Gold Butte AML Closures
2017-NDM-1792C
Final Project Report

FINAL PROJECT REPORT FORMAT:

- **Executive Summary:**

Wildlife compatible closures were installed at 18 AML hazards in the Gold Butte National Monument, two AML hazards in the Valley of Fire State Park, and six AML hazards in the Historic Goodsprings Mining District. All 26 closures meet the goal of this project to close off AML hazards removing the dangers associated with them while maintaining habitat accessibility and functionality for wildlife including bats and desert tortoise.The project was completed by the Nevada Division of Minerals (The Division) in consultation with Nevada Department of Wildlife (NDOW) and with prior approval from the Bureau of Land Management (BLM) on hazards on BLM land and Nevada State Lands and Nevada State Parks for the hazards on State Lands.

- **Introduction:**

NDOW routinely works with the Division's Abandoned Mine Lands (AML) program and identifies significant wildlife habitat within historic abandoned mines statewide. NDOW identified 18 AML hazards in the Gold Butte National Monument with significant wildlife habitat that requires wildlife compatible closures. The closures will not only prevent human entry into the AML hazards, but also protect the habitat of more than five species of bats and desert tortoises. The Gold Butte closures were completed in October of 2018 and additional funding was available. NDOW and the Division worked together to prioritize the hazards with known significant bat habitat in Clark County to utilize the remaining funding. The Division and NDOW identified the two hazards Valley of Fire and six hazards at Goodsprings. The gates at Valley of Fire were completed in March 2019 and the Goosprings gates were completed in October 2019.

- **Methods and Materials**

The 26 Wildlife compatible closures installed Gold Butte National Monument, Valley of Fire State Park, and the Historic Goodsprings Mining District were designed for each specific AML hazard by the Division and its contract in consultation with NDOW. The designs meet the standards of Bat Conservation International (BCI), and all hazards with tortoise habitat have an opening at the floor of the gate sufficient to allow for tortoise ingress/egress. During construction of wildlife compatible closures with tortoise habitat, an NDOW wildlife biologist was be present. All construction adhered to any seasonal wildlife restrictions.

The closures materials consisted of 2 inch square tube steel being cut, welded, drilled and fabricated at the individual hazards. Some of the openings to the mines were not stable or safe enough for the contractor to fabricate the gate inside and instead a gate was fabricated inside metal culvert which was then inserted into the mine and polyurethane foam was used to seal the culvert inside the mine.

To continue to understand and better implement the science of why bats are using the mines, some of the hazards were fabricated with at hidden removable bar that has a unique keyed bolt that can only be removed by a unique lug key. This key is designed only for the

Division and will only be sold to the Division by the manufacture. NDOW acquires a key from the Division and will monitor the habitats insides the mines to further improve the science behind the habitat.

Majority of the mines were not accessible by road requiring the use of a helicopter to sling load the metal for the gate and all welding and cutting equipment needed to construct the gate inside the portal. The use of helicopter not only reduced the footprint of the contractor by removing all overland travel, but also reduced the project time resulting in a net reduction on the project cost.

- **Results and Evidence of the Results**

The 26 wildlife closures meet all goals and objectives outlined for the project. The habitat protected in the mines covered a vast array of climates. The Virgin Mountains in the northeast corner of the Gold Butte National Monument reach an elevation of nearly 8,000 feet with pine and fir forests at its peaks. These mountains look down on a gray and red desert where elevations can dip below 1,000 feet. Pinion and Juniper forests are along the mid-slope elevations while the majority of the monument is dominated by an arid eastern Mojave Desert landscape that is characterized by the creosote bush and white bursage environments that cover large, open expanses scattered with low shrubs. The hazards at Valley of Fire State Park are close to the Overton Arm on Lake Mead leading to ample areas of feeding grounds for the bats. The six hazards in the Historic Goodsprings Mining District is a great example of the habitat provided by the Mojave Desert.

NDOW used a game camera on one hazard that was noted to have a tortoise exit the mine after the gate was constructed. The game camera not only captured the use of this mine by bats, but also a small gray fox and a ring tale cat. The camera was only up for a short period of time and did not capture the tortoise re-entering the mine but further evaluations of the gate will be conducted of the next few years. Below is a list compiled by NDOW of wildlife that can use mines for habitat:

