

A Summary of the activities of the
Laskeek Bay Conservation Society
on East Limestone Island

Spring and Summer 1990

In the early spring of 1990, the Laskeek Bay Conservation Society began its program of long term biological research, interpretation and education on East Limestone Island in the Laskeek Bay area of the Queen Charlotte Islands.

East Limestone Island is a 14 ha island located off the east coast of Louise Island in the Queen Charlottes, just north of the South Moresby/Gwaii Haanas National Park Reserve. The Island is part of the Skedans, Limestone, Reef Island Wildlife Management Area and the Society's activities on Limestone Island are undertaken with the permission of the Wildlife Branch of the Ministry of Environment.

In 1990, the Society build a small rustic cabin to serve as a field station and research headquarters on East Limestone and began research activities. These are described in this report. In addition, the Society began preliminary programs to provide interpretative and educational information for visitors and residents of the Queen Charlottes.

Field Station Activities (1990)

The 1990 field program began with construction of the field station on East Limestone Island in March and early April. Rudimentary trails were laid out on the Island and improved for easy access. The island was explored and mapped, and names were given to prominent features. Approximately 40 volunteer days were spent on these activities.

The 1990 field research program operated from the Limestone Island field station from April 25 to June 19. A total of 203 person days were spent on the research activities described below. One hundred and sixty-eight of these person days of work were contributed by volunteers.

Visitors

Thirty-five visitors from two different commercial tour operations visited the island. All were accompanied by a knowledgeable guide and were well briefed. They were given tours of the research activities on the colony by the Society. About half of the visitors spent a night at the banding stations and assisted the volunteers and staffperson in banding and weighing Ancient Murrelet chicks and adults.

Several visitors commented that their visit to Limestone Island was the highlight of their trip to South Moresby/Gwaii Haanas because of the close involvement with wildlife.

We also had visitors from the Wildlife Branch of the Ministry of Environment, Parks Canada and from the raccoon research program at nearby Vertical Point.

Research and Monitoring Work

The research and monitoring work conducted in 1990 included:

1. Banding

Adult Ancient Murrelets (ANMU) were caught and banded in the pre-egg laying period (March 30 to April 4) and also in the late and post incubation periods (May 8 to June 10). A total of 335 adults ANMU were banded. Thirty-six adults banded in 1989 or earlier in the season were retrapped. One adult bird that had been banded as a non-breeder on Reef Island in 1987 was retrapped. All adult birds captured were also weighed, examined for brood patches and measured.

Temporary plastic fences were erected to form 6 funnels on the east and north sides of the Island. The funnels direct ANMU chicks through temporary banding stations on their migration to the sea. Chicks were banded and weighed from the banding stations at the six funnels from May 12 to June 15. The fences were removed at the end of the season.

A total of 873 chicks were banded. The peak night was May 22 when 65 chicks were banded. Fifty percent of the chicks had departed from the colony by May 23, and 95% had departed by June 8.

Since the ANMU population on E. Limestone Island is estimated to be 1200 pairs, the number of chicks banded represents approximately 30-40% of the estimated total chick production.

2. Predation

Six 20 meter wide predation transects were located and monitored every 5 days from April 26 to June 13. The transects range from 120 to 200 metres in length and cover 2.2 ha or 15% of the total colony area.

A total of 88 predations on ANMU were recorded on the transects. This indicates a predation rate of 50 birds per ha and a total of 700 predations over the 14 ha colony. This is a relatively high level of predation.

Seventy-five per cent of the predations are typical avian predations as observed on other ANMU colonies and include feather piles or wings.

Twenty-five per cent of the predations on the transects included broken eggs, excavated burrows and/or decapitated, but otherwise unmarked carcasses and are considered to be mammalian predations.

In addition to the transects, all casual encounters with Ancient Murrelet predations that were assumed to be mammalian were recorded. An additional 14 predations were recorded in this way. Some carcasses were marked in an attempt to determine if they were removed by other birds or animals.

Circumstantial evidence points very strongly to a raccoon as the likely mammalian predator. Raccoon scats, and hairs from excavated burrows were collected and will be analysed for further confirmation of raccoon predation.

A preliminary report "The Evidence of Raccoon Predation of Ancient Murrelets on East Limestone Island in 1990" has been completed and circulated to management agencies. It provides the strongest evidence collected to date to implicate introduced raccoons in the predation of Ancient Murrelets. Work is continuing on a report for publication.

3. Burrow Excavations

52 ANMU burrows were investigated for successful nesting after the nesting season was completed. 38 of these burrows had successfully fledged young. The burrows are now prepared for monitoring with temperature probes for next season.

4. Staging Area Counts

Counts of Ancient Murrelets on their staging area near Low Island were made each evening. Two five minute counts were made at a fixed time using a tripod mounted scope.

