Denman Hornby Bat Project

Year 2 2018-2019

Report Submitted to

Denman Conservancy Association &

Conservancy Hornby Island

By

J. Balke RP Bio

January 15, 2019

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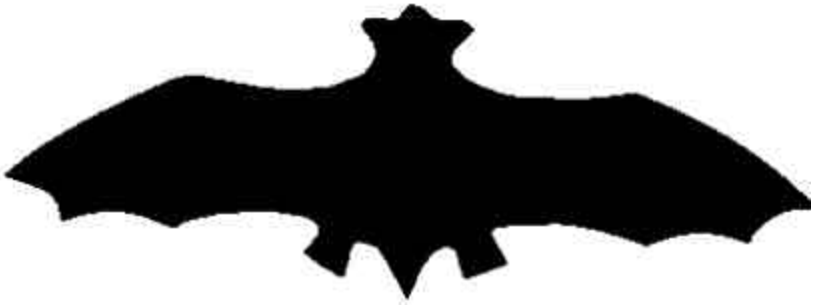


Acknowledgements

Many thanks to the granting agencies and other supporters who funded the project over the last 2 years including:
Bob Berry Scholarship Fund's Titley Electronics Award- Year 1
BC Community Bat Program's grant with Habitat Conservation Trust Foundation
BC Community Bat Program's grant with Environment and Climate Change Canada's Habitat Stewardship Program
Comox Valley Regional District's Grant in Aid – Year 1
Denman Conservancy Association
National Wetland Conservation Fund.

Once again, the project was possible due to the participation of the many residents of Denman and Hornby islands who continue to support bats in our increasingly crowded and complex island environments. Also, many thanks to those in Denman Conservancy Association (DCA) and Conservancy Hornby Island (CHI) who this year helped to organize bat activities and to build and put up bat houses, particularly John Millen and Tim Fuchs for DCA and Grant Scott for CHI. Thanks also to Christine Wilson who continues to assist with the sale and creation of felted bats. Once more, a big thank you to the many folks in the BC Community Bat Program for obtaining funds and for their technical support and their outstanding encouragement! BC Bats provincial coordinator Mandy Kellner has been terrific. Thanks to Cori Lausen and Kim Livenwood for the great bat acoustic course in Stanley Park.
Most sincerely our appreciation is extended to all the bats, as we acknowledge our impacts on the individuals and on the habitats we have explored and manipulated.

Live bat photos courtesy the photography of Dennis Forsyth and the participation of bats at the Denman Old School Building.

Table of Contents

Bat Project Activities 2018

1 Bat Outreach

1.1 Presentations / Bat Walks

The bat costume was back and flew in both Denman's and Hornby's fall fair parades, as well as at the Denman Conservancy Association (DCA) booths at Denman's summer market and the DCA book sale (cover photo). A "bat talk" was also requested by and delivered to the visiting Courtenay Garden Club.

During the summer, six "Bat walks" were held on Denman and Hornby (see Appendix for Bat Walk advertising). The walks were very popular and were attended by 57 people. The walks gave the public an insight into both bat activities and bat species on the islands. Bat walk hosts on Hornby were Grant Scott and Peter Wardle. Walks were conducted around their properties including forest habitat, fields and ponds. On Denman, the walks began at the Marcus Isbister (Old) School where the emergence of 100's of bats from the maternal colony in the school's attic was a popular attraction. The Denman walks continued into Denman Conservancy's Central Park Property along forest paths and adjacent to wetland habitats. All walks began with a short introductory "bat talk" followed by the walk. During each walk participants used an Echo Meter Touch (EMT) device by Wildlife Acoustics, loaned by the BC Bat Community program to detect bat species. The Anabat Walkabout device by Titley Scientific, provided by the Bob Berry Scholarship Fund's Titley Electronics Award, was also used to record bat acoustic calls.

On the walks, acoustic calls of a variety of bat species were detected including: Big brown bat *Eptesicus fuscus*, California bat *Myotis californicus*, Hoary bat *Lasiurus cinereus*, Little brown bat *Myotis lucifugus*, Long-legged bat *Myotis volans*, Silver-haired bat *Lasionycteris noctivagans*, Western long-eared bat *Myotis evotis* and Yuma bat *Myotis yumanensis*. Among the Old School's emerging bats, Yuma and Little brown bats were the predominant species detected by the EMT.

