Energy and Sage-grouse
Conceptual Framework for Compensatory Mitigation
[provided for the purposes of stimulating thought and conversation—R. Northrup]

Introduction: Mitigation is a cost of doing business for energy development in Montana. For sage-grouse in particular, the state sage-grouse conservation plan calls for "no net loss in overall distribution and quality of sagebrush habitat." The plan also calls for maintaining distribution and abundance of sage-grouse, staying within the documented population range. All mitigation measures should be geared toward the most effective measures that serve to achieve these long-term plan conservation goals. Effectively locating developments, minimizing impacts through staged development and clustering, and effective on-site mitigation is preferable to compensatory mitigation. Both Core and Lek Area habitats are important for effectively conserving sage-grouse. Within Core Sage-grouse Habitats, the primary conservation strategy is to entirely avoid development in these areas.

Compensatory mitigation scope: All forms of energy development within occupied Core sage-grouse habitat should be subject to compensatory mitigation. Lek areas (non-Core sage-grouse habitats) should utilize effective conservation measures to minimize impacts, considering compensatory mitigation as an additional offset but also utilizing it in a manner that encourages effective on-site mitigation.

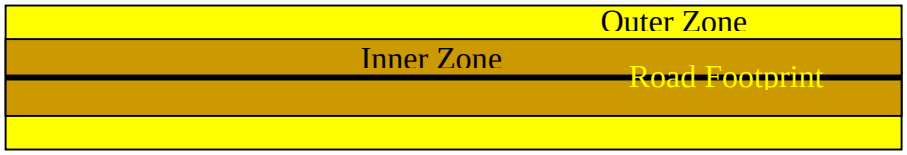
Compensatory mitigation:

1) **Objective**–establish protections and enhancements on strategic high priority habitat areas in a manner that offsets losses to populations and habitat function. Encourage effective on-site mitigation through compensatory mitigation program.
2) **Longevity**—compensatory mitigation should be applied in a manner that provides permanent benefits. This makes up for on-going impacts due to energy development and the uncertain longevity of impacts associated with most developments.
3) **Conservation Easements** involving protections and management prescriptions (enhancements) are a primary tool. Compensatory mitigation should be applied using the following priority hierarchy:
    a) Enhance existing functional intact habitat while also protecting from deleterious uses (e.g., forego development, establish wildlife-friendly grazing management)
    b) Restore and maintain healthy plant communities on degraded sites while also protecting from deleterious uses (e.g., forego development, defer grazing, apply grazing treatments that promote plant community integrity)
    c) Re-establish native vegetation on converted sites (e.g., croplands, exotic plantings) while also protecting from deleterious uses
4) **Framework**—the framework needs to contain the following elements: 1) define extent of impact area (e.g., footprint and surroundings, measured in acres), 2) determine population effect over the impact area (e.g., within the impact area, we anticipate XX% decline in local population or a percent loss in habitat function/capacity); 3) determine the effectiveness of compensation protections and enhancements (e.g., we anticipate XX% increase in local population or a percent

increase in habitat function/capacity); 4) determine the extent (area) of compensation habitat needed for mitigation.

The following is a straw man attempt to build a framework with alternatives, including potential benefits and drawbacks:

a) Impact areas or impact distances resulting from energy developments are affected by noise levels, disturbance magnitude and frequency, infrastructure sighting distance, obstruction qualities, and juxtaposition to key habitats (e.g., leks, winter habitat, nesting habitat, brood habitat).
b) Debt Acres—defined as those acres that fall within the area of influence or impact area resulting from developments and associated disturbance.
c) Consider the following *possible* approaches for assessing Debt Acres:
    i) **Standard Buffer Approach.** Each type of infrastructure would be assigned a standard buffer width based on research, which when summed are the total Debt Acres. Overlapped buffers count only once.
        (1) Strengths: simple, easy to understand. Buffer widths can be adjusted for different on-site mitigation approaches; incentive for better on-site mitigation, corresponding to fewer Debt Acres.
        (2) Weakness: does not provide substantial incentive for consolidation. Does not recognize different impact levels.
    ii) **Zoned Impact Approach.** A buffer would be divided into 2 or more zones that correspond to an impact gradient (i.e., impact decreases as distance from the disturbance site increases). The greatest impact is the disturbance footprint, followed by the closest buffer zone, and then more distant zones. For example, the graphic of a road (below). The road and borrow ditch itself is a direct measurable conversion of habitat. The zone closest to the road experiences more noise and disturbance than the outer zone. Inner zone areas and actual footprints would require more substantial compensation compared to outer zone acreages. This may require multiple categories of Debt Acres (e.g., foot print, inner zone, more distant zones).



(a) Strengths: takes into account the impact-distance gradient. Stronger incentive for reducing footprints and clustering to maximize overlap of or otherwise minimizing “inner zone” acreages.
(b) Weaknesses: more complicated, may be difficult to describe varying levels of impact with a formula that is empirical-based [will require more investigation if we feel this is an appropriate approach]

iii) **Percentage Impact approach**. Core areas would be divided into lek complexes or some other suitable geographic unit. The *percent* of a complex impacted by industry would translate into Debt Acres. For instance, a lek complex involving 200K acres might be 3% impacted by oil wells and associated infrastructure, which translates into 6,000 Debt Acres. This would require some type of buffering to assess impacted acres.
   (a) Strengths: provides an overall (cumulative) analysis of lek complex health or risk at a landscape scale (particularly if sodbusting and other impacts are also incorporated into the analysis)
   (b) Weakness: lacks strong incentive for consolidation. Lacks site specific detail.

iv) **Credit and Penalty Approach**. Based on mapped habitats, strategically locating infrastructure and disturbances (based on cover types, topography, etc.), would result in a balance sheet of penalties and bonus. For example, locating a drill pad on suitable sage-grouse habitat within 3 miles of a lek results in a penalty, which increases with closeness to the lek. But, locating the same well on cropland and burying power lines would result in a credit. Ultimately, the more penalty points, the more compensatory mitigation would be recommended.

v) [**One, a combination, or none** of the above are possibilities. Short-term impacts (up to 2 years?) may fall into a different category approach.]

d) **Compensation:Debt Ratios.**

Depending on the approach used for assessing Debt Acres, a prescribed ratio of Compensation Acres:Debt Acres will be necessary.

i) As an example, *if* enhancing habitat productivity on compensated acres results in a 30% increase in sage-grouse abundance, and impacts from development result in an average loss of 40% of sage-grouse within the Debt Acres, a minimum ratio of 1.2:1 would be appropriate to compensate for losses.

ii) Depending on the extent and effectiveness of on-site mitigation and the anticipated benefit of enhancements on compensated acres, the Compensation:Debt Ratio may need to vary among differing circumstances.

iii) In a core area, it seems appropriate to "over-compensate" to assure no-net loss of sage-grouse abundance. Compensatory acres should be identified within the core area where impacts occurred.

iv) [In their draft mitigation plans, Colorado and Wyoming have both identified entities for determining appropriate levels of compensatory mitigation. Wyoming has an Activity Plan Working Group that serves this purpose. Colorado intends to use local science teams. We need to consider how this should work in MT and the need for statewide coordination]