On May 23, a visual count from a zodiac at the centre of the staging area showed over 1000 ANMU. An additional 500 ANMU were estimated to be in the staging area but were beyond the range of a visual count.

5. Ocean Transects

Transects along the inshore and across open offshore waters in Laskeek Bay were established to survey Marbled Murrelets and other marine bird numbers and distributions.

These transects (inshore and offshore) cover a total distance of 43 km and were run from an inflatable boat every 5 days between April 25 to June 9 at a standard time in the evening. An early set of transects were run on April 2. Transects were also run at different times in the morning and afternoon for comparison purposes. All observations of Marbled Murrelets were recorded and mapped and have been provided to the Marbled Murrelet research team.

On the offshore transects, the highest number of MAMU seen was 170 on May 23. This number declined to 35 on the same transect on June 5.

On the inshore transects, the highest number of MAMU was 78 on May 11 and the lowest number was 6 on April 2.

In general, more MAMU were seen on the offshore transects, than on the inshore transects. More MAMU were seen on the transects between Limestone Islands and Skedans Islands than on the transects south of Limestone Island. The total number of MAMU declined in June to approximately 30% of the number seen in May. Birds were seen in winter plumage until April 28.

All other birds on the water were also noted and mapped. A total of 21 species were recorded. An additional 9 species were recorded on the shorelines. Large numbers of Pacific Loons (>200), and various ducks were seen on the transects until mid-May.

6. Other work on East Limestone Island

Other projects initiated include

- Preliminary identification and mapping of areas used by Cassin's Auklets on E. Limestone Is.

- A preliminary identification of other nesting birds on E. Limestone and a species list of birds seen or heard

- Observations of ANMU use on W. Limestone Is. and of raccoon predation on W. Limestone

- Observation of an active PEFA eyrie and 3 Black Oystercatcher nests on E. Limestone Is.

- A preliminary plant list

- Counts of sealions on the haulouts at Skedans Is. and Reef Is.

- Counts of glaucous-winged gull nests on Low Is and islets off Reef Island.

7. Reef Island projects

Some work from the previous 6 years of research undertaken by the Canadian Wildlife Service on Reef Island is being continued by the Society. All burrows

in 2 plots (110 burrows) were checked for occupancy. For the first time in 5 years a nest box had been occupied and successfully fledged.

One night was spent mist netting and banding Cassin's Auklets. Four of the 5 birds trapped had been banded previously on Reef Island.

The previous CWS camp on Reef Island was thoroughly cleaned up and all remnants removed from the Island. Some material was recycled into the Limestone field station.

Acknowledgements

The Society gratefully acknowledges the Wildlife Branch, Ministry of Environment for permission to conduct research on East Limestone Island in the Skedans, Limestone, Reef Island Wildlife Management Area.

We also gratefully acknowledge the financial support provided by the Canadian Wildlife Service. This support included a contract provided to Andrea Lawrence, the purchase of building materials and the loan of equipment.

The Canadian Parks Service assisted our program by transporting volunteers to and from E. Limestone Is.

Considerable assistance in transporting volunteers and supplies was also contributed by Husband Charters of Queen Charlotte City.

THE EVIDENCE OF RACCOON Predation of Ancient Murrelets
on East Limestone Island in 1990

Background

In 1983 an intensive survey of East and West Limestone Islands was undertaken by CWS to establish a baseline population estimate for Ancient Murrelets. At that time, a few burrows on West Limestone Island were found to be dug out, presumably by a mammalian predator, but none were noted on East Limestone Island. Similar evidence of a few dug out burrows was found during brief surveys of East Limestone Island in 1987 and 1988, and another intensive survey in 1989. Two possible candidates were river otters, known to have at least one active den on East Limestone Island and raccoons, abundant on nearby Louise Island.

Extensive work over 6 field seasons (1984-1989) on nearby Reef Island encountered two broad types of predation remains of Ancient Murrelets. The most common type included single wings, pairs of wings and feather piles, which are thought to be the result of avian predation by eagles, peregrines and ravens. The second type of predation remains, found only occasionally, consisted of inverted carcasses. This predation is thought to be the work of river otters which are present on Reef Island. A few dug out burrows were found, also thought to be caused by otters, but no Ancient Murrelet carcasses were associated with them. There are no signs of raccoons on Reef Island.

Findings in 1990 on East Limestone Island

During the period of 4 April to 19 June, 1990, predations of Ancient Murrelets were located and quantified on East Limestone Island by 3 methods:

- (1) survey every 5 days along a 20 m. width of 6 transect lines passing from the seashore inland through the colony. These transects averaged 183 m. and covered 16% of the colony area.
- (2) site investigations following telemetry fixes of a radio-collared raccoon (in conjunction with Lisa Hartman's studies).
- (3) incidental encounters.