1.2 Felt Bats

Felted "little brown bats" were displayed and sold at DCA booths, at the local craft store and together with felt bat kits at Denman's "Felt and Fibre" store. These sales were often accompanied by discussions about bats. Many discussions lead to the acquisition of additional roost information, as well as further interest by both islanders and others in bat houses and bat monitoring.

Figure 1. Felted little brown bats.

1.3 Bat Articles

Bat articles were published in DCA newsletters as shown in the Appendix. Bat project updates were also put on both Denman and Hornby Conservancy Blogs, see Web site below.

1.4 Website Information

John Millen continued to maintain bat information on the DCA web site http://www.denman-conservancy.org/. He also added any up to date bat input as provided by the bat project.

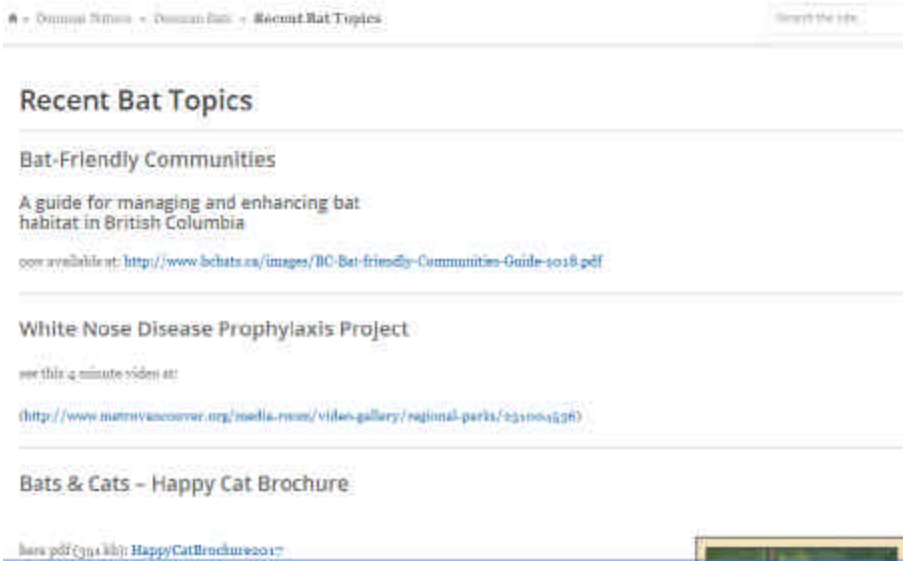


Figure 2. Denman Conservancy Association web page "Denman Nature –Denman Bats – Recent Bat Topics"

In addition the DCA Blog and Conservancy Facebook sites on both islands carried bat postings:

Figure 3. Denman Conservancy Blog post example.

1.4 Building-trade Professional Contacts

The BC Community Bat program brochures continued to be handed out to building-trade professionals and others interested in bats. This usually provided the opportunity to have discussions with local professionals that deal with bat issues on the islands, as well as with visitors to the islands. Additional copies of the publication "Got Bats? A BC Guide for Managing Bats in Buildings" were obtained thanks to Kerri Davis, BC Min. of Environment. These were given to bat roost and bat house participants.

1.5 Community Contacts

Email contacts for the Denman Hornby Bat Program were usually handled by the project organizers' personal email address although some emails still came in to the gmail address used in 2017. The new gmail address on the DCA website will be "dhbatproject@gmail.com". Over 132 emails were exchanged and more than 32 phone conversations were conducted.

2 Bat Counts

2.1 Bat Count Sites 2018

Visual counts of bats were once again conducted at Denman's two major maternal colony sites: the Marcus Isbister (Old) School's mixed Myotis colony and the private farm's Townsend Big-eared bat *Corynorhinus townsendii* colony. While in 2017, bats were counted at one Denman private home, this year counts took place at 5 additional homes or outbuildings. Also, on Hornby, bats emerging from one bat house were counted. All counts were conducted at dusk except for the Townsend's count. The Townsend's site was counted and photographed during the day, as at this site, it is very difficult to get an accurate count of bats emerging at dusk. Bat acoustic calls were recorded by the Echo Meter Touch and Anabat Walkabout devices.

