

HABITAT USE BY BATS AND RADON CONCENTRATIONS OF ROOSTS IN ABANDONED URANIUM MINES

Presented By: Jason Corbett, Director of Subterranean Programs, Bat Conservation International
PO Box 22159 Flagstaff, AZ 86002
jcorbett@batcon.org
928.288.2398

We studied how selection of roost characteristics affected exposure to radon gas in 59 abandoned uranium mines in southern Colorado and Utah. Townsend's big-eared bat (*Corynorhinus townsendii*) selected mines that had greater complexity and lower temperature in winter. However, variables selected by Townsend's big-eared bats differed from those variables affecting radon. We found that radon gradually increased with distance from the entrance. In the summer, radon decreased with increasing height from ground and this pattern was reversed in the winter. Overall radon concentrations in mines were lower in the winter (197 pCi/L) than in the summer (619 pCi/L) but radon concentrations at roosts were higher in the winter (338 pCi/L) than in summer (112 pCi/L). Townsend's big-eared bats used areas significantly further from the entrance in the winter than in the summer. This, along with the inverse of radon in height from ground, accounted for higher concentrations at roosts during winter. Bats spend more time in mines during the winter months than any other time of year, so not only are bats being exposed to higher radon concentrations but they are exposed for a longer duration. However, bats are often in torpor or hibernating during winter months which decreases respiration rates thus decreasing exposure. All radon concentrations were well above the EPA's recommended exposure maximum of 4 pCi/L. The general effect of radon exposure is an increased chance of lung cancer. However, high radon concentrations can be found in natural caves, suggesting that cave-obligate bat species may have evolved in the presence of radon. Additional research should focus on the effects on bats exposed to radon concentrations similar to those in this study. Without additional information indicating radon has deleterious effects on bats, land managers should continue current protocol of gating mines to exclude humans while allowing use by bats.