
Appendix D

Garfield County Greater Sage-Grouse
Conservation Plan



GARFIELD COUNTY

**GREATER SAGE-GROUSE CONSERVATION
PLAN**

Adopted: March 18, 2013 (via Resolution 2013-23)



Garfield County Board of County Commissioners

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CHAPTER 2 Purpose of the Plan

The purpose of the Garfield County Sage-Grouse Conservation Plan (the Plan) is to provide private and public land owners with land management principles, policies, incentives, and best management practices based on the best available science that are tailored to fit Garfield County's unique landscape and habitat characteristics for the betterment of the species.

Because of the County's unique landform, elevation, topography and vegetative cover that differ drastically from the rest of the national range, the Board of County Commissioners (the Board) commissioned an in-depth analysis, based on best available science, to determine what suitable habitat exists in the County at a refined level never before completed to obtain a very realistic and accurate picture of what suitable habitat exists.

The land located within the Plan Area is primarily held in private ownership with the Bureau of Land Management (BLM) representing the only public land. Coincidentally, most of the public lands and private property in this area contain significant oil and gas resources that are actively being developed or are intended for future development. By design, this Plan will continuously adapt as science expands for the species and habitat as well as acknowledging advances in energy exploration technology that continue to reduce the disturbance footprint. Ultimately, this will result in adaptive land management policies intended for the survival and success of the species.

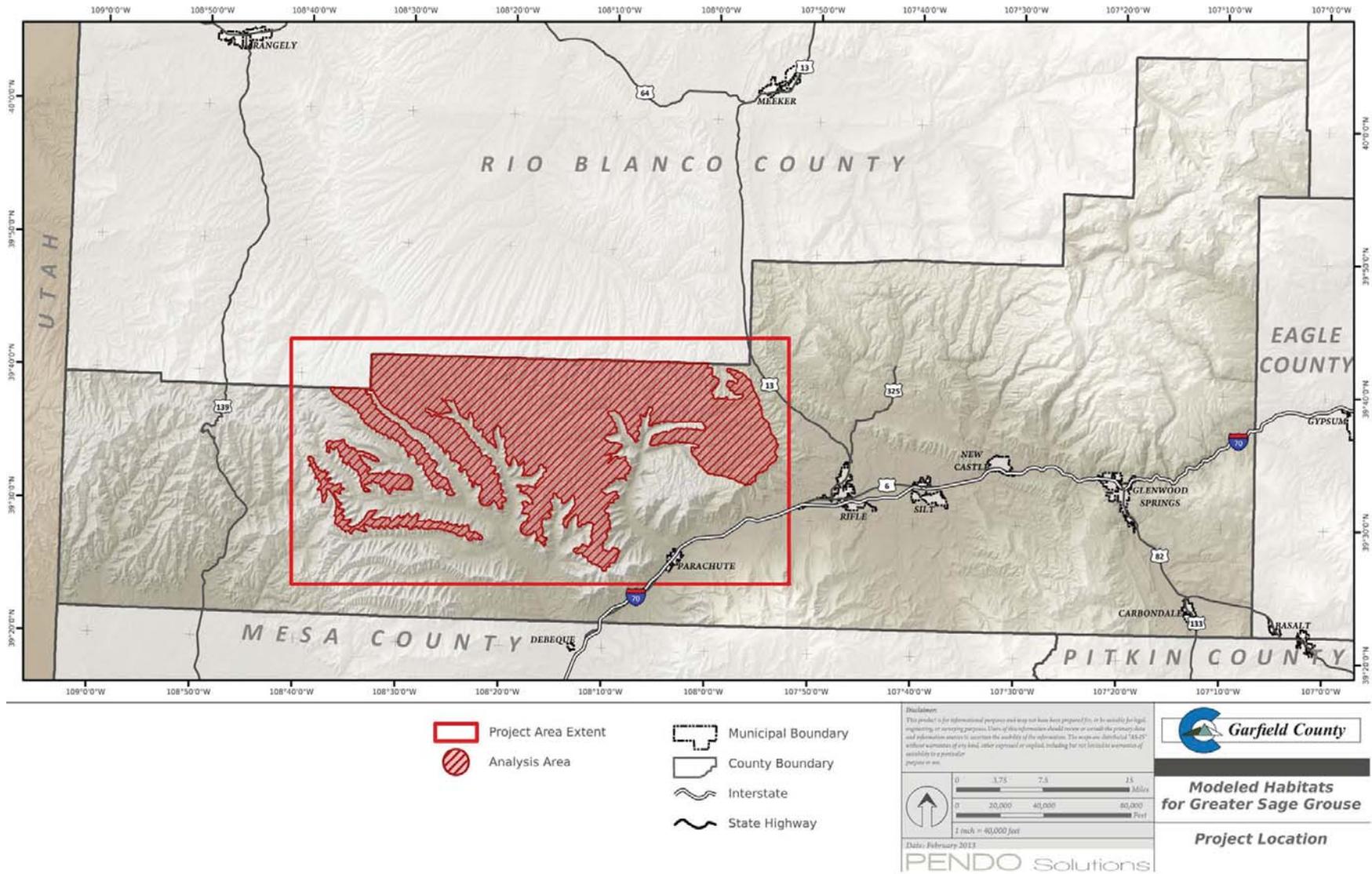
As implemented, this Plan shall require these policies and principles be applied on public lands as 'regulatory assurances' through Coordination and they will be applied on private lands as 'incentive-based assurances.' In this way, this Plan serves as a planning tool for private land owners by informing and improving their conservation efforts on a voluntary basis with the added opportunity to amend this Plan as a result of their stewardship successes.

Finally, because of the scientifically sound habitat modeling conducted to identify the suitable habitat in Garfield County which is the basis of this Plan, the County intends that this Plan may serve as a model for other counties located within the national range. Furthermore, this Plan explicitly relies on the Coordination process that requires federal and state agencies with sage-grouse management responsibilities in Garfield County to ensure that their plans are consistent with this Plan. Ultimately, the Coordination process will be the vehicle that brings disparate parties together with the same intent on making sound land management decisions that benefit the sage-grouse and its habitat recognizing that there are multiple uses being managed at the same time.

CHAPTER 3 Plan Area

The Plan Area includes the area where the suitable habitats are located within Garfield County and are primarily limited to the western region of the county in occupied habitats on the Roan Plateau (see **Figure 1**, below). Approximately 85% of the land within the Plan Area does not support habitat characteristics necessary to support the sage-grouse, but within this area there are small but important patches of suitable habitat. In order to ensure that habitat containing, or has the potential to contain, sage-grouse is properly managed; this Plan and the associated maps identify distinct habitat categories in the Plan Area including Suitable Habitat, Temporarily Disturbed, Unoccupied Suitable Habitat, and Lek No Surface Occupancy (NSO) Habitat.

Figure 1: Plan Area



Habitat Categories

Sage-grouse require somewhat different seasonal habitats distributed across sagebrush-dominated communities to complete their life cycle. All of these habitats consist of, are associated with, or are immediately adjacent to, sagebrush. The Plan utilizes the following habitat categories to define habitats in the Plan area, utilizing recent and pertinent research from the Plan area.

1. Suitable Habitat

Suitable Habitat includes all seasonal habitats (including lekking, nesting, brood rearing/summer and winter habitats) within the Plan area. Specifically, Suitable Habitat includes:

- Sagebrush cover is from 10 to 50%
- Cover of Mixed Mountain Shrubs is not more than 10%
- Distance to nearest Forest is over 100 meters
- Distance to Shrubby Woodlands is over 50 meters
- Grass/forb dominated habitats (with <10% sagebrush cover) within 30 meters of sagebrush habitat
- Contiguous habitats >3 acres in size, or part of a block of Suitable Habitats in close proximity

Sagebrush- includes all species and sub-species of the genus *Artemisia* except the mat-forming sub-shrub species *frigida*.

Mixed Mountain Shrubs- are shrublands dominated by Utah serviceberry (*Amelanchier utahensis*), Saskatoon serviceberry (*A. alnifolia*), mountain mahogany (*Cercocarpus montanus*), oakbrush (*Quercus gambelii*), bitterbrush (*Purshia tridentata*), and may have a sagebrush component. Mapped Mixed Mountain Shrublands have greater than 10% cover of these non-sagebrush shrub species, as this is the threshold at which sage-grouse show a strong avoidance of this community type.

Shrubby Woodlands- are vegetation communities dominated by oakbrush or pinyon (*Pinus edulis*) and Rocky Mountain juniper (*Sabina scopulorum*) or Utah juniper (*S. osteosperma*) types. Mapped Shrubby Woodlands have greater than 10% cover of pinyon-juniper, as this is the threshold at which sage-grouse show a strong avoidance of this community type.

Forests- in the Plan area include contiguous stands larger than 1/2 acre of aspen (*Populus tremuloides*), Douglas-fir (*Pseudotsuga menziesii*), mixed conifers (including, but not limited to Douglas-fir, Engelmann spruce [*Picea engelmannii*], subalpine fir [*Abies bifolia*] and ponderosa pine [*Pinus ponderosa*]), pinyon-juniper woodlands, and oakbrush.

2. Seasonal Habitats

While sage-grouse generally change their use of micro-scale habitats throughout the year, sage-grouse may be found within Suitable Habitat at any time of the year. The following definitions are used for seasonal habitats, and were utilized in the development of the Seasonal Habitats Maps.

Nesting- Nesting habitat is generally moderately sized patches of denser and taller sagebrush, further away from roads and other activity areas. Specifically:

- Sagebrush cover is from 20 to 50%
- Cover of Mixed Mountain Shrubs is not more than 10%
- Distance to nearest Forest is over 100 meters
- Distance to Shrubby Woodlands is over 50 meters

Brood Rearing- Brood rearing habitats are utilized after chicks have hatched, and are generally more mesic (moist) areas with a higher percentage of forbs and grasses which help provide higher densities of insects, plant material, and seeds for chicks, hens, as well as males during the summer and early fall months. Specifically:

- Sagebrush cover is from 10 to 30%
- Cover of Mixed Mountain Shrubs is not more than 10%
- Distance to nearest Forest is over 100 meters
- Distance to Shrubby Woodlands is over 50 meters

Winter Habitat- Winter habitat is generally utilized by sage-grouse from November through early April. It is primarily determined by the depth and persistence of snow cover. During more severe winters, snow can limit winter habitat to wind-swept ridges and patches of the tallest sage-brush. During the winter sage-grouse food is strictly limited to sage-brush. However, sage-grouse can do quite well on winter diets. Specifically:

- Sagebrush cover is >25%
- Cover of Mixed Mountain Shrubs is not more than 10%
- Distance to nearest Forest is over 100 meters
- Distance to Shrubby Woodlands is over 50 meters
- Specific areas where sage-grouse congregate should be mapped as information becomes available

3. Temporarily Disturbed

Temporarily disturbed areas have seen recent vegetation disturbance activities (such as pipeline corridors and wildfire events) and may not support sagebrush cover at a density or height suitable for sage-grouse use. If these areas occur within a block of Suitable Habitat, they will be considered Temporarily Disturbed, and still would be considered as long-term as Suitable Habitat. Temporarily Disturbed habitat will need to be tracked spatially within the Plan area.

4. Unoccupied Suitable Habitat

CPW, the BLM, and energy companies within the Plan area have conducted multiple research and investigation efforts to determine areas where sage-grouse currently occupy habitats and these areas are relatively well-known. There are also areas that support Suitable Habitat, but for which sage-grouse currently do not occupy these areas or the status of occupancy are unknown. These areas, for whatever reason, are deemed less-than-optimal by sage-grouse (e.g., due to predation

pressures, non-lethal disturbances, an ineffectively small area of suitable habitat, etc.) and thus sage-grouse prefer to utilize other areas. These areas may also be degraded with regards to habitat, and do not meet life-history requirements for sage-grouse, or (as an example) may have low levels of invasion by pinyon-juniper trees, and is therefore ineffective habitat.

5. Lek No Surface Occupancy Habitat

Lek No Surface Occupancy (NSO) Habitats are areas where an Active Lek has been cited (determined by the County to exist), which is not located in Temporarily Disturbed or Unoccupied Suitable Habitat.

CHAPTER 4 Habitat Mapping, Modeling & Methodology

This Chapter details the process by which Suitable Habitats for Greater Sage-Grouse were developed within the Plan Area.

Section 1 Goals and Objectives of Mapping Process

The habitat mapping provided by State and Federal agencies in 2012 for Greater Sage-Grouse in the Plan Area previously occurred at a landscape level that did not accurately address the unique topography of the Roan Plateau, or provide planning information at resolution accurate enough for County to use in the Plan, and for relevant land-use planning activities potentially occurring within the Plan area. Because of the significant implications on land use and ongoing land management, the most accurate delineation of habitat was deemed necessary by the County. This habitat mapping process followed the latest and most relevant peer-reviewed habitat mapping process available for mapping large and diverse areas.

The project objective was to locate and quantify the availability of suitable sage-grouse habitat on the Roan Plateau within Garfield County, independent of analyses already performed by State and Federal agencies, as well as independent of other habitat mapping efforts produced by energy companies, but still incorporating peer-reviewed and accepted habitat parameters for sage-grouse produced by the scientific community.

The process incorporated the following:

- Phase 1: Conducted a literature search and determined relevant criteria for identifying suitable habitat for the greater sage-grouse within northern Colorado. Built multi-criteria suitability spatial models incorporating all relevant criteria to model areas for general habitat suitability.
- Phase 2: Perform field verifications to validate accuracy of spatial data to on-the-ground habitat conditions (planned for spring 2013)
- Phase 3: Build multi-criteria suitability spatial models to delineate specific greater sage-grouse habitat types, including summer and winter habitats (e.g., Nesting, Brood Rearing, and Winter Habitat areas). Understanding the spatial locations of specific habitat types will help identify areas occupied by greater sage-grouse populations across the course of a typical year (planned for spring 2013)

The 220,969-acre Plan Area occurs on the Roan Plateau within Garfield County as shown in **Figure 1**. The spatial extent of the Plan Area represents all areas within the County currently indicated as Preliminary Priority Habitat (PPH) as mapped by CPW and adopted by the BLM. Of the

220,969-acre PPH analysis area, 61,338 acres (28%) are BLM Lands, while the remaining 159,631 acres (72%) are private and state lands.

Table 1: Literature References and Habitat Parameters Employed

Author	General Habitat	Lek/ Breeding	Nesting	Brood Rearing Summer	Summer-Fall	Winter
Apa 2010¹						
Sagebrush	-	-	37%	30%	-	-
Total Shrub	-	-	68%	34%	-	-
Walker 2010						
<i>Sage dominance</i>	-	57-96% (100m)	-	50-92% (100m)	-	-
Sage+grass+MMS	-	90-98% (350m)	-	88-91% (350m)	-	-
Forest	-	0.5-6.5% (350m)	-	4.5-11.5% (740m)	-	-
MMS ²	-	0-1.2% (740m)	-	0-1.3% (740m)	-	-
CO Sage-Grouse Consv. Plan 2008						
Sagebrush cover	-	20-30% around leks	15-38% avg. 27%	10-15% 20-25% for escape	>15%	>25%
NTT Report³						
Sagebrush cover	-	-	-	10-25%	-	-
Connelly et al. 2000						
Sagebrush cover	-	15-25%	-	10-25%	-	10-30%
Grass/forb cover	-	>25%	-	>15%	-	NA
Area with suitable habitat	-	>80%	-	>40%	-	>80%
Connelly et al. 2011						
Sagebrush cover	12-48%	Follow Connelly et al. 2000				
Grass/forb cover	-	Follow Connelly et al. 2000				
Garfield County Habitat Map						
Sagebrush cover	10-50%	Not limiting, not mapped	20-50%	10-30%		>25%
MMS cover	<10%		<10%	<10%		<10%
Slopes	<20%		<20%	<20%		<20%
Dist. To Forest	>100m		>100m	>100m		>100m
Dist. To Shrubby Woodlands	>50m		>50m	>50m		>100m

Section 2 Model Methodology

To model general greater sage-grouse habitats in the Roan Plateau PPH area in Garfield County, a multi-criteria suitability model was employed in a Geographic Information System (GIS) utilizing all relevant criteria. The relevant criteria are input in the suitability model in the form of individual spatial datasets that are weighted by importance in determining suitable habitat relative to all other criteria datasets. Furthermore, the values of each criteria dataset are ranked by a scale of 0 – 10, with higher values indicating increased habitat suitability for all criteria datasets.

While numerous criteria exist in determining seasonal habitat types (e.g., brood rearing, summer and winter ranges) for the greater sage-grouse, the Phase 1 General Habitat model attempts to capture the aggregate of all specific habitat types (i.e., overall habitat). As such, the Phase 1 Suitable Habitat model employs only those criteria common to all habitats.

Publicly available datasets depicting vegetation cover types across the project area were initially employed in the spatial models; the datasets include LANDFIRE vegetation cover, obtained from the USGS, and the Colorado Vegetation Classification Project (CVCP), obtained from CPW. However, review of the data revealed widespread inaccuracies in correctly identifying and classifying the vegetative cover types when compared to high-resolution aerial photography. In addition, the cell resolution of both the LANDFIRE and CVCP datasets, measured at 30-meters and 25-meters, respectively, and is too coarse to accurately delineate broader vegetation communities at the local scale. As a result, the spatial coarseness combined with the mistyped vegetative covers inherent to both datasets led to the conclusion that the datasets were inadequate in appropriately identifying suitable vegetative cover types at the local scale.

