



U.S. Department of the Interior
Bureau of Land Management



November 2006

Wildlife Management



Best Management Practices for Fluid Minerals

BMPs Minimize Wildlife Habitat Fragmentation and Loss

Typical BMPs May Include:

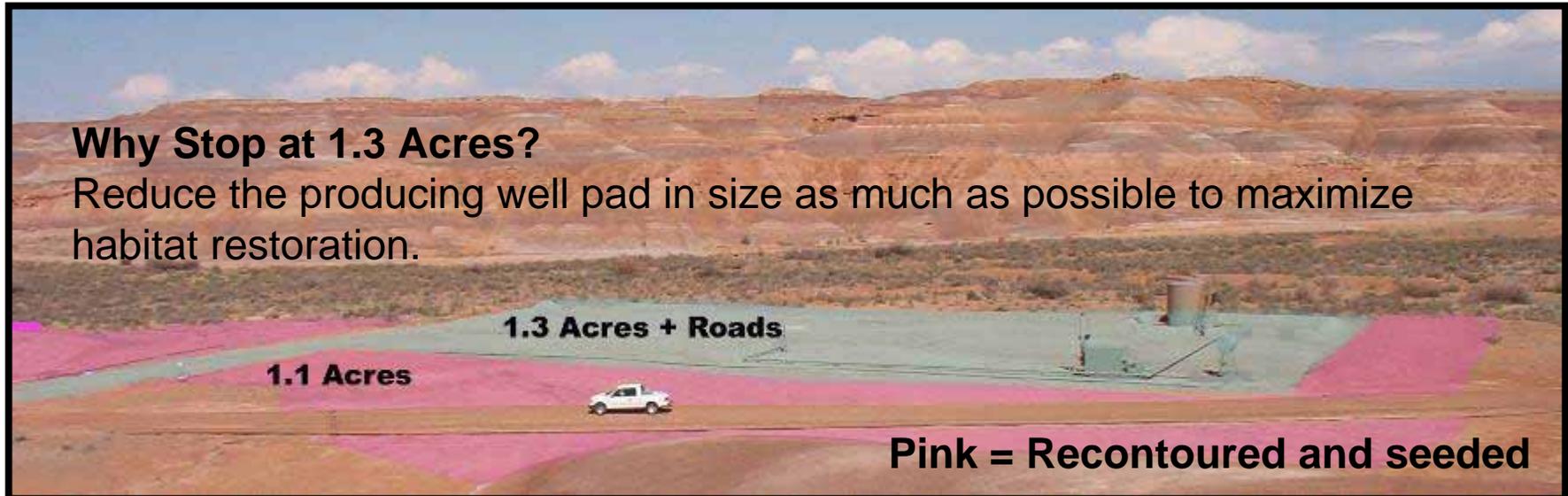
- Reducing the Size of Roads, Utilities, & Well Pads
- Drilling Multiple Wells from a Single Well Pad
- Eliminating Hazards to Wildlife
- Reducing Noise
- Centralizing Production Facilities
- Remote Production Monitoring



Interim Reclamation

Short-term reclamation that occurs as the well is beginning initial production of oil and/or gas. Includes partially reshaping and revegetating roads, and well pads to reduce the amount of bare ground created during construction and drilling activity.

To minimize habitat loss and fragmentation, re-establish as much habitat as possible by maximizing the area reclaimed during well production operations. In many cases, this “interim” reclamation can cover nearly the entire site.



Interim Reclamation - A Paradigm Shift

It is OK to set up well workover operations on, or park on, the restored wellsite or roadside vegetation.

Limit activities to only the area that is necessary. To avoid fires, consider mowing the vegetation where you will park. Repair the damage and revegetate when you are done.

Question: “But aren’t you are damaging the new vegetation?!?”

Answer: Yes, but it is temporary and minor damage. Keep in mind, the operator has the right to develop the lease and maintain production operations within reasonable constraints. Future well maintenance operations use far less land surface area than do the original drilling operations.

And Consider this:

What causes less loss of habitat:

