

**GUIDELINES FOR
OIL AND GAS DEVELOPMENT
February 2004
New Mexico Department of Game and Fish**

I. Regulation of Oil & Gas Impacts

Guidelines to protect wildlife and wildlife habitat on federal and state lands in New Mexico are administered by the surface management agency. Most often they are designed to limit surface damage and disturbance to wildlife during critical periods. The state Energy, Minerals and Natural Resources Department, Oil Conservation Division (OCD), which regulates spacing and permitting and monitors production of oil and gas wells, also has some environmental rules, mostly aimed at groundwater protection.

Oil and gas development on Federal lands in New Mexico is regulated primarily by the Bureau of Land Management (BLM), as surface administrator and trustee of the Federal Mineral Estate. Other federal agencies, such as the Forest Service (USFS), are also involved as surface administrators and trustees. On federal lands, Department of Game and Fish (Department) involvement takes place through the National Environmental Policy Act (NEPA) process, which provides us the opportunity to supply wildlife information and recommendations for inclusion in impact statements, environmental assessments, and land use planning documents. In dealing with activities that may not require an Environmental Impact Statement or Environmental Assessment, or else are covered under National Permits, we rely on the stipulations or Conditions of Approval that accompany the permit issued by the regulatory agency.

In the leasing phase, stipulations attached to the lease (generally by USFS or the BLM) have been the major vehicle for addressing wildlife concerns. A number of different stipulations have been attached, depending on the extent and nature of the wildlife habitat. Our involvement more typically comes when a federal agency issues a scoping statement for a particular project. At this time, we can identify potential conflicts and propose mitigation measures. The attachment of these stipulations, and their enforcement, is largely the responsibility of agency professionals, not the Department. In the past, inadequate follow-up monitoring and enforcement of environmental stipulations has been a problem.

On state lands, the Commissioner of Public Lands has primary regulatory authority in dealing with oil and gas development. We have the opportunity to comment on individual developments. On surface owned or controlled by the Game and Fish Commission, the Department generally has the same rights as any private surface owner involved in oil and gas development. On these lands, it is the stated policy of the Commission to prohibit uses that are incompatible with providing quality habitat for wildlife.

On private surface, regulatory authority lies with the OCD. Landowners can require stipulations on well rights-of-way. Wildlife input into the environmental analysis with regard to oil and gas development on privately owned lands is at best very limited.

II. Impacts and Mitigation

Habitat Fragmentation. Habitat fragmentation is the division of wildlife habitat into smaller areas separated by physical or other barriers. Causes of habitat fragmentation are not limited to oil and gas development, but may also include other disturbances such as highways, urbanization, and agriculture. Oilfield developments that may contribute to habitat fragmentation include roads, pipelines, wellpads and other industrial developments such as compressors or pump stations. Habitat fragmentation has been associated with declines in numbers in species dependent on large blocks of habitat, loss of genetic diversity, and other detrimental community- and population-level effects. The roadbed directly removes two acres of habitat per mile of 16-foot wide road. In one study conducted in southern Utah, the average width of roadside verges with an increased richness and cover of exotic species was approximately 6 meters (20 feet) on each side for graded dirt roads, and the adjacent plant communities were also affected to a lesser degree. Effective habitat loss due to elk (*Cervus elaphus*) avoidance of human activity may extend for 0.25 mi around each wellpad and along both sides of each road. Aggressive parasitic birds such as Brown-headed Cowbirds (*Molothrus ater*) tend not to venture deeply into woodlands except when paths such as roads or pipelines are cut through, exposing many native forest interior species to nest parasitism. Many forest birds do not fare well against Brown-headed Cowbirds; since they evolved in the absence of these nest parasites they have developed no natural defenses against them. Habitat fragmentation by roads also increases access opportunities for poachers. More information on habitat fragmentation is presented in the Department Guideline on Roads and Highways (available in 2004).