In an effort to increase the accuracy of the spatial data depicting existing vegetative cover types within the Plan Area, an unsupervised image classification process involving color-infrared aerial photography was performed to better represent vegetation communities. Image classification is achieved by first combining multiple bands from the same image to detect reflectance values, and subsequently clustering the reflectance values into separate classes based on a similar range in spectral values.

Color-infrared photography provides four bands that detect specific wavelength ranges of reflected solar radiation; three bands within the visible light spectrum (i.e., Red, Green and Blue), and a fourth near infrared band that measures reflected radiation beyond the visible light spectrum. The band combinations can yield a variety of properties and characteristics of the objects and vegetation interpreted in the aerial photography. For example, using the near infrared, red and green spectral bands to produce a ‘false color’ image (e.g., mapping the near infrared, red and green bands to RGB) provides high contrast between heavily vegetated areas (e.g., aspen, mixed conifer, mixed mountain shrubs), less vegetated areas (grasslands, shrublands, etc.) and barren areas. Furthermore, within forested areas, image combinations

utilizing the near infrared band help to distinguish between deciduous and coniferous tree species. Deciduous trees contain more chlorophyll and therefore reflect an intense bright red, while coniferous trees contain less chlorophyll and reflect lighter tones of red, magenta or pink. Within grassland and shrub communities, delineations were detected in a similar manner; the higher presence of chlorophyll present in grasses and forbs caused these communities to reflect much brighter as compared to adjacent sage communities.

The image classification for this project was performed on four-band, 1-meter resolution photography acquired in 2011 from the USDA as part of the National Agriculture Imagery Program (NAIP).

Table 2: Habitat Model Components

CRITERIA	Weight	Rank
Slope	25%	
0% – 10%		10
10% - 20%		9
35%+		0
Distance to Forest	25%	
>350 Meters		10
275 – 350 Meters		9
100 – 275 Meters		8
0 – 100 Meters		3
In Forest		0
Canopy Cover	10%	
Tree Cover > 10% & < 20%, Shrub & Herb Cover > 20% & < 40%		10
Herb Cover > 50% & < 60%		9
Shrub & Herb Cover > 10% & < 20%		8
Tree Cover > 20% & < 30%, Shrub Cover > 40% & < 50%		7
Tree Cover > 30% & < 40%, Shrub Cover > 50% & < 60%		5
Shrub Cover > 60% & < 70%		4
Agricultural, Shrub Cover > 70% & < 80%		3
Shrub Cover > 80% & < 90%		2
Barren		1
All Other		0
Vegetation	40%	
Sagebrush-Dominated		10
Sage-Dominated/Grass Mix		9
Grass-Dominated/Sage Mix		7
Sage-Dominated/Mixed Mtn Shrubs		6
Grasses & Barren areas w/in 20 Meters of Sage Community		5
Grass-Dominated/Mixed Mtn Shrubs w/in 20 Meters of Sage Community		3
Grasses & Barren areas over 20 Meters from Sage Community		0
Aspen, Mixed Conifer, Mixed Mtn Shrubs, Water		0

The Suitable Habitat model utilized the above-listed criteria, employing the data weights and ranks listed. A value of 0 would be completely unsuitable for sage-grouse, while a value of 10

would be the most valuable habitat for sage-grouse. In order to produce a meaningful model, we eliminated all vegetation polygons having areas less than one (1) hectare and buffered the resulting forested areas to delineate four distinct zones around forest perimeters; 0 – 100 meter, 100 – 275 meters, 275 – 350 meters, and more than 350 meters from forested vegetation.

Section 3 Habitat Model Results

The results of the multi-criteria suitability model are produced as a GRID dataset, containing cells with values ranging from 0 – 10, with higher values indicating higher levels of habitat suitability. The Suitable Habitat model results considered all cells with values of 9 or 10 as suitable habitat for sage-grouse.

The initial unmodified Suitable Habitat model results produced 13,945 polygons totaling 21,155 acres (~10% of the analysis area) of Suitable Habitat. The initial results were subsequently filtered to remove areas not meeting a defined area threshold (areas less than 1 hectare), as well as those areas depicted as long, linear features with minimal width that generally occur in deeply incised swales and valley bottoms where greater sage-grouse would generally not occur (i.e., areas with ineffective habitat due to the dominance of the area by unsuitable habitats and edge effects). As a result, the filtered results produced 1,140 polygons totaling 17,891 acres (~8% of the analysis area) of suitable habitat. Furthermore, of the 17,891 acres of filtered suitable habitat, 5,325 acres (~30% of modeled suitable habitat) occur on BLM Lands, while the remaining 12,566 acres (~70% of modeled suitable habitat) occurred on private lands.

The following Figures depict the data utilized in the model and the results of the initial habitat model.