Table 1 Denman's Major Maternal Roost colony counts: Old School and Townsend's

Site	Building Type	Use	Roost Site	Count Site	Count Date	Bat Emerge Time	Number Bats
Old School	Public building	Active	Attic - several areas	Front of bldg	June 9	9:45-10:15	55
					June 18	9:45-10:30	731
					July 13	9:28-10:10	721
					July 30	9:19-9:56	706
					Aug 15	8:50-9:15	196
LPFm	Private Farm Out-building	Active	Open but separate part of attic	Edge of attic opening	July 6	mid-day	190+

2.1.1 Old School Colony (Marcus Isbister School)

Last year's guano sampling at Denman's Old school site identified Yuma, Little Brown and Western long-eared/lLittle brown as the major species roosting in both attic areas. Big brown bats, detected by previous guano DNA analysis may have been using a different site this year or their guano was not collected/sampled. Although several sites of guano deposition in the Old School attic were sampled, a large amount of guano is present each year and it is possible that guano from a small number of big brown bats could have been missed.

At Denman's Old school, the highest number of bats counted this year was 731 on June 18th. This record was very close to the 2017 count of 717 June 24th. In both years, the counts declined later in the summer, from the end of July/early August. Possibly, when the juveniles can fly, the mums and pups may leave this large colony to forage at other sites that are closer to food sources, for example at wetland shores.

The Old school building has 2 separated areas in the attic. The west attic side (photo A) is separated from the east side (photo C) by a shake roof (photo B). This shake roof was the roof of an older one-room school building. The newer two-classroom building was constructed over top of the lower shake roof. A hole connecting the 2 sides of the attic, can be seen in photo B behind the chimney. The photos above were taken during the annual guano clean up. Most of the guano was found on the east side this year. The east side soffits and fascia boards were also where the bats were seen leaving the attic. Thus, most of the bats were either roosting in, or travelling to the east side to exit the attic at night. The temperature may be lower under the new roof in the larger west side attic and this may be a factor affecting the possible decrease in bat-use of the west side.

Denman's Old School Exterior & Attics

Old School exterior

A. Attic west side

B Old shake roof in attic. Access hole to east side visible behind chimney

C. Attic east side (lower height)

Figure 4. Marcus Isbister (Old) School, Denman Island.

New Bat Exits for Old School Since the new roof was completed 2 years ago at the Old School, bats exit from the attic primarily through holes in rotted sections of the old original fascia boards and

soffits. Also when the new roof was added, small bat-exits were mounted in the soffits, but access to these exits from the insulated roof is awkward for the bats. Thus, two new bat exits have been designed for the attic walls and will be completed during January-February 2019. The new bat exits will be placed in the triangular areas seen on the front of the building in the photo above. These will be able to be closed in winter when the bats are not present. If the bats use the new exits, then the old rotting fascia and soffits can be replaced.

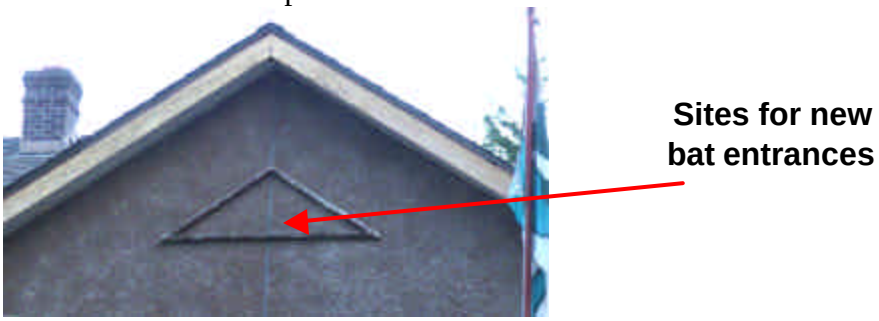


Figure 5. Front exterior attic area, Old School, Denman Island.

2.1.2 Private Farm – Townsend's Colony

The Townsend's bat colony is difficult to count. The roost has no single exit to view at dusk and the internal rafters that the bats use for roosting obstruct the view and prevent day-time photos from accurately revealing all of the bats. The visual photo count of ears (adults and juveniles) July 6, 2018 of 190 is higher than that of June 14 2007 of 137. But these counts are approximate. Attempts at exit counts in 2017, suggested that as many as 300 were exiting when juveniles could fly.

Figure 6. Townsend's big-eared bat colony, Denman Island, July 6, 2018.

2.1.3 Private Homes

Bat counts were conducted at six private houses or out-buildings in 2018. At the houses, bats were counted emerging from behind open fascia boards (1), from a hole in sealed-soffit areas (1), from roof joints over a cathedral ceiling (1) and from an attic (1). At one out-building, bats were counted emerging from under shakes. At the other un-used barn, bats were using the entire interior open barn roof as a roost, plus an externally-attached wall-mount bat house. At this site, bats were counted emerging from the barn via the end of the metal roof-peak and also as they exited the nearby bat house.