- In the leasing phase, limitations can be placed on the total area of disturbed ground, number of wellpads or the linear distance of roads per section.
- Minimize the construction of new roads and require closure and reclamation of closed roads.
- Boreholes to different oil-bearing formations should be drilled from the same pad where feasible. Directional holes can be drilled from the one pad where feasible.
- Solar powered automated well monitoring can reduce the number of wellsite visits needed (otherwise typically one per day).
- Piping produced water to a central collector location reduces water truck travel (otherwise typically at least one per day to each well).
- Bury pipeline along existing or planned road corridors to minimize additional surface disturbance.

Trenching. Trenching for pipeline burial causes wildlife mortalities from entrapment. Reptiles, amphibians and small mammals, which cannot escape, are particularly vulnerable. For information on recommended practices to minimize loss of wildlife, please see the Department Guideline on Trenching.

Noise. Existing regulations about wellhead and compressor noise levels are designed to protect human noise receptors. Wild mammals and birds respond to noise disturbance

with short-term avoidance behavior, however most studies have shown they quickly become habituated. Possible negative impacts include interference with songbird or lekking bird communication in the breeding/nesting season, and altered predator/prey dynamics. Continual compressor noise is especially likely to be associated with such impacts. Mammals habituated to traffic noise may be more vulnerable to road kill.

- Possible noise-related impacts and mitigations should be considered on a case-by-case basis.

Weeds. Weedy plant species spread in disturbed areas such as roadside impact zones, pipelines, etc. with detrimental effects to native plants and animals as well as livestock. Non-native invader species are known to bring negative impacts including such “unseen impacts” as non-native bacteria, viruses, insect pests, and/or chemical defense compounds with toxic and/or allergenic properties. Non-native plant species are often included in seed mixes sown on newly disturbed roadsides and pipelines (California Poppy, *Eschscholzia californica*, and Palmer Penstemon, *Penstemon palmeri*, are two examples). The impact of these introduced species on local populations of plants and animals is unknown. The New Mexico Department of Agriculture publishes a list of noxious weed species and an identification booklet. Counties and federal agencies may have their own lists of invasive species for specific geographic areas. Federal agencies have management responsibility (in published management plans) to prevent spread of noxious weeds.

- Project stipulations should include weed surveillance and a commitment by the project proponent to take responsibility for combating invasive species problems which result from their activities.
- Specify native species in revegetation seed mixes.

Erosion. In addition to habitat fragmentation, another effect of road-building is erosion of sediment into watercourses, and capture of surface runoff, which can result in reduced infiltration, a lower water table and lower rangeland productivity. Seismic exploration and pipeline corridors are linear developments which can have similar impacts, particularly if the rights-of-way become informal roads. However the impacts are generally less severe than those of roads because the rights-of-way are revegetated within a short time frame. Soil survey information can be helpful in the evaluation of specific sites for erosion hazard.

- Prevent unauthorized travel on seismic and pipeline corridors, and enforce and monitor revegetation requirements.
- Wellpad construction disturbs a larger footprint of ground than is needed for post-construction production operations. Unused disturbed ground around wellpads and above buried pipeline should be recontoured and revegetated soon after completion. Produced water meeting the New Mexico Water Quality Control Commission surface water standards may be used for irrigation of reclaimed areas until vegetation is established. Fencing may sometimes be appropriate to protect areas under reclamation.
- Require proper alignment of roads on moderate grades with a side slope, and ensure adequate drainage. Drainage considerations include proper size, frequency and placement of culverts.

- Surface amendment with gravel, sand, stone, cinders or other available material should be considered for dirt roads that must be placed on soils which may develop ruts or on steeper grades. Travel can be prohibited during periods when the ground is wet.
- Speed limits can reduce airborne dust but are generally unenforceable on low-volume oilfield roads.