Figure 2: Vegetation Community Types

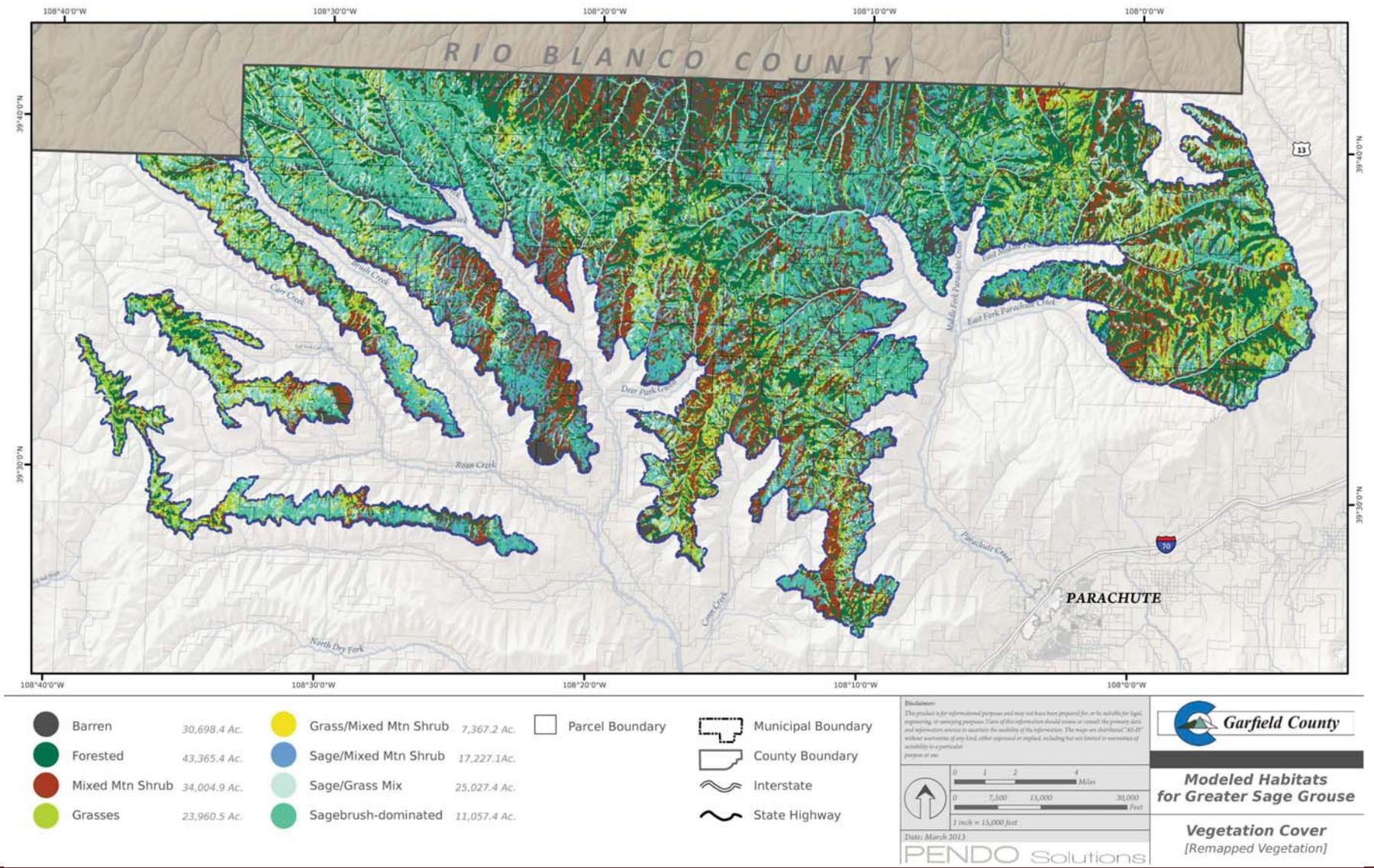


Figure 3: Forested Vegetation Community Types

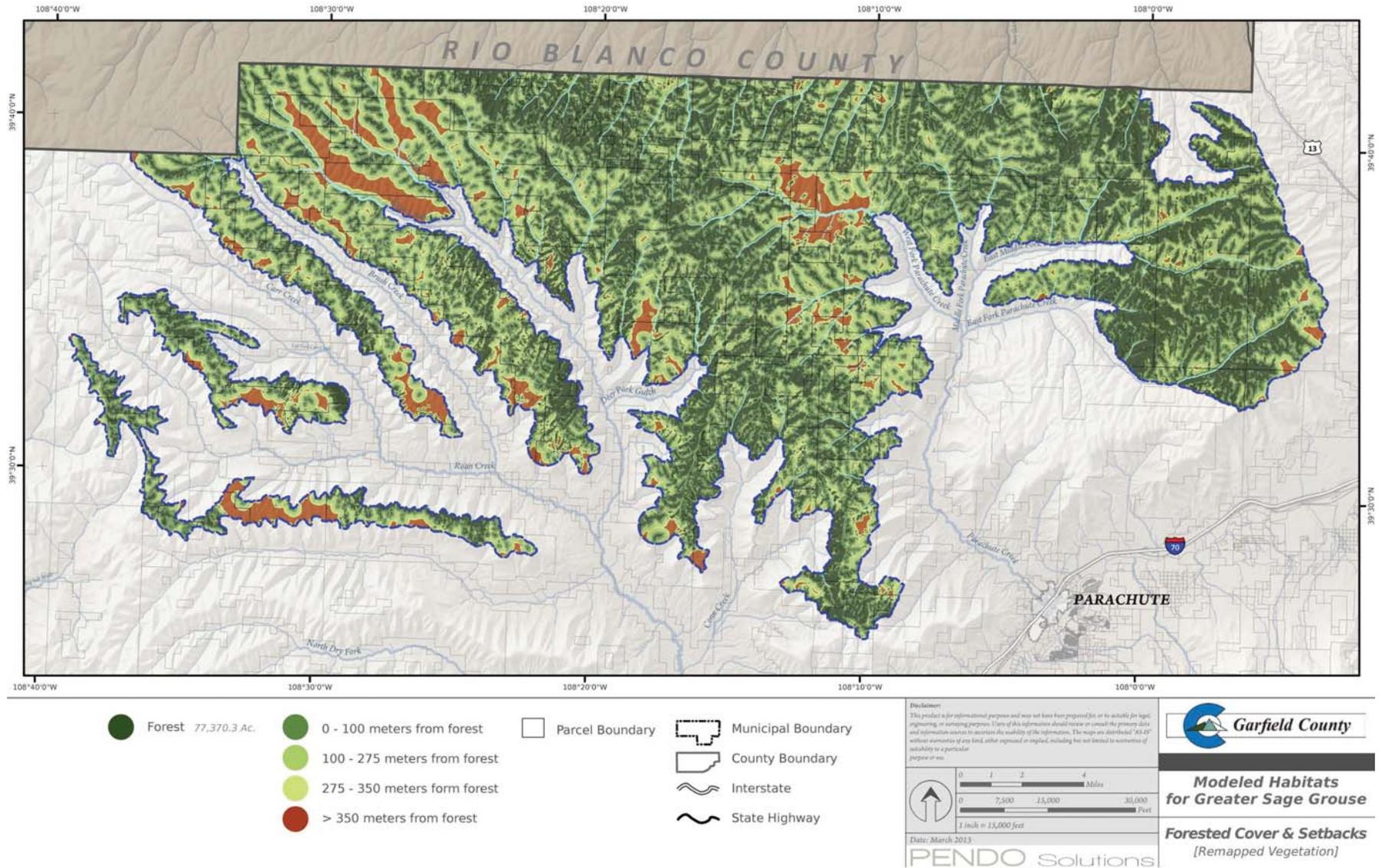


Figure 4: Sagebrush-Dominated Habitats

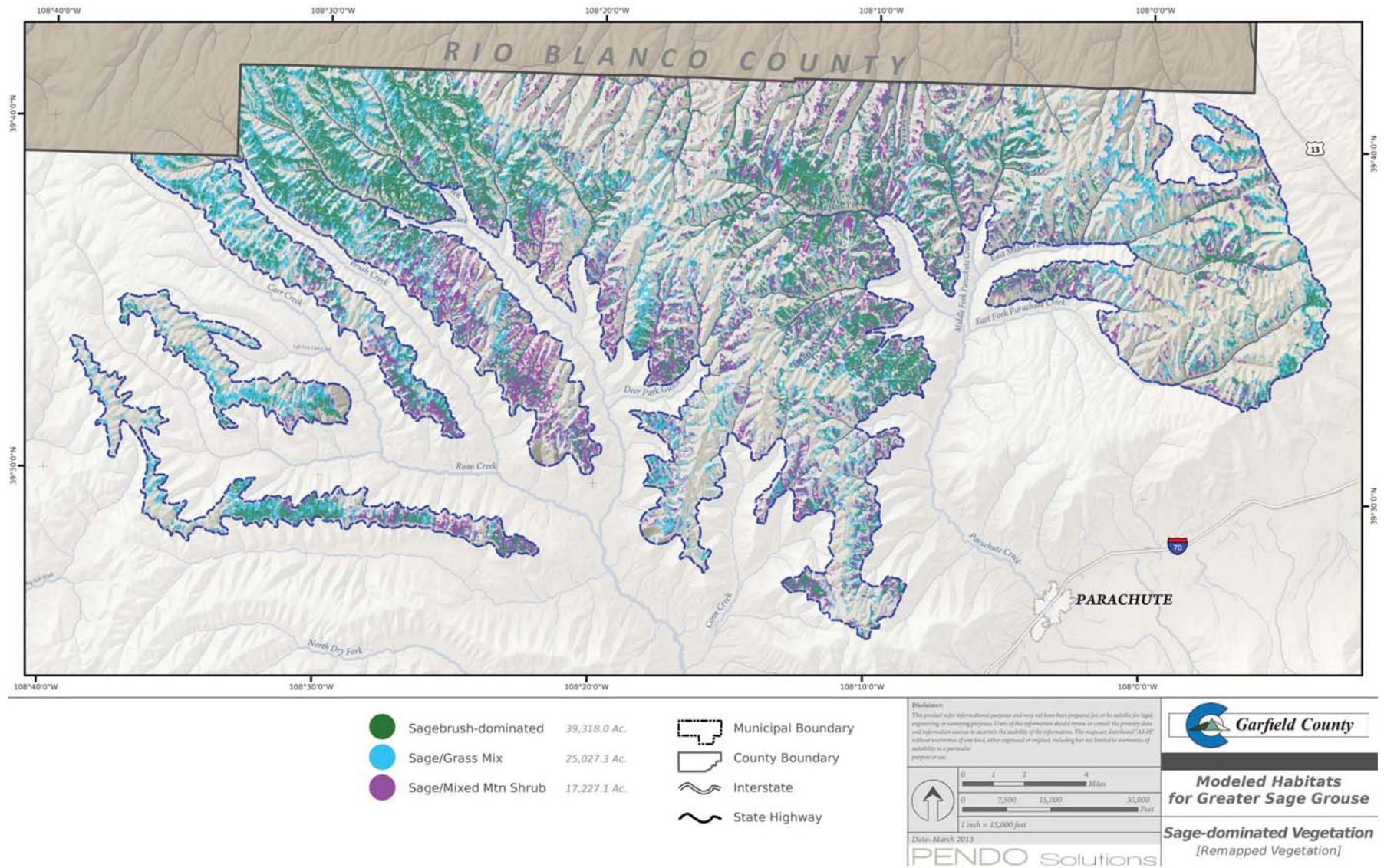


Figure 5: Steep Slope Areas

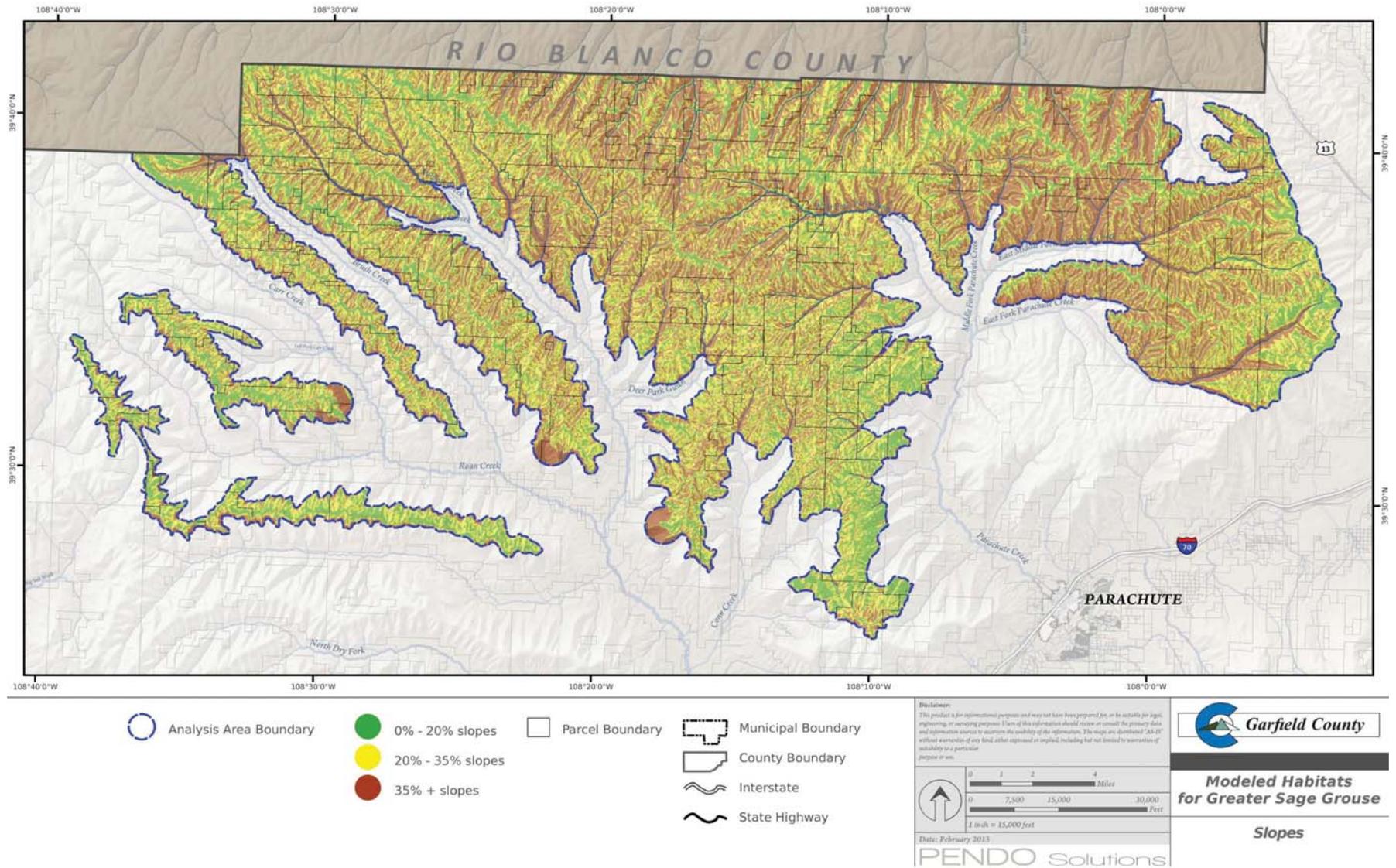
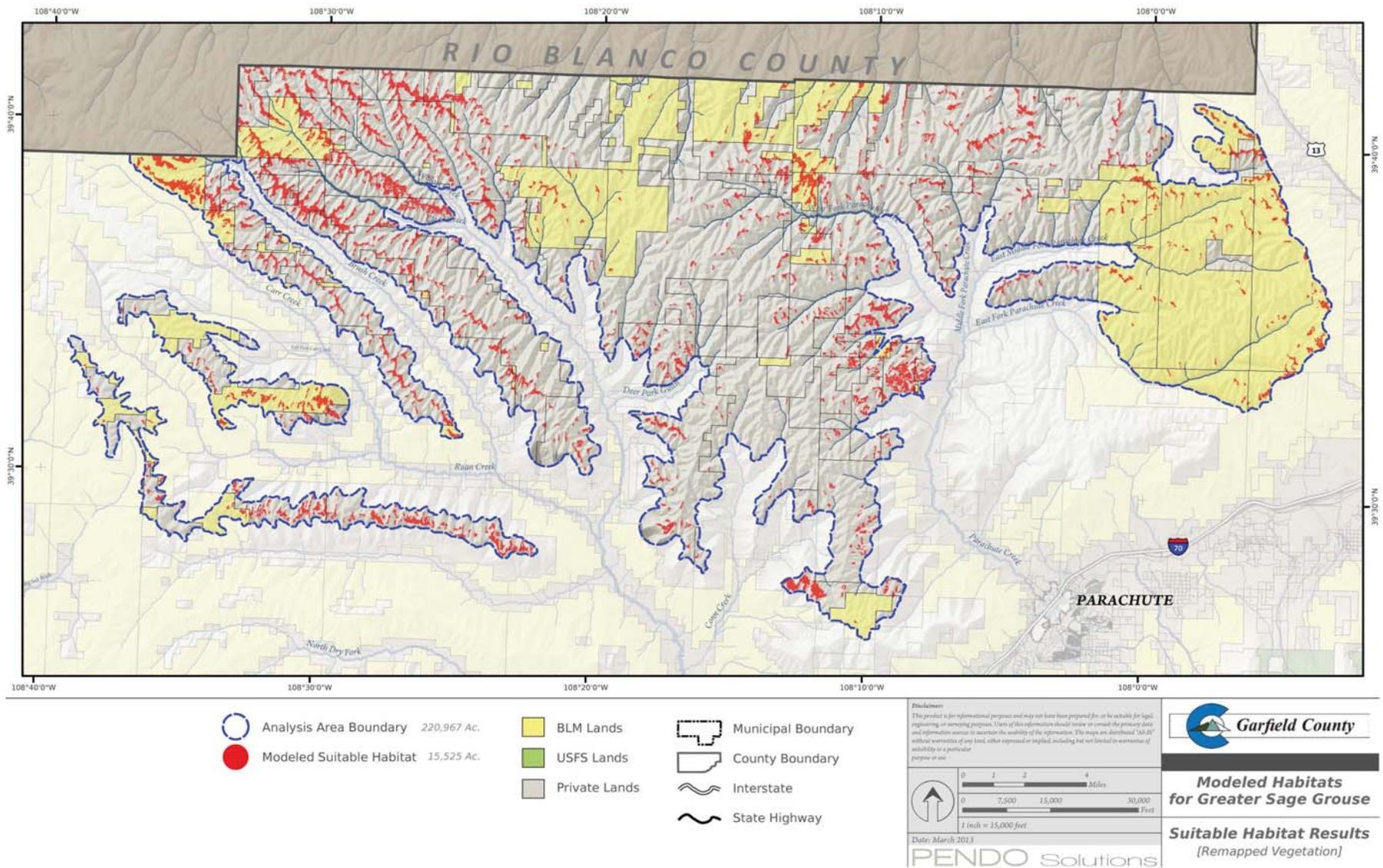


Figure 6: Resultant Suitable Habitat in Plan Area



Tabular Data on Suitable Habitat Model

The following table quantifies the results of vegetation mapping and applying restrictions to potential sagebrush community types.

Table 3: Suitable Habitat Vegetation

Remapped Vegetation				
Sage Cover (irrespective of size and slope)				
<i>Value</i>	<i>Type</i>	<i>Count</i>	<i>Acres</i>	<i>% of SA</i>
10	Pure Sage	6,328.0	39,318.0	18%
9	Sage-Dominated/Grass Mix	5,206.0	11,057.4	5%
7	Grass-Dominated/Sage Mix	6,715.0	13,969.9	6%
6	Sage/Mixed Mtn Shrub	7,481.0	17,227.1	8%
Total		25,730.0	81,572.4	37%
Sage Cover on < 20% Slopes (irrespective of size)				
<i>Value</i>	<i>Type</i>	<i>Count</i>	<i>Acres</i>	<i>% of SA</i>
10	Pure Sage	5,257.0	16,695.9	8%
9	Sage-Dominated/Grass Mix	4,339.0	4,485.4	2%
7	Grass-Dominated/Sage Mix	5,330.0	4,626.3	2%
6	Sage/Mixed Mtn Shrub	5,602.0	4,523.9	2%
Total		20,528.0	30,331.5	14%
Sage Cover > 3 Ac. on < 20% Slopes				
<i>Value</i>	<i>Type</i>	<i>Count</i>	<i>Acres</i>	<i>% of SA</i>
10	Pure Sage	2,674.0	14,200.8	6%
9	Sage-Dominated/Grass Mix	2,593.0	3,726.5	2%
7	Grass-Dominated/Sage Mix	2,485.0	3,188.7	1%
6	Sage/Mixed Mtn Shrub	2,855.0	3,237.6	1%
Total		10,607.0	24,353.6	11%

The sagebrush cover types are a summary of all the cover types that have a sagebrush component, and therefore would likely be considered Suitable Habitat. This presents a good summary of vegetation conditions in the Plan Area potentially suitable for grouse use. To summarize, there are approximately 81k acres of sagebrush (or 37% of the Plan Area), but of that 30k acres are on slopes <20%, and of that, there are approximately 24k acres of sagebrush areas that are in polygons >3 acres.

The model builds in the additional criteria of canopy cover of sagebrush and the distance to Forests and Woody Shrublands. With the inclusion of buffering Forests and canopy cover, the final results are that approximately 15,525 acres or 7% of the PPR area is mapped as suitable habitat (pending additional QA/QC procedures).

Section 4 Interpretations and Additional Information Regarding Suitable Habitat Mapping

Subsequent to data refinement, additional models specific to each seasonal habitat will be developed, incorporating criteria that uniquely identifies the distinct characteristics of each habitat. The seasonal habitat model results should predict suitable habitats available to greater sage-grouse populations across an annual timeframe. Lastly, a least-cost-path model will employ the locations of the resulting habitat zones, as well as a full list of criteria depicting friction to movement across the landscape, to determine linkage corridors to disconnected habitat zones and probable movements of the greater sage-grouse between seasonal habitats.

CHAPTER 5 Plan Implementation

The Garfield County Board of County Commissioners (the BOCC) shall be responsible for managing and implementing the Plan. The principles and policies contained within the Plan shall be used to address functional surface disturbance for the four sage-grouse habitat categories (see Chapter 3) in the Plan Area within the political boundaries of Garfield County (the County) as depicted on **Figure 1**.

A. Implementation on Public Lands

The principles and policies contained within this Plan shall be required for the management of sage-grouse and its habitat on public lands that contain suitable habitat as depicted in **Figure 6**.

B. Implementation on Private Lands

For private lands in the Plan Area, the principles and policies contained within this Plan are considered voluntary and are encouraged to be implemented through Best Management Practices (BMPs) and conservation measures for the management of sage-grouse and its habitat as defined as suitable habitat and depicted on **Figure 6**.

C. Implementation Process

This policy shall serve as the primary conservation policy for the sage-grouse in Garfield County. The BOCC has the unique authority to require federal and state agencies to coordinate their plans and policies with the County, therefore ensuring that all entities with responsibilities for the species and habitat are working together efficiently and effectively and not pursuing counter-productive measures. This Plan is designed to serve as the comprehensive planning document for the sage-grouse in Garfield County.

While recognizing that each agency has its own planning processes, federal agencies are required to not only consider the County's policies, but work to resolve conflicts and make federal plans consistent with the county's policies (43 USC 1712). Federal statutes require that the County's policies are integrated into the federal conservation strategy for the sage-grouse on federal lands within the County's borders. The State of Colorado has given Garfield County planning authority over lands within the County's borders, ensuring the coordination of the County's sage-grouse policy with state agencies as well.

Implementation of this plan will be conducted through a formal coordination process with all agencies that have jurisdiction and/or responsibility for the sage-grouse and/or its habitat. The plan will serve as the unifying and primary planning document.

Specifically, the BOCC shall utilize this Plan as a tool to evaluate and provide comment regarding land management decisions on both public and private lands for which it has land management jurisdiction. More specifically, the BOCC shall utilize this Plan in evaluating land use / development applications submitted under the County's development regulations as well as ensuring that any federal or state land management action remains consistent with this Plan.

D. Plan Update / Amendment Process

This Plan is managed under adaptive management principles where it is understood that the scientific understanding of the species and its habitat in will be continually expanding. This requires that the policies, principles, and best management practices of this Plan be frequently evaluated and modified as warranted by the best available science appropriate for the unique Plan Area in Garfield County.

1. Annual Review

The BOCC will conduct an annual Coordination review, commencing one year from the date of enactment of this Plan with the federal and state agencies that have habitat or species responsibilities within the Plan Area. This review process will evaluate the availability and condition of habitats, direct and indirect impacts, conservation measures, policies and best management practices being implemented by each agency for their effectiveness and applicability to the Plan Area.

Also incorporated in this review is any new science and, if warranted, modifications to the best management practices, policies, and conservation incentives within the Plan. The Coordination review shall take place in government-to-government meetings between the different agencies and the BOCC.

The BOCC will also initiate meetings with entities that have private property interests in the Plan Area for the purpose of analyzing their conservation efforts and effectiveness, as well as any new science they may be able to contribute to the process to ensure Plan updates are also based on the best available science.

The consideration of changes to the Plan shall be discussed in these coordination meetings, followed up with a draft Plan update to be shared with all agencies through the Coordination process and private entities with private property interests for input. The input shall be considered and incorporated where appropriate into a formal written Plan update to be reviewed approved by the BOCC within 120 days of the submittal date of the requested change.

2. New Scientific Information

If at any time between the annual review period where federal or state agencies, or private entities with property interests in the Plan Area become aware of or acquire new science regarding the species or its habitat in the Plan Area within Garfield County that may warrant changes to the best management practices, conservation measures, or policies within this Plan, then they shall submit a written report to the County, including the scientific review and supporting data, for the County's consideration. If the BOCC finds changes to the Plan are warranted then it can initiate a formal review of the Plan in coordination with all entities.

3. Additional Coordination Meetings

Additional Coordination meetings are encouraged beyond the required annual review and new scientific information review for the purpose of keeping apprised of and working to resolve all issues impacting the sage-grouse.

CHAPTER 6 Principles

The Plan Principles are designed to inform and guide all decision making, regardless of specific issue or impact, as they relate to the well-being of the sage-grouse in Garfield County.

1. The sage-grouse habitat in Garfield County is naturally fragmented, as a result of topography and the patchy nature of sagebrush, non-sagebrush shrubs, meadows, aspen, and conifers in the Plan area. Expanses of contiguous sage-brush, necessary to support a large stable population (as described by the Service in their March 2010 candidate determination notice), do not exist in Garfield County. Additionally, the sage-grouse population inhabiting Garfield County is a peripheral population located on the far southeastern edge of the species range. As a result, the stewardship of the population requires detailed knowledge of local conditions, including the mapping of Suitable Habitat (as determined by Garfield County Geographic Information Systems (GIS) mapping and analysis).
2. Human disturbances to Suitable Habitat are minimal, generally temporary in nature, and can be avoided or successfully mitigated in most cases.
3. Sage-grouse management decisions shall be made based on the best available scientific information that is applicable to sage-grouse habitat in Garfield County. The scientific information used will be consistent with standards of the Information Quality Act (see definitions of Quality, Objectivity, Utility and Integrity), as determined by the County.
4. Land management plans of all government agencies that have ownership or management responsibilities for the lands or species within Garfield County shall be consistent with the policies set forth in this plan subject to valid existing rights.
5. For private lands, the policies set forth in this Plan are incentive-based to be encouraged through conservation incentives and best management practices that do not encumber private property rights of the landowners but do address long-term habitat needs of sage-grouse.
6. No policies shall infringe on the private property rights of any landowner within Garfield County. All species and land coverage information gathered on private property shall be treated as the property of the landowner and shall not be used by any private or government entity for any purpose unless express, written permission has been obtained by the landowner.
7. All sage-grouse habitat and species management programs that impact the County, administered by federal and state government agencies, shall be coordinated with Garfield County, and the data collected by state and federal agencies will be shared with the County in a

timely manner or be provided to the County regardless of completeness at the formal request of the County.

8. All Federal lands within the Plan Area containing suitable habitat for sage-grouse shall be managed to continue the multiple-uses of the lands as required by 43 U.S.C 1701(a)(7). No policies shall be implemented that prescribe the management of the land for a single purpose, but all functions of the land, including providing habitat for wildlife and supporting the productive uses of its resources, shall be considered with the objective of balancing and continuing all uses of the land. Unlike government owned land where there are many property interest holders and the multiple uses must be maintained, private land owners have more discretion to manage their property for the primary purpose of conserving sage-grouse, if so desired.

9. The ability of wildlife, including sage-grouse, to habituate to inanimate manmade structures and changes to the landscape shall be acknowledged.

10. All sage-grouse conservation measures enacted on federal land or through a federal nexus shall be for the purpose of directly benefiting the species and its verified habitats. These measures shall be scientifically defensible. All data and information used to produce conservation measures shall be made available to the public and the County and shall be coordinated with the County. Additionally, the balance of impacts to other species and to human welfare must be weighed prior to approval and implementation. All planning efforts shall be governed through adaptive management principles to ensure use of the latest scientific research on sage-grouse and their habitat, best management practices, technological advances, and incorporation of impact avoidance, minimization, and mitigation opportunities are vetted and utilized.

CHAPTER 7 Policies

The policies set forth in this chapter are for the purpose of providing specific conservation measures that are to be implemented in the Plan Area in order to eliminate or limit impacts that may affect the suitable, temporarily disturbed and unoccupied habitat of the sage-grouse.