- Bats that regularly, or occasionally, use mines in the Mojave:
    - *Macrotus californicus*, California leaf-nosed bat
    - *Antrozous pallidus*, pallid bat
    - *Corynorhinus townsendii*, Townsend's big-eared bat
    - *Eptesicus fuscus*, big brown bat
    - *Euderma maculatum*, spotted bat
    - *Idionycteris phyllotis*, Allen's big-eared bat
    - *Lasionycteris noctivagans*, silver-haired bat
    - *Myotis californicus*, California myotis
    - *Myotis ciliolabrum*, western small-footed Myotis
    - *Myotis evotis*, long-eared myotis
    - *Myotis lucifugus*, little brown bat
    - *Myotis thysanodes*, fringed myotis
    - *Myotis yumanensis*, Yuma myotis
    - *Parastrellus hesperus*, Canyon bat
    - *Tadarida brasiliensis*, Brazilian free-tailed bat
    - *Myotis velifer,* Cave myotis
- Other potential wildlife habitat:
    - Desert Tortoise
    - Woodrats
    - Other small desert mammals
    - Ringtail cats
    - Barn owls
    - Say's phoebe

- Rabbits
- Bobcats

Please see **Appendix A** for example photos of the gates and work completed.
Please see **Appendix B** for the a map of the wildlife closures

- **Evaluation / Discussion of Results**

The success of this project has resulted in the removal of unsafe conditions to the public while maintaining and protecting wildlife habitat at 26 individual hazards across a wide array of climates in Clark County. With the ability to monitor the habitat as time allows, these mines will help NDOW understand what unique climates that are found in abandoned mines that make them suitable habitat for multiple wildlife species.

The Gold Butte Project consisted of 40 total sites including the 18 hazards with significant wildlife habitat and was selected for the National Association of Abandoned Mine Lands Programs (NAAMLP) 2019 Remediation of Physical Safety at Hardrock Mines national award. The selection of this award demonstrates the successful results of the project, as well as, the effective use of funding towards AML remediation and wildlife habitat protection.

- **Conclusion**

All goals and objectives were completed for the project with no planned modifications or alterations in methods used for the project.

- **Recommendations**

With 26 individual wildlife habitats being protected resulting in the effective use of funding and develop of new collaboration between partnering agencies, the Division proposes to perform a similar project if DCP receives or obligates funding in the future for protecting bat habitat.

- **Literature Cited**

None

Appendix A

2017-NDM-172C

Desert Conservation Program

Final Report

November 11, 2019

Photos of Desert Tortoise, Bats, Gray Fox, and a Ring-tailed cat using the gate in Gold Butte National Monument

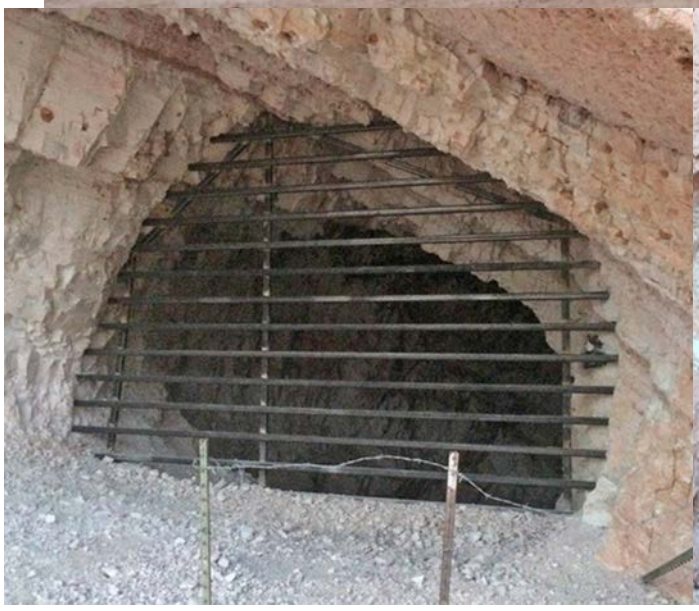
Left: Helicopter transporting a culvert using a super sack bag creating drag reducing spin during transport
Top Right: Materials staging area
Bottom Right: The helicopter delivering materials in the Virgin Mountains

Left: An ore loadout associated with a hazard in the Virgin Mountains
Right: A view looking north from the southernmost hazard in the project with the Virgin Mountains in the far horizon showing the vast distance between hazard sites within the Gold Butte project

