

A Survey of Bat Use in CRMO Caves Open to the Public After One Year of Closure Due to COVID-19

Todd Stefanic and Mauro Hernandez May 2021

On May 12, 2021 Todd Stefanic (Wildlife Biologist – National Park Service) and Mauro Hernandez (Research Analyst – Oregon State University) surveyed Buffalo Caves, Beauty Cave, Boy Scout Cave, Dew Drop Cave and Indian Tunnel for bats and signs of bat use. This effort was aimed at assessing changes to bat use in these caves after they had been closed to public visitation for one year due to concerns over transmitting COVID-19 to North American bats and the inability to effectively socially distance in the caves / on the caves trail.

This information has been gathered to provide insights into the effects on bat usage to the sudden cessation of human disturbance after many years of continued human visitation and to provide information to management in order to help make a decision as to whether to close the caves for a second year as the pandemic begins to wane.

HISTORY AND CONTEXT OF HUMAN DISTURBANCE TO CRMO CAVES

These caves (and others) have been visited by humans for over a hundred years. The earliest records come from 1902 when I.C. Russell visited the area he called "Cinder Buttes," and recounted finding numerous caverns in U.S. Geological Survey Bulletin No. 199

According to H.T. Stearns, "from about 1910 on, Mr. S.A. Paisley, first custodian of the monument, made numerous trips into the area and located many of the caves and natural bridges. Mr. Era Martin, who has lived within 3 miles of the area for over forty years, discovered and marked with monuments many of the caves and waterholes (Jex, 1993)

Zink (1956) stated that "at the time of the proclamation creating the Monument in 1924 it is believed the Loop Road was in existence. This would give access to such points of interest as the North Crater Lava Flow, the Devil's Orchard, the Big Craters area, and several caves in the Cave Area." He further wrote "a trail ran from the Cave Area parking location to Dew Drop Cave, Indian Tunnel, and possibly on out to the Natural Bridge, Spatter Cones, Needles Cave, Horseshoe Cave, Last Chance Cave, and Lava River Cave."

Zink credits Samuel A. Paisley of Arco with the discovery of Indian Tunnel in 1923 (and many other caves) as well as for much of the original work of trail locating. Zink reports for the first time on some negative effects of human visitation to this area, writing that "quite a number of artifacts were obtained around Indian Tunnel shortly after it was discovered. There are no records as to who found them or where they are now located."

Zink recounts that during Paisley's time as Park Custodian (~1925-1927) "access to the various caves of the monument were by means of crude rope and pole ladders." The next custodian "removed a pole ladder from the Ice Cave" (possibly a reference to today's Snow Cone). One of the probable reasons Zink gave for this was concern over the "increasing number of visitors" creating enough warm air to melt the ice in the cave prematurely. This represents the first known reference to human disturbance having negative effects on CRMO caves themselves.

Boy Scout Cave was discovered in 1927 and by 1928 efforts were being made to make the caves more accessible to the public by constructing and cindering a trail to Dew Drop Cave and Indian Tunnel (Zink, 1956).

In 1928 Harold Stearns provides a list of principal lava caves and their locations in his *Guide to Craters of the Moon National Monument, Idaho*. Among these are listed Buffalo Caves, Dewdrop Cave and Indian Tunnel.

By 1932 it had become necessary for the Park Custodian to clean the two spatter cones of rocks and trash every few years and “the work became a greater task with increased visitation” (Zink 1956).

The trail through Indian Tunnel was constructed in 1933 (Zink, 1956)

By the late 1930’s entry into Crystal Pit was being discouraged as visitor’s were destroying the crystal formations (Zink, 1956).

Before 1946 visitation hardly exceeded 20,000 per year. In 1946 the number reached 58,000 and by 1952 had increased to 85,000 (Zink, 1956)

1952 saw the first exploration of Arco Tunnel and the first pre-mix was laid on the caves trail from the trailhead to Dew Drop Cave (Zink, 1956).

Zink (1956) writes that the first signs were erected at trail heads in 1954 (but does not specifically mention the Caves Trail).

The *Short History of Craters of the Moon National Monument* (Zink, 1956) contains the first mention of “lava tubes accessible to the public.” In it he specifically mentions Boy Scout Cave, Beauty Cave and “an unnamed tube just beyond Beauty Cave” (a reference to Arco Tunnel).

In 1956 pre-mix was laid from Dew Drop to Boy Scout Cave (Zink).

A visitor use survey done in 1988 found that 64% of monument visitors stop at the "caves" area.