Section 1 Travel and Transportation

Because the majority of roads in the Plan Area containing Suitable Habitat are private roads with controlled access that are used on a limited /seasonal basis, they do not measurably contribute to bird collisions. These roads do not produce barriers to movement for sage-grouse. These same roads provide necessary access to the area to ensure proper management of resources, infrastructure and assets, and accessibility in the event of emergencies. Very few roads support through traffic. Because of the nature of the terrain, company policies, road surfaces, and driving conditions, vehicles maintain low speeds and the risk of collision with the sage-grouse is minimal.

Policy

- A. Limit motorized travel to existing roads, primitive roads, and trails, as verified by Garfield County, at a minimum in Suitable Habitats and in Lek NSO areas.
- B. County roads, as determined by Garfield County and identified on County Maps (see Habitat Maps Chapter of the Plan), shall only be closed or restricted by Garfield County.
- C. Allow no upgrading of existing routes, as verified by Garfield County, in Suitable Habitat or Lek NSO areas that would change route category (road, primitive road, or trail) or capacity unless the upgrading would have minimal impact on sage-grouse habitat, is necessary for motorist safety, or eliminates the need to construct a new road.
- D. When reclaiming roads and trails, use locally native seed mixes as prescribed by a professional biologist and use transplanted or seeded sagebrush unless unfeasible.

Section 2 Recreation

Recreational use within the Plan Area is extremely limited because the majority of the land is privately held and access is strictly controlled. This significantly reduces potential direct or indirect impacts to sage-grouse or their habitats by the general public. Any plan for creating new or additional recreational opportunities on federal lands in Suitable Habitats must provide Garfield County a sage-grouse impact analysis for review.

Policy

- A. Limit motorized recreational use to existing roads, primitive roads, and trails (as verified by Garfield County), in Suitable Habitat and Lek NSO areas.
- B. Avoid all Suitable Habitat and Lek NSO areas as identified on Garfield County Habitat Maps.

Section 3 Lands and Realty Management

Habitats within the Plan Area are naturally fragmented and patchy; therefore, there are opportunities for new roads and energy development infrastructure to be placed outside Suitable Habitats. Further, any land acquisition shall be by mutual agreement between public and private entities.

Policy

- A. Placement of new above-ground power lines in Suitable Habitat and Lek NSO areas is prohibited.
- B. Bury new powerlines within Suitable Habitats and follow existing corridors unless there is a technical infeasibility, subject to valid existing rights. Anti-perch devices may be used where powerline burial is technically infeasible.
- C. Private land ownership of sage-grouse Habitat areas should be continued and encouraged as private land conservation efforts have been the most effective methods to preserve diverse and healthy habitats for many species.

Section 4 Range Management

Garfield County continues to enjoy a long history of livestock grazing on both private and public lands. When properly managed, livestock can coexist with sage-grouse as well as help improve suitable habitat and decrease fire hazards.

Policy

- A. Maintain sustainable grazing consistent with historic land use and ranching practices that are sustainable for both agricultural operations as well as sage-grouse habitats, as recommended by the U.S. Department of Agriculture, Natural Resources Conservation Service throughout the Plan Area.
- B. Livestock grazing can be utilized as a tool to properly manage sage-grouse habitat, and should not be removed from the Plan Area.
- C. Any grazing restrictions or conservation measures that are put in place through a grazing permit shall be based solely on the conditions and activities specific to that permitted grazing allotment.

Section 5 Predation

Predation of sage-grouse eggs, juveniles, and adults occurs naturally, but can increase in association with human development, unless precautions are undertaken.

Policy

Encourage use of anti-perch devices, burying of powerlines, closed rubbish bins, removal of road kill and dead livestock, and other methods to discourage predators on sage-grouse and limit excess predation. If predation on sage-grouse is documented to have a deleterious effect on the Roan Plateau sage-grouse population, then allow for appropriate mitigation of predation under USDA guidance.

Section 6 Wild Horse and Burro Management

Wild Horses and Burro's are not known to occur within the Plan Area and therefore do not presently impact sage grouse habitat.

Policy

Collaborate with appropriate agencies to discourage establishment of (feral) wild horse populations that could be detrimental to sage-grouse habitat.

Section 7 Mineral Development

The extraction of fluid minerals in Garfield County is accomplished using increasingly advanced technologies, more efficient operations, avoidance of critical habitats, impact minimization, mitigation, and habitat restoration than in the past. As a result, surface disturbances can be minimal and temporary. The fast pace of these technological developments has meant that the primary literature on the impacts of mineral extraction on sage-grouse in Wyoming, that is cited in government publications, is inconsistent with current practices used in Garfield County. It is anticipated that the advanced technologies currently in use, as well as future ones under development, will continue to allow the efficient extraction of resources while avoiding or minimizing impacts to sage-grouse and other species.

Policy

- A. Close suitable habitat as determined by the County's GIS mapping to future mineral leasing surface disturbance unless the fluid resource cannot be extracted without minimal surface disturbance. In this case, the Best Management Practices will be followed and if necessary mitigation utilized to ensure a no net loss to sage grouse habitat and no deleterious demographic effect on the population.
- B. All active Leaks identified outside of suitable habitat shall have a 0.6 mile NSO for all non-functional surface disturbance as defined in the Colorado State Plan. Exceptions for allowing functional disturbance within the 0.6 mile NSO may be allowed for exceptional or unique topography or other non-contributing habitat aspects or circumstances that will not adversely impact sage-grouse. If the resources cannot be accessed without disturbing the active Lek NSO habitat, then Best Management Practices will be followed and necessary mitigation utilized to ensure a no net loss to sage grouse potential habitat and no deleterious demographic effect on the population.
- C. No federal land mineral withdrawals shall be made in Suitable Habitat areas if the resources can be accessed and extracted without surface disturbance.

Section 8 Wildfire Suppression, Fuels Management and Fire Rehabilitation

A. Fuels Management Policy

- 1) Provide technical (GIS) support that can be used by landowners for voluntary fuels management that is consistent with sage-grouse habitat protection and enhancement.
- 2) Work with landowners to design fuels management projects in Suitable Habitat to strategically and effectively reduce wildfire threats.

- 3) During fuels management project design, consider the utility of using livestock to strategically reduce fine fuels (Diamond et al. 2009), and implement grazing management that will accomplish this objective (Davies et al. 2011 and Launchbaugh et al 2007). Consult with ecologists to minimize impacts to native perennial grasses consistent with the objectives and conservation measures of the range management policy.

B. Emergency Stabilization and Rehabilitation Policy

- 1) Follow the County's habitat restoration policy in developing an emergency rehabilitation plan for temporarily disturbed areas within suitable habitat.
- 2) Coordinate with appropriate agencies in developing and implementing rehabilitation plans.
- 3) Collaborate with private landowners and leaseholders to integrate their expertise and knowledge of local conditions into rehabilitation plans.

Section 9 Habitat Restoration

The naturally patchy habitat in the Plan Area requires that habitat restoration projects be planned accordingly and that creating large contiguous landscapes of sagebrush is not consistent with the plant communities in the Plan Area.

Policy

- A. Encourage habitat restoration projects on private land. Request that private landowners report annually on the progress of restoration efforts (providing spatial data associated with an API number, date, and status of restoration), so the County may track disturbed vs. restored acreages in and near Suitable Habitat.
- B. Recognizing that local conditions in the Plan Area differ from those range-wide for sage-grouse, the County's mapped Suitable Habitat will be used for quantifying habitat conservation objectives of no net loss of Suitable Habitat (excluding that resulting from wildfire and temporary disturbances, as permitted).
- C. Require the use of native plant species for restoration based on availability, and probability of successful establishment.

- D. Encourage local private landowners to share information among themselves and the County on restoration design and strategies to obtain favorable outcomes.
- E. In former sagebrush habitat or in habitat to be converted to sagebrush: make re-establishment of sagebrush and desirable understory plant cover (relative to ecological site potential) the highest priority for restoration efforts.

Section 10 Monitoring and Habitat Category Changes

The primary objective of this plan is to ensure the long-term health and continued existence of Sage-grouse in Garfield County. Regular monitoring of the species and its habitat in Garfield County is essential to ensuring the policies and best management practices are updated and implemented within the Plan Area.

Policy

- A. All federal and state agencies with management responsibilities in the plan area for the species and/or its habitat shall provide the County with an annual update of the monitoring programs they have in place, data collected and specifics about their collection protocols. These agencies will inform the County of proposed research projects and allow for the County's input and collaboration prior to implementation.
- B. All data shall be collected and studies prepared using protocols that will ensure the quality, utility, objectivity and integrity of the information as required under the Information Quality Act.
- C. All data that is gathered in the Plan Area shall be shared with the County in a timely manner, and supplied to the County regardless of its state of completion at the formal request of the County.
- D. Private landowners are also encouraged to monitor and share data collected on private property with the County.
- E. All data that is shared with the County that is not public information will be treated as confidential and used by the County only to help inform its policies and best management practices.

CHAPTER 8 BEST MANAGEMENT PRACTICES

1) West Nile Virus

Recommend pond designs based upon current recommendations of the CPW. *“Require treatment of waste water pits and any associated pit containing water that provides a medium for breeding mosquitoes with Bti (Bacillus thuringiensis v. israelensis) or take other effective action to control mosquito larvae.”* These actions will reduce the distribution and abundance of mosquitoes that vector West Nile virus and reduce the risk of West Nile virus transmission to sage grouse and other wildlife (Walker, B. 2008, , before the Oil and Gas Commission of the State of Colorado on Draft Rule 1204, DOCKET NO. 0803-RM-02.

<http://cogcc.state.co.us/rulemaking/StaffPreHearState/Exhibits/FINAL DOW TESTIMONY/B.Walker Testimony-041808 FINAL.pdf>

2) Fluid Mineral Development within Suitable Habitat

- A. Establish speed limits on county roads near suitable sage grouse habitat that are appropriate to safety and reducing vehicle/wildlife collisions.
- B. Encourage clustering / centralization of disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.
- C. Encourage use of directional and horizontal drilling to reduce surface disturbance, and adoption of new technologies.
- D. Encourage placement of infrastructure in already disturbed locations where the habitat has not been restored.
- E. Encourage use of oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.
- F. Encourage a phased development approach with concurrent reclamation.
- G. Encourage placement liquid gathering facilities outside of priority areas. Have no tanks at well locations within priority areas (minimizes perching and nesting opportunities for

ravens and raptors and truck traffic). Pipelines must be under or immediately adjacent to the road (Bui et al. 2010).

- H. Restrict the construction of tall facilities and fences to the minimum number and amount needed. To discourage avian predators, require installation of anti-perch devices on new fences and facilities within 4 miles of occupied suitable habitat where avian predation has been identified as a cause of mortality. Additionally, encourage retrofitting of existing fences and structures with anti-perch devices that are also located within 4 miles of occupied suitable habitat where avian predation has been identified as a cause of mortality.
- I. Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.

CHAPTER 9 GLOSSARY OF TERMS

Active Lek. Active leks are defined as locations where two or males have been observed and documented as actively courting females in the last two years the lek was surveyed (Doherty et al. 2011).

Adaptive Management. A scientific approach to adaptive management of wildlife populations requires that threats and management actions be treated as potentially falsifiable hypotheses, rather than certain knowledge. If the presumed threats to a population are ranked in order of importance (based on plausible cause and effect mechanisms), then even hypothetical threats can be prioritized and subsequently investigated in a scientific manner.

Best Management Practices (BMPs). A suite of techniques that guide or may be applied to management actions to aide in achieving desired outcomes. BMPs are often developed in conjunction with land use plans, but they are not considered a planning decision unless the plans specify that they are mandatory.

Brood Rearing Habitat. Brood rearing habitats are utilized after chicks have hatched, and are generally more mesic (moist) areas with a higher percentage of forbs and grasses which help provide higher densities of insects, plant material, and seeds for chicks, hens, as well as males during the summer and early fall months. Specifically:

- Sagebrush cover is from 10 to 30%
- Cover of Mixed Mountain Shrubs is not more than 10%
- Distance to nearest Forest is over 100 meters
- Distance to Shrubby Woodlands is over 50 meters

Consistent: possessing firmness or coherence; marked by harmony, regularity, or steady continuity: free from variation or contradiction. (Webster Revised Dictionary)

Coordinate. Equal in rank or order; not subordinate. (Webster's Revised Unabridged Dictionary)

Coordination. The act of coordinating; the act of putting in the same order, class, rank, dignity, etc.; as, the coordination of the executive, the legislative, and the judicial authority in forming a government; the act of regulating and combining so as to produce harmonious results; harmonious adjustment as, a coordination of functions. (Webster's Revised Unabridged Dictionary)

Coordination Process. A process mandated by federal law that requires federal agencies to coordinate their plans, programs and management activities with local governments. The minimum parameters of this process were defined by Congress at 43 USC 1712(c)(9) and prescribe that the agencies (1) keep apprised of State, local, and tribal land use plans; (2) assure that consideration is given to those State, local, and tribal plans that are germane in the development of land use plans for public lands; (3) assist in resolving, to the extent practical, inconsistencies between Federal and non-Federal Government plans; (4) provide for meaningful public involvement of State and local government officials, both elected and appointed, in the development of land use programs, land use regulations, and land use decisions for public lands, including early public notice of proposed decisions which may have a significant impact on non-Federal lands; and (5) make land use plans consistent with State and local plans to the maximum extent the Secretary finds consistent with Federal law. (Federal Land Policy and Management Act, 43 USC 1701)

Coordination Meeting. A government-to-government meeting between a government agency or agencies and the BOCC. These meetings are public meetings, publicly noticed with agenda provided in advance. While public comment is not received during the meeting, the public is encouraged to attend and provide comments during later regular BOCC meetings as the intent is for the coordination process to be open and transparent to the public. The discussion is between the agency and the BOCC and is for the purpose of fulfilling the coordination duty, informing the agencies and BOCC of relevant projects, plans, studies and management activities. It is also the forum for discussion towards the resolution of unresolved conflicts between the counties policies and plans and the agencies programs.

Cooperation. The act of cooperating, or operating together to one end; joint operation; concurrent effort or labor. (Webster’s Revised Unabridged Dictionary)

Collaborate. To work together with another toward a common goal, especially in an intellectual endeavor; as, four chemists collaborated on the synthesis of the compound; three authors collaborated in writing the book. (Webster’s Revised Unabridged Dictionary)

Conserve. To cause no degradation or loss of sage-grouse habitat. Conserve can also refer to maintaining intact sagebrush steppe by fine tuning livestock use, watching for and treating new invasive species and maintaining existing range improvements that benefit sage-grouse etc.

Development. Active drilling and production of natural gas and oil wells.

Development Area. Areas primarily leased with active drilling and wells capable of production in payable quantities.

Enhance. The improvement of habitat by increasing missing or modifying unsatisfactory components and/or attributes of the plant community to meet sagegrouse objectives. Examples include modifying livestock grazing systems to improve the quantity and vigor of desirable forbs, improving water flow in riparian areas by modifying existing spring developments to return more water to the riparian area below the development, or marking fences to minimize sage-grouse hits and mortality.

Exploration. Active drilling and geophysical operations to 1) determine the presence of the mineral resource; or 2) determine the extent of the reservoir.

Forests. Forests in the Plan area include contiguous stands larger than 1/2 acre of aspen (*Populus tremuloides*), Douglas-fir (*Pseudotsuga menziesii*), mixed conifers (including, but not limited to Douglas-fir, Engelmann spruce [*Picea engelmannii*], subalpine fir [*Abies bifolia*] and ponderosa pine [*Pinus ponderosa*]), pinyon-juniper woodlands, and oakbrush.

Inactive Lek. Any lek where sufficient data suggests that there was no strutting activity throughout a strutting season. Absence of strutting grouse during a single visit is insufficient documentation to establish that a lek is inactive. This designation requires documentation of either: 1) an absence of sagegrouses on the lek during at least 2 ground surveys separated by at least seven days. These surveys must be conducted under ideal conditions (April 1-May 7 (or other appropriate date based on local conditions), no precipitation, light or no wind, halfhour before sunrise to one hour after sunrise) or 2) a ground check of the exact known lek site late in the strutting season (after April 15) that fails to find any sign (tracks, droppings, feathers) of strutting activity. Data collected by aerial surveys should not be used to designate inactive status as the aerial survey may actually disrupt activities.

Late Brood Rearing Area. Habitat includes mesic sagebrush and mixed shrub communities, wet meadows, and riparian habitats as well as some agricultural lands (e.g. alfalfa fields, etc).

Lek Complex. A lek or group of leks within 2.5 km (1.5 mi) of each other between which male sage-grouse may interchange from one day to the next. Fidelity to leks has been well documented. Visits to multiple leks are most common among yearlings and less frequent for adult males, suggesting an age-related period of establishment (Connelly et al. 2004).

Lek. A traditional courtship display area attended by male ~~grouse~~ sage-grouse in or adjacent to sagebrush dominated habitat. A lek is designated based on observations of two or more male sage-grouse engaged in courtship displays. Sub-dominant males may display on itinerant strutting areas during population peaks. Such areas usually fail to become established leks. Therefore, a site where less than five males are observed strutting should be confirmed active for two years before meeting the definition of a lek (Connelly et al 2000, Connelly et al. 2003, 2004).

Mitigation. Compensating for resource impacts by replacing or providing substitute resources or habitat.

Mixed Mountain Shrubs. Shrublands dominated by Utah serviceberry (*Amelanchier utahensis*), Saskatoon serviceberry (*A. alnifolia*), mountain mahogany (*Cercocarpus montanus*), oakbrush (*Quercus gambelii*), bitterbrush (*Purshia tridentata*), and may have a sagebrush component. Mapped Mixed Mountain Shrublands have greater than 10% cover of these non-sagebrush shrub species, as this is the threshold at which sage-grouse show a strong avoidance of this community type.

