker from Denmark and three members of the Queen Charlotte Coast Guard Auxiliary. The missing man was found unharmed the next day. The total number of all visitors for 2001, including Project Limestone, was 279.

ANCIENT MURRELETS

The study and conservation of Ancient Murrelets continues to be important because about one half of the world's population breeds on Haida Gwaii and the species is declining throughout its range. The world population estimate for Ancient Murrelet lies between 1 and 2 million, with approximately 500,000 birds breeding in Haida Gwaii. Ancient Murrelets are listed as vulnerable in Canada by the Council on the Status of Endangered Wildlife in Canada (COSEWIC) and will only be removed from the list when factors that threaten the population are removed (e.g. introduced species and oil pollution).

Introduced predators are a continual threat to Ancient Murrelets on Haida Gwaii. There is an on-going need for vigilance and population control both on and near seabird colonies, to remove raccoons or rats before they gain access to nests and adult birds.

Due to the possible lifting of the oil and gas drilling moratorium in British Columbia, there is heightened concern for those species that reside in the marine environment. Ancient Murrelets are found in the Hecate Strait and other waters off Haida Gwaii from February to September, and in other parts of BC from August to March. Chicks feed exclusively in the protected waters near Haida Gwaii for the first four to six weeks of their life. Oil pollution could have devastating effects on the breeding population of Ancient Murrelets and depending on the conditions, spills have the potential to greatly impact the chick population for the year in they occur.

Ancient Murrelet breeding success and colony attendance were monitored from March 29 until June 20, 2001. The same methods to capture, band, monitor burrows and measure the reproductive success of this seabird were used as in previous years, save for some minor adjustments.

Adult banding

Three large, knock-down flight nets were used to catch adult Ancient Murrelets leaving the colony before dawn. Adults were caught from March 29 to April 11, stopped during egg-laying and then continued from May 16 to June 12, 2001. The nets were opened on 16 nights, for 29.25 hours of banding. We caught 63 adults before egg-laying, and 154 adults afterwards, plus an additional 10 birds in burrows. Total capture was 217 birds however, 46 adults were caught more than once so the actual number of birds was 181 (70 new and 111 retraps) (Table 1).

Table 1
The number of breeding and non-breeding adult Ancient Murrelets caught at three net stations (including ground) and in monitored burrows, East Limestone Island, 2001. Those classified as of “Unknown” breeding status were birds with brood patches 10 to 19 mm

Capture Method	Breeding Status	New	Retrap	All Retraps (with multiple captures)
Net	Breeder: before egg laying	9	48	54
	Breeder: after egg-laying	16	39	63
	Non-breeder: after egg laying	39	13	22
	Unknown	3	5	11
Burrow	Breeder	3	6	7
TOTAL		70	111	157

The average weight (mean \pm one standard deviation) of the birds was 199 ± 14 g for breeders, and 184 ± 9.6 g for non-breeders. More birds were caught at the Spring Valley location than at either Cabin or North Cove (120 birds, mean 15 birds/night; 43 birds, 10.75 birds/night; 49 birds, 12.25 birds/night, respectively). The Spring Valley net was used eight times, and Cabin and North Cove nests used four times each.

Ancient Murrelets banded in other years continue to return to East Limestone Island. These birds contribute to our annual survival statistics. A bird banded as an adult in 1989 was recaptured and this is the oldest bird known to date for this colony (minimum 14 years old, presuming it was at least 2 yr old at initial capture). We recorded 101 birds banded as adults from all years, 1989-2000, and 87 percent were breeding. Seven chicks were recaptured, three of them breeders. Chicks from 1993 have still never been recaptured on Limestone Island.

Chick banding

The same system of plastic funnels to weigh and band chicks at six locations was used this year. We replaced 250 of the cedar stakes and all of the plastic sheeting except for Funnel 6 and the end of Funnel 4. Chick trapping began at 22.30 h at the start of the season, but in late May the time of starting was set back to 23.00 because of the later time of sunset. Trapping ended at 02.30 throughout the season. Chicks were first heard calling from the colony on 7 May, so the funnel gates were closed the next night and the first chicks were banded on 10 May. The peak of departures occurred nine days later, on 19 May, when 54 chicks were caught (Figure 1).

We banded and weighed 560 chicks at the funnels, a little less than in 2000 and about the same as in 2001. The overall trend in numbers appears to have levelled off after falling during the period up to 1998 (Figure 2). An additional 11 chicks were banded in monitored burrows (18 May to 9 June). The mean (\pm SD) weight of the chicks was 26.7 ± 2.5 g.

The peak of chick departures occurred on 17-19 May, which is earlier than normal, but there was a long tail-off, with numbers departing remaining more or less constant from 22 May - 12 June. Consequently, although the median date of departures was quite early, the period during which 50% of chicks departed was more prolonged than in any year on record (15 d, compared to 7-11 d previously; Figure 3). The significance of this distribution is unclear.