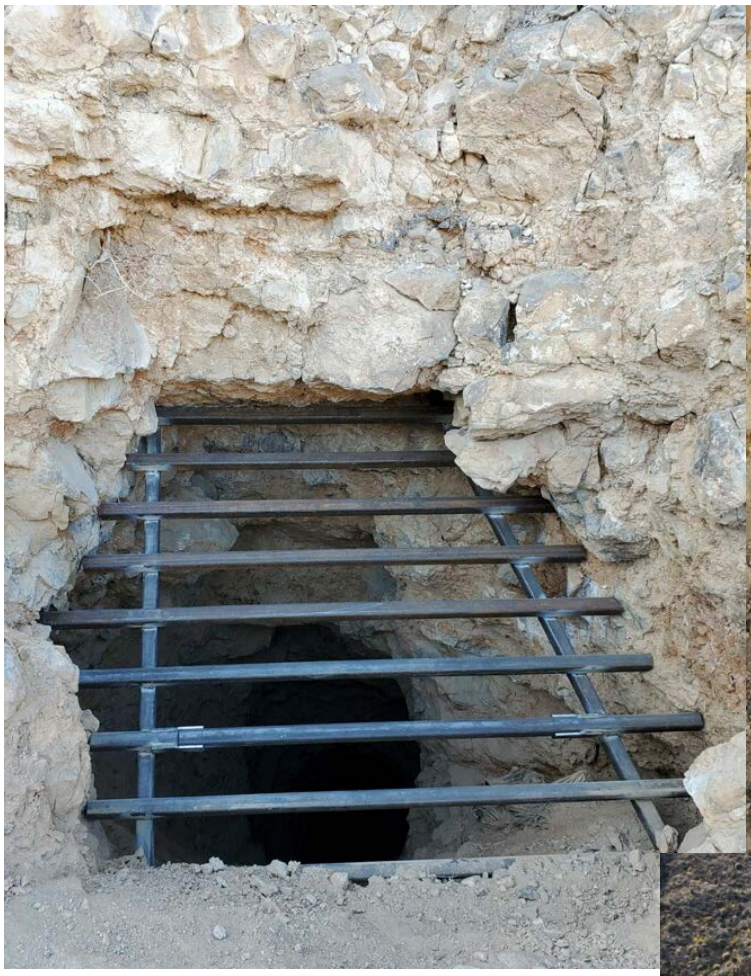
Photos captured by the Las Vegas Review Journal during their site visit. The grate across this shaft being welded by an EPS employee was located near the ghost town of Gold Butte.

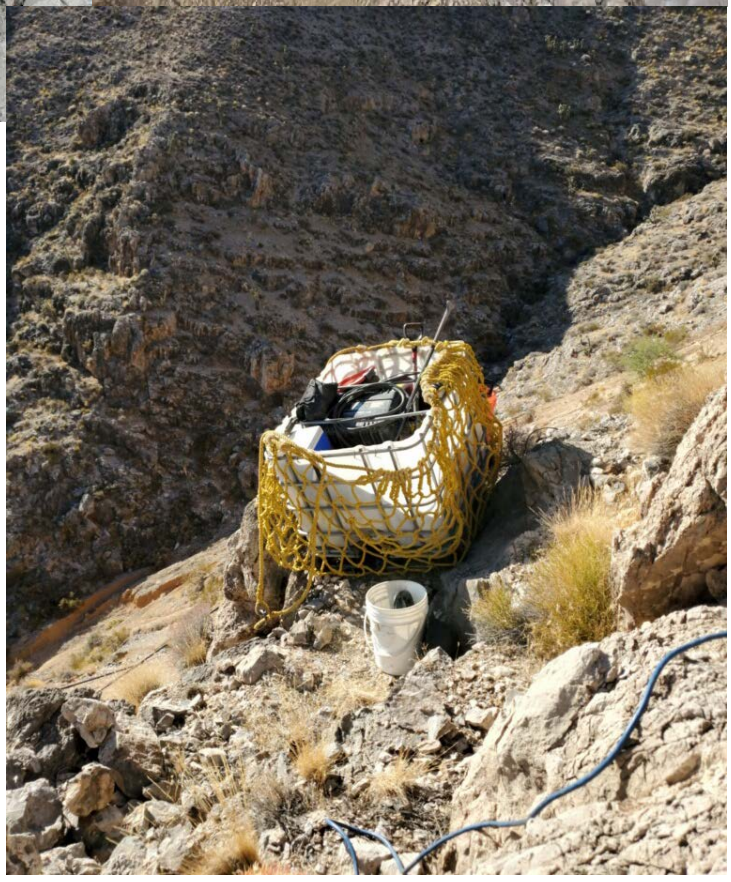
The Tramp Complex apart of the Gold Butte Project: although remote, an established unofficial hiking trail was used to hike personnel to the site after the materials were dropped off by the helicopter. The before and after photos on the right illustrates how EPS was able to construct a wildlife gate without impacting the cultural resources.