Multiple Use: The management of the public lands and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including, but not limited to, recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output. (Federal Land Policy and Management Act, 43 USC 1702(c)).

Nesting Habitat. Nesting habitat is generally moderately sized patches of denser and taller sagebrush, further away from roads and other activity areas. Specifically:

- Sagebrush cover is from 20 to 50%
- Cover of Mixed Mountain Shrubs is not more than 10%
- Distance to nearest Forest is over 100 meters
- Distance to Shrubby Woodlands is over 50 meters

Occupied Lek: A lek that has been active during at least one strutting season within the prior 10 years.

Offsite Mitigation. Compensating for resource impacts by replacing or providing substitute resources or habitat at a different location than the project area.

Range Improvement. Any activity, structure or program on or relating to rangelands which is designed to improve production of forage; change vegetative composition; control patterns of

use; provide water; stabilize soil and water conditions; and provide habitat for livestock and wildlife. The term includes, but is not limited to, structures, treatment projects, and use of mechanical means to accomplish the desired results.

Reclamation. Rehabilitation of a disturbed area to make it acceptable for designated uses. This normally involves recontouring, replacement of topsoil, re-vegetation, and other work necessary to ensure eventual restoration of the site.

Restoration. Implementation of a set of actions that promotes plant community diversity and structure that allows plant communities to be more resilient to disturbance and invasive species over the long term. The long-term goal is to create functional, high quality habitat that is occupied by sage-grouse. Short-term goal may be to restore the landform, soils and hydrology and increase the percentage of preferred vegetation, seeding of desired species, or treatment of undesired species.

Sagebrush. Includes all species and sub-species of the genus *Artemisia* except the mat-forming sub-shrub species *A. frigida*.

Shrubby Woodlands. Vegetation communities dominated by oakbrush or pinyon (*Pinus edulis*) and Rocky Mountain juniper (*Sabina scopulorum*) or Utah juniper (*S. osteosperma*) types. Mapped Shrubby Woodlands have greater than 10% cover of pinyon-juniper, as this is the threshold at which sage-grouse show a strong avoidance of this community type.

Suitable Habitat. Suitable Habitat includes all seasonal habitats (including lekking, nesting, brood rearing/summer and winter habitats) within the Plan area. Specifically, Suitable Habitat includes:

- Sagebrush cover is from 10 to 50%
- Cover of Mixed Mountain Shrubs is not more than 20%
- Distance to nearest Forest is over 100 meters
- Distance to Shrubby Woodlands is over 50 meters
- Grass/forb dominated habitats (with >10% sagebrush cover) within 20 meters of sagebrush habitat
- Contiguous habitats >3 acres in size, or part of a block of Suitable Habitats in close proximity

Temporarily Disturbed Areas. Areas that have seen recent vegetation disturbance activities (such as pipeline corridors and wildfire events) may not support sagebrush cover at a density or height suitable for sage-grouse use. If these areas occur within a block of Suitable Habitat, they will be considered Temporarily Disturbed, and still would be considered as long-term as

Suitable Habitat. Temporarily Disturbed habitat will need to be tracked spatially within the Plan area.

Unoccupied Lek. A lek that has either been “destroyed” or “abandoned.”

Unoccupied Suitable Habitat. Areas that support Suitable Habitat, but for which sage-grouse currently do not occupy these areas or the status of occupancy are unknown. These areas, for whatever reason, are deemed less-than-optimal by sage-grouse (e.g., due to predation pressures, non-lethal disturbances, too small an area of suitable habitat, etc.) and thus sage-grouse prefer to utilize other areas.

Winter Habitat. Winter habitat is generally utilized by sage-grouse from November through early April. It is primarily determined by the depth and persistence of snow cover. During more severe winters, snow can limit winter habitat to wind-swept ridges and patches of the tallest sage-brush. During the winter sage-grouse food is strictly limited to sage-brush. However, sage-grouse can do quite well on winter diets. Specifically:

- Sagebrush cover is >25%
- Cover of Mixed Mountain Shrubs is not more than 10%
- Distance to nearest Forest is over 100 meters
- Distance to Shrubby Woodlands is over 50 meters

CHAPTER 10 APPENDIX

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No.	Program Area	NTT Alternative	GARFIELD COUNTY PLAN / ALTERNATIVE
Objective: Maintain and enhance populations and distribution of sage-grouse by protecting and improving sagebrush habitats and ecosystems that sustain sage-grouse populations.			
Travel & Transportation		Objective: Manage travel and transportation to 1) reduce mortality from vehicle collisions, 2) limit change in sage-grouse behavior, 3) avoid, minimize, and mitigate habitat fragmentation, 4) limit the spread of noxious weeds, and 5) limit disruptive activity associated with human access.	
1	Travel	(P) Limit motorized travel to existing roads, primitive roads, and trails at a minimum.	<p>Section 1, Travel and Transportation Because the majority of roads in the Plan Area containing Suitable Habitat are private roads with controlled access that are used on a limited /seasonal basis, they do not measurably contribute to bird collisions. These roads do not produce barriers to movement for sage-grouse. These same roads provide necessary access to the area to ensure proper management of resources, infrastructure and assets, and accessibility in the event of emergencies. Very few roads support through traffic. Because of the nature of the terrain, company policies, road surfaces, and driving conditions, vehicles maintain low speeds and the risk of collision with the sage-grouse is minimal.</p> <p>Policy</p> <ul style="list-style-type: none"> A. Limit motorized travel to existing roads, primitive roads, and trails, as verified by Garfield County, at a minimum in Suitable Habitats and in Lek NSO areas. B. County roads, as determined by Garfield County and identified on County Maps (see Habitat Maps Chapter of the Plan), shall only be closed or restricted by Garfield County. C. Allow no upgrading of existing routes, as verified by Garfield County, in Suitable Habitat or Lek NSO areas that would change route category (road, primitive road, or trail) or capacity unless the upgrading would have minimal impact on sage-grouse habitat, is necessary for motorist safety, or eliminates the need to construct a new road. D. When reclaiming roads and trails, use locally native seed mixes as prescribed by a professional biologist and use transplanted or seeded sagebrush unless unfeasible.
2	Travel	(P) Travel management should evaluate the need for permanent or seasonal road or area closures.	Section 1, Travel and Transportation, Policy B (above) applies here.
3	Travel	(P) Complete activity level plans within five years of the record of decision. During activity level planning, where appropriate, designate routes with current administrative/agency purpose or need to administrative access only.	
4	Travel	(P) Limit route construction to realignments of existing designated routes if that realignment has a minimal impact on sage-grouse habitat, eliminates the need to construct a new road, or is necessary for motorist safety	Section 1, Travel and Transportation, Policy C (above) applies here.
5	Travel	(P) Use existing roads or realignments as described above to access valid existing rights that are not yet developed. If valid existing rights cannot be	

		accessed via existing roads, then build any new road constructed to the absolute minimum standard necessary, and add the surface disturbance to the total disturbance in the priority area. If that disturbance exceeds 3 % for that area, then make additional, effective mitigation necessary to offset the resulting loss of sage-grouse habitat.		
6	Travel	(P) Allow no upgrading of existing routes that would change route category (road, primitive road, or trail) or capacity unless the upgrading would have minimal impact on sage-grouse habitat, is necessary for motorist safety, or eliminates the need to construct a new road.	Section 1, Travel and Transportation, Policy C (above) applies here.	
7	Travel	(P) Conduct restoration of roads, primitive roads and trails not designated in travel management plans. This also includes primitive route/roads that were not designated in Wilderness Study Areas and within lands with wilderness characteristics that have been selected for protection.	<p>Section 1, Travel and Transportation, Policies C and D (above) applies here.</p> <p>Section 9, Habitat Restoration The naturally patchy habitat in the Plan Area requires that habitat restoration projects be planned accordingly and that creating large contiguous landscapes of sagebrush is not consistent with the plant communities in the Plan Area.</p> <p>Policy A: Encourage habitat restoration projects on private land. Request that private landowners report annually on the progress of restoration efforts (providing spatial data associated with an API number, date, and status of restoration), so the County may track disturbed vs. restored acreages in and near Suitable Habitat.</p> <p>Policy B: Recognizing that local conditions in the Plan Area differ from those range-wide for sage-grouse, the County's mapped Suitable Habitat will be used for quantifying habitat conservation objectives of no net loss of Suitable Habitat (excluding that resulting from wildfire and temporary disturbances, as permitted).</p> <p>Policy C: Require the use of native plant species for restoration based on availability, and probability of successful establishment.</p>	
8	Travel	(P) When reseeding roads, primitive roads and trails, use appropriate seed mixes and consider the use of transplanted sagebrush.		
Recreation		Objective: Manage Recreation to avoid activities that 1) disrupt sage-grouse, 2) fragment sage-grouse habitat, or 3) spread noxious weeds		
9	Recreation	(P) Only allow SRPs that have neutral or beneficial affects to priority habitat areas.	<p>Section 2, Recreation Recreational use within the Plan Area is extremely limited because the majority of the land is privately held and access is strictly controlled. This significantly reduces potential direct or indirect impacts to sage-grouse or their habitats by the general public. Any plan for creating new or additional recreational opportunities on federal lands in Suitable Habitats must provide Garfield County a sage-grouse impact analysis for review.</p> <p>Policy A: Limit motorized recreational use to existing roads, primitive roads, and trails (as verified by Garfield County), in Suitable Habitat and Lek NSO areas.</p> <p>Policy B: Avoid all Suitable Habitat and Lek NSO areas as identified on Garfield</p>	

			County Habitat Maps.	
Lands and Realty Management		Objective: Manage the Lands and Realty program to avoid, minimize, and mitigate the loss of habitat and habitat connectivity through the authorizations of Rights of Ways (ROWs), land tenure adjustments, proposed land withdrawals, agreements with partners, and incentive programs.		
Rights-of-Way (ROW)				
10	Lands/ Realty	(P) Make priority sage-grouse habitat areas exclusion areas for new ROWs permits. Consider the following exceptions:	<p>Section 3, Lands and Realty Management, Habitats within the Plan Area are naturally fragmented and patchy; therefore, there are opportunities for new roads and energy development infrastructure to be placed outside Suitable Habitats. Further, any land acquisition shall be by mutual agreement between public and private entities.</p> <p>Policy A: Placement of new above-ground power lines in Suitable Habitat and Lek NSO areas is prohibited.</p> <p>Policy B: Bury new powerlines within Suitable Habitats and follow existing corridors unless there is a technical infeasibility, subject to valid existing rights. Anti-perch devices may be used where powerline burial is technically infeasible.</p> <p>Best Management Practice 2B: Encourage clustering / centralization of disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.</p>	
		(P) Within designated ROW corridors encumbered by existing ROW authorizations: new ROWs may be co-located only if the entire footprint of the proposed project (including construction and staging) can be completed within the existing disturbance associated with the authorized ROWs.		
		(P) Subject to valid, existing rights: where new ROWs associated with valid existing rights are required, co-locate new ROWs within existing ROWs or where it best minimizes sage-grouse impacts. Use existing roads, or realignments as described above, to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then build any new road constructed to the absolute minimum standard necessary and add the surface disturbance to the total disturbance in the priority area. If that disturbance exceeds 3% for that area, then make additional effective mitigation necessary to offset the resulting loss of sage-grouse.	<p>Best Management Practice 2B (above) applies here.</p> <p>Best Management Practice 2D: Encourage placement of infrastructure in already disturbed locations where the habitat has not been restored.</p> <p>Best Management Practice 2F: Encourage a phased development approach with concurrent reclamation.</p> <p>Best Management Practice 2G: Encourage placement liquid gathering facilities outside of priority areas. Have no tanks at well locations within priority areas (minimizes perching and nesting opportunities for ravens and raptors and truck traffic). Pipelines must be under or immediately adjacent to the road (Bui et al. 2010).</p>	
11	Lands/ Realty	(P) Evaluate and take advantage of opportunities to remove, bury, or modify existing power lines within priority sage-grouse habitat areas.	Section 7, Realty and Lands Management, Policy B (above) applies here.	
12	Lands/ Realty	(P) Where existing leases or ROWs have had some level of development (road, fence, well, etc.) and are no longer in use, reclaim the site by removing these features and restoring the habitat. <i>Planning Direction Note:</i> While engaged in this sage-grouse EIS planning process, relocate existing designated ROW corridors crossing priority	<p>Section 7, Realty and Lands Management, Policies A and B (above) apply here.</p> <p>Best Management Practice 2D. Encourage placement of infrastructure in already disturbed locations where the habitat has not been restored.</p>	

		sage-grouse habitat void of any authorized ROWs, outside of the priority habitat area. If relocation is not possible, undesignated that entire corridor during the planning process.		
13	Lands/ Realty	(G) Make general sage-grouse habitat areas "avoidance areas" for new ROWs.	Note that Garfield County GIS analysis does not support the recognition of BLM's General Habitat category.	
14	Lands/ Realty	(G).Where new ROWs are necessary, co-locate new ROWs within existing ROWs where possible.	Section 3, Land and Realty Management, Policies A and B Best Management Practice 2G	
Land Tenure Adjustment				
15	Lands/ Realty	(P) Retain public ownership of priority sage-grouse habitat. Consider exceptions where:	Section 3, Land and Realty Management, Policy C: Private land ownership of sage-grouse Habitat areas should be continued and encouraged as private land conservation efforts have been the most effective methods to preserve diverse and healthy habitats for many species.	
		(P) There is mixed ownership, and land exchanges would allow for additional or more contiguous federal ownership patterns within the priority sage-grouse habitat area.		
		(P) Under priority sage-grouse habitat areas with minority federal ownership, include an additional, effective mitigation agreement for any disposal of federal land. As a final preservation measure, consideration should be given to pursuing a permanent conservation easement.		
16	Lands/ Realty	(P) Where suitable conservation actions cannot be achieved, seek to acquire state and private lands with intact subsurface mineral estate by donation, purchase or exchange in order to best conserve, enhance, or restore sage-grouse habitat.	Section 7, Mineral Development Policy C: No federal land mineral withdrawals shall be made in Suitable Habitat areas if the resources can be accessed and extracted without surface disturbance.	
Proposed Land Withdrawals				
17	Lands/ Realty	(P) Propose lands within priority sage-grouse habitat areas for mineral withdrawal.	Section 7, Mineral Development Policy C	
18	Lands/ Realty	(P) Do not approve withdrawal proposals not associated with mineral activity unless the land management is consistent with sage-grouse conservation measures. (For example, in a proposed withdrawal for a military training range buffer area, manage the buffer area with sage-grouse conservation measures.)		
Range Management		Objectives: Manage the Range Management program to 1) maintain residual herbaceous cover to reduce predation during nesting, 2) avoid sage-grouse habitat changes due to herbivory, 3) avoid direct effects of herbivores on sage-grouse, such as trampling of nests and eggs, 4) avoid altering sage-grouse behavior due to the presence of herbivores, 5) avoid impacts to sage-grouse and sage-grouse behavior from structures associated with grazing management, and 6) maintain and develop agreements with partners that are consistent with before-stated Range Management objectives.		
				<i>Objectives and Actions in PPR as "recommendations" at this time</i>
19	Range	(P) Within priority sage-grouse habitat, incorporate sage-grouse habitat objectives and management considerations into all BLM grazing allotments through AMPs or permit renewals.	Section 4, Range Management Garfield County continues to enjoy a long history of livestock grazing on both private and public lands. When properly managed, livestock can coexist with sage-grouse as well as help improve suitable habitat and decrease fire hazards. Policy A: Maintain sustainable grazing consistent with historic land use and ranching practices that are sustainable for both agricultural operations as well as sage-grouse habitats, as recommended by the U.S. Department of Agriculture, Natural Resources Conservation Service throughout the Plan Area. Policy B: Livestock grazing can be utilized as a tool to properly manage sage-grouse habitat, and should not be removed from the Plan Area.	
20	Range	(ADH) Work cooperatively on integrated ranch planning within sage-grouse habitat so operations with deeded/BLM allotments can be planned as single units.		
21	Range	(P) Prioritize completion of land health assessments and processing grazing permits within priority sage-grouse habitat areas. Focus this process on allotments that have the best opportunities for conserving, enhancing, or restoring habitat for sage-grouse. Utilize Ecological Site Descriptions (ESDs) to conduct land health assessments to determine if standards of range-land health are being met.		
22	Range	(ADH) Conduct land health assessments that include (at a minimum) indicators and measurements of structure/condition/composition of vegetation specific to achieving sage-grouse habitat objectives (Doherty et al. 2011). If local/state seasonal habitat objectives are not available, use		