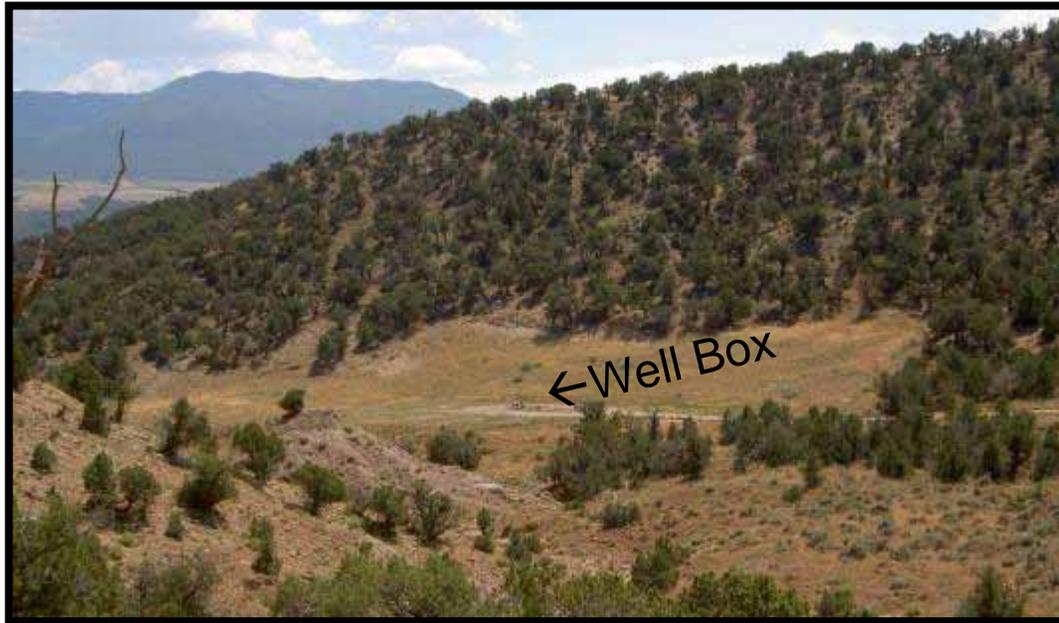
- A one or two acre well pad left barren for 40 years of oil or gas production, or
- Revegetating the entire well location, knowing that a small portion of it will sustain vehicle traffic and temporary vegetation damage during future production and maintenance operations?



Parking on the vegetation.
(It will green-up next spring.)

Interim Reclamation

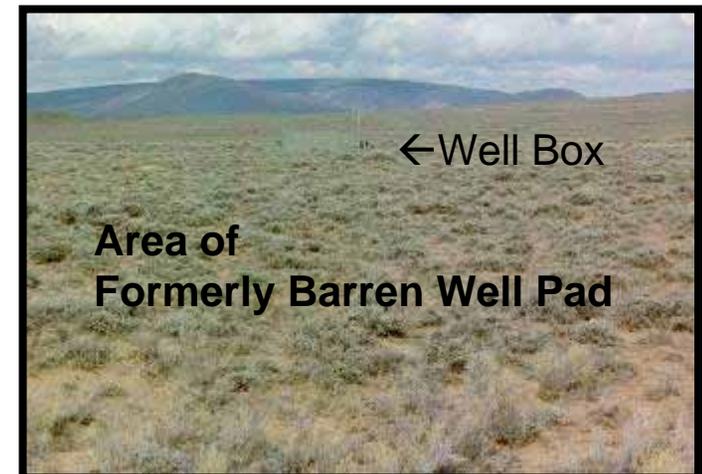
Interim reclamation should begin shortly after construction or establishing oil or gas production on the site.



If the disturbed areas are covered with topsoil and seeded with appropriate amounts and varieties of native species, over time, local natives will typically reestablish themselves on the site, helping to restore proper species composition and structure.

Steps:

1. Fully recontour unneeded areas to the original contour or a contour that blends with the surrounding topography;
2. Respread topsoil over entire pad;
3. Revegetate to reestablish habitat.

