

**HABITAT GUIDELINES FOR  
MINE OPERATIONS AND RECLAMATION**

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**New Mexico Department of Game and Fish**

## **I. Regulation of Mining Impacts**

The state Energy, Minerals and Natural Resources Department (EMNRD), Mining and Minerals Division, includes three mine regulation programs. The Coal Mine Reclamation Program administers requirements of the federal Surface Mining Control and Reclamation Act of 1977 (SMCRA). The Abandoned Mine Land Program, authorized by SMCRA, reclaims historic abandoned coal and non-coal mines. The Mining Act Reclamation Program administers requirements of the New Mexico Mining Act of 1994 (NMMA), which applies to hard rock mines. Hard rock mining refers to extraction of most solid minerals other than coal. Phosphate mines and sand and gravel pits are not regulated by EMNRD, although local county regulations may apply. The Bureau of Land Management requires a Mine Plan of Operations for mineral extraction activities on their surface, and the Forest Service issues Special Use Permits. New Mexico Environment Department Discharge Permits are required at all mine sites that may affect a groundwater aquifer. The purpose of the Discharge Permits is to ensure compliance with NM Water Quality Control Commission standards. Projects involving more than one acre surface disturbance are required to obtain National Pollutant Discharge Elimination System permits from US Environmental Protection Agency under the Clean Water Act.

The most extensive Department of Game and Fish (Department) involvement takes place on NMMA regulated hard rock operations. The Act requires EMNRD to consult with the Department on all permit approvals and modifications. We also frequently receive requests for consultation from other agencies for other types of mine projects.

### **• Impacts and Mitigation**

**Habitat Loss and Degradation.** Proposed new mines, and modifications to existing mines, should be evaluated for their effect on wildlife habitat. Pre-disturbance surveys are useful to establish baseline data for reclamation. Potential effects on listed species of concern should be identified and mitigated. Special habitat values or features should be identified for replacement during reclamation. Stormwater run-off should be controlled to avoid adding sediment to streams. Excessive sediment load affects aquatic organisms by covering up substrate habitat, carrying toxic elements, alteration of water quality or direct fish kill. Mine-related habitat loss may be temporary where mitigated by adequate reclamation practices, or permanent if reclamation is not required or is not properly implemented. The Department encourages the practice of concurrent reclamation, whereby portions of the affected area no longer in use are reclaimed while active operations continue nearby.

## **Physical and chemical hazards.**

Many mining and milling operations involve the use of chemicals or the contamination of water by acid generating drainage. Open water that may present a hazard to wildlife includes stormwater impoundments, tailings ponds, and pit lakes remaining after the cessation of mining. No pits should be located below the ordinary high water mark of any watercourse, lakebed, sinkhole, or playa lake, or in any wetland. Any open water in an arid environment will attract wildlife of all kinds. Wildlife need to be protected from contacting and ingesting harmful liquids.

Where ponds, pits or open-top tanks contain hazardous liquids, they should be netted, fenced or otherwise protected. The US Fish & Wildlife Service provides technical guidance on protective netting on the internet at <http://www.r6.fws.gov/contaminants/contaminants1c.htm>. Wildlife exclusion fencing may be appropriate for some situations. Exclusion fences must be a minimum eight feet in height, constructed of chain link or woven or welded wire mesh. They should be secured at the ground or preferably buried to prevent animals digging under, and should be wrapped around the base with a durable finer mesh material to deter small mammals and reptiles and amphibians. Fences which are intended to exclude livestock should be designed to minimize potential for causing injury or death to large wildlife attempting to cross over or under. The Department has fence specifications available for a variety of conditions.

Non-toxic ponds, pits and trenches may also present a trapping hazard for wildlife, if they are steep-sided and/or lined with smooth-surfaced material. Textured liner material is available which can be attached to create escape ramps. Depending on the configuration of the trapping hazard, earthen ramps, floating rafts and ladders may also be appropriate solutions. The Department can provide consultation and design specifications on the appropriate technology.