		sage-grouse habitat recommendations from Connelly et al. 2000b and Hagen et al. 2007.	<p>Policy C: Any grazing restrictions or conservation measures that are put in place through a grazing permit shall be based solely on the conditions and activities specific to that permitted grazing allotment.</p> <p>Section 5, Predation: Predation of sage-grouse eggs, juveniles, and adults occurs naturally, but can increase in association with human development, unless precautions are undertaken.</p> <p>Policy: Encourage use of anti-perch devices, burying of powerlines, closed rubbish bins, removal of road kill and dead livestock, and other methods to discourage predators on sage-grouse and limit excess predation. If predation on sage-grouse is documented to have a deleterious effect on the Roan Plateau sage-grouse population, then allow for appropriate mitigation of predation under USDA guidance.</p> <p>Best Management Practice 2H: Restrict the construction of tall facilities and fences to the minimum number and amount needed. To discourage avian predators, require installation of anti-perch devices on new fences and facilities within 4 miles of occupied suitable habitat where avian predation has been identified as a cause of mortality. Additionally, encourage retrofitting of existing fences and structures with anti-perch devices that are also located within 4 miles of occupied suitable habitat where avian predation has been identified as a cause of mortality.</p>	
Implementing Management Actions after Land Health and Habitat Evaluations				
23	Range	(ADH) Develop specific objectives to conserve, enhance, or restore priority sage-grouse habitat based on ESDs and assessments (including within wetlands and riparian areas). If an effective grazing system that meets sage-grouse habitat requirements is not already in place, analyze at least one alternative that conserves, restores, or enhances sage-grouse habitat in the NEPA document prepared for the permit renewal (Doherty et al. 2011b, Williams et al. 2011).	<p>Section 4, Range Management, Policies A, B, and C (above) apply here.</p> <p>Section 10, Monitoring and Habitat Category Changes The primary objective of this plan is to ensure the long-term health and continued existence of Sage-grouse in Garfield County. Regular monitoring of the species and its habitat in Garfield County is essential to ensuring the policies and best management practices are updated and implemented within the Plan Area.</p> <p>Policy</p> <p>A. All federal and state agencies with management responsibilities in the plan area for the species and/or its habitat shall provide the County with an annual update of the monitoring programs they have in place, data collected and specifics about their collection protocols. These agencies will inform the County of proposed research projects and allow for the County's input and collaboration prior to implementation.</p> <p>B. All data shall be collected according to the guidelines issued under the</p>	
24	Range	(ADH) Manage for vegetation composition and structure consistent with ecological site potential and within the reference state to achieve sage-grouse seasonal habitat objectives.		
25	Range	(ADH) Implement management actions (grazing decisions, AMP/Conservation Plan development, or other agreements) to modify grazing management to meet seasonal sage-grouse habitat requirements (Connelly et al. 2011c). Consider singly, or in combination, changes in: 1) Season or timing of use; 2) Numbers of livestock (includes temporary non-use or livestock removal); 3) Distribution of livestock use; 4) Intensity of use; and 5) Type of livestock (e.g., cattle, sheep, horses, llamas, alpacas and goats) (Briske et al. 2011).		
26	Range	(P) During drought periods, prioritize evaluating effects of the drought in		

		priority sage-grouse habitat areas relative to their needs for food and cover. Since there is a lag in vegetation recovery following drought (Thurrow and Taylor 1999), ensure that post-drought management allows for vegetation recovery that meets sage-grouse needs in priority sage-grouse habitat areas.	<p>Information Quality Act.</p> <p>C. All data that is gathered in the Plan Area shall be shared with the County in a timely manner, and supplied to the County regardless of its state of completion at the formal request of the County.</p> <p>D. Private landowners are also encouraged to monitor and share data collected on private property with the County.</p> <p>All data that is shared with the County that is not public information will be treated as confidential and used by the County only to help inform its policies and best management practices.</p>	
Riparian Areas and Wet Meadows				
27	Range	(P) Manage riparian areas and wet meadows for proper functioning condition within priority sage-grouse habitats.	<p>Section 4, Range Management, Policies A, B, and C (above) apply here.</p> <p>Section 10, Monitoring and Habitat Category Changes, Policies A, B, C, and D (above) apply here.</p>	
28	Range	(ADH) Within priority and general sage-grouse habitats, manage wet meadows to maintain a component of perennial forbs with diverse species richness relative to site potential (e.g., reference state) to facilitate brood rearing. Also conserve or enhance these wet meadow complexes to maintain or increase amount of edge and cover within that edge to minimize elevated mortality during the late brood rearing period (Hagen et al. 2007, Kolada et al. 2009, Atamian et al. 2010).		
29	Range	(ADH) Where riparian areas and wet meadows meet proper functioning condition, strive to attain reference state vegetation relative to the ecological site description. For example: Within priority sage-grouse habitat, reduce hot season grazing on riparian and meadow complexes to promote recovery or maintenance of appropriate vegetation and water quality. Utilize fencing/herding techniques or seasonal use or livestock distribution changes to reduce pressure on riparian or wet meadow vegetation used by sage-grouse in the hot season (summer) (Aldridge and Brigham 2002, Crawford et al. 2004, Hagen et al. 2007).		
30	Range	(P) Authorize new water development for diversion from spring or seep source only when priority sage-grouse habitat would benefit from the development. This includes developing new water sources for livestock as part of an AMP/conservation plan to improve sage-grouse habitat.		
31	Range	(P) Analyze springs, seeps and associated pipelines to determine if modifications are necessary to maintain the continuity of the predevelopment riparian area within priority sage-grouse habitats. Make modifications where necessary, considering impacts to other water uses when such considerations are neutral or beneficial to sage-grouse.		
Treatments to Increase Forage for Livestock/Wild Ungulates				
32	Range	(P) Only allow treatments that conserve, enhance or restore sage-grouse habitat (this includes treatments that benefit livestock as part of an AMP/Conservation Plan to improve sage-grouse habitat).	<p>Section 4, Range Management, Policies A, B, and C (above) apply here.</p> <p>Section 10, Monitoring and Habitat Category Changes, Policies A, B, C, and D (above) apply here.</p>	
33	Range	(P) Evaluate the role of existing seedings that are currently composed of primarily introduced perennial grasses in and adjacent to priority sage-grouse habitats to determine if they should be restored to sagebrush or habitat of higher quality for sage-grouse. If these seedings are part of an AMP/ Conservation Plan or if they provide value in conserving or enhancing the rest of the priority habitats, then no restoration would be necessary. Assess the compatibility of these seedings for sage-grouse		

		<p>habitat or as a component of a grazing system during the land health assessments (Davies et al. 2011).</p> <p>For example: Some introduced grass seedings are an integral part of a livestock management plan and reduce grazing pressure in important sagebrush habitats or serve as a strategic fuels management area.</p>		
Structural Range Improvements and Livestock Management Tools				
34	Range	<p>(P) Design any new structural range improvements and location of supplements (salt or protein blocks) to conserve, enhance, or restore sage-grouse habitat through an improved grazing management system relative to sage-grouse objectives. Structural range improvements, in this context, include but are not limited to: cattleguards, fences, exclosures, corrals or other livestock handling structures; pipelines, troughs, storage tanks (including moveable tanks used in livestock water hauling), windmills, ponds/reservoirs, solar panels and spring developments. Potential for invasive species establishment or increase following construction must be considered in the project planning process and monitored and treated post-construction.</p>	<p>Section 4, Range Management, Policies A, B, and C (above) apply here.</p> <p>Section 10, Monitoring and Habitat Category Changes, Policies A, B, C, and D (above) apply here.</p>	
35	Range	<p>(P) When developing or modifying water developments, use Best Management Practices (BMPs) or Required Design Features (RDFs) (See this table's BMPs/RDFs) to mitigate potential impacts from West Nile virus (Clark et al. 2006, Doherty 2007, Walker et al. 2007b, Walker and Naugle 2011).</p>		
36	Range	<p>(P) Evaluate existing structural range improvements and location of supplements (salt or protein blocks) to make sure they conserve, enhance or restore sage-grouse habitat.</p>		
37	Range	<p>(P) To reduce outright sage-grouse strikes and mortality, remove, modify or mark fences in high risk areas within priority sage-grouse habitat based on proximity to lek, lek size, and topography (Christiansen 2009, Stevens 2011).</p>		
38	Range	<p>(P) Monitor for, and treat invasive species associated with existing range improvements (Gelbard and Belnap 2003 and Bergquist et al. 2007).</p>		
Retirement of Grazing Privileges				
39	Range	<p>(ADH) Maintain retirement of grazing privileges as an option in priority sage-grouse areas when the current permittee is willing to retire grazing on all or part of an allotment.</p> <p>Analyze the adverse impacts of no livestock use on wildfire and invasive species threats (Crawford et al. 2004) in evaluating retirement proposals.</p> <p><i>Planning direction Note:</i> Each planning effort will identify the specific allotment(s) where permanent retirement of grazing privileges is potentially beneficial.</p>	<p>Section 4, Range Management, Policy A (above) applies here.</p>	
Wild Horse Management		Objective: Manage wild horses in a manner designed to 1) avoid reductions in grass, forb and shrub cover, 2) avoid increasing unpalatable forbes and invasive plants such as cheatgrass.		
40	Wild Horses	<p>(P) Manage wild horse and burro population levels within established Appropriate Management Levels (AML).</p>	<p>Section 6, Wild Horse and Burro Management, Wild Horses and Burro's are not known to occur within the Plan Area and therefore do not presently impact sage grouse habitat.</p> <p>Policy: Collaborate with appropriate agencies to discourage establishment of (feral) wild horse populations that could be detrimental to sage-grouse habitat.</p>	
41	Wild Horses	<p>(ADH) Prioritize gathers in priority sage-grouse habitat, unless removals are necessary in other areas to prevent catastrophic environmental issues, including herd health impacts.</p>		
42	Wild Horses	<p>(P) Within priority sage-grouse habitat, develop or amend herd management area plans (HMAPs) to incorporate sage-grouse habitat objectives and management considerations for all BLM herd management areas (HMAs).</p>		

43	Wild Horses	(P) For all HMAs within priority sage-grouse habitat, prioritize the evaluation of all AMLs based on indicators that address structure/condition/composition of vegetation and measurements specific to achieving sage-grouse habitat objectives.		
44	Wild Horses	(ADH) Coordinate with other resources (Range, Wildlife, and Riparian) to conduct land health assessments to determine existing structure/condition/composition of vegetation within all BLM HMAs.		
45	Wild Horses	(P) When conducting NEPA analysis for wild horse and burro management activities, water developments or other rangeland improvements for wild horses in priority sage-grouse habitat, address the direct and indirect effects to sage-grouse populations and habitat. Implement any water developments or rangeland improvements using the criteria identified for domestic livestock identified above in priority habitats.		
Fluid Minerals Management		Objective: Manage fluid minerals to avoid, minimize, and mitigate 1) direct disturbance, displacement, or mortality of sage-grouse, 2) direct loss of habitat, or loss of effective habitat through fragmentation, and 3) cumulative landscape-level impacts.		
Unleased Fluid Minerals				
46	Fluid Minerals	<p>(P) Close priority sage-grouse habitat areas to fluid mineral leasing. Upon expiration or termination of existing leases, do not accept nominations/expressions of interest for parcels within priority areas. Exception: When an opportunity exists for the BLM to influence conservation measures where surface and/or mineral ownership is not entirely federally owned (i.e., checkerboard ownership). In this case, a plan amendment may be developed that opens the priority habitat area for new leasing. The plan must demonstrate long-term population increases in the priority area through mitigation (prior to issuing the lease) including lease stipulations, off-site mitigation, etc., and avoid short-term losses that put the sage-grouse population at risk from stochastic events leading to extirpation.</p>	<p>Section 7, Mineral Development</p> <p>The extraction of fluid minerals in Garfield County is accomplished using increasingly advanced technologies, more efficient operations, avoidance of critical habitats, impact minimization, mitigation, and habitat restoration than in the past. As a result, surface disturbances can be minimal and temporary. The fast pace of these technological developments has meant that the primary literature on the impacts of mineral extraction on sage-grouse in Wyoming, that is cited in government publications, is inconsistent with current practices used in Garfield County. It is anticipated that the advanced technologies currently in use, as well as future ones under development, will continue to allow the efficient extraction of resources while avoiding or minimizing impacts to sage-grouse and other species.</p> <p>Policy A: Close suitable habitat as determined by the County's GIS mapping to future mineral leasing surface disturbance unless the resource cannot be extracted without minimal surface disturbance. In this case, the Best Management Practices will be followed and if necessary mitigation utilized to ensure a no net loss to sage grouse habitat and no deleterious demographic effect on the population.</p> <p>Policy B: All active Leaks identified outside of suitable habitat shall have a 0.6 mile NSO for all non-functional surface disturbance as defined in the Colorado State Plan. Exceptions for allowing functional disturbance within the 0.6 mile NSO may be allowed for exceptional or unique topography or other non-contributing habitat aspects or circumstances that will not adversely impact sage-grouse. If the resources cannot be accessed without disturbing the active Lek NSO habitat, then Best Management Practices will be followed and necessary mitigation utilized to ensure a no net loss to sage grouse potential habitat and no deleterious demographic effect on the population.</p> <p>Policy C. No federal land mineral withdrawals shall be made in Suitable Habitat</p>	

			areas if the resources can be accessed and extracted without surface disturbance.	
		(P) Allow geophysical exploration within priority sage-grouse habitat areas to obtain information for existing Federal fluid mineral leases or areas adjacent to state or fee lands within priority sage-grouse habitat areas. Allow geophysical operations only using helicopter-portable drilling, wheeled or tracked vehicles on existing roads, or other approved methods conducted in accordance with seasonal timing limitations and other restrictions that may apply. If no timing stip on NTT Plus, need to add one here.	Section 7 Mineral Development policies A, B, and C (above) apply here.	
47	Fluid Minerals			
Leased Fluid Minerals				
48	Fluid Minerals	(P) Apply the following conservation measures through Resource Management Plan (RMP) implementation decisions (e.g., approval of an Application for Permit to Drill, Sundry Notice, etc.) and upon completion of the environmental record of review (43 CFR 3162.5, include appropriate documentation of compliance with NEPA. In this process evaluate, among other things: 1. Whether the conservation measure is “reasonable” (43 CFR 3101.1-2) with the valid existing rights; and 2. Whether the action is in conformance with the approved RMP.	Section 7 Mineral Development policies A, B, and C (above) apply here. Section 5, Predation Policy (above) applies here. Best Management Practice H.	
49	Fluid Minerals	(P) Provide the following conservation measures as terms and conditions on an approved RMP:		
50	Fluid Minerals	(P) Do not allow new surface occupancy within priority habitat areas, including winter concentration areas, during any time of the year (Doherty et al. 2008, Carpenter et al. 2010). Exception:		
51	Fluid Minerals	<ul style="list-style-type: none"> If the lease is entirely within priority habitats, apply a 4-mile NSO around the lek and limit permitted disturbances to 1 per section with no more than 3% surface disturbance in that section. 		1.
52	Fluid Minerals	<ul style="list-style-type: none"> If the entire lease is within the 4 mile lek perimeter, limit permitted disturbances to 1 per section with no more than 3% surface disturbance in that section. Require any development to be placed at the most distal part of the lease from the lek, or depending on topography and other habitat aspects, in an area that is less demonstrably harmful to sage-grouse. 		
53	Fluid Minerals	(P) Apply a seasonal restriction on exploratory drilling that prohibits resurface-disturbing activities during the nesting and early brood-rearing season in all priority sage-grouse habitat during this period.		
54	Fluid Minerals	(P) BLM should closely examine the applicability of categorical exclusions in priority habitat. If extraordinary circumstances review is applicable, BLM should determine whether those circumstances exist.		
55	Fluid Minerals	(P) Complete Master Development Plans in lieu of Application for Permit to Drill (APD)-by-APD processing for all but wildcat wells.		
56	Fluid Minerals	(P) When permitting APD’s on existing leases that are not yet developed, the proposed surface disturbance cannot exceed 3% for that area. Consider an exception if: <ul style="list-style-type: none"> Additional effective mitigation is demonstrated to offset the resulting loss of sage-grouse. 		Section 7 Mineral Development policies A, B, and C (above) apply here.
57	Fluid Minerals	(P) When necessary, conduct additional, effective mitigation in 1) priority sage-grouse habitat areas or—less preferably—2) general sage-grouse		

		habitat (dependent upon the area-specific ability to increase sage-grouse populations).		
58	Fluid Minerals	(P) Conduct additional, effective mitigation first within the same population area where the impact is realized, and if not possible then conduct mitigation within the same Management Zone as the impact, per 2006 WAFWA Strategy (pp. 2-17).		
59	Fluid Minerals	(P) Require unitization when deemed necessary for proper development and operation of an area (with strong oversight and monitoring) to minimize adverse impacts to sage-grouse according to the Federal Lease Form, 3100-11, Sections 4 and 6.		
60	Fluid Minerals	(P) Identify areas where acquisitions (including subsurface mineral rights) or conservation easements would benefit sage-grouse.		
61	Fluid Minerals	(ADH) For future actions, require a full reclamation bond specific to the site in accordance with 43 CFR 3104.2, 3104.3, and 3104.5. Ensure bonds are sufficient for costs relative to reclamation (Connelly et al. 2000, Hagen et al. 2007) that would result in full restoration of the lands to the condition it was found prior to disturbance. Base the reclamation costs on the assumption that contractors for the BLM will perform the work.		
62	Fluid Minerals	Where applicable and technically feasible, apply BMPs/RDFs (see this table's Fluid Minerals and Multiple Program Sections) as mandatory Conditions of Approval (COAs) within priority sage-grouse habitat.		
Solid Minerals		Objective: Manage solid mineral programs to avoid, minimize and mitigate adverse impacts to sage-grouse habitat to the extent practical under the law and BLM jurisdiction.		
Coal				
63	Solid Minerals- Coal	(ADH) Apply minimization of surface-disturbing or disruptive activities (including operations and maintenance) where needed to reduce the impacts of human activities on important seasonal sage-grouse habitats. Apply these measures during activity level planning. Use additional effective mitigation to offset impacts as appropriate (determined by local options/needs).		
64	Solid Minerals- Coal	(P) <i>Surface mines:</i> Find unsuitable all surface mining of coal under the criteria set forth in 43 CFR 3461.5.		
65	Solid Minerals- Coal	(P) <i>Sub-surface mining:</i> Grant no new mining leases unless all surface disturbances (appurtenant facilities) are placed outside of the priority sage-grouse habitat area. In priority sage-grouse habitat areas, place any new appurtenant facilities outside of priority areas. Where new appurtenant facilities associated with the existing lease cannot be located outside the priority sage-grouse habitat area, co-locate new facilities within existing disturbed areas. If this is not possible, then build any new appurtenant facilities to the absolute minimum standard necessary.	Same as Section 7, Mineral Development policies.	
66	Solid Minerals- Coal			
67	Solid Minerals - Coal			
68	Solid Minerals- Coal			