Up until 2020 when caves were closed, visitation rates had fluctuated the area of 200,000-250,000 (? Waiting on data from Interp) a year for the past 10 years. Greg Reed (personal communication) from the Interpretation Division reports that the Caves area is the #1 destination for CRMO visitors, estimating 80% of them visit the caves area.

2020 CAVES CLOSURE

In 2020 the closure to the Caves Area consisted of an orange snow fence placed across the turn off of the Loop Road into the Caves Parking Area Caves which physically prevented visitors from entering the parking lot and signs which said the caves were closed. At Buffalo Caves a “closed” sign was placed on the pole at the mouth of the caves entrance. There was not enough staff to monitor these sites to see how effective these closures were and/or to see how many people may have ignored the fencing and signage and entered the caves anyway.

RESULTS OF SURVEYS MAY 2021

Beauty Cave

The floor of Beauty Cave was littered with an abundance of moth wings from front entrance to the metal barrier which prevents visitors from going into “The Squeeze”. Some guano was also found on the cave floor. The presence of moth wings and guano indicates this cave is being used by bats for night feeding and as a day roost. Moth wings or guano in Beauty cave are previously undocumented in CRMO records. This is not terribly surprising as this cave was said to have “high visitor use” and to be “highly disturbed” as far back as 1982 (Skonier and Hunt). About 300 moth wings were collected for potential identification. One moth forewing was positively identified as a Nevada tiger moth (*Grammia nevadensis*) and one hindwing was identified as being likely a Williams tiger moth (*Grammia williamsii*). *G. nevadensis* adults are on wing in late summer and fall and most Pacific Northwest records for *G. williamsii* are from July and August. Both species only have one generation per year. This indicates that this cave was being used by bats in 2020. It may be of note that Moths are the predominant food source for Townsend’s big-eared bats. Due to the obvious uptick in bat sign that was discovered we deployed a Wildlife Acoustics Song Meter 4 Ultrasonic Recorder between the front entrance of Beauty Cave and Arco Tunnel. After a week of being deployed the SD card was swapped out and the data was processed by Mauro Hernandez. This detector recorded 4,079 files of which XX (it will be 90+% but still being processed) were bat passes. XX (will be at least 7) species were verified.

No bats or bat sign was found in the back section of Beauty Cave.

Boy Scout Cave

Some moth wings were found on the floor of this cave which provides evidence it too was used by bats in 2020 for night feeding and as a day roost.

Dew Drop Cave

A few moth wings and small amounts of guano were found in Dew drop Cave. One pristine moth forewing in the very back end of the western passage was photographed for potential identification. This forewing was identified as belonging to a dart moth in the genus *Anarta*. I believe it to be *A. crotchii* but *A. fusculeta* is also possibility. In either case, the condition of the wing and the fact that both species fly in the spring, from April to early June indicate that this cave has been used this year for night feeding and as a day roost.

Indian Tunnel

Small numbers of moth wings were found in the light-to-dark transition zone to the right of the bottom of the stairs. Small amounts of guano also noted near the back exit/ skylight. A Wildlife Acoustics Song Meter4 Ultrasonic Recorder set up near the staircase. After a week of being deployed the SD card was swapped out and the data was processed by Mauro Hernandez. This detector recorded 2,588 files of which XX (90+%) were bat passes. Eight bat species were verified.

Buffalo Caves

One *Myotis* species was scene in torpor near the back entrance. This bat was about 5 feet up on the wall (i.e. low enough for a human-to-bat interaction). Guano found throughout the cave in small amounts. The east end shelter contained maternity colony-sized amounts of guano. Substantial guano pile in rear of cave before reaching metal barrier at back entrance (est:300+ pellets). Pellets appear fresh as degradation appears minimal. Sample of this guano collected on 3/18 for potential ID through Species from Feces. There were other spots of sediment resembling pellet piles in the surrounding area, but these were too poor quality to positively ID as guano. A Wildlife Acoustics Song Meter 4 Ultrasonic Recorder set up near the back entrance. After a week of being deployed the SD card was swapped out and the data was processed by Mauro Hernandez. This detector recorded 348 files of which 338 were bat passes. Eight species were verified: Townsend's big-eared bat (*Corynorhinus townsendii*), western small-footed myotis (*Myotis ciliolabrum*), California myotis (*Myotis californicus*), little brown myotis (*Myotis lucifugus*), long-eared myotis (*Myotis evotis*), Yuma myotis (*Myotis yumanensis*), big brown bat (*Eptesicus fuscus*) and silver-haired bat (*Lasionycteris noctivagans*). Also, some calls that were probably long-legged myotis (*Myotis volans*) were captured but these calls were not of sufficient quality to verify.

REFERENCES

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