Research Needs. Biological systems are exceedingly complex. There can be serious cascading effects – unexpected connections leading to surprising effects due to disturbance impacts. One example: a failure in flowering of an early flowering plant causes migrating hummingbirds to leave the area. As a result, a later-flowering species experiences low visitation and lower seed set. The disruption of such sequential mutualisms could cause cascading effects through the community, possibly including the extirpation of local populations. Little baseline data is available on existing plant and animal species with which comparisons can later be made in attempts to document changes or lack thereof due to oil and gas development. We do not yet know the effects of the current level of habitat fragmentation.

- Conduct as many surveys of plants, animals (including reptiles, small mammals and invertebrates, as well as fish, large mammals and birds) currently in the area as possible to establish baseline reference data for future comparison.

Physical and chemical hazards. An excellent example of cooperation between the oil and gas industry and government agencies and concerned citizens is the capping of dehydrator stacks with screen cones to exclude native birds and bats. This straightforward solution implemented on all federal lands in New Mexico by oil and gas companies has eliminated what was formerly a serious threat to birds and bats that flew down the stacks and died.

- OCD publishes a manual titled Pollution Prevention Best Management Practices, and the Pollution Prevention Pocket Guide, which can be downloaded free from their website at <http://www.emnrd.state.nm.us/ocd/>. These publications should be consulted for practices that could be applied as relevant to each particular project.
- OCD Rules require that all pits (other than drilling and workover pits) and ponds, and tanks greater than 16 feet diameter, be netted or otherwise rendered non-hazardous to migratory birds. The Department further suggests that pits smaller than 16 feet diameter also be protected. No pits may be located below the ordinary high water mark of any watercourse, lakebed, sinkhole, or playa lake, or in any wetland. The US Fish & Wildlife Service provides technical guidance on protective netting on the internet at <http://www.r6.fws.gov/contaminants/contaminants1c.html>.
- Wildlife exclusion fencing may be appropriate for some situations.
- Hydrogen sulfide (H₂S) emissions are known to be toxic to wildlife. Monitoring and control measures to minimize or reduce emissions should be implemented at all well sites where H₂S is associated with the formation being drilled.

Recreation. Keep tourism/outdoor activities/wilderness experience/wildlife watching in mind during development. Whether it be too much noise near a good fishing hole or a reduction in numbers of an interesting bird species or excessive weedy plants such as

thistles and tumbleweeds, it will lead to reduced satisfaction with the outdoor experience among fishermen, hunters, nature photographers, bird watchers and wildflower enthusiasts. With tourism the major business in many places already, and great competition for the spending power these groups possess, many towns and cities already are working hard to be sure their own local and regional natural areas remain in good condition so they are competitive.

- Mitigations for recreational use might include noise reduction or barriers, and seasonal restrictions on construction.
- Locate above-ground facilities for the smallest visual impact (not on ridgelines), paint an appropriate color, leave a screen of trees.

Special Habitats. Development in less abundant habitat types that may contribute disproportionately to regional biodiversity should be avoided, minimized or mitigated. Examples include riparian zones or rimrock outcrops.

III. Some impacted wildlife

Big Game. Big game impacts might include lower carrying capacity through direct habitat loss, disruption of migration routes, or disturbance or loss of critical winter range or calving habitat. Increased road access can result in traffic avoidance reactions, illegal take and road kills.

- Project mitigations related to big game animals can include seasonal restrictions on construction, and relocating projects to avoid locally important cover types.
- Gate single-purpose roads, and close/reclaim all unnecessary roads.
- Reclamation plantings can be designed with locally appropriate native species suitable for big game browse.

Raptors. Raptors may abandon their nests in response to disturbance. Ferruginous hawks (*Buteo regalis*) and golden eagles (*Aquila chrysaetos canadensis*) are especially sensitive to human activity. USFS has designated Protected Activity Centers and nesting areas for Mexican spotted owl (*Strix occidentalis lucida*), where development is prohibited or restricted. BLM has restrictions on oil and gas development in designated raptor nesting areas.