Figure 1
Number of chicks trapped in funnels on East Limestone Island, 8 May to 16 June 2001

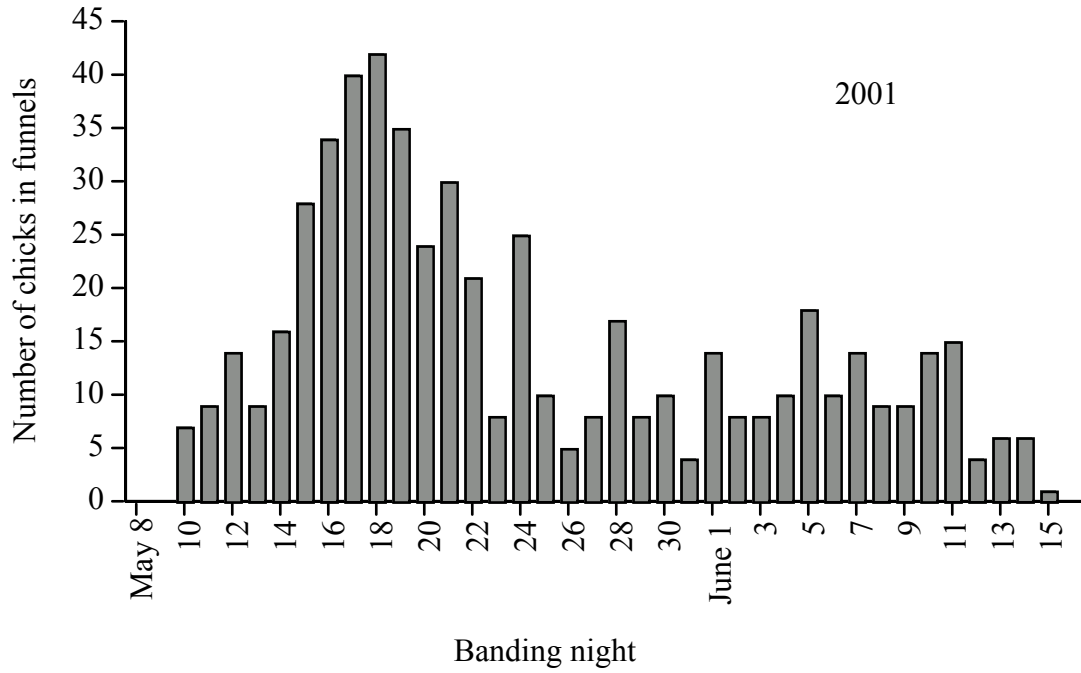


Figure 2
Numbers of chicks captured in funnels on East Limestone Island, 1990 - 2001. The solid line is a fitted polynomial regression, the hatched lines are 95% confidence bands for the mean

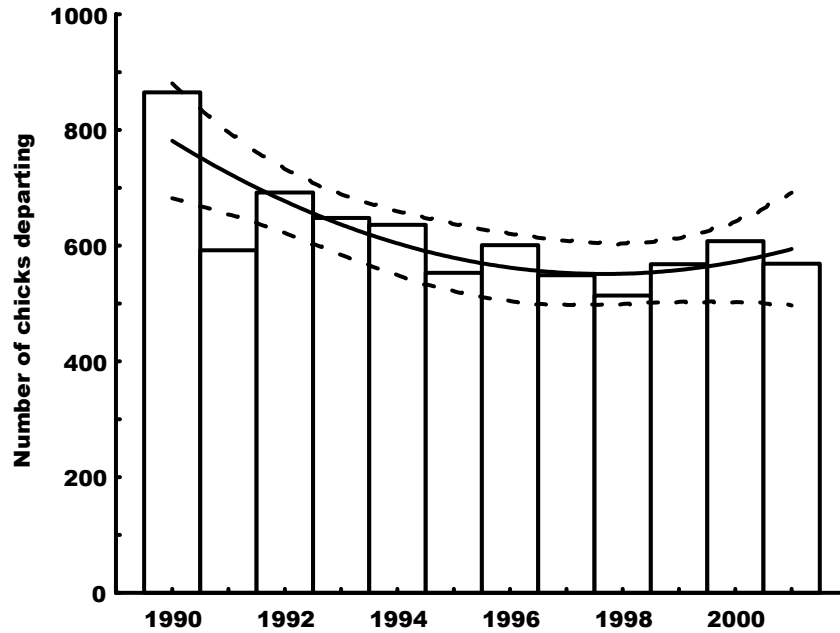
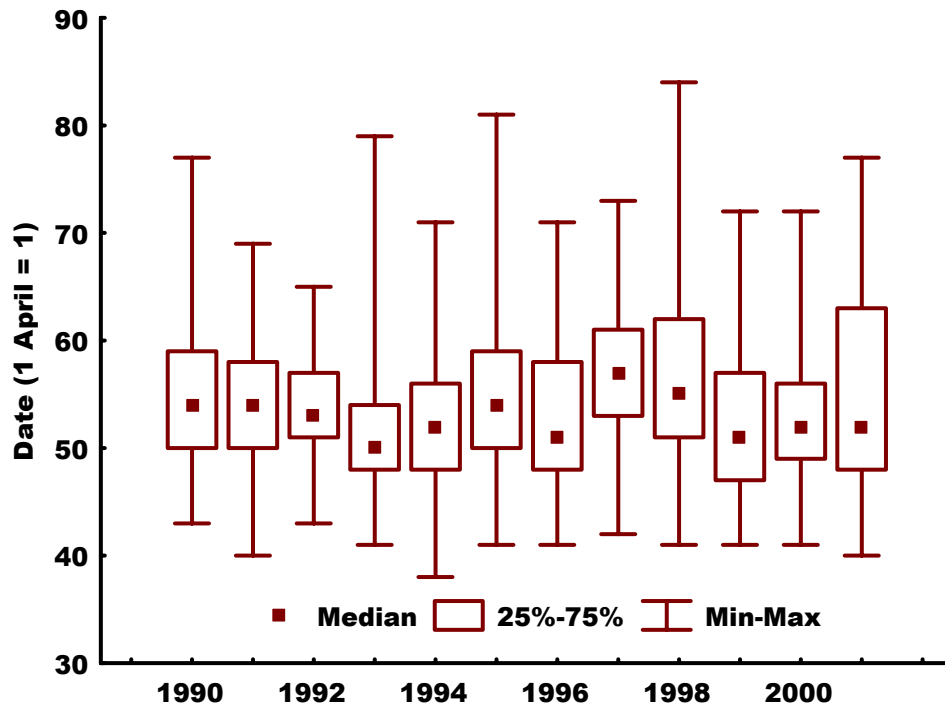