Locatable Minerals			
69	Locatable Minerals	(P) Propose withdrawal from mineral entry based on risk to the sage-grouse and its habitat from conflicting locatable mineral potential and development.	
70	Locatable Minerals	(P) Make any existing claims within the withdrawal area subject to validity exams or buy out. Include claims that have been subsequently determined to be null and void in the proposed withdrawal.	
71	Locatable Minerals	(P) In plans of operations required prior to any proposed surface disturbing activities, include the following: <ul style="list-style-type: none"> Additional effective mitigation in perpetuity for conservation (in accordance with existing policy, WO IM 2008-204). For example, purchase private land and mineral rights or severed subsurface mineral rights within the priority area and deed to US Government. Consider seasonal restrictions if deemed effective 	Same as Section 7, Mineral Development policies.
72	Locatable Minerals	(P) Where applicable to prevent unnecessary or undue degradation, apply BMPs/RDFs (See this table's BMP/RDFs for Locatable Minerals and Multiple Program) as mandatory conditions of approval.	
Non-energy Leasable Minerals			
73	Non-energy Leasable Minerals	(P) Close priority habitat to non-energy leasable mineral leasing. This includes not permitting any new leases to expand an existing mine.	Same as Section 7, Mineral Development policies.
74	Non-energy Leasable Minerals	(P) For existing non-energy leasable mineral leases, in addition to the solid minerals BMPs/RDFs, follow the same BMPs/RDFs applied to Fluid Minerals when wells are used for solution mining.	
Salable Mineral Materials			
75	Salable Minerals	(P) Close priority habitat to mineral material sales.	Same as Section 7, Mineral Development policies.
76	Salable Minerals	(P) Restore saleable mineral pits no longer in use to meet sage-grouse habitat conservation objectives.	
Mineral Split Estate		Objective: Utilize federal authority to protect sage-grouse habitat on split estate lands to the extent provided by law.	
77	Split Estate Minerals	(P) Where the federal government owns the mineral estate and the surface is in non-federal ownership, apply the conservation measures applied to public lands.	Section 7, Mineral Development policies (above) apply here.
78	Split Estate Minerals	(P) Where the federal government owns the surface, and the mineral estate is in non-federal ownership, apply appropriate Fluid Mineral BMPs to surface development.	
Wildfire Suppression, Fuels Management and Fire Rehabilitation			
Fuels Management		Objective: Manage the fuels program to avoid sage-grouse habitat loss and restore damaged habitat.	
79	Fuels Management	(P) Do not reduce sagebrush canopy cover to less than 15% (Co Connelly et al. 2000, Hagen et al. 2007) unless a fuels management objective requires additional reduction in sagebrush cover to meet strategic protection of priority sage-grouse habitat and conserve habitat quality for the species. Closely evaluate the benefits of the fuel breaks against the additional loss of sagebrush cover in the EA process.	Section 8, Wildfire Suppression, Fuels Management and Fire Rehabilitation A. Fuels Management Policy 1) Provide technical (GIS) support that can be used by landowners for voluntary fuels management that is consistent with sage-grouse habitat protection and enhancement.

			<p>2) Work with landowners to design fuels management projects in Suitable Habitat to strategically and effectively reduce wildfire threats. Garfield County Greater Sage-Grouse Conservation Plan Page 36</p> <p>3) During fuels management project design, consider the utility of using livestock to strategically reduce fire fuels (Diamond et al. 2009), and implement grazing management that will accomplish this objective (Davies et al. 2011 and Launchbaugh et al 2007). Consult with ecologists to minimize impacts to native perennial grasses consistent with the objectives and conservation measures of the range management policy.</p> <p>B. Emergency Stabilization and Rehabilitation Policy</p> <p>1) Follow the County's habitat restoration policy in developing an emergency rehabilitation plan for temporarily disturbed areas within suitable habitat.</p> <p>2) Coordinate with appropriate agencies in developing and implementing rehabilitation plans.</p> <p>3) Coordinate with private landowners and leaseholders to integrate their expertise and knowledge of local conditions into rehabilitation plans.</p>	
80	Fuels Management	(P) Apply appropriate seasonal restrictions for implementing fuels management treatments according to the type of seasonal habitats present in a priority area.		
81	Fuels Management	(P) Allow no treatments in known winter range unless the treatments are designed to strategically reduce wildfire risk around or in the winter range and will maintain winter range habitat quality.		
82	Fuels Management	(P) Do not use fire to treat sagebrush in less than 12-inch precipitation zones (e.g., Wyoming big sagebrush or other xeric sagebrush species; Connelly et al. 2000, Hagen et al. 2007, Beck et al. 2009). However, if as a last resort and after all other treatment opportunities have been explored, and site specific variables allow, the use of prescribed fire for fuels breaks that would disrupt fuel continuity or enhance land health could be considered where cheatgrass is a very minor component in the understory (Brown 1982).	Section 8, Wildfire Suppression, Fuels Management and Fire Rehabilitation Policies A1 and A2 (above) apply here.	
83	Fuels Management	(P) Monitor and control invasive vegetation post-treatment.	Section 10, Monitoring and Habitat Category Changes, Policies A, B, C, D, and E (above) apply here.	
84	Fuels Management	(P) Rest treated areas from grazing for two full growing seasons unless vegetation recovery dictates otherwise (WGFD 2011).	Section 4, Range Management, Policy C (above) applies here.	
85	Fuels Management	(P) Require use of native plant seeds for fuels management treatment based on availability, adaptation (site potential), probability for success (Richards et al. 1998). Where probability of success or native seed availability is low, non-native seeds may be used as long as they meet sage-grouse habitat objectives (Pyke 2011).	Section 9, Habitat Restoration, Policies B and C (above) apply here.	
86	Fuels Management	Design post fuels management to ensure long term persistence of seeded or pre-burn native plants. This may require temporary or long-term changes in livestock grazing, wild horse and burro, and travel management, etc., to achieve and maintain the desired condition of ES&R projects to benefit sage-grouse (Eiswerth and Shonkwiler 2006).		
87	Fuels	Design fuels management projects in priority habitat to strategically and effectively reduce wildfire threats in the greatest area. This may require		

	Management	fuels treatments implemented in a more linear versus block design (Launchbaugh et al. 2007).	Section 8, Wildfire Suppression, Fuels Management and Fire Rehabilitation, Policy A3 (above) applies here.
88	Fuels Management	During fuels management project design, consider the utility of using livestock to strategically reduce fine fuels (Diamond et al. 2009), and implement grazing management that will accomplish this objective (Davies et al. 2011 and Launchbaugh et al 2007). Consult with ecologists to minimize impacts to native perennial grasses, consistent with the objectives and conservation measures of the grazing section.	
Fire Operations		Objective: Manage fire to maintain and enhance large blocks of contiguous sagebrush.	
89	Fire Operations	(P) In priority sage-grouse habitat areas, prioritize suppression, immediately after life and property, to conserve the habitat.	NA: Note that Garfield County GIS analysis does not support the recognition of BLM's General Habitat category. As verified in the Garfield County mapping, large blocks of continuous sagebrush do not exist in the Plan Area.
90	Fire Operations	(G) In general habitat, prioritize suppression where wildfires threaten priority sage-grouse habitat.	
Emergency Stabilization and Rehabilitation (ES&R)		Objective: Use ES&R to address post-wildfire threats to sage-grouse habitat.	
91	ES&R	(ADH) Prioritize native seed allocation for use in priority sage-grouse habitat in years when preferred native seed is in short supply. This may require reallocation of native seed from ES&R projects outside of priority sage-grouse habitat to those inside it. Use of native plant seeds for ES&R seedings is required based on availability, adaptation (site potential), and probability of success (Richards et al. 2007). Where probability of success or native seed availability is low, non-native seeds may be used as long as they meet sage-grouse habitat conservation objectives (Pyke 2011). Re-establishment of appropriate sagebrush species/subspecies and important understory plants, relative to site potential, shall be the highest priority for rehabilitation efforts.	Section 8, Wildfire Suppression, Fuels Management and Fire Rehabilitation, Emergency Stabilization and Rehabilitation Policies B1, B2 and B3 (above) apply here.
92	ES&R	(ADH) Design post ES&R management to ensure long term persistence of seeded or pre-burn native plants. This may require temporary or long term changes in livestock grazing, wild horse and burro, and travel management, etc, to achieve and maintain the desired condition of ES&R projects to benefit sage grouse (Eiswerth and Shonkwiler 2006).	
93	ES&R	(ADH) Consider potential changes in climate (Miller et al. 2011) when proposing restoration seedings when using native plants. Consider collection from the warmer component of the species' current range when selecting native species (Kramer and Havens 2009).	
Habitat Restoration		Objective: Use habitat restoration as a tool to create and/or maintain landscapes that benefit sage-grouse.	
94	Habitat Restoration	(ADH) Prioritize implementation of restoration projects based on environmental variables that improve chances for project success in areas most likely to benefit sage-grouse (Meinke et al. 2009). Prioritize restoration treatments and monitoring in seasonal habitats that are thought to be limiting sage-grouse distribution and/or abundance.	Section 9, Habitat Restoration The naturally patchy habitat in the Plan Area requires that habitat restoration projects be planned accordingly and that creating large contiguous landscapes of sagebrush is not consistent with the plant communities in the Plan Area.
95	Habitat Restoration	(P) Include sage-grouse habitat parameters as defined by Connelly et al. (2000), Hagen et al. (2007) or if available, State Sage-Grouse Conservation plans and appropriate local information in habitat restoration objectives. Make meeting these objectives within priority sage-grouse habitat areas a high restoration priority.	Policy A: Encourage habitat restoration projects on private land. Request that private landowners report annually on the progress of restoration efforts (providing spatial data associated with an API number, date, and status of restoration), so the County may track disturbed vs. restored acreages in and near Suitable Habitat.
96	Habitat Restoration	(P) Require the use of native seeds for restoration based on availability, adaption (ecological site potential, and probability of success (Richards et al. 1998). Where probability of success or adapted seed availability is low, non-native seeds may be used as long as they support sage-grouse habitat objectives.	Policy B: Recognizing that local conditions in the Plan Area differ from those range-wide for sage-grouse, the County's mapped Suitable Habitat will be used for quantifying habitat conservation objectives of no net loss of Suitable Habitat
97	Habitat Restoration	(P) Design post restoration management to ensure long term persistence of seeded or pre-burn native plants. This may require temporary or long	

		term changes in livestock grazing, wild horse and burro, and travel management, etc, to achieve and maintain the desired condition of ES&R projects to benefit sage grouse (Eiswerth and Shonkwiler 2006).	(excluding that resulting from wildfire and temporary disturbances, as permitted).
98	Habitat Restoration	(P) Consider potential changes in climate (Miller et al. 2011) when proposing restoration seedlings when using native plants. Consider collection from the warmer component of the species' current range when selecting native species (Kramer and Havens 2009).	Policy C: Require the use of native plant species for restoration based on availability, and probability of successful establishment.
99	Habitat Restoration	(ADH) Restore native (or desirable) plants and create landscape patterns which most benefit sage-grouse.	Policy D: Encourage local private landowners to share information among themselves and the County on restoration design and strategies to obtain favorable outcomes.
100	Habitat Restoration	(ADH) Make reestablishment of sagebrush and desirable understory plant cover (relative to ecological site potential) the highest priority for restoration efforts.	Policy E. In former sagebrush habitat or in habitat to be converted to sagebrush: make re-establishment of sagebrush and desirable understory plant cover (relative to ecological site potential) the highest priority for restoration efforts.
10	Habitat Restoration	(ADH) In fire prone areas where sagebrush seed is required for sage-grouse habitat restoration, consider establishing seed harvest areas that are managed for seed production (Armstrong 2007) and are a priority for protection from outside disturbances.	

REQUIRED DESIGN FEATURES & BEST MANAGEMENT PRACTICES

- a. The following provides a list of best management practices (BMPs) and required design features (RDFs) that are applicable to all alternatives in the resource management plan.
- b. RDFs are design features required for a specified proposal or project and are often necessary to prevent unnecessary or undue degradation of public land resources.
- c. BMPs are established guidelines followed by the BLM and incorporated into management activities, where applicable, that support the best management of public lands.
- d. While the list of BMPs/RDFs is thorough, the list is not intended to be exhaustive; additional BMPs/RDFs could be developed and implemented to help achieve resource objectives. BMPs/RDFs include state-of-the-art measures applied on a site-specific basis to avoid, minimize, reduce, rectify, or compensate for adverse environmental or social impacts. They are applied to management actions to help achieve desired outcomes for safe, environmentally responsible resource development by preventing, minimizing, or mitigating adverse impacts and reducing conflicts. BMPs/RDFs also can be proposed by project applicants for activities on public lands (e.g., for gas drilling). BMPs/RDFs not incorporated into the permit application by the applicant may be considered and evaluated through the environmental review process and incorporated into the use authorization as conditions of approval (COAs) or rights-of-way stipulations. Standard conditions of approval and rights-of-way stipulations are provided in Appendix XV. Additional BMPs/RDFs, COAs, and rights-of-way stipulations could be developed to meet resource objectives based on local conditions and resource specific concerns.

[AWAITING WO DEFINITION OF BMP—DISTINCTION BETWEEN BMP/RDF NEEDS CLARIFICATION]

	NTT Alternative	GARFIELD COUNTY PLAN / ALTERNATIVE	
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**WEST NILE VIRUS
All Designated Habitat**

The following seven site modifications will minimize exploitation of coal bed natural gas ponds by Culex tarsalis:

	<p>100 (ADH) 1. Increase the size of ponds to accommodate a greater volume of water than is discharged. This will result in un-vegetated and muddy shorelines that breeding <i>Cx. tarsalis</i> avoid (De Szalay and Resh 2000). This modification may reduce <i>Cx. tarsalis</i> habitat but could create larval habitat for <i>Culicoides sonorensis</i>, a vector of blue tongue disease, and should be used sparingly (Schmidtman et al. 2000). Steep shorelines should be used in combination with this technique whenever possible (Knight et al. 2003).</p>	<p>Chapter 8, Best Management Practices 1: West Nile Viru Recommend pond designs based upon current recommendations of the CPW. "Require treatment of waste water pits and any associated pit containing water that provides a medium for breeding mosquitoes with <i>Bti</i> (<i>Bacillus thuringiensis v. israelensis</i>) or take other effective action to control mosquito larvae." These actions will reduce the distribution and abundance of mosquitoes that vector West Nile virus and reduce the risk of West Nile virus transmission to sage grouse and other wildlife (Walker, B. 2008, , before the Oil and Gas Commission of the State of Colorado on Draft Rule 1204, DOCKET NO. 0803-RM-02. http://cogcc.state.co.us/rulemaking/StaffPreHearState/Exhibits/FINAL/DOW_TESTIMONY/B.Walker Testimony-041808 FINAL.pdf)</p>
100	(ADH) 2. Build steep shorelines to reduce shallow water (>60 cm) and aquatic vegetation around the perimeter of impoundments (Knight et al. 2003). Construction of steep shorelines also will create more permanent ponds that are a deterrent to colonizing mosquito species like <i>Cx. tarsalis</i> which prefer newly flooded sites with high primary productivity (Knight et al. 2003).	
100	(ADH) 3. Maintain the water level below that of rooted vegetation for a muddy shoreline that is unfavorable habitat for mosquito larvae. Rooted vegetation includes both aquatic and upland vegetative types. Avoid flooding terrestrial vegetation in flat terrain or low lying areas. Aquatic habitats with a vegetated inflow and outflow separated by open water produce 5-10 fold fewer Culex mosquitoes than completely vegetated wetlands (Walton and Workman 1998). Wetlands with open water also had significantly fewer stage III and IV instars which may be attributed to increased predator abundances in open water habitats (Walton and Workman 1998).	