- Any suitable habitat (cliffs, large trees, snags) within one mile of a proposed project site should be surveyed for raptor nests. If any are found the project should be sited to provide a suitable buffer zone, or seasonal limitations placed on construction activity.

Prairie Chicken. The lesser prairie chicken (LPC) (*Tympanuchus pallidicinctus*) is a grouse native to the plains of eastern New Mexico. The LPC is naturally subject to large fluctuations in population and range occupancy. LPC's generally depend on mixed grass-dwarf shrub vegetation found on sandier soils. In southeastern New Mexico, LPC's use mixed stands of tall grass and shinnery oak (*Quercus havardi*). In northeast New Mexico, they utilize sand sagebrush (*Artemisia filifolia*) rangelands. They face a variety of threats to habitat by several of the mechanisms discussed above. Oil and gas development has expanded into most of the LPC range of southeastern New Mexico.

- The BLM has regulatory authority to move facilities such as drill pads, rights-of-way, and range improvements 200 meters away from known booming grounds, known as leks. During the NEPA process, the BLM may extend the off-set distance even farther if it is determined that the 200-meter offset is not sufficient to minimize impacts.
- Drilling for oil and gas and 3-D geophysical operations are not allowed by BLM regulations within potential habitat that occurs within shinnery oak cover, or within two miles of a historic lek site, from March 15-June 15, the LPC booming season. During that period, activities that produce noise or involve human activity are not allowed between the times of 3:00 am and 9:00 am, excepting normal around the clock operations such as venting, flaring, or pumping, which do not require a human presence.

Mountain Plover. Another bird showing a decline in numbers throughout its range due to habitat loss and fragmentation is the Mountain Plover (*Charadrius montanus*) a short-grass prairie species. Mountain plover are listed as a FWS Species of Concern. In northwest New Mexico they breed in open sagebrush scrub. Surface disturbance that results from prairie dog towns and livestock grazing are beneficial for mountain plover, so the impacts of oil and gas development may not be all negative. However they are sensitive to disturbance by human activity.

- Suitable nesting habitat that is proposed for development should be surveyed in the appropriate season, and seasonal restrictions applied if occupied.

Sand Dune Lizard. Sand dune lizard (*Sceloporus arenicolus*) is a small, terrestrial lizard restricted to sand dune formations inhabited by shinnery oak. It is listed as Threatened by the state of New Mexico, and is considered a Sensitive Species by the BLM. The sand dune lizard occurs only within a small area of shinnery oak habitat in parts of southeast New Mexico and adjacent Texas. In New Mexico, the species is known to exist as fragmented populations within an area of about 900 sq. mi. in parts of Chaves, Eddy, Lee, and Roosevelt counties. However, within this area the potential and occupied habitat consists of only 655 sq. mi. In a recent study, sand dune lizards were found throughout oil and gas fields, but overall population levels were 31-52% lower in oil and gas fields compared to undeveloped areas.

Recommendations from the Department Sand Dune Lizard Management Plan include:

- Oil/gas well density should be limited to ≤ 13 wells per square mile. New oil/gas wells should not be placed in dunal areas within occupied or suitable habitat. Well sites proposed in these areas should be moved to adjacent shinnery oak flats.
- Sand removed during pad construction should be stacked on one side of the pad to be used later during site reclamation. Abandoned well pads and the caliche roads that serve these wells should be cleaned of caliche, raked, and reclaimed with native sand. Abandoned well pads, pipeline corridors and out-of-service roads should not be reseeded in dunal areas.
- The use of “thumper trucks” should not occur in occupied and adjacent suitable habitat. Being poikilothermic (often referred to as “cold-blooded”), *S. arenicolus* hibernates during colder temperatures (generally October – April). During hibernation or seasons of inactivity, they are immobile and unable to move about to escape.

Seismic exploration in occupied habitat during these periods of inactivity could result in direct take of sand dune lizards. Direct take could also occur during summer months when sand dune lizards are laying eggs in underground nests that could be crushed.

References

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