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Armed Rangers and Harsh Lands
Conserving abandoned mines for endangered desert bats
Jim Kennedy

"Hold up!" said the man with the gun. The hikers â€“ five biologists and archaeologists â€“ obeyed immediately: we stopped in our tracks and fell silent. Two guards moved cautiously across the thorny scrubland, AR-15 rifles at the ready. These elite National Park Service rangers had joined our hike to keep us out of trouble as we approached the abandoned mines of Organ Pipe Cactus National Monument in southern Arizona. Armed guards are a thankfully rare aspect of bat research in most places, but they reflect the special challenges of working along this isolated stretch of U.S.-Mexico borderlands.

The monument sprawls across 314,000 acres (127,000 hectares) of arid Sonoran Desert, one of the most impressive and sensitive ecosystems in the United States, and 95 percent of it is designated a wilderness area. With its big columnar cacti, particularly the iconic saguaro and organ pipe, along with the rugged mesquites, stubby creosote bushes and spiny palo verde trees, the desert conjures up a classic image of the barren American West. But looks can be deceiving. In fact, this harsh land is a hotbed of biodiversity. The Sonoran Desert is home to at least 60 species of mammals, 350 of birds and more than 100 reptiles. It is the only place in the United States where jaguars are still found.

The United Nations declared the Organ Pipe Cactus National Monument (known as ORPI) an International Biosphere Reserve in 1976. Among the monument's rich medley of flora and fauna are at least 14 species of bats. The largest-known maternity colony of the endangered lesser long-nosed bat (Leptonycteris yerbabuenae) in the United States spends its summers in ORPI's abandoned Copper Mountain Mine.

Last October, I spent two weeks hiking through ORPI with colleagues to assess 72 abandoned mines that are slated for closure because of their potential danger to humans and wildlife. The National Park Service had received a total of $750 million in economic stimulus funds, some of which are being used to close hazardous mines on parklands, including ORPI. Lewis Berger and Associates, the Park Service's contractor for the project, asked BCI to examine old mines at ORPI for current or potential use by bats, then to design and recommend the best methods for closure. Those could range from simply filling insignificant pits with dirt to planning elaborate systems of gates for mines that host large bat colonies â€“ with a lot of options in between.

The Copper Mountain colony â€“ an estimated 40,000 bats â€“ has grown steadily over the years, so much so, apparently, that this endangered species has formed smaller, satellite colonies that moved into other old mines in the area. This is an exciting turn of events for the recovery of the species, but it dramatically complicates management. A single site is much easier to protect, gate and monitor than a half-dozen remote backcountry sites, but the broader effort is essential to protecting the species' long-term recovery.

This and similar bat populations elsewhere have convinced BCI to emphasize comprehensive conservation planning and action on a landscape scale rather than the "whack-a-mole" approach of focusing on individual, prominent sites when crises arise.

That means we basically treat all the lesser long-nosed bats of Organ Pipe Cactus National Monument â€“ those at Copper Mountain as well as denizens of smaller, isolated mines in the region â€“ as a single population.

Among cave- and mine-roosting bats, when conditions allow colonies to grow, subpopulations will often move out of primary roosts and colonize other subterranean sites where conditions are similar, if less than optimal. Bats may move among the primary roosts and its satellites. The satellite colonies are vital for continued population growth, maintaining genetic diversity within the species and as reservoirs that could escape catastrophic incidents at the main roost and rebuild the population. Losing current and potential satellite mines would have serious impacts on the long-term success of the Copper Mountain colony.

And the national monument provides less of a safe haven for plants and Â-animals than you might suppose. Ranching and mining have left slow-healing scars on the landscape. More recent visitors also leave their mark. Up to a million undocumented immigrants cross the border illegally each year and trek northward across the monument. Empty water jugs, worn-out clothing and assorted trash are discarded along their footpaths, and the few available water holes and other habitats, including some mines, are disturbed. More ominously, the area has seen a recent surge in drug smuggling since the construction of the U.S.-Mexico border wall. Hence the well-armed National Park Service rangers who accompanied us every time we left the safety of the Visitors Center/Campground area and ventured into the "Red Zone." We encountered no smugglers, but the guards were nonetheless a comfort.