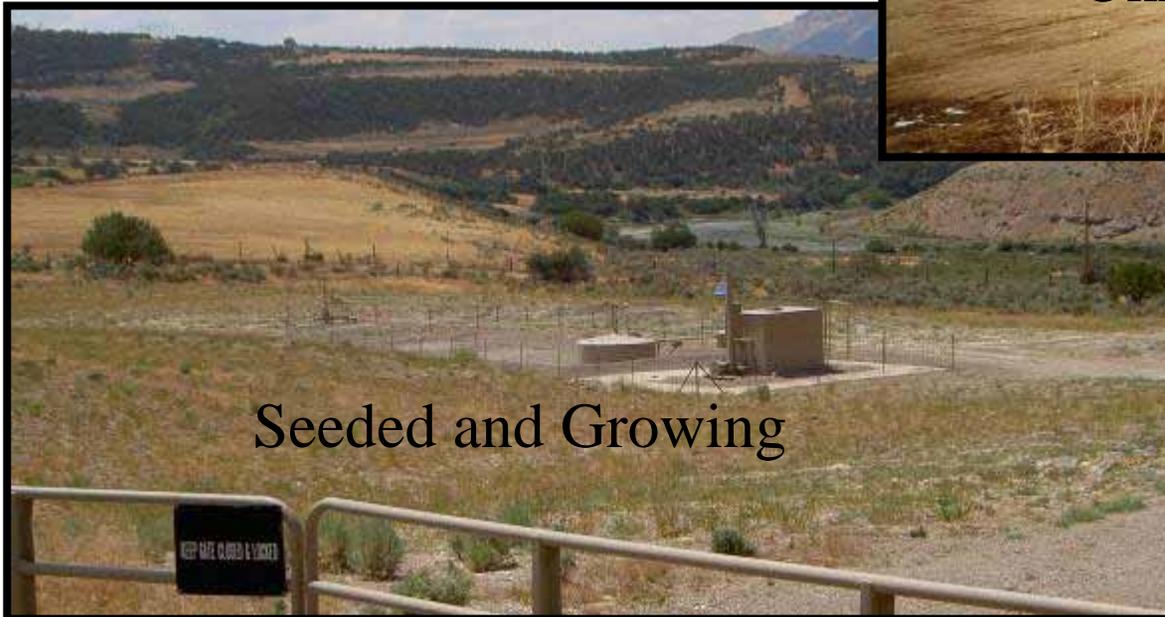


Interim Reclamation – Good and Bad Examples

Seed with the proper species, varieties, and amounts of seed.
The use of native species is preferred. Consider adding shrubs and forbs to the seed mixture, where appropriate, to reestablish habitat.

Good...

- Vegetation Reestablishing on Pad.
- Concentrate facilities near center to maximize area for interim reclamation.



Not so Good...
Bare Ground.
Long-term
Loss of Habitat
And Forage

Interim Reclamation of Roads



The Standard Road:

Ditches erode each time it rains. Annual maintenance including blading and weed control is required.



With Interim Reclamation:

Borrow ditches covered with topsoil and seeded. Consider seeding the road surface for low use roads. Forage and habitat is partially restored. (Along high speed or high traffic roads, avoid planting species that will attract wildlife.)

Interim Reclamation of Roads

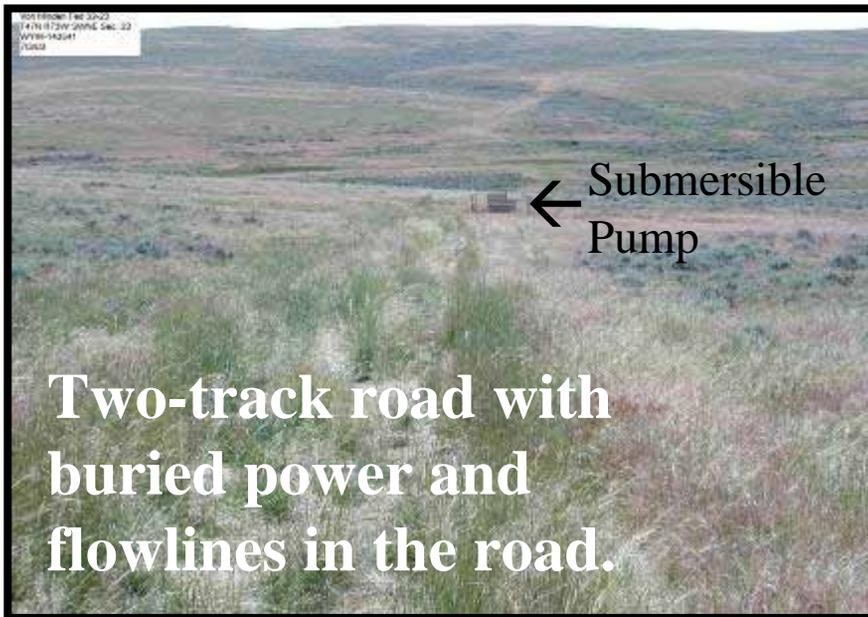
Respread Topsoil On All Road Cut and Fill Slopes and Revegetate to Ensure Slope Stability, Erosion Control, Restoration of Forage & Habitat, Maintenance of Visual Resources, and Topsoil Viability.



Minimize Roads

In the BLM 9113 Manual, it states:

Bureau roads must be designed to an appropriate standard no higher than necessary to accommodate their intended functions...



In some cases, low volume, two-track roads may be the suitable choice and create the least fragmentation of habitat.

Consider:

Average daily traffic (ADT)
load, vehicle size, soils, topography,
weather, season of use, safety, etc...



Emerging Practices Under Study

To Reduce Reclamation Costs & Speed Recovery

Use of Oak Mats for Pads and Roads



Drilling Multiple Wells On An Individual Well Pad

Consider drilling multiple wells from a single well pad to reduce the footprint of oil and gas activity on wildlife habitat.

Photo of 16 Wells on 1 Well Pad...

The result: Construction of 15 fewer well pads, 15 fewer roads, 15 fewer power lines, and less maintenance.



Flex Rig



Directional drilling costs are typically greater than drilling straight holes. However, in the example shown on this slide, in steep country, the total cost of directionally drilling 16 wells from one pad may cost the same or less than constructing and drilling at 16 separate well pad locations.