Table 2 Denman Bat Counts 2018 – Private homes.

Site	Building Type	Use	Roost Site	Count Site	Count Date	Bat Emerge Period	Number Bats
W&KHm	Home	Active	Behind south-facing fascia	Front of house	June 19	*watched 9:35-10:15*	0
					July 22	9:30-45	82
					Aug 30	8:15-45	146
SWHm	Outbuilding	Active	Shakes	Front of bldg	July 3	9:45-10:10	26
RPHm	Home	Active	Soffit	Front door area	July 12	na	7
S&YHm	Home	Active	Attic	Front of house	July 14	9:40-10:00	8
MBHm	Home	Active	Cathedral ceiling	Back of house	July 14	9:20-30	4
CLake	Outbuilding	Un-used	Building & Bat house	Lake side of bldg	July 28	9:15-40	180
YOHm*	Home	Active	Unoccupied attic, between wall & under eaves	front & back	Aug 23	8:40-9:10	40

* Vancouver Island home.

Bat numbers at these sites ranged from 4 to 180 bats. This year, in addition to smaller roost sites, another moderate-sized Denman maternal colony was added to the annual bat count (Clake). At this site, initial acoustic monitoring with the Echometer Touch suggested that this new addition was a little brown bat colony. This site consisted of both an occupied wall-mount bat house and the interior roof of an unused barn-type structure. The exit count could not distinguish between the two roosting areas as the exit-openings were adjacent.

The first private house bat roost, counted in 2017, is the other moderate-sized maternal colony and consists of Yuma bats, identified from last year's guano DNA analysis (W&KHm). The number of bats counted at this site on August 30th was 146, and that was higher than any of the previous 5 years of August counts. Previous years' counts ranged from 41 to 102 bats. This colony roosts behind the facia board of a south-facing roof. In mid-June of this year, no bats were counted at this site. The bats may have been roosting somewhere else before coming to the site or may have been late returning.

In addition to the roost sites included in the annual bat count (Table 2), a count from one of the new bat houses was obtained this year. Two bats were seen emerging at dusk from the first newly occupied bat house. More bats were seen at the house later in the summer. This bat house is shown in the blog post in the Website information section above.

The Bat Project was also contacted by a homeowner across Baynes Sound on Vancouver Island. The owner's bat count and guano sample was included in this year's records. Now that a Bat Collective has started in Cumberland on Vancouver Island, this record will be passed to them
This summer, guano was collected for DNA analysis from nine human-built sites where bats were counted or seen roosting. These sites included five bat houses and three buildings. Guano from a hollow tree roost site was also sampled.

3 Bat Habitat Enhancement / Roost Detection

3.1 Natural Bat Habitat

This year, a bat roost site was identified in a large hollow Western redcedar tree on private land. Large amounts of guano were present, but no bats were seen in the hollowed-out portion. Guano was collected for DNA analysis. Unfortunately a new cat was present in the area that may be a bat predator or at least a roost deterrent. Also, several bats were seen emerging from an old-growth Douglas-fir snag on public land near Graham Lake. The EMT acoustic detector recorded these bats as the tiny California bats.

Natural wetland habitats were also explored using the Echo Meter Touch and Anabat Walkabout acoustic devices. Bats were detected at Graham and Chickadee lakes, along the SW seashore and along several interior Denman marshes. Numerous files are awaiting further acoustic analysis. The Vancouver Bat Acoustics course provided an excellent background in both collecting and analyzing bat acoustic recordings. Calls from 2016 and 2017 have been analyzed.

3.2 Bat Habitat

3.2.1 Buildings

Buildings continue to be the most numerous recorded roost sites on the islands. Currently bats have been identified roosting in at least ten buildings on Denman and four on Hornby. Buildings usually can provide heat, security and space, but bat guano, noise and access to human areas are problems. Often, site visits about bat house installation included discussions about possible bat roosts in buildings. Each building presented a different situation, for example one owner had been unable to keep the bats from accessing the living area, as there were openings around the chimney flashing. Another owner was willing to tolerate bats in the attic. In the Old School attic, the majority of the guano is cleaned up each fall and the human entrance to the attic is covered by a tarp to prevent bat guano in that area, see Figure 4 Photo A. Bats were often found roosting directly under metal roofing as shown in Figure 7. The buildings where bats have been counted on Denman and Hornby are shown in the maps on Figure 11.

