



**COLUMBIA BASIN  
FISH & WILDLIFE  
COMPENSATION  
PROGRAM**

**BC**hydro 



# **TOWNSEND'S BIG-EARED BAT IN THE EAST KOOTENAYS**

## **UPDATE REPORT**

**PREPARED BY**  
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## **Update: Townsend's Big-eared Bat in the East Kootenays**



*Photo of St. Eugene Mission 2002 – Note entrance to bat roost at roof peak.*

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## **1.0 Introduction**

This report updates the information presented in the November 1999 report “Townsend’s Big-eared Bat (*Plecotus townsendii*) in the East Kootenays” for the Columbia Basin Fish and Wildlife Compensation Program, also by Mitch Firman. The material in this report is current up to March 2003.

## **2.0 St. Eugene Mission Maternity Roost**

Construction activities at the Mission since 1999 have been sporadic. Numbers have remained stable at approximately 100 adult bats. It was previously impossible to completely seal the mission building, and in 2000 as in earlier years, the bats had the run of the whole building. New windows and a roof were installed in the winter of 2000/2001. Because of these changes to the building, we were able to restrict the bats to the roost during summer of 2001.



**Photo 1. Construction at St. Eugene Mission Winter 2002.**

The new roof is made of pressed steel that resembles clay tile construction. The air gaps under the uneven roofing material might add some insulating quality to the roof, hopefully reducing solar heating of the attic space. Originally a vent cap was planned at roof peak to provide subroof ventilation but this was not part of the installed design. Although the bat roost's false insulated-subroof does have an air gap the change in roof design means that this air is stagnant and hot air is not vented up and out.

Construction in the Mission and new adjacent hotel structure started in earnest during the fall of 2001 (Photo 1). Opening was scheduled for July 2002 and construction activity levels were expected to be high and possibly 20 hours a day to meet the opening schedule. Although the bats were previously used to construction disturbances, these activities never occurred in the evening and the site was essentially quiet and dark except for the adjacent golf course. In the end, the schedule was relaxed and night work-shifts were not required with construction in the old mission building not completed until November 2002. Due to the construction activities the bats could not be restricted to the roost and the bats occupied the roost and mission attic during the spring/summer of 2002.

## **2.1 Alternate Roosts**

Since construction activity levels for the spring of 2002 were expected to be higher than future operating levels, it was likely that a portion of the Mission maternity colony would look for an alternate site. The bats could move to other known maternity sites but it is preferable that the number of separate maternity roosts in the region not be reduced. A few abandoned buildings exist in the vicinity of the Mission but all have limitations.

As a potential alternative to the Mission site, the old building adjacent to Joseph Creek on the Petruk property was modified. During spring 2002, plywood was placed on the inside of the two upper windows to darken the top floor but retain airflow. It is uncertain if this building is acceptable to the bats since it still retains the smell of its previous packrat residents. The Petruk building is also located beside Joseph Creek road, which may raise the likelihood of traffic mortalities if it is occupied by the bats. To date,

only two Townsend's Big-eared Bat were recorded in the building once during the day (May , 2002).

There are a few abandoned houses on the adjacent Kootenay Indian Reserve<sup>1</sup> but they are adjacent to occupied houses and it may not be in the residents' interest to prolong the life of these buildings. These abandoned homes are also situated on the opposite side of the St. Mary River from the Mission and it is uncertain how long it would take the bats to revisit them if they were modified.

## **2.2 New Roost Structure**

It was decided that building a roost structure near the Mission was the best alternative for potential disruption to the mission roost during the spring/summer of 2002. The structure would look like a large shed and be designed to provide a wide range of temperatures inside so that no active temperature control would be needed. Helder Ponte (Ktunaxa Kinbasket Tribal Council representative) was amenable to the plan and a location beside Joseph Creek a few hundred meters south of the Mission was agreed upon (Photo 2). The site is slated for future development (staff housing) but for now it will provide the best opportunity to test the new roost structure and provide an alternative to the bats. The site is gated at night, away from public access and adjacent to the golf course's maintenance facility where resort security will patrol.



**Photo 2. Location of Maternity Roost Structures on St. Mary's IR 1A.**



**Photo 3. New Roost Structure under Construction.**

The new roost structure was built during the early spring of 2002 and is portable by a flat deck trailer (Photo 3). Guano from the mission roost was placed inside the roost structure to make it 'smell like home'. If successful, there is potential for additional structures to be built to complement other maternity sites where structures are



deteriorating or adjacent government land could provide a more stable alternative to buildings on private land. As mentioned in section 2.0, the bats remained faithful to the Mission building in 2002 and no evidence of the bats using the portable roost structure was seen (i.e. resident bats or fresh guano).

### **2.3 Mission Bat Mortalities**

Inspection of the Mission roost on September 23, 2002 noted higher than average mortality levels for the year. Typically, from 2 to 5 bats are found dead in the Mission each year but in this case, 17 bats remained in the roost. Based on calcification of joints in the wing bones, the mortalities were three adult bats, thirteen full size juveniles, and one noticeably smaller juvenile. Temperature logs indicated a maximum temperature of 35.8 Celsius, which was at the top range of believed acceptable levels. The size of the juvenile bats indicated a late summer death, and correspondingly, temperatures for much of August were above average levels. It is possible that the duration of higher than average temperatures proved unbearable to some adult and juvenile bats. It is also possible that activity levels of insect prey species were also affected negatively by the high temperatures. Anecdotal evidence of other maternity colony die-offs came from the Okanagan and California in 2002 (Stelfox pers. com.; Dixie Pierson pers. com.). Roost air conditioning will now be set to keep temperatures at or below 30 Celsius (previously 35 Celsius).