- The feasibility of directional drilling is dependent on the subsurface geology and the depth of the hole.

Drilling Multiple Wells on an Individual Well Pad

Centralizing wells allows the operator to avoid drilling and maintaining wells near sensitive resources and maintains large areas of uninterrupted habitat, thereby, reducing habitat fragmentation.

Directionally drilled wells require larger well pads, but with interim reclamation, pad size can be reduced significantly.



Six wells were drilled from this well pad.

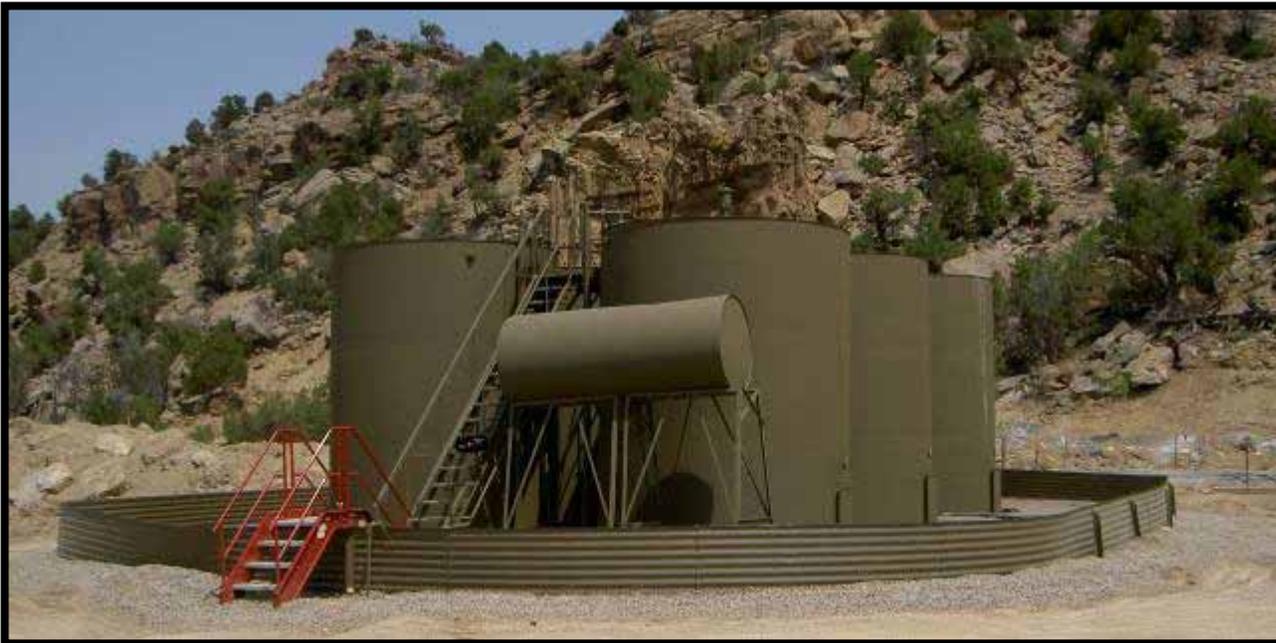
Centralized Tank Batteries

Run flow lines (oil, gas, water, condensate) to centralized tank batteries placed offsite, away from sensitive resources and habitat.

The Result:

Year-round truck traffic to each individual well is significantly reduced.

- Therefore, you may be able to use lower standard roads which result in less loss of habitat.
- There is less disturbance to wildlife because large haul trucks are not running to each well location during critical wildlife time periods.



Example of a centralized tank battery.

Remote Monitoring

Remote telemetry of wells and related production equipment can reduce the number of maintenance and inspection trips made during critical time periods for wildlife and result in less wildlife disturbance.