Figure 3
Ancient Murrelet chick departure dates for East Limestone Island 1990 - 2001



Burrow monitoring

Daily nest checks began on April 7, finding three eggs, and resulted in 12 eggs from 13 active burrows (we missed the first egg in burrow C21). Nine burrows successfully fledged one (n=5) or two (n=4) chicks, and four burrows were deserted (1 - one egg, 2 - two eggs and 1 - three eggs). One nest was abandoned after an incubating adult was taken from the burrow and killed (S8); the predator was suspected to be a raven. Despite an intensive search for new burrows to monitor at both the Cabin and Spring Valley plots, no new active nests were found. This year, we had the lowest number of active burrows than of any previous season.

The first chicks hatched in the monitored burrows on May 20. Three days later, to our surprise, we found a burrow with three warm eggs in S-plot during a routine 30-day check (S34). We learned that two different females were incubating the eggs but this unusual nest was not successful because the nest was abandoned before the chicks hatched. We took the eggs from the burrow, measured them and examined their contents. Two eggs were similar in size and colour but the third was smaller and coloured differently. The dissimilar egg contained a rotting embryo while the two similar-looking eggs contained nearly formed chicks.

We spent time in the northern part of the colony this year, setting up a pilot monitoring plot at North Cove. The plot's purpose was primarily to help us find suitable locations for the new Ancient Murrelet nest boxes. We have not monitored burrows at North Cove before and consulted a Canadian Wildlife Service colony census (1985) to mark out a plot. We temporarily marked 41 burrows between Funnel 1 and 4, monitored them for 7 weeks and found 24 active nests.

Gathering Ground count

Ancient Murrelets adults were counted as they gathered on the water on the western side of Low Island. We began counts on April 6 and continued nightly until 19 June. The peak count was 328 murrelets on May 23. The high counts for each month were: 20 April - 220; 23 May - 328; and 1 June - 106. We missed 13 evenings as a result of poor weather or commitments with our visitor program.

Nest boxes

In 2001, we installed 100 wooden nest boxes for Ancient Murrelet, to investigate whether there is a shortage of available nest sites and to create predator-proof nests. Thirty-three boxes were installed at each of the Cabin and Spring Valley plots, and 34 were installed at the North Cove. The boxes were made locally and constructed with a front hatch, a u-shaped tunnel, and a typical burrow entrance. About 20 cm back from the hatch, a small piece of wood was fastened to the floor so that birds would nest and lay their eggs against this structure, instead against of the door - a problem detected with similar boxes at Reef Island. Boxes were checked for activity on 20 May for 10 days. No eggs or birds were found in the boxes but 13 were visited during the period of monitoring.

Predation

In 2001, we found 41 Ancient Murrelet burrows excavated by a predator, but we were not able to confirm its identity. Twice, headless murrelet skins were close to an excavated burrow and one carcass was inside out. Three burrows were found with two eggs on the nest cup. During one search, a partially excavated burrow (the whole entrance and half the tunnel was gone) was found with an adult incubating two eggs; the nest was found abandoned the next day. We suspected that a raccoon was responsible for the diggings but since eggs were not taken from some of the burrows, it was possible that river otters were also involved. As noted by Michelle Masselink and others, the diggings were typical of raccoons and we have not seen this amount of digging for ten years, although river otters have lived on Limestone this entire time. On June 14, 2001, a raccoon survey and burrow-digging report was prepared and sent to Sean Sharpe, Regional Biologist at the Ministry of Environment, Lands and Parks in Smithers. We requested that MoELP initiate a control program on Limestone Island and Vertical Point, as per a 1995 multi-agency agreement. In October, a raccoon control team camped on Limestone Island for five days and removed at least nine animals from Vertical Point; no raccoons were found on Limestone Island.