Chemicals stored in containers should be labeled, container integrity maintained in good condition, and secondary containment (berms or sumps) provided around tanks and at points of transfer. Machinery and infrastructure should be maintained in good condition to prevent leaks and spills, and appropriate spill response equipment and procedures should be identified prior to bringing chemicals on site.

Another mine feature which may present a hazard to wildlife is overhead electric supply lines. Please refer to the Department powerline habitat guideline for more information on that subject.

- **Reclamation.**

**Cover and Revegetation.** Traditional mine reclamation has included grading the reclaimed area to a uniform 3:1 slope for the purpose of minimizing erosion. The Department encourages incorporation of topographic variability reflecting the natural site surroundings and fluvial geomorphology where feasible. Vertical habitat diversity is the single most important factor contributing to avian species diversity. Where substrate integrity is sufficient to prevent erosion or slumping, highwalls may provide a vertical habitat feature that mimics natural cliffs or rimrock. The habitat value of highwalls can be enhanced by design features including an undulating profile, niches or ledges on the face, and placing rubble at the toe of the wall. Habitat enhancement features can also be added to a homogeneous slope to provide vertical diversity and opportunities to hide from predators. Features might include clumps or rows of planted shrubs, brush piles, rock piles or constructed perches or nest platforms. The Department is available to help determine optimal configuration of features given the setting and available materials.

The two main purposes of reclaimed mineland vegetation are to prevent surface erosion, and prevent infiltration of rainwater to the depth of buried material which may cause groundwater contamination. Surface preparation should at a minimum include placement of topsoil, either stockpiled from the site or borrowed from elsewhere, furrowing on contour, and mulching after seed is applied. Soil cover should be designed to minimize uptake of toxic materials by plant roots, and from there into the ecological food chain. Seed mixes are typically specified by the regulating agency and/or the surface owner. The Department encourages the use of native species exclusively. Seed lots and mulch should be weed-free and reclaimed areas should be monitored for noxious weed infestation. Plants which are of value to particular wildlife (for example, deer browse) may be recommended where appropriate.

**Water.** Wildlife may need protection from contaminated water sources, as detailed above, during and after reclamation. Conversely, provision of clean drinking water should be considered, to mitigate loss or degradation of natural water sources, or other habitat loss. Earthen tanks may be created where infiltration to contaminated subsurface layers is not a concern. Impermeable rainwater catchment drinkers may be a solution in other situations. The Department is available for consultation and specifications for providing wildlife watering facilities.

**Underground Features.** Many abandoned mine workings, and some active mine sites, have historic underground tunnels, shafts or adits. These features can cause injury or death to people who approach or attempt to enter, so they are often targeted for filling or plugging. However underground features are often used by bats, and some raptors, owls and snakes. Many of the bats are species of concern, because of population declines or simply because there is not enough information to determine their conservation status. Importance of a feature as habitat depends on factors including the particular species present, the type or seasonality of use, and surrounding habitat characteristics. Historic underground mine features should be evaluated by an expert in the field to decide the appropriate method of closure or guarding. Where appropriate, custom bat gates can be installed to protect public safety while maintaining bat access to the interior. In New Mexico, the EMNRD Abandoned Mine Land program has developed a high level of expertise about bat-friendly closures.

#### References

NM Mining Act Rules, NMAC Title 19 Chapter 10  
[http://www.nmcpr.state.nm.us/nmac/\\_title19/T19C010.htm](http://www.nmcpr.state.nm.us/nmac/_title19/T19C010.htm)

Coal Mine Reclamation Program Rules, NMAC Title 19, Chapter 8  
[http://www.nmcpr.state.nm.us/nmac/\\_title19/T19C008.htm](http://www.nmcpr.state.nm.us/nmac/_title19/T19C008.htm)

NM Water Quality Control Commission homepage  
<http://www.nmenv.state.nm.us/Oots/wqcc.htm#Legislation>