← Antenna

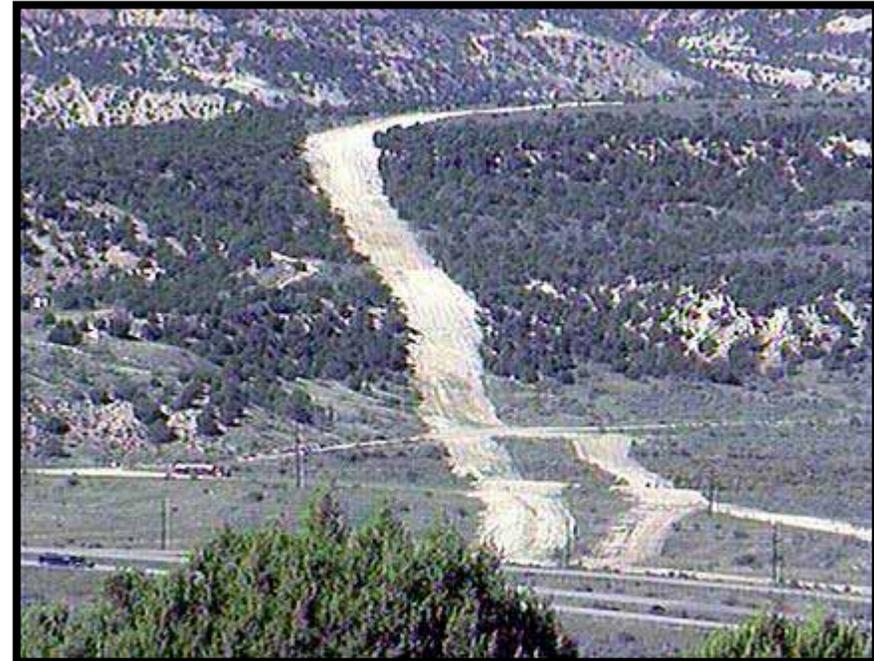
Natural gas compressor with electronic monitoring.

Line Placement – Reduce Fragmentation of Habitat

Bury power, flow, and pipe lines in or adjacent to the road to eliminate cross-country vegetation clearing and resulting habitat fragmentation.



The utility corridor on the right not only fragments habitat, but also reduces the scenic quality. →



Burying Lines & Utilities



Plowing and pulling pipes and lines into the ground in certain soil types will disturb much less ground and vegetation than excavating and trenching.

Standard Method



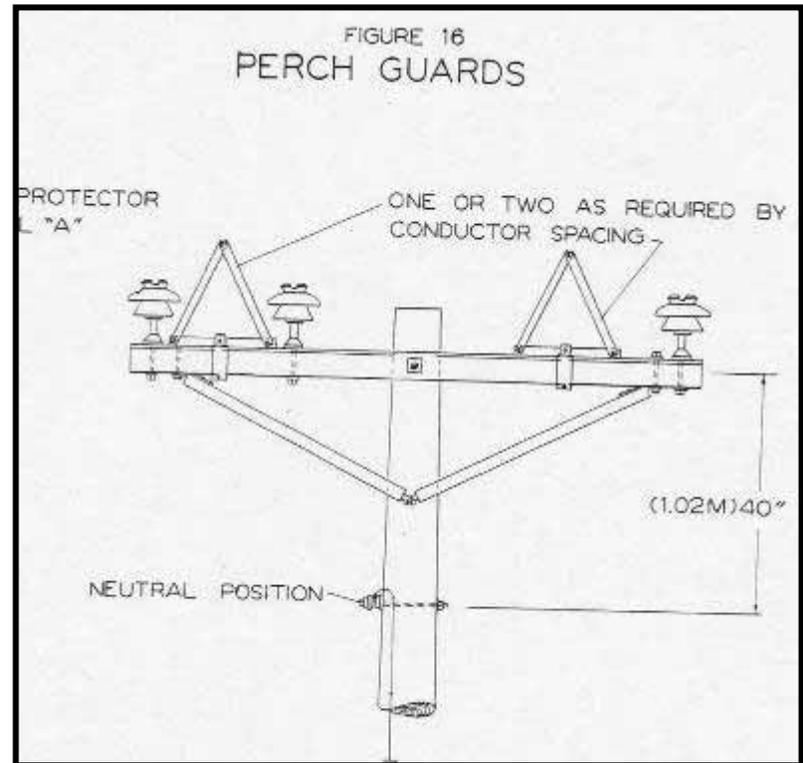
Utilities – Protect Wildlife

In important sage-grouse habitat and prairie dog towns, discourage raptor perching by using anti-perching devices.

Raptors perching on power poles can be electrocuted. Perches also provide easier hunting for raptors that prey on BLM sensitive species, such as sage-grouse.



This is a device to prevent raptor perching.



For additional information, refer to: "Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996"

http://www.eei.org/products_and_services/descriptions_and_access/suggested_pract.htm

Minimize Noise

Noise can deter wildlife from using an area.

- Use noise reduction mufflers to comply with noise standards.
- Also, consider using earthen berms, walls, sheds, and/or distance to reduce sound levels in important habitats.

4-Side, Open Compressor Building



4-Side, Closed Compressor Building



Photo courtesy of: Acoustical Control Inc.

Development Planning

Planned Development can reduce unnecessary disturbance by reducing unnecessary roads in important habitat. A **Field Development Plan** should address sensitive area avoidance or mitigation, potential road, utility, and well locations, road classes, plans for interim and final reclamation.



None of the road shortcuts are necessary.

Plan the main road system prior to development.