A Common Raven nest was found near the trail as it crests the hill leading to Boat Cove. At least 25 wings and numerous eggshell fragments were found on the ground at the base of a large Sitka spruce tree. Throughout the entire season, we found many new wings and feather piles in all colony areas. A predator disturbed a burrow that has been active since 1992 and the incubating murrelet was pulled out and killed. We suspect that the predator was a raven because of the way the rocks were set aside, hatch cover moved and the presence of a the feather pile. On Reef Island, Michelle Masselink watched as a raven pulled an adult murrelet out of a burrow during the day and killed it. The murrelet struggled and made many loud calls but was unable to free itself from the raven's claws. Michelle also found a very large pile of murrelet wings, legs and eggshell fragments on the ground under a large tree on Reef Island.

BLACK OYSTERCATCHERS

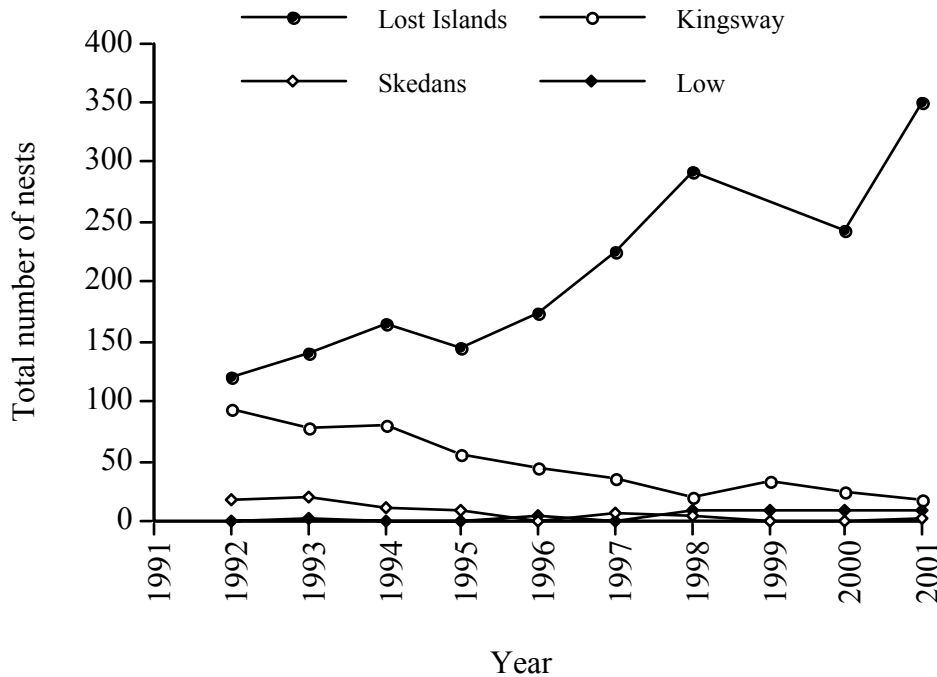
As in earlier years, all Black Oystercatcher nest sites in Laskeek Bay were surveyed for breeding activity and chicks were banded when they reach 100 grams; adults were banded when possible. This marking program helps to track chick survivorship, year-to-year movements and should eventually provide information on the longevity of some oystercatchers. A total of 32 pairs were located on islands in Laskeek Bay: Reef Island 7, Low Island 2, South Low Island 5, the Skedans Islands 6, Kingsway Rock 3, Lost Island 5, West Limestone Island 1 and East Limestone Island 3. No count was made at Cumshewa Rocks, where there are usually 2-4 pairs. Twelve chicks were banded, on Reef, Skedans, Low and Lost islands.

There are three nest sites on Limestone Island that are used each year. On 30 May, nest sites ELI-1 and ELI-2 both had eggs, ELI-3 had no eggs; adults were present at all sites. All nests were re-checked in early June when none had eggs; adults were still nearby. Eggshells were found at the ELI-3 (North Cove) in early June and early July, suggesting that the adults might have laid two clutches. The lack of success by Black Oystercatchers at East Limestone Island in 2001 may be associated with the presence of the unidentified predator: Vermeer *et al.* (1992) found that raccoon predation on oystercatchers was prevalent in Skidegate Inlet.

GLAUCOUS-WINGED GULLS

Nest and adult counts of five Glaucous-winged Gull colonies in Laskeek Bay were made on 18-29 June and on 10-23 July. The trend for increasing numbers of breeding gulls on the Lost Islands continues with 376 nests and 750 adults counted (including 29 juveniles). The colony on Kingsway Rock continues to decline (Figure 4). Numbers of nests were as follows: Lost Islands - 376 (89%), Kingsway Rock - 25 (6%), Low Island - 14 (3%), Skedans Islands - 4 (0.9%), Cumshewa Islet - 3 (0.7%) and Reef Island (SE rocks) - 2 (0.5%). The total number of nests on all colonies was 424, of which 294 (69%) contained three eggs and 39 (9%) were empty. Nests on the Cumshewa Islet and Reef Island colonies were found on 10 and 23 July; no nests were present at those sites during the earlier surveys. Glaucous-winged Gull egg-laying may have been delayed by cool temperatures and stormy weather in May.