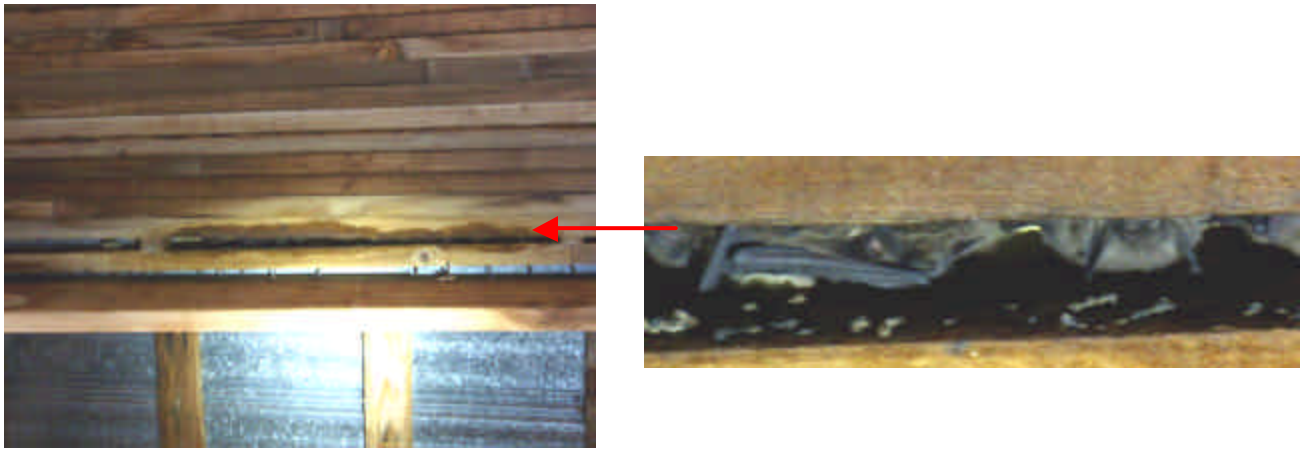


Figure 7. Bats between the wooden slats under metal roofing, Hornby Island.

3.2 Bat Houses

There are currently 69 bat houses in the bat project. Of the thirty-nine bat houses on Denman, twenty-nine were checked in 2018, and of the thirty on Hornby, twenty-seven were visited. On Denman, eight of the bat houses were occupied by at least a few bats in 2018 and one of these houses that was up prior to the start of the bat project had an active maternal colony, as shown in Figure 9. Occupied bat houses were determined either by the presence of feces below the house, Figure 10, or by seeing bats in the house using a flashlight. On Hornby, four of the bat houses were occupied in 2018. Most of the bat houses are three-chambered wall-mount style boxes, except for six rocket-style boxes on Denman and ten on Hornby. The bat houses have been put up in a variety of ways, as shown in Figure 8.

Two of the rocket bat houses on the DCA's Settlement Lands, Denman with beaver protection at the base.

One of Hornby's 10 rocket boxes

Double wall-mount boxes on a pole on Denman

Denman wall-mount box on a pole

Multiple box mount on Denman barn

Tree mount on Hornby

Figure 8. Bat houses on Hornby and Denman.

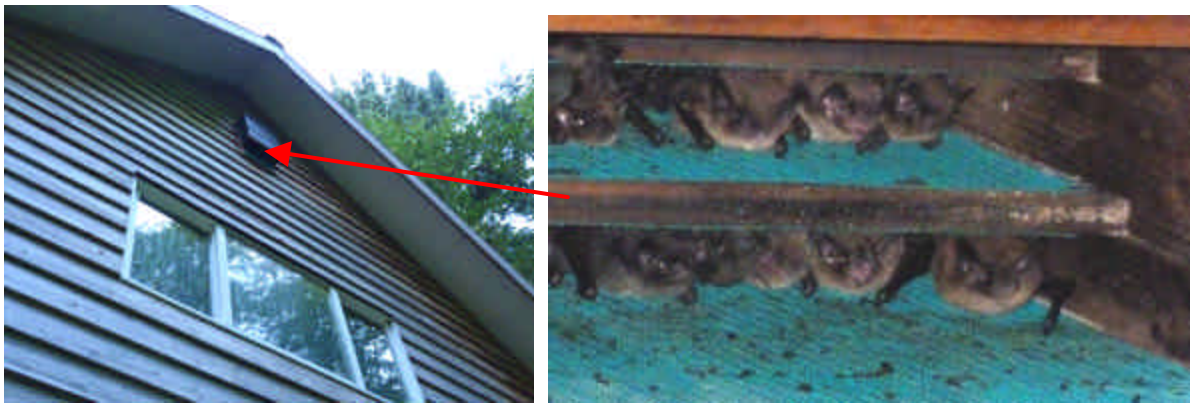


Figure 9. Bat house with maternal colony, Denman Island.