(Photo Simulation)

Reduce Vehicle Traffic

In important wildlife areas and during critical wildlife use periods consider:

- Seasonal restriction of public vehicular access in new development areas such as dead-end, well access roads or designated portions of the field.
- Operator enforced speed limits during critical seasons.
- Using shuttle vans and buses to transport drilling rig workers and field service personnel.



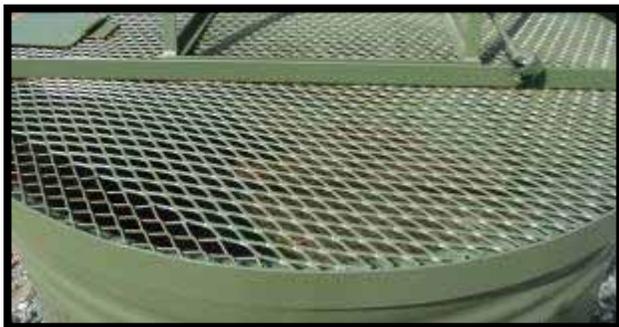
Frequent vehicular use... creates dust which degrades habitat, produces noise which disturbs wildlife, causes direct mortality from collisions, and requires higher class roads to accommodate increased traffic.

Wildlife Exclosures

Cover all “production” related pits and tanks to exclude wildlife, regardless of pit or tank size. Migratory birds can drown in small volumes of water and other fluids. Violations of the Migratory Bird Treaty Act can result in substantial penalties.



Tanks with wildlife exclosure covers.



Searching for dead birds in an **open** tank.

Unfortunate Results:



BMPs Must Be Correctly Designed, Monitored, and Maintained

It is not enough to use BMPs, they must also be properly designed, constructed, and maintained to ensure they are functioning properly. Constant monitoring, inspection, and enforcement are required to ensure BMPs remain necessary and effective.



In this photo, there is oil in the pit and the net is down.

This net was placed above the pit to prevent migratory waterfowl from landing in the pit in the unlikely event oil was accidentally discharged into the pit. (Oil is not permitted in pits.)

The net has fallen down due to its poor design, construction, and a lack of maintenance and is no longer effective at preventing wildlife access.