## **3.0 Other Maternity Roost Sites**

### **3.1 Madison Roost**

When George Madison left the property, all the buildings except the roost and one other were torn down. Initially, displaced pigeons occupied the roost building but as of 2003 have not returned. Colony size has remained stable but vandalism is a concern now that the property has no permanent resident. In spring 2000 some pieces of nicely weathered wood were removed from the roost building and doors have been repeatedly left open. Damage has resulted from the one door being left open and in 2003 it should be repaired so that it can properly close. There is no simple solution for the curious public, as locked doors will probably be forcibly opened. Ensuring that the gate at the

beginning of the property (W.L.A.P. controlled) is maintained can only reduce the likelihood of problems occurring.



**Photo 4. Madison Roost Building.**

### **3.2 Leask Roost**

The Leask maternity site has remained unchanged and numbers stable at approximately 20 adult bats. The only changes that may be needed is the repair of some exterior metal sheeting that has come loose near the top of the roost.

### **3.3 Turmunde Roost**

The building's doors and windows were modified to darken attic and back room as well as retain airflow (Photo 5). Although the bats seem to occupy this roost two months later than occurs at other sites, its size of at least 50 bats would indicate a maternity colony. Unfortunately, timing of visits has not allowed the presence of juvenile bats to be verified.



**Photo 5. Turmunde Roost Building.**

### **3.4 Newgate Roosts**

Numbers at the Charleworth roost have remained small, with from one to twelve bats. The Ambrose colony is difficult to census and it is uncertain if the bats have returned since the owner modified the building. Clean paper should be placed in the attic to make it easy to record fresh guano.

### **4.0 Bat DNA**

In November 2002, mortalities remaining in the Mission and Leask roosts were collected as part of a project to study the family tree of Townsend's big-eared bat in North America. No mortalities could be found in other maternity sites until November 2002 when a specimen was collected from the Turmunde roost (juvenile). Ted Antifeau, Rare and Endangered Species Biologist, has sent the specimens to Toni Piaggio at the University of Colorado, Boulder, for analysis. DNA has been retrieved from the majority of specimens.

Sequences for eight animals, three from WASA and five from the Mission, have been completed. Among these animals, there are five mtDNA control region haplotypes found within two separate evolutionary lineages. These lineages are separated by two base pair differences. The first lineage includes three haplotypes, each separated by one

base pair change, one haplotype from WASA, and two separate haplotypes from the Mission. The second lineage has two haplotypes, these haplotypes are separated by one base pair change. In the second lineage, one haplotype is represented by one animal from the Mission and the other haplotype includes two samples from WASA and two from the Mission. Details of the analysis are in the following document:



Preliminary DNA  
Results

## **5.0 Hibernacula**

### **5.1 St. Mary Lake Hibernacula**

Numbers at the St. Mary Lake hibernacula were at a high of 43 bats in March 1998 and down slightly to 35 bats in December 1999. Census counts at the mine were infrequent, to reduce disturbance to the bats. Unfortunately, the bats' ability to switch hibernacula mid winter made it difficult to ascertain maximum numbers. Unfortunately, it was easier to document increased disturbances in the mine from the public, as one local had begun to bring his family to the mine a few times each winter so everyone could see the bats and take pictures. In response to increasing disturbance levels the mine was gated at the end of August 2000 (Photo 6).



## **Photo 6. Gate at Entrance of Dominion Mine Addit.**

Investigation of the finished gate on Sept 15, 2000 revealed guano on gate, fresh moth wings floating on water in the mine and at least one Townsend's big-eared bat inside (flying). Subsequent winter counts have been favorable: 39 bats January 14, 2001; 32 bats January 29, 2002; and 36 bats November 30, 2002. The hibernating bats have been occupying the same extent of the mine as they did before it was gated, which would indicate that the mine microclimate was not significantly altered.

### **5.2 New Investigations**

On Aug 9, 2000, mine workings near Canal Flats were investigated. A single addit 20m long open at both ends was located but no evidence of bat activity was seen. Location: Easting 580550, Northing 5557000, NAD27, Zone 11U, 3200ft elev.

On Aug 10, 2000 an area Northeast of Elko was investigated for caves. Two caves were accessed but no bat activity was noted. Locations: Easting 638400, Northing 5466400, NAD27, Zone 11U, 6100ft elevation and Easting 638150, Northing 5467000, NAD27, Zone 11U, 5500ft elevation. There are caves with anecdotal evidence of bat use in the Elko area that have not yet been investigated (approximate location: Easting 63700, Northing 5465000, NAD27, Zone 11U, 5500ft elevation).

## **6.0 Closure**

I trust the above meets requirements. If you have any questions or require additional details, please contact the undersigned.

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## **7.0 Authorities Cited**

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