Figure 4
Glaucous-winged Gull nest counts for four colonies in Laskeek Bay, 1992-2001. Colony counts from 1999 were not included for the Lost Islands



PIGEON GUILLEMOT NEST BOXES

Ten wooden nest boxes were installed at the Lookout Point, south east of the cabin, to study whether nest sites are limited for Pigeon Guillemots on Limestone Island. The boxes are predator and weather proof, and are basically a short tunnel with a small, dark nest chamber. The nest boxes were carried or raised into permanent locations on the rock cliff, weighted down and filled with a thin layer of soil and pebbles. Two boxes had fresh droppings inside the tunnel entry when they were surveyed in July prior to camp closure.

MARINE SURVEYS

Seabird surveys

In 2001, we did four nearshore surveys (21 April, 21 May, 3-6 June, 23 June) and two offshore surveys (11 June and 1 July). Our data are sent to the Canadian Wildlife Service in Ottawa to become a part of the permanent records of annual seabird counts along the west coast of British Columbia. The transects have been done in Laskeek Bay since 1989 (except Cumshewa Inlet), giving a 13-year-data set. One of the primary purposes of the nearshore survey is to count Marbled Murrelets, a species that is listed in Canada as endangered by COSEWIC. Our project forms an integral part of the information needed to watch this species and is the longest time series for Marbled Murrelets in British Columbia. The peak count was on 23 June, with a total of 165 murrelets for all transects.

Species diversity was good for the late April and May surveys (19 species each), declining to nine and eleven species in June. The complete species list for the nearshore surveys was: Common and Pacific loons, Red-necked Grebe, Double-crested and Pelagic cormorants, White-winged and Surf scoters, Brant, Common Merganser, Harlequin Duck, Bufflehead, Long-tailed Duck (Oldsquaw), Green-winged Teal, Black Oystercatcher, Black Turnstone, Glaucous-winged and Herring gulls, Black-legged Kittiwake, Ancient and Marbled murrelets, Cassin's and Rhinoceros auklets, Pigeon Guillemot, Bald Eagle, Northwestern Crow, and Belted Kingfisher.

Black-legged kittiwakes were recorded in Laskeek Bay in 16 of the 17 weeks of the field season and were seen during all of the nearshore surveys in 2001. Several large flocks of mostly immature birds were noted on or near Kingsway Rock with 80 birds on May 21 and 235 on June 29.

We observed eleven and ten species, respectively, on the two offshore surveys. Sooty Shearwaters were seen on both surveys, with 148 birds on the first and 598 (plus additional 300 off transect) on the second. A dark phase Northern Fulmar was seen on 1 July, as well as five unidentified sandpipers. On 11 June more than 400 Ancient Murrelets were between Low Island and Skedans Islets at 07.50 h; one humpback whale was close by. The bird list for the offshore surveys was: Common Loon, Pelagic Cormorant, Northern Fulmar, Sooty Shearwater, White-winged Scoter, unidentified sandpipers, Glaucous-winged Gull, Herring Gull, Common Murre, Pigeon Guillemot, Ancient Murrelet, Cassin's Auklet, and Rhinoceros Auklet.

Marine Mammal Surveys

In 2001, we had a total of 85 sightings of nine species of marine mammals: the most sightings recorded by the Limestone Island crew since we began collecting records in 1990. The sightings were made from the Limestone cabin, on sea surveys, or during sea watches. We spent 20.5 hours at the Lookout, fewer than in other years, but rough seas in April and May severely hampered our visibility.

Humpback Whales were in seen in Laskeek Bay from 1 April to 27 July, with sightings on 26 days, being seen almost daily between 20 May and 23 June (Table 2). On one sea watch alone, over 20 animals were spotted in the southern portion of Laskeek Bay. At times, there were more than 40 whales feeding in Laskeek Bay, as reported by the Reef Island crew and tour operators on several occasions. Humpbacks may have remained in the area because of an abundance of feed, as all animals were definitely feeding during our observations.

Orcas were encountered twice (17 June and 5 July), both times near the Skedans Islets. The first time, a pod with two males, four females and two calves slowly travelled north. This pod gave an amazing show with body rolls, tail slapping, breaching, somersaults, and spy-hopping displays. Several times, four animals would simultaneously spy-hop. The second encounter with three whales in the lagoon of the Skedans Islets on July 5 lasted for over one hour. We made a recording and took photos of the bull, cow, and calf. At one point, the calls of the bull could be clearly heard through the hull of the boat!

On two occasions (14 and 21 April) a single elephant seal was spotted at the surface near Low Island; on 14 April the elephant seal appeared to be following a large group of Ancient Murrelets. These seals (possibly the same one each time) were probably young males, as they were alone.

Non-breeding Steller's Sea Lions were counted three times at the Reef Island haul-out (28 March, 21 April and 21 May), with the highest count of more than 720 animals on 21 April. This year, we saw very few sea lions at the Skedans Islands, with the peak of 75 on 21 April. The peak numbers at Reef Island were about one month earlier than previous years. One male at Reef Island had a rope caught around its neck and was in poor condition. Our sea lion observations were sent to Parks Canada to be included in their annual Steller's Sea Lion haul-out counts in the South Moresby region of Haida Gwaii.