Off-Site

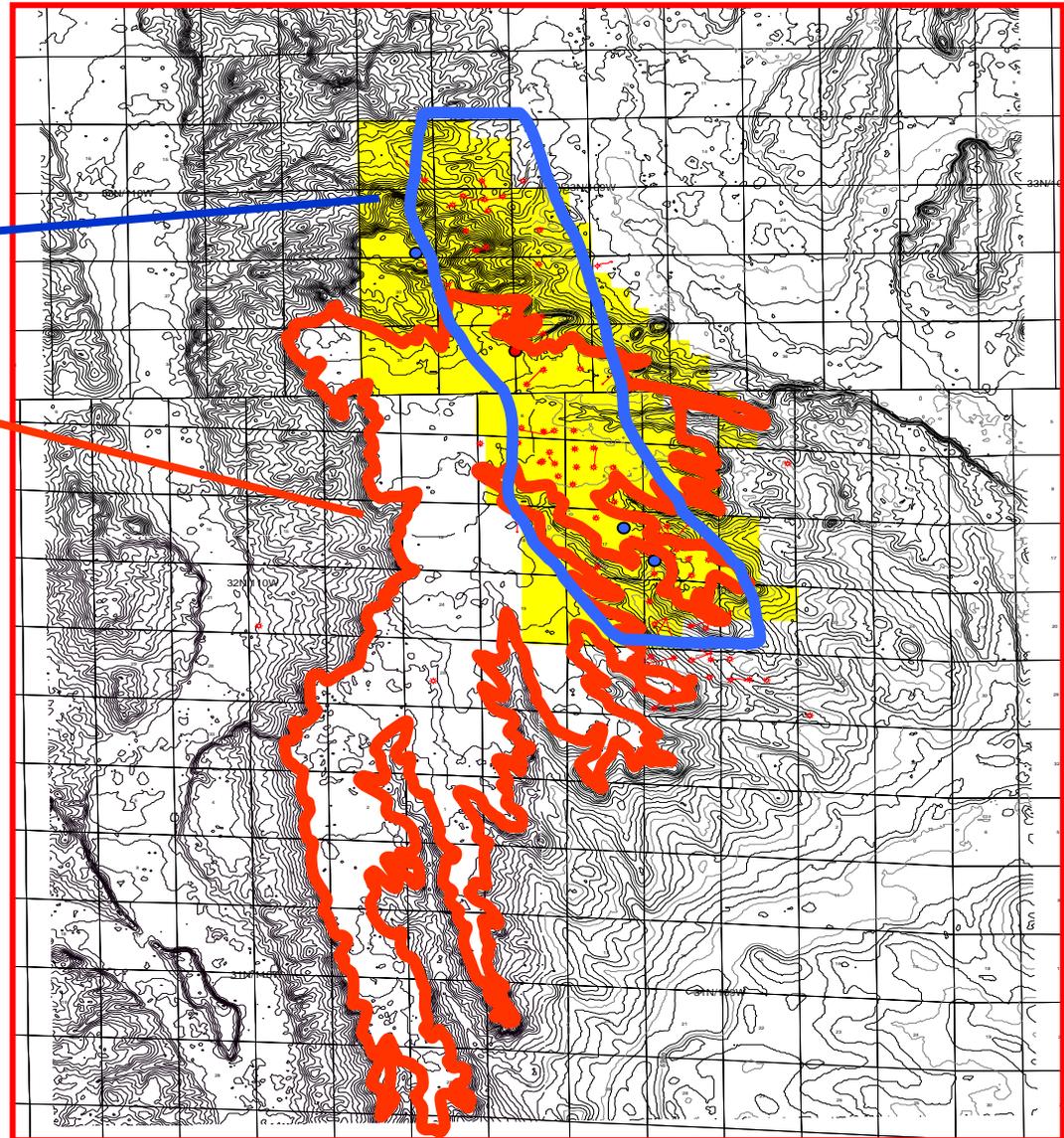
Habitat Mitigation

Photo of an energy production area and an area of wildlife habitat that could be improved to compensate for energy development.

Productive Energy Area

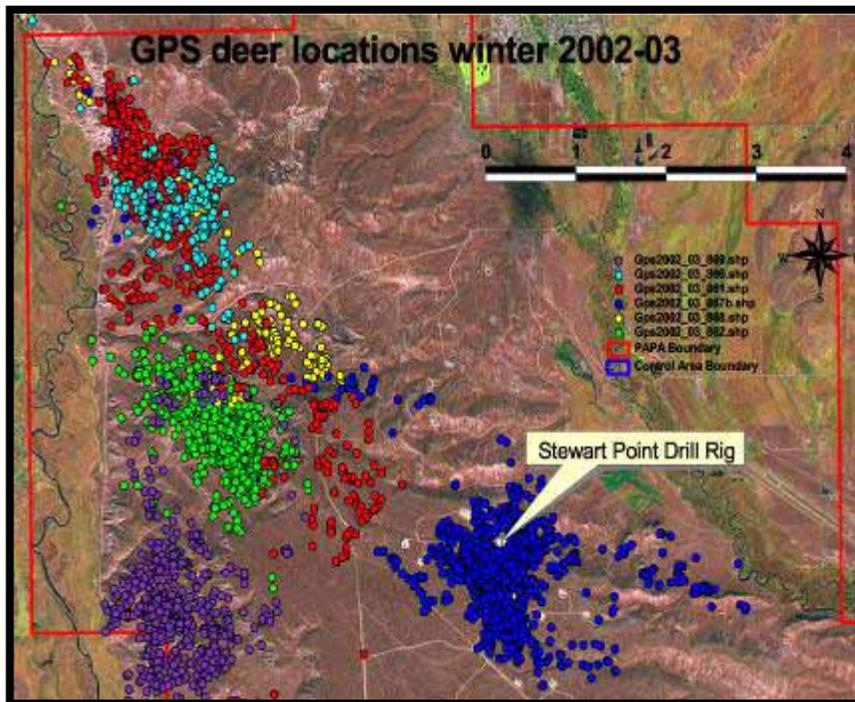
Potential habitat mitigation area

In some cases, the cumulative impacts of development to wildlife habitat may necessitate taking actions to enhance local or off-site habitat. Habitat mitigation helps to reduce the impacts of habitat loss or fragmentation until full, final reclamation at the end of the oil and gas field life.



Wildlife Monitoring

Monitoring wildlife populations is critical to confirming that our mitigation is necessary and effective. It also provides the justification for taking new actions or avoiding unproductive actions.



Each colored dot represents one deer with a GPS collar that records three times per day.

← The blue dots represent the locations of a tagged mule deer around a winter drilling operation.

Monitoring deer populations during winter drilling operations. Photo overlay is a summertime photo.

Final Reclamation

Final reclamation begins when well production ends. Ensure the site is recontoured, stable, and fully revegetated. If reclamation is done correctly, over time, the habitat will restore itself.

Remember, oil and gas development is not a permanent use of the land.



This reclaimed well pad has been recontoured (reshaped) to the pre-drilling contour, revegetated with native species, and over time will blend with the surrounding seamless landscape.