The Azure Ridge Complex apart of the Gold Butte Project. Located inside a wash that leads to a slot canyon, the Azure ridge complex consisted of two open adits, one caved adit, and one caved shaft. A road led to the mouth of the wash upstream from the complex but had been washed out by years of flash flood rains. Just past the mine complex, a BLM sign was still intact warning four-wheelers of the slot canyon and not to procced past that point. The haulage adit received a bat gate and EPS was able to construct the gate without impacting the rails. What the photos do not show is that EPS was able to dig underneath the rails without impacting them, insert a bar below on the bedrock and then bury the bar so no one could dig underneath the bars to gain entry.



Gates at the Magnesite Mine Complex a the Valley of Fire State Park



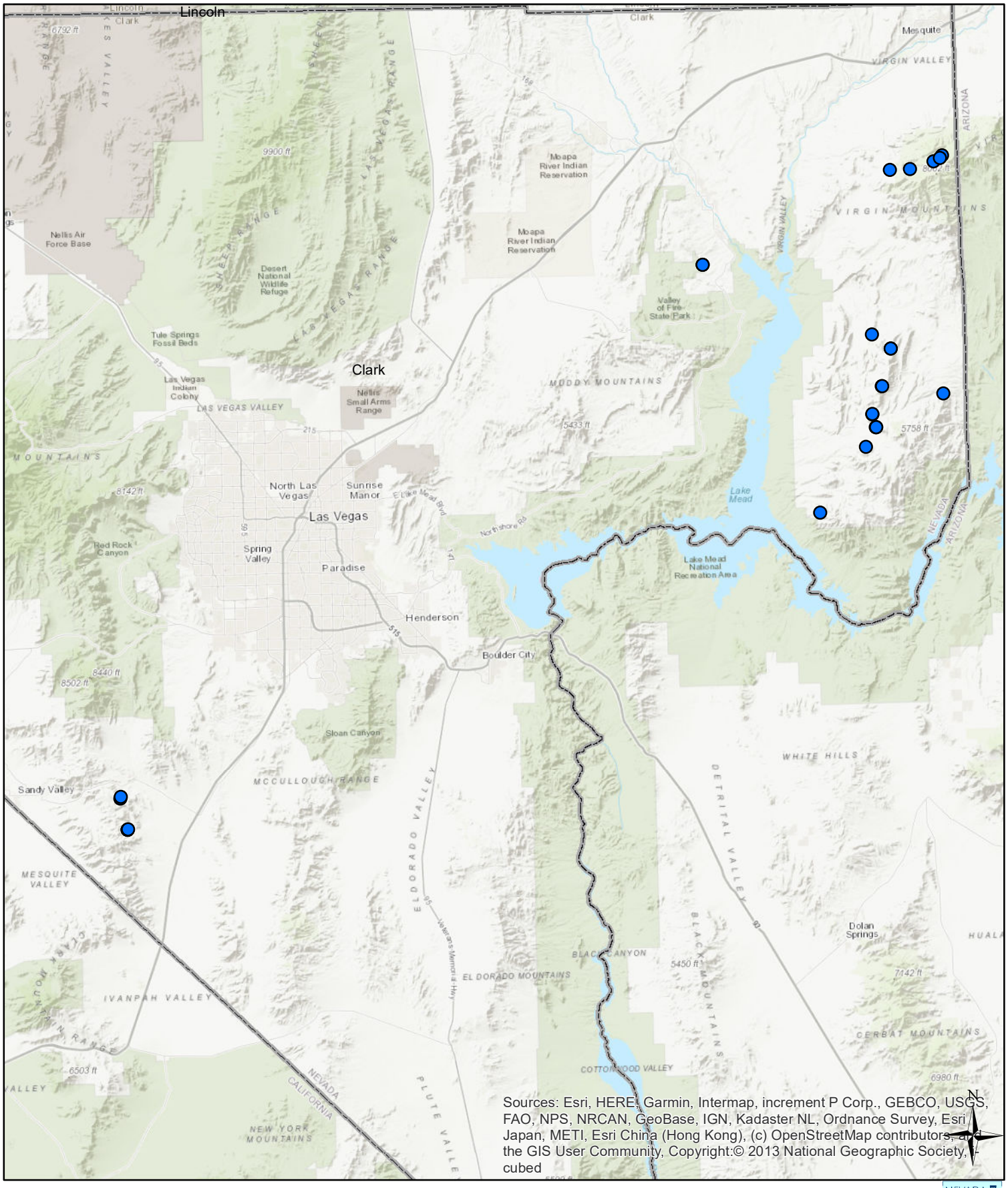


Two completed gates and a small materials landing zone for hazards at the Goodsprings project

2017-NDM-1792C Final Report Map

Clark County, Nevada

Appendix B



Wildlife Compatible Closures (n=26)

Scale 1:750,000

Date: 11/21/2019