Other marine mammal species recorded in 2001 included a sighting of two Fin Whales east of Skedans Rock on 1 May; one Sei Whale off Haswell Island on 21 May and 2 Minke Whales on 9 and 10 July. Pacific White-sided Dolphins were seen on seven dates between 21 April - 21 July and 2-3 Harbour Porpoises on six dates between 23 June - 25 July. The number of sightings of Harbour Porpoise is higher than usual. On 21 June, several hundred Harbour Seals were counted at traditional pupping sites (Kinguii, Reef and Cumshewa islands, Kingsway Rock, and elsewhere).

Table 2
All marine mammal sightings in Laskeek Bay in 2001, except for records of groups of <10 Steller's Sea Lions and Harbour Seals

Date	Species	Number	Location	Activity
28/3/01	Steller's Sea Lion	310	Reef I. rocks, SE	hauled out
16/4/01	Humpback	1	off Cabin Cove	traveling N
19/4/01	Pacific W-S Dolphin	20	near Kunga I, Porter Head	foraging, spray
20/4/01	Humpback	7 to 8	SW of Low and Reef	feeding, surface diving, fin slaps, slow moving
14/4/01	Elephant Seal	1	W of Low I 500 m	on surface traveling S
21/4/01	Steller's Sea Lion	>700	rocks SE tip of Reef I	hauled out
21/4/01	Elephant Seal	1	.75 NM ENE of Low I	traveling S
21/4/01	Pacific W-S Dolphin	6 to 7	W side Low I	traveling S
21/4/01	Pacific W-S Dolphin	1	E side ELI, 75 m from shore	traveling N
21/4/01	Steller's Sea Lion	75	Skedans Rock	hauled out
22/4/01	Humpback	2	S end of Low I.	traveling S on surface
22/4/01	Humpback	2 to 3	75 m off ELI cabin	traveling N on surface
23/4/01	Pacific W-S Dolphin	41 to 45	1 to 1.5 nm off ELI cabin	traveling S fast

30/4/01	Humpback	3 to 5	S of Low I.	breaching, rolling, feeding
01/05/01	Fin Whale	2	Hecate Strait, 10 nm off ELI	breaching, blows
01/05/01	Humpback	4	NE Low I., 2 nm	feeding, diving, slapping
01/05/01	Steller's Sea Lion	11	Skedans Rock	hauled out
01/05/01	Fin Whale	2	10 nm NE of ELI	breaching, blows
01/05/01	Harbour Seal	1	E tip S. Low I.	on rock
01/05/01	Humpback	4 to 6	off Porter Head to Helmet I.	feeding, rolling, fin slaps
05/05/01	Humpback	1	off Porter Head	feeding
09/05/01	Humpback	1	Laskeek Bay, Hemming Head	feeding
12/05/01	Humpback	5 to 7	Laskeek Bay, Hemming Head	feeding
20/5/01	Pacific W-S Dolphin	3 to 5	2 nm W of Low I.	feeding on surface
20/5/01	Humpback	2 to 3	4 to 5 nm E of ELI	blows
21/5/01	Humpback	>5	2 to 3 nm E of Low I.	blows
21/5/01	? Sei Whale	1	Haswell I.	surfacing, blows
21/5/01	Steller's Sea Lion	300	Reef I haulout	hauled out
21/5/01	Steller's Sea Lion	33	Skedans I haulout	hauled out
21/5/01	Humpback	1	1.5 nm NE Low I.	pectoral fin slaps
23/5/01	Humpback	>12	E of Low I.	fluke slaps, fin slaps
22/5/01	Humpback	>6	E of Low I.	breaching, tail lob
22/5/01	Humpback	8 to 10	N of Kunga I.	breaching, tail lobes, fin slaps
28/5/01	Humpback	3	W of Reef I.	feeding, head out
28/5/01	Humpback	2	SSW of S Low I.	feeding, blows
28/5/01	Humpback	18 to 20	Skedans Islets to Kinga I.	fin slaps, breaching, diving

28/5/01	Humpback	5	Between Skedans Islets and ELI	blows, breaching, rolling
29/5/01	Humpback	1 to 2	E of ELI 2 nm	blows
29/5/01	Humpback	2	N of Low I.	blows
30/5/01	Humpback	2	NE of Low I.	blows
29/5/01	Humpback	4	N of Low I.	blows
31/5/01	Humpback	2	N of Low I.	blows, tail slaps
05/06/01	Humpback	1	S of Reef I.	blows, tail slaps
05/06/01	Pacific W-S Dolphin	20	between Low and ELI	foraging, traveling
07/06/01	Humpback	2	S of Low I.	blows
08/06/01	Humpback	1	300m off Cabin Cove	blows
10/06/01	Humpback	4 to 6	E of Low I., 1 nm, between Low & Reef	feeding, breaching
11/06/01	Humpback	about 15	off shore transect lines	feeding
17/06/01	Orca	8	1nm E of Skedans Is.	foraging for fish ?, repeated spyhopping
18/06/01	Humpback	7	S & SW of Reef Is, in Laskeek Bay	feeding, breaching, fluke photos taken
23/06/01	Harbour Porpoise	2	400m off Lookout Pt.	moving north
23/06/01	Humpback	3	half way between Low & Reef I.	heading SW
30/06/01	Harbour Porpoise	3	half way tween Low & ELI	feeding in large circles, moving south
04/07/01	Harbour Porpoise	2	300m off NE pt of ELI	moving south
05/07/01	Humpback	3	just E of Reef I.	heading slowly west, inc. 1 juvenile
05/07/01	Steller's Sea Lion	174	outer rock at Reef HO	on rock, inc. 32 juveniles
05/07/01	Orca	3	Skedans Lagoon	hunting seals, no kill, recordings and possible picture
09/07/01	Minke Whale	1 (2?)	half way to Low I.	moving SW
10/07/01	Harbour Seal	12	on Low I.	resting rocks, incl. 4 pups