Meanwhile, more than a century of mining for gold, silver, copper and other minerals left hundreds of abandoned mines and prospects spread across the monument. Today, many of them provide shelter for desert tortoises, collared peccary, cougars, woodrats and, of course, bats. They also house an array of historical and cultural artifacts. Unfortunately, many of these open and untended shafts present a hazard to humans.

The mines we visited fell into several distinct categories: shallow "prospects," exploration pits that were generally just 6-13 feet (2-4 meters) deep; blind shafts, deeper versions of the prospects that can extend as deep as 100 feet (about 30 meters); and adits, horizontal or gently sloping passages that often have a single entrance. Very few of these mines had any side passages. As expected, we found that the longest and most complex mines were most favored by wildlife, especially bats. The bat-rich Copper Mountain Mine, for example, is a tunnel that's nearly 1,000 feet (300 meters) long with several side branches.

Lesser long-nosed bats migrate into southern Arizona from central Mexico in April and May, timing their arrival with the blooming of desert agave and cacti, such as saguaro, organ pipe and senita. The bats are essential for pollinating these plants and for dispersing their seeds. That colorful diet of cactus fruits and pollens simplifies identifying their roosts, even in fall and winter, after the bats have returned to Mexico. They leave distinctive reddish or yellow guano splats on the walls and scatter countless poppyseed-sized cactus seeds beneath their roosts.

The walls of Copper Mountain are deeply painted with the leavings of lesser long-nosed bats. This is a rather well-studied colony and the National Park Service protects it by removing its location from monument maps, fencing entrances and posting warning signs. Those efforts allowed the maternity colony to thrive and grow â€“ and add the satellite colonies. But the mine is visible from two public roads, and experience teaches that fences

and signs offer little deterrence to dedicated trespassers and vandals. Such an important roost, and others like it, would benefit from increased protection that effectively keeps people safely away without interfering with the coming and going of bats.

For small mine roosts, such as Lost Cabin Mine #13, which shelters a few hundred bats with little chance of greater numbers, a basic, bat-friendly gate with horizontal bars will be adequate. For shaft entrances used by bats, such as at the Baker Mine, cupola-style gates permit bat flights in any direction.

The Copper Mountain bat colony, however, is far too big for a basic gate. Here, we are recommending state-of-the-art "chute gates" at each portal (or opening) to accommodate the nightly movement of so many bats. These are large, tube-like vents through which bats can move freely in either direction. Each portal will need to be cleared of rockfalls and decaying mine timbers to maximize flight space and support the gate.

We identified 15 openings of various mines that require bat-friendly gates or similar closures. Decision-making for most of these sites seems rather straightforward â€“ except for the Victoria Mine. More than 300 feet (90 meters) deep but without demonstrated use by bats, Victoria is problematic. It contains four closely spaced shafts that are probably interconnected, making this perhaps the longest and most complex mine at ORPI â€“ and could potentially become a major bat roost. But the opening is unstable and the current closures, distinctly unfriendly to bats, prevented an internal assessment. The mine also features an array of historic artifacts and the ruins of surface structures. Managers now face tough decisions about whether to make these openings bat friendly, which would require considerable time, expense and complex engineering that would likely impact cultural artifacts.

But with the surprising success of this endangered species throughout the OrÂ-gan Pipe Cactus National Monument and the real possibility of removing these bats from the Endangered Species List, a bat-friendly Victoria Mine might offer an extraordinary opportunity for the long-term Â-recovery of lesser long-nosed bats.

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BCI has been working for almost two decades to educate and collaborate with federal, state and private land managers to protect bats' use of critical caves and mines around the Southwestern United States. Jason Corbett leads our Southwest Subterranean program, with a focus on lesser long-nosed bats and other at-risk species. To support these programs, please visit www.batcon.org/donate.