A type of predation only once before previously encountered was observed on East Limestone in 1990. This included freshly broken and eaten eggs and Ancient Murrelet bodies from which the head had been cleanly severed. These remains were often associated with diggings into burrows. Of a total of 30 predations of this type found, 17 were fresh carcasses found undamaged except for a severed head. 3 of these carcasses were adjacent to excavated burrows. Carcasses not found next to diggings may have been scavenged by birds. A raven was seen feeding on a fresh headless carcass and a flying crow was seen to drop an otherwise undamaged, fresh headless carcass. In some cases, headless carcasses and eaten eggs were found at a burrow entrance where no digging had occurred.

Of the 30 atypical predations, 16 were incidences of eaten eggs and 13 of these were associated with diggings.

The overall level of predation estimated from the transects was 50 per ha. or 700 for the 14 ha. colony area. Of this total, 25% of the predations were headless carcasses, broken and eaten eggs and/or diggings with cold eggs. A total of 24 dug out burrows were located, of which 16 were located on the transects.

One radio-collared raccoon was definitely present on East Limestone Island throughout the breeding season except for brief forays onto West Limestone Island. Other raccoons may have been present as an adult female with two young was sighted after the breeding season was over. An adult raccoon was sighted twice in the colony area.

Evidence from the telemetry fixes shows that the radio-collared raccoon, Gordo, frequently crossed the island at night, traversing the colony area. Raccoon scats were found containing crab shell and Ancient Murrelet shell, and hairs which appeared to be raccoon were found at several sites of dug burrows. Both raccoon and otter tracks were seen in an interior wet area outside the colony where there was a high concentration of predation remains. The few otter scats observed contained only fish remains.

From this year's observations it seems evident that a significant proportion (25%) of predations on East Limestone Island were caused by mammals rather than birds. The only other record of similar predations is from West Limestone Island in 1983 when 9 diggings and 1 headless carcass were found. Headless carcasses have never been noted on any other Ancient Murrelet colonies in the Queen Charlottes.

In 1988, 4 dug burrows were found on East Limestone Island, 3 containing cold eggs and 2 of them with associated inverted carcasses. The state of the carcasses and the fact that the eggs were ignored indicates that river otters rather than raccoons were responsible for these predations in 1988. One raccoon scat and several otter scats were found in 1989, the otter scats with Ancient Murrelet feathers.

Conclusions

It seems likely that most of the 30 recorded incidents of atypical mammalian predation on East Limestone Island in 1990 can be attributed to raccoons rather than river otters because:

(1) Hairs which appear to be raccoon were found at some dug burrows, and raccoon scats were found with Ancient Murrelet eggshell.

(2) The distinctive style of predation where the corpse is left untouched except for the severed head was never seen in 6 seasons on Reef Island, and was seen only once previously on another colony. That was in 1983 on West Limestone Island, close to the raccoon population on Louise Island.

A local long-time trapper, on a visit to Limestone Island, had never observed a severed head predation associated with otter and did not find any sign of otter at the site of the severed head predation that he observed.

(3) At least one raccoon was known to be active on East Limestone Island during the period when the diggings and predations occurred and in some cases the predation remains were found as a result of investigation of a site fixed by the previous night's telemetry.

(4) The preference of eggs as food over the meat of the bird is typical of raccoon habit with domestic fowl and wild ducks, as reported from other locations on the Queen Charlottes.

(5) No otter was seen in the colony area and no otter scats were observed to contain feathers or eggshell in 1990. Only 1 inverted carcass, characteristic of otter predation on other Ancient Murrelet colonies, was found.

Some questions can now be regarded as answered

- (1) Will raccoons swim to islands and stay for periods of time? Yes
- (2) Will raccoons kill adult Ancient Murrelets? Yes
- (3) Will raccoons dig out occupied Ancient Murrelet burrows? Yes
- (4) Will raccoons consume Ancient Murrelet eggs? Yes

Other important questions remain unanswered. For example

(5) Does raccoon predation scare off potential breeding Ancient Murrelets and cause them to abandon nests or colonies?

(6) Can raccoon predation cause Ancient Murrelet populations to decline?

The answers to these later two questions can only be obtained by further monitoring of Ancient Murrelet colonies invaded by raccoons. However, knowing now that raccoons can and will kill adult Ancient Murrelets, dig up their burrows and consume their eggs, there seems to be little justification in proceeding with further investigations that might adversely affect the health of the Ancient Murrelet populations involved. There are now good grounds for trying to keep raccoons away from Ancient Murrelet colonies and for trying to eliminate them if they do get there.