10/07/01	Minke Whale	2	just off Cabin Cove kelp patch	moving north
11/07/01	Harbour Seal	12	Skedans Lagoon haul out	resting
14/07/01	Harbour Seals	42	Low I.	resting on rocks
14/07/01	Harbour Porpoise	2	just off Cabin Cove	heading south
15/07/01	Orca	5	Skedans Islands	moving through lagoon, no big male, 1 juvenile
15/07/01	Harbour Porpoise	4	off Cabin Cove kelp	heading SE
17/07/01	Harbour Porpoise	2	between Low and ELI	heading SW, feeding in large circles
18/07/01	Harbour Seal	20	on Low I.	resting on rocks
18/07/01	Harbour Porpoise	2	between S Low I. and ELI	heading SW
21/07/01	Pacific W-S Dolphin	2	E of Low I.	heading south
22/07/01	Humpback Whale	1	half way between Lost & Reef islands	heading SE, far out
25/07/01	Harbour Porpoise	2	just off Cabin Cove kelp patch	heading N

FOREST BIRDS

Wildlife Trees

We surveyed 69 wildlife trees in 2001. We confirmed the use of twenty-five trees by cavity nesting birds and of these, 10 were new this year. All 69 wildlife trees were snags (dead, standing trees): 57% (39 trees) Sitka spruce, 35% Western hemlock, 3% Alder and 5% unknown species. Of the 25 active trees, 64% were Sitka spruce, 28% Western hemlock, and 8% Alder.

The bird species using the trees for nesting (chicks heard and/or fledged) were: Red-breasted Sapsucker (21 nests); Brown Creeper (1); Chestnut-backed Chickadee (1); Northern Flicker (1); and Hairy Woodpecker (1), plus later, Northern Saw-whet Owl (1). Wildlife tree 20 (on the trail to the biffy) was active again in 2001 and a Red-breasted Sapsucker pair (one banded) successfully raised their chicks to fledging.

Lee Burles measured all of the trees for height and diameter (DBH), took GPS bearings on some trees, and wrote detailed directions on location of others. New tags were put on some trees and a few trees were re-numbered to eliminate confusion. New data forms were created to help us track the history of use for each tree, particularly since some trees have been used for more than five years. Full details are given elsewhere in this report.

Songbird Banding

One part of the RGIS project studies songbirds and the impact of introduced species, such as deer and squirrels, on their diversity, breeding success, and numbers in. Staff from Limestone and Reef Islands banded songbirds from 20 June - 25 July, running six stations on Reef, Low, West Skedans, East Limestone and Louise islands (Vertical Point). Eight banding sessions of five hours were carried out at each station, with at least a two-day break between sessions at the same station. The Limestone Island crew banded at East Limestone Island, Vertical Point, and West Skedans Island. More details are provided by Gaston et al. (this report).

Measurements of tarsus, wing and bill were taken from birds captured to contribute to information on geographical variation. Birds were also aged by looking at plumage, feather condition, moult limits, and if necessary, skull formation. The ratio of hatch-year (HY) birds and after-hatch-year (AHY) adults helps us to monitor the breeding success of the population around the banding stations (see Gaston *et al.*, this volume).

Much lower numbers than in previous years were trapped at East Limestone Island and West Skedans Island, while numbers trapped at Vertical Point were the highest to date; this was only the second year of trapping at West Skedans Island. On East Limestone Island, 49 birds were banded or recaptured, of which 18% were HY birds. On Vertical Point, 119 birds were caught, with 46% HY. On West Skedans Island 156 birds were trapped, of which 23% were HY. Eleven species of songbirds were caught on East Limestone Island, 12 species at Vertical Point, and 14 species at West Skedans Island. Vertical Point had an unusually high number of Hermit Thrush: 31 out of the 55 HY birds banded.

One female Hermit Thrush, originally banded on Limestone Island in 1998, has been re-trapped each year. Each time she has a brood patch, which means this bird returns to the same area of the island to breed. A Wilson's Warbler was netted at the Low Island on 25 July the first time this species has been banded in Laskeek Bay.

NATURAL HISTORY

Daily Bird Checklist

A daily checklist of birds on Limestone Island and the surrounding area resulted in a total of 73 species in 2001. The maximum species count on a single day was 38 on 11 June. Some interesting highlights were: young of the year Ancient Murrelets off the boat cove on 21 July and a male Blue Grouse calling almost daily from dawn to the middle of the night for 17 weeks. During a storm on 6 May, several thousand Sooty Shearwaters were seen flying south, inside Low Island.