Figure 10. Cloths or cardboard below bat houses used to check for guano to show bats were present.

Bat Houses as Habitat Bat houses may provide lower quality habitat for bat colonies than larger building spaces or natural habitats. Bat houses are relatively small, may offer insufficient temperature range for bat colonies and may accumulate parasites. On the other hand, they may provide adequate day resting sites for shelter and in some instances may contribute significant bat habitat enhancement. Given the moderate temperatures of the islands in summer, with bats roosting directly under metal roofing in buildings, it is unlikely that most bat houses here will be too warm and cause heat-related mortalities. One Denman colony was occupying both the inside roof area of a large unused barn, as well as a bat house on the barn's exterior wall. Over 180 bats were counted at this site and most of the bats appeared to exit from the bat house.

The addition of a significant amount of bat house habitat may also change the overall composition of bat species on the islands. Having lots of bat houses may lead to an increase in the populations of those bat species that favour roosting in bat houses. But since the late 1800's, human settlers have been drastically altering the natural habitat for bats on these islands and humans have likely caused repeated changes in bat species composition. The first assault of the settlers was to clear-cut all intact old-growth forested lands, then, the next was to build relatively small wooden buildings, many of which were open and inviting to bats. Later, many of these older open buildings and hand-crafted wooden homes were gradually replaced with new well-sealed bat-proof buildings. In addition, humans brought many non-indigenous and open land plants, as well as non-indigenous insects, predatory cats and other species. Thus, while human-built bat houses may be yet another alteration of bat habitat, these houses may enhance the survival of at least some of the bat species, in this era of environmental stress.

On a definite plus side, bat houses provide significant outreach opportunities. Community members delight in having bats in their bat houses and take a genuine interest in the bat colonies. These bat house stewards become the bats' best advocates.

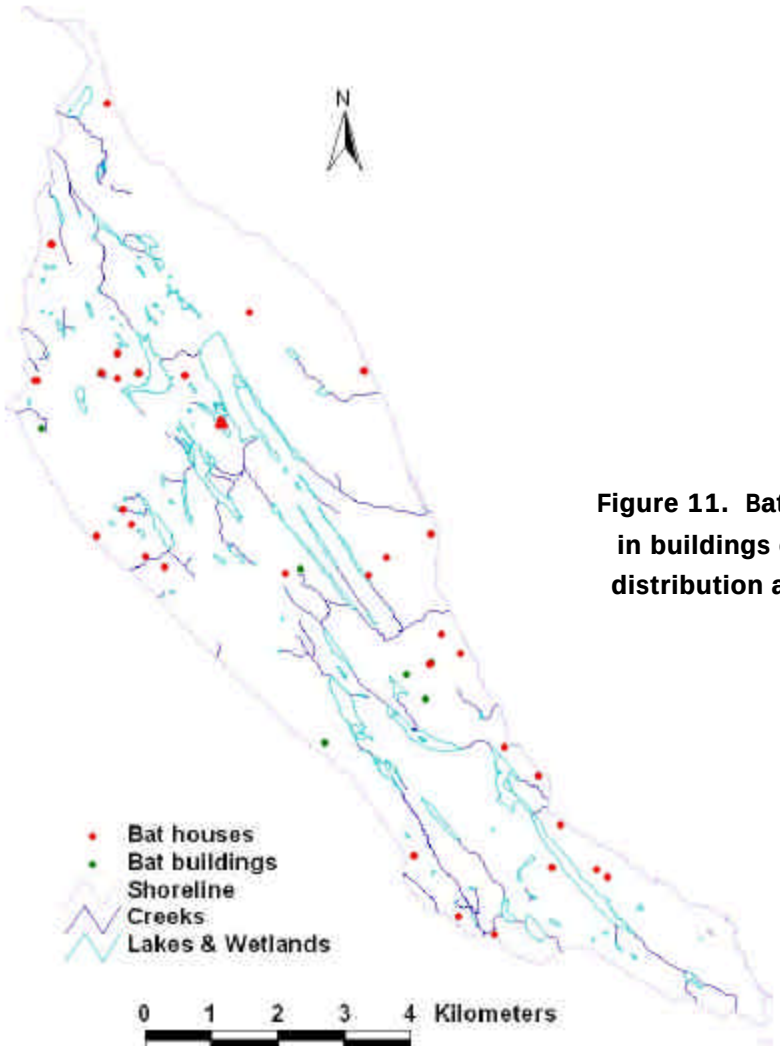


Figure 11. Bat houses and bat counts sites in buildings on Denman showing overall distribution and proximity to freshwater.