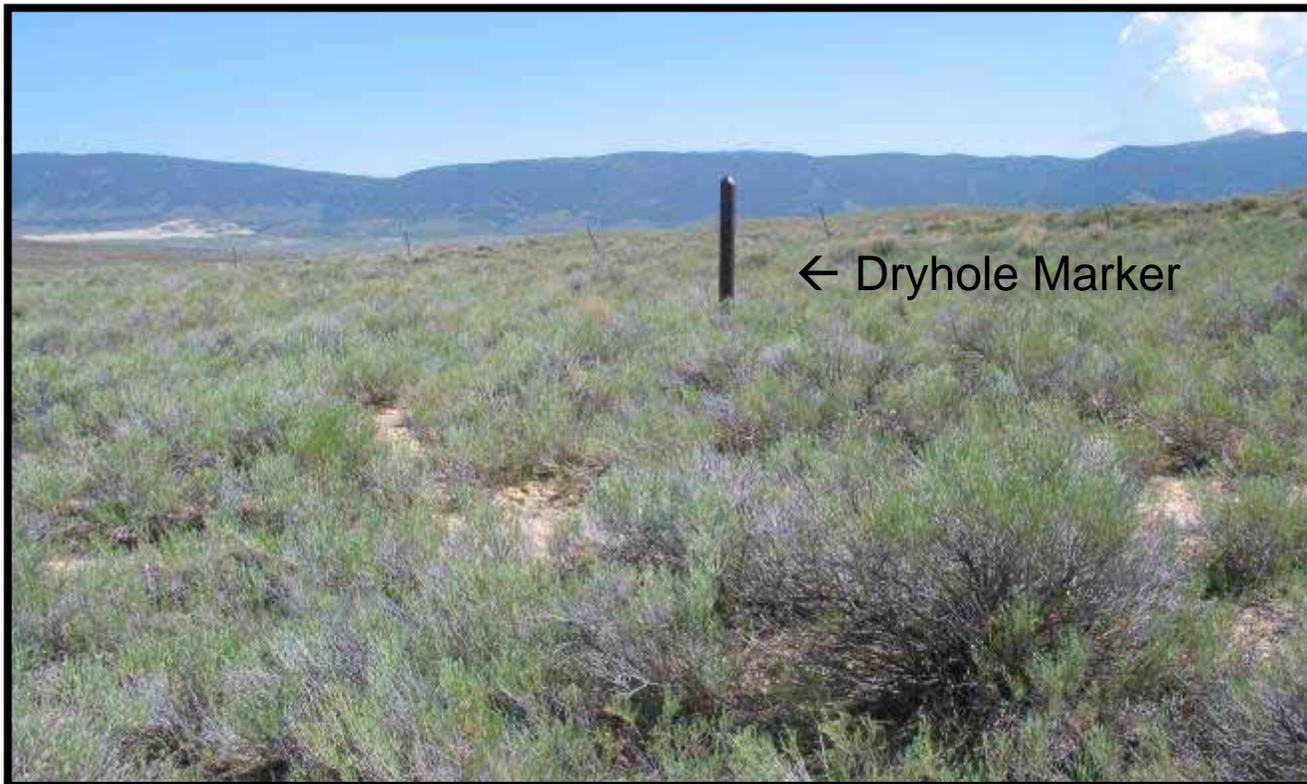
Final Reclamation Monitoring

Questions to ask:

Is the site stable from wind and water erosion?

Has the native plant community reestablished itself over time?

Has habitat been restored to proper species composition, size, and structure?



In this photo, the native plant community is slowly reestablishing itself on the reclaimed well pad. The dryhole marker indicates the old well location.

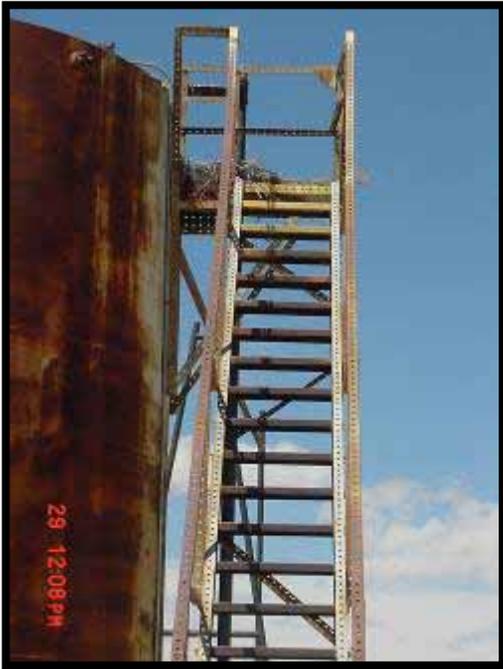
(Avoid the use of surface dryhole markers that can serve as raptor perches.)

In Summary: Minimize the Footprint of Energy Development

To reduce wildlife habitat fragmentation, loss, and degradation, consider:

- lower class roads
- smaller pads
- interim reclamation of roads and well pads





← Hawk nest



Rabbit →

Hawk nest →



Deer on Well Pad