Birds of Prey

This year we found the first Northern Saw-whet Owl (*Aegolius acadicus brooksi*) nest on Limestone Island; this subspecies is found only on Haida Gwaii. The familiar, monotonous calls were not heard until 5 May, much later than normal. However, an owl was frequently sighted at dusk in the area near the cabin and on 20 June, Joelle Fournier saw an owl flew straight into wildlife tree number 1, entering an old Northern Flicker nest cavity. Daily observations of this nest tree revealed that an owl briefly visited the tree every evening, often carrying prey. On 4 July an adult was sighted with its head outside the nest cavity with the other adult sitting on the tree. On 20 July chick(s) were heard calling whenever the adult owl came in carrying prey. Once the chicks had hatched, an adult would frequently come to the nest during the day. Winter Wrens were observed dive-bombing an adult saw-whet owl in the spruce regeneration near the owl's nest. The last check, on 27 July, showed that the chicks were still sticking their heads out of the nest hole. However, by 15 August the chicks had left.

The excitement with nesting raptors continued when a pair of Bald Eagles occupied the nest on Cassin's Tower for the second year in a row. A quick visit to the Tower before egg-laying turned up a Ancient Murrelet band in a fresh eagle pellet - a bird banded on East Limestone Island in 1993. After the first egg was laid, we watched the incubation from behind a tree on the ridge trail. A chick appeared on 9 June,

poking its head out from under an adult: we checked the nest weekly thereafter. When camp closed on 27 July, the chick was fully feathered but had not yet fledged. No further checks of the auklet/storm petrel colony were made in 2001.

Sharp-shinned Hawks were occasionally sighted throughout the season and we saw territorial displays by two adults over the channel between the Limestone Islands. On 2 July, a fledgling hawk was heard calling from the cedar trees on the west side of the boat cove and on 8 July, the adults were observed feeding a squirrel to the chick perched on a tree. However, no nest site was located. There was no activity at the Peregrine Falcon eyrie on the south side of Limestone Island. The nest site was checked periodically after 24 May, but no birds were seen.

Plants

An unconfirmed Queen's cup (*Clintonia uniflora*) was found in the woods north of boat cove (seen only once; no pictures). This lily is common in coastal temperate forests but has never been found on the Limestone Islands. The plants in the deer enclosures are growing, with the most obvious change being the extent of ground cover from young huckleberry and false azalea. The rare plants on the cliffs near the boat cove (e.g. *Anemone multifida*, *Polemonium pulcherrimum*) continue to fare well, as they are out of reach of the deer. In mid-June, the rare Richardson's geranium (*Geranium richardsonii*) was found in bloom at the two sites first located in 1992.

Introduced species

Perhaps the single greatest concern this year was the suspected presence of a raccoon on Limestone Island. For the first time since 1992, we noticed unusual burrow excavations in three parts of the colony. The diggings first appeared on April 23 at the northern end of the island, then more diggings were found towards Lookout Point, in Spring Valley and the northeast colony areas. Michelle Masselink came over from Reef Island and looked for latrines on Limestone and Louise Islands, finding none on Limestone but at least 40 on Louise. In total, there were 41 excavated burrows, with no estimate of adult mortality. As well, two similar sized diggings were found on West Limestone Island. Despite a massive search effort of two midnight spotlight surveys, several daytime shoreline surveys and numerous dawn searches in the colony, no raccoons were found during the field season. Live animal traps were borrowed from Parks Canada and set for 60 trap days. We baited the traps with fresh chicken eggs but failed to catch anything but two red squirrels. In October, a raccoon control crew spent five days on Limestone Island to remove raccoons from Vertical Point and Limestone Island. The crew shot and killed nine animals, probably killed two others, and saw two more, all on Vertical Point/Louise Island. A pair of eyes was seen on Limestone Island but a raccoon was never confirmed, despite one bait pile of fresh fish and two live traps with fresh fish (A. Edie, pers. comm.).

Sitka Black-tailed deer continue to live and breed on East Limestone Island. We recorded the locations of two radio-collared deer from April to June. A yellow/red collared deer was seen 15 times and a white/red collared deer was seen four times. Most of the observations were on the east side of the island but the deer ranged from the boat cove to cabin cove and into Crow Valley regularly. A fawn was found on 13 June near North Cove and at times, the yellow-red deer was accompanied by up to four other animals.

The squirrel surveys were continued this year and we completed ten surveys between 15 May - 13 June. In total, 66 squirrels were seen or heard, 19 of them within the 20 m radius plots.

Other Species

River otters were very active on Limestone Island this year, with numerous observations of young otters frolicking along the shoreline. On two occasions (6 May and 14 June), an otter was seen in the forest. We found an active den on 3 May, on the ridge top, heading towards Lookout Point.

We were excited to see large numbers of a pelagic invertebrate, *Salpa fusiformis*, in the waters around Limestone Island for several weeks in May and June. This salp is solitary but can form long daisy chains, looking a bit like a children's toy.