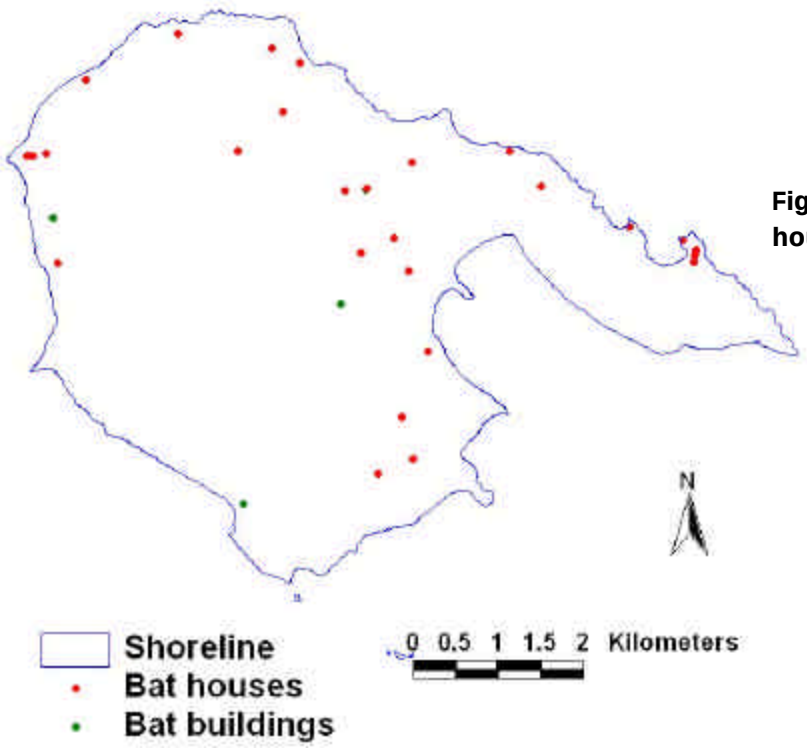


Figure 12. Overall distribution of bat houses on Hornby Island

3.3 Bat Exclusion

This year there were at least three inquiries about keeping bats out of Denman Island homes and two calls from the Comox Valley regarding methods and timing of possible bat exclusion. One Denman couple, convinced that bats were a problem, changed their minds after a bat walk.

4 Dead Bats & Disease Testing

4.1 Dead Bats & Live Bat Sampling

Only one dead bat was collected and submitted for White nose disease testing this past year. In addition, wing/nose swabs were taken from two live bats during the winter and three fecal samples were collected from returning bats in the early spring. No White nose disease was detected in the samples.

5 Conclusions & The Future

5.1 Year 2 - Conclusions

The Denman Hornby Bat Project has been expanding rapidly with many more islanders keen to have bat houses and to learn more about bats. This year the emphasis was on getting bat houses up and monitored, as well as on bat outreach to islanders via "bat walks" with the Echo Meter Touch device. The bat walks were very popular and were a great way to introduce people of all ages directly to the bats in their environment.

Of note, many islanders felt that bat numbers were reduced on the islands this year, because in June and July they felt they were not "seeing as many bats as they used to". However, this may be due to a couple of combined factors. First, bats were getting a lot of project attention in the early part of the summer when their emergence times were fairly late, often close to 10 pm. Second, many of the bat enthusiasts are older and are not staying up as late as they once did. Thus, early in the summer, folks just may have missed seeing bats emerging and flying near their homes as they weren't outside later in the evening. As the summer progressed, people reported seeing more bats, and the addition of flying juveniles plus the earlier bat-emergence times may have accounted for the difference.

One of the overall objectives of the project continues to be identifying bat species and determining numbers of bats. Thus, monitoring bat houses and counting bats emerging from bat houses and building roost sites is important. Unfortunately it seems that patiently waiting late into the night and counting critters is not a normal activity for most busy people in the summer. Thus, strategies to encourage counting bats are being developed.

5.2 Future Goals - Bat Friendly Communities

In 2019, a major objective is to have both Denman and Hornby Islands recognized as Bat Friendly Communities (BFC) under the BC Bats Community Bat Program. The Bat Project on the islands has been fulfilling the supportive bat services of a BFC and the next stage will be to take the idea to the local Residents Associations for their endorsement.

A second objective is to provide both training and inducement regarding counting bats, particularly for bat house stewards. As residents start to get the "count-bug" they need to be further encouraged to branch out and check for other roost sites in their neighbourhoods. Early training sessions will be offered, an EMT may be able to be shared among the stewards, and specific count times will be advertised and have supportive follow-up. Various incentives are being considered.

Third, if a passive bat logger is obtained, natural habitats will be further monitored to determine the diversity of bat species particularly around the wetland habitats. As more is learned about bat species, additional behavioural information may be obtained from further observations. A better understanding of the bat community, its habitat use and its needs is important for protecting critical habitat and providing the opportunities for the long term survival of bats on the islands.

Finally, bat outreach will continue and be expanded. Additional educational ideas will be shared during a provincial meeting of the BC Bat Community coordinators in April 2019. In addition, the Denman Hornby Bat Project will present a poster about the project's activities at the Western Bat Meeting also in April. Further bat walks and talks will be conducted. The project will liaise with other community groups, researchers and with the new Cumberland Bat Collective on Vancouver Island.

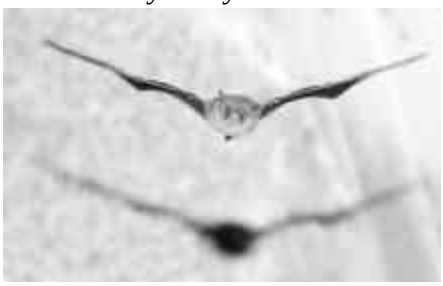
Appendix

1 Bats in Denman Conservancy Association Newsletters 2018

Feb 2018 DCA Newsletter:

Denman's Gone Batty

By Jenny Balke



Bat at the Old School by Dennis Forsyth

On Denman, over 30 new maternal bat houses will await the spring return of the bat-Mums. Many thanks to all the Denman bat house builders. Special thanks to David Scruton for recently hosting a pleasant and productive evening of bat-house-kit-assembly. Bat-house-materials-chief, Stirling Fraser and his team will be preparing more bat house kits for those on the waiting list…we haven't forgotten! In April, DCA will provide a planning session for discovering, counting and identifying bats in these new houses.

The Denman Hornby Bat Project is part of BC's Community Bat Program. More details about the project are on the DCA web site. Most important for the Bat world at this time is to send off any dead bats for White Nose Disease (WND) testing and also to swab the wings of any cooperative live bats, also for WND testing. So please call 335-2151 if you have an available bat, dead or alive.

April-May 2018 DCA Newsletter:

Bats

Denman Hornby Bat Program

Call 335-2151 or email di2017bats@gmail.com

Want to know if bats are in your bat house? Contact the bat program to arrange a site visit about monitoring your bat house this spring/summer.

Some additional bat houses will be available in the first week of May.

In June-July the bat program will offer **bat walks** in DCA lands to identify bats at dusk

Bats need your help – the **White Nose Disease** Monitoring Program asks us to send **BATS found DEAD** or **new spring bat FECES** (up May to **31**) for testing for this devastating disease……

Please call the bat program to collect dead bats or new bat feces (before May **31).**

Sept DCA Newsletter:

BATS On the Move

Perhaps you've seen more bats around this last month. Right now all the bats, males, females and juveniles are around the island busily gobbling up all the bugs they can get in preparation for their long winter snooze. Interestingly many of the new bat houses have had daytime bat visitors recently – check for the guano that they drop as they leave the house! Now that the bats have discovered these bat houses, they may return to use them as maternal colonies next year. Most of our 9 species of bats will soon be leaving the island for their secret siesta spots, with only a few staying on the island. The Denman Hornby Bat Project thanks all the enthusiastic bat supporters. We are well on the way to becoming a "Bat Friendly Community". For information on being Bat Friendly or other bat data, please see the DCA web site.

2 Bat Walk Add examples

Denman

BAT WALK

Using a bat detector
we'll check Central Park for different bat species at night!

Meet at the Old School

9:30-10:30 PM

Thursday July 5, weather dependent!

Bring a good **head lamp or flashlight** – it will be **DARK!!**

BAT WALK

Using a bat detector
we'll be able to "look" at the echolocations of the different bat species out hunting over ponds and meadow edges at night!

Meet at the Golf Course 5045 Little Tribune

8:45- 9:30 PM

Tuesday July 31 ***if not raining***!

Bring a good **head lamp or flashlight** – it will get **DARK!!**