103	(ADH) 4. Construct dams or impoundments that restrict down slope seepage or overflow by digging ponds in flat areas rather than damming natural draws for effluent water storage, or lining constructed ponds in areas where seepage is anticipated (Knight et al. 2003).		
104	(ADH) 5. Line the channel where discharge water flows into the pond with crushed rock, or use a horizontal pipe to discharge inflow directly into existing open water, thus precluding shallow surface inflow and accumulation of sediment that promotes aquatic vegetation.		
107	(ADH) 6. Line the overflow spillway with crushed rock, and construct the spillway with steep sides to preclude the accumulation of shallow water and vegetation.		
108	(ADH) 7. Fence pond site to restrict access by livestock and other wild ungulates that trample and disturb shorelines, enrich sediments with manure and create hoof print pockets of water that are attractive to breeding mosquitoes.		
FLUID MINERAL DEVELOPMENT			
Fluid Mineral Roads Priority Habitat			
109	(ADH) Design roads to an appropriate standard no higher than necessary to accommodate the intended purpose.	Section 1, Travel and Transportation, Policy E. Limit motorized travel to existing roads, primitive roads, and trails, as verified by Garfield County, at a minimum in Suitable Habitats and in Lek NSO areas. F. County roads, as determined by Garfield County and identified on County Maps (see Habitat Maps Chapter of the Plan), shall only be closed or restricted by Garfield County. G. Allow no upgrading of existing routes, as verified by Garfield County, in Suitable Habitat or Lek NSO areas that would change route category (road, primitive road, or trail) or capacity unless the upgrading would have minimal impact on sageouse habitat, is necessary for motorist safety, or eliminates the need to construct a new road.	
110	(P) Locate roads to avoid important areas and habitats.		
111	(P) Coordinate road construction and use among ROW holders.		
112	(P) Construct road crossing at right angles to ephemeral drainages and stream crossings.		
113	(P) Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.	Best Management Practice A: Establish speed limits on county roads near priority sage grouse habitat that are appropriate to safety and reducing vehicle/wildlife collisions.	
114	(P) Establish trip restrictions (Lyon and Anderson 2003) or minimization through use of telemetry and remote well control (e.g., Supervisory Control and Data Acquisition).	Note: Use of telemetry is a standard practice in the industry as it increases overall efficiency.	
115	(P) Do not issue ROWs to counties on newly constructed energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.		
116	(P) Restrict vehicle traffic to only authorized users on newly constructed routes (use signing, gates, etc.).	Section 1, Travel and Transportation, Policy F (above) applies here.	

117	(P) Use dust abatement practices on roads and pads.		
118	(P) Close and rehabilitate duplicate roads.		
Fluid Mineral Operations Priority Habitat			
119	(P) Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.	Best Management Practice B: Encourage clustering / centralization of disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.	
120	(P) Use directional and horizontal drilling to reduce surface disturbance.	Best Management Practice C: Encourage use of directional and horizontal drilling to reduce surface disturbance, and adoption of new technologies .	
121	(P) Place infrastructure in already disturbed locations where the habitat has not been restored.	Best Management Practice D: Encourage placement of infrastructure in already disturbed locations where the habitat has not been restored.	
122	(P) Consider using oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.	Best Management Practice E: Encourage use of oak (or other material) mats for drilling activities to reduce vegetation disturbance and for roads between closely spaced wells to reduce soil compaction and maintain soil structure to increase likelihood of vegetation reestablishment following drilling.	
123	(P) Apply a phased development approach with concurrent reclamation.	Best Management Practice F: Encourage a phased development approach with concurrent reclamation.	
124	(P) Place liquid gathering facilities outside of priority areas. Have no tanks at well locations within priority areas (minimizes perching and nesting opportunities for ravens and raptors and truck traffic). Pipelines must be under or immediately adjacent to the road (Bui et al. 2010).	Best Management Practice G: Encourage placement liquid gathering facilities outside of priority areas. Have no tanks at well locations within priority areas (minimizes perching and nesting opportunities for ravens and raptors and truck traffic). Pipelines must be under or immediately adjacent to the road (Bui et al. 2010).	
125	(P) Restrict the construction of tall facilities and fences to the minimum number and amount needed.	Section 5 Predation Policy (above) applies here.	
126	(P) Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.	Best Management Practice A.	
127	(P) Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.	Section 3, Lands and Realty Management, Policy B.	
128	(P) Bury distribution power lines.		
129	(P) Corridor power, flow, and small pipelines under or immediately adjacent to roads.		
130	(P) Design or site permanent structures which create movement (e.g. a pump jack) to minimize impacts to sage-grouse.		
131	(P) Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce sage-grouse mortality.		
132	(P) Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.	Section 5, Predation Policy (above) applies here.	
133	(P) Control the spread and effects of non-native plant species (Evangelista et al. 2011). (E.g. by washing vehicles and equipment).		

13 ³	(P) Use only closed-loop systems for drilling operations and no reserve pits.		
13 ³	(P) Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).	Best Management Practice 1, West Nile Virus.	
13 ³	(P) Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat: <input type="checkbox"/> Overbuild size of ponds for muddy and non-vegetated shorelines. <input type="checkbox"/> Build steep shorelines to decrease vegetation and increase wave actions. <input type="checkbox"/> Avoid flooding terrestrial vegetation in flat terrain or low lying areas. <input type="checkbox"/> Construct dams or impoundments that restrict down slope seepage or overflow. <input type="checkbox"/> Line the channel where discharge water flows into the pond with crushed rock. <input type="checkbox"/> Construct spillway with steep sides and line it with crushed rock. <input type="checkbox"/> Treat waters with larvicides to reduce mosquito production where water occurs on the surface.		
13 ³	(P) Limit noise to less than 10 decibels above ambient measures (20-24 dBA) at sunrise at the perimeter of a lek during active lek season (Patricelli et al. 2010, Blickley et al. <i>In preparation</i>).	Section 7, Mineral Development, Policy B (above) applies here.	
13 ³	(P) Require noise shields when drilling during the lek, nesting, broodrearing, or wintering season.		
13 ³	(P) Fit transmission towers with anti-perch devices (Lammers and Collopy 2007).	Section 3, Lands and Realty Management, Policy B (above) applies here.	
14 ⁴	(P) Require sage-grouse-safe fences.		
14 ⁴	(P) Locate new compressor stations outside priority habitats and design them to reduce noise that may be directed towards priority habitat.	Best Management Practice B.	
14 ⁴	(P) Clean up refuse (Bui et al. 2011).	Section 5, Predation Policy (above) applies here.	
14 ⁴	(P) Locate man camps outside of priority habitats.	Best Management Practice B.	
Fluid Minerals Reclamation Priority Habitat			
14 ⁴	(P) Include objectives for ensuring habitat restoration to meet sage-grouse habitat needs in reclamation practices/sites (Pyke 2011). Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.	Section 9, Habitat Restoration Policies A, B, C, D, and E (above) apply here. Best Management Practice F.	
14 ⁴	(P) Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.		
14 ⁴	(P) Restore disturbed areas at final reclamation to the pre-disturbance landforms and desired plant community.		
14 ⁴	(P) Irrigate interim reclamation if necessary for establishing seedlings more quickly.		
14 ⁴	(P) Utilize mulching techniques to expedite reclamation and to protect soils.		

14 ^d	(G) Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.	Note that Garfield County GIS analysis does not support the recognition of BLM's General Habitat category. As verified in the Garfield County mapping, large blocks of continuous sagebrush do not exist in the Plan Area.	
15 ^d	(G) Do not issue ROWs to counties on energy development roads, unless for a temporary use consistent with all other terms and conditions included in this document.		
15	(G) Establish speed limits to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.		
15 ^d	(G) Coordinate road construction and use among ROW holders.		
15 ^d	(G) Construct road crossing at right angles to ephemeral drainages and stream crossings.		
15 ^d	(G) Use dust abatement practices on roads and pads.		
15 ^d	(G) Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.		
Fluid Minerals Operations General Habitat			
15 ^d	(G) Cluster disturbances, operations (fracture stimulation, liquids gathering, etc.), and facilities.		
15 ^d	(G) Use directional and horizontal drilling to reduce surface disturbance.		
15 ^d	(G) Clean up refuse (Bui et al. 2010).		
15 ^d	(G) Restrict the construction of tall facilities and fences to the minimum number and amount needed.		
16 ^d	(G) Cover (e.g., fine mesh netting or use other effective techniques) all drilling and production pits and tanks regardless of size to reduce sage-grouse mortality.		
16	(G) Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.		
16 ^d	(G) Use remote monitoring techniques for production facilities and develop a plan to reduce the frequency of vehicle use.		
16	(G) Control the spread and effects from non-native plant species. (e.g., by washing vehicles and equipment).		
16 ^d	(G) Restrict pit and impoundment construction to reduce or eliminate augmenting threats from West Nile virus (Dougherty 2007).		
Fluid Minerals Reclamation General Habitat			
16 ^d	(G) Include restoration objectives to meet sage-grouse habitat needs in reclamation practices/sites (Pyke 2011). Address post reclamation management in reclamation plan	Note that Garfield County GIS analysis does not support the recognition	

	such that goals and objectives are to enhance or restore sage-grouse habitat.	of BLM's General Habitat category. As verified in the Garfield County mapping, large blocks of continuous sagebrush do not exist in the Plan Area.	
LOCATABLE MINERALS			
Locatable Minerals Roads All Designated Habitat			
16 ^d	(ADH) Design roads to an appropriate standard no higher than necessary to accommodate their intended purpose.	Note that Garfield County GIS analysis does not support the recognition of BLM's General Habitat category. As verified in the Garfield County mapping, large blocks of continuous sagebrush do not exist in the Plan Area.	
16 ^e	(ADH) Locate roads to avoid important areas and habitats.		
16 ^f	(ADH) Coordinate road construction and use among ROW holders.		
16 ^g	(ADH) Construct road crossing at right angles to ephemeral drainages and stream crossings.		
17 ^h	(ADH) Establish speed limits on BLM system roads to reduce vehicle/wildlife collisions or design roads to be driven at slower speeds.		
17 ⁱ	(ADH) Do not issue ROWs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.		
17 ^j	(ADH) Restrict vehicle traffic to only authorized users on newly constructed routes (e. g., use signing, gates, etc.).		
17 ^k	(ADH) Use dust abatement practices on roads and pads.		
17 ^l	(ADH) Close and reclaim duplicate roads, by restoring original landform and establishing desired vegetation.		
Locatable Minerals Operations All Designated Habitat			
17 ^m	(ADH) Cluster disturbances associated with operations and facilities as close as possible.	Note that Garfield County GIS analysis does not support the recognition of BLM's General Habitat category. As verified in the Garfield County mapping, large blocks of continuous sagebrush do not exist in the Plan Area.	
17 ⁿ	(ADH) Place infrastructure in already disturbed locations where the habitat has not been restored.		
17 ^o	(ADH) Restrict the construction of tall facilities and fences to the minimum number and amount needed.		
17 ^p	(ADH) Site and/or minimize linear ROWs to reduce disturbance to sagebrush habitats.		
17 ^q	(ADH) Place new utility developments (power lines, pipelines, etc.) and transportation routes in existing utility or transportation corridors.		
18 ^r	(ADH) Bury power lines.		
18 ^s	(ADH) Cover (e.g., fine mesh netting or use other effective techniques) all pits and tanks regardless of size to reduce sage-grouse mortality.		

18	(ADH) Equip tanks and other above ground facilities with structures or devices that discourage nesting of raptors and corvids.		
18	(ADH) Control the spread and effects of non-native plant species (Gelbard and Belnap 2003, Bergquist et al. 2007).		
18	(ADH) Restrict pit and impoundment construction to reduce or eliminate threats from West Nile virus (Doherty 2007).		
18	(ADH) Remove or re-inject produced water to reduce habitat for mosquitoes that vector West Nile virus. If surface disposal of produced water continues, use the following steps for reservoir design to limit favorable mosquito habitat: <input type="checkbox"/> Overbuild size of ponds for muddy and non-vegetated shorelines. <input type="checkbox"/> Build steep shorelines to decrease vegetation and increase wave actions. <input type="checkbox"/> Avoid flooding terrestrial vegetation in flat terrain or low lying areas. <input type="checkbox"/> Construct dams or impoundments that restrict down slope seepage or overflow. <input type="checkbox"/> Line the channel where discharge water flows into the pond with crushed rock. <input type="checkbox"/> Construct spillway with steep sides and line it with crushed rock. <input type="checkbox"/> Treat waters with larvicides to reduce mosquito production where water occurs on the surface.		
18	(ADH) Require sage-grouse-safe fences around sumps.		
18	(ADH) Clean up refuse (Bui et al. 2010).		
18	(ADH) Locate man camps outside of priority sage-grouse habits.		
Locatable Minerals Reclamation			
All Designated Habitat			
18	(ADH) Include restoration objectives to meet sage-grouse habitat needs in reclamation practices/sites. Address post reclamation management in reclamation plan such that goals and objectives are to protect and improve sage-grouse habitat needs.	Note that Garfield County GIS analysis does not support the recognition of BLM's General Habitat category. As verified in the Garfield County mapping, large blocks of continuous sagebrush do not exist in the Plan Area.	
19	(ADH) Maximize the area of interim reclamation on long-term access roads and well pads including reshaping, topsoiling and revegetating cut and fill slopes.		
19	(ADH) Restore disturbed areas at final reclamation to pre-disturbance landform and desired plant community.		
19	(ADH) Irrigate interim reclamation as necessary during dry periods.		
19	(ADH) Utilize mulching techniques to expedite reclamation.		
19	(ADH) Do not issue ROWs to counties on mining development roads, unless for a temporary use consistent with all other terms and conditions included in this document.		
FIRE MANAGEMENT			
Fire Management—Fuels Management			
All Designated Habitat			

19	(ADH) 1. Where applicable, design fuels treatment objective to protect existing sagebrush ecosystems, modify fire behavior, restore native plants, and create landscape patters which most benefit sage-grouse habitat.			
19	(ADH) 2. Provide training to fuels treatment personnel on sage-grouse biology, habitat requirements, and identification of areas utilized locally.			
19	(ADH) 3. Use fire prescriptions that minimize undesirable effects on vegetation or soils (e.g., minimize mortality of desirable perennial plant species and reduce risk of hydrophobicity).			
19	(ADH) 4. Ensure proposed sagebrush treatments are planned with interdisciplinary input from BLM and /or state wildlife agency biologist and that treatment acreage is conservative in the context of surrounding sage grouse seasonal habitats and landscape.			
19	(ADH) 5. Where appropriate, ensure that treatments are configured in a manner (e.g., strips) that promotes use by sage-grouse (See Connelly et al., 2000*).			
20	(ADH) 6. Where applicable, incorporate roads and natural fuel breaks into fuel break design.			
20	(ADH) 7. Power-wash all vehicles and equipment involved in fuels management activities prior to entering the area to minimize the introduction of undesirable and/or invasive plant species.			
20	(ADH) 8. Design vegetation treatment in areas of high frequency to facilitate firefighting safety, reduce the risk of extreme fire behavior; and to reduce the risk and rate of fire spread to key and restoration habitats.			
20	(ADH) 9. Give priority for implementing specific sage-grouse habitat restoration projects in annual grasslands first to sites which are adjacent to or surrounded by sage-grouse key habitats. Annual grasslands are second priority for restoration when the sites not adjacent to key habitat, but within 2 miles of key habitat. The third priority for annual grasslands habitat restoration projects are sites beyond 2 miles of key habitat. The intent is to focus restoration outward from existing, intact habitat.	Note that Garfield County GIS analysis does not support the recognition of BLM's General Habitat category. As verified in the Garfield County mapping, large blocks of continuous sagebrush do not exist in the Plan Area.		
20	(ADH) 10. As funding and logistics permit, restore annual grasslands to a species composition characterized by perennial grasses, forbs, and shrubs.			
20	(ADH) 11. Emphasize the use of native plant species, recognizing that non-native species may be necessary depending on the availability of native seed and prevailing site conditions.			
20	(ADH) 12. Remove standing and encroaching trees within at least 100 meters of occupied sage-grouse leks and other habitats (e.g., nesting, wintering, and brood rearing) to reduce the availability of perch sites for avian predators, as appropriate, and resources permit.			
20	(ADH) 13. Protect wildland areas from wildfire originating on private lands, infrastructure corridors, and recreational areas.			
20	(ADH) 14. Reduce the risk of vehicle or human-caused wildfires and the spread of invasive species by planting perennial vegetation (e.g., green-strips) paralleling road rights-of-way.			
20	(ADH) 15. Strategically place and maintain pre-treated strips/areas (e.g., mowing, herbicide application, and strictly managed grazed strips) to ail in controlling wildfire should wildfire occur near key habitats or important restoration areas (such as where investments in restoration have already been made).			
Fire Management All Designated Habitat				
21	(ADH) 1. Develop state-specific sage-grouse reference information and resource materials containing maps, a list of resource advisors, contact information, local guidance, and other relevant information.		Note that Garfield County GIS analysis does not support the recognition of BLM's General Habitat category. As verified in the Garfield County mapping, large blocks of continuous sagebrush do not exist in the Plan	
21	(ADH) 2. Provide localized maps to dispatch offices and extended attack incident commanders for use in prioritizing wildfire suppression resources and designing			

	suppression tactics.	Area.	
21	(ADH) 3. Assign a sage-grouse resource advisor to all extended attack fires in or near key sage-grouse habitat areas. Prior to the fire season, provide training to sage-grouse resource advisors on wildfire suppression organization, objectives, tactics, and procedures to develop a cadre of qualified individuals.		
21	(ADH) 4. On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in sage-grouse habitat areas.		
21	(ADH) 5. During periods of multiple fires, ensure line officers are involved in setting priorities.		
21	(ADH) 6. Locate wildfire suppression facilities (i.e., base camps, spike camps, drop points, staging areas, and heli-bases) in areas where physical disturbance to sage-grouse habitat can be minimized. These include disturbed areas, grasslands, near roads/trails or in other areas where there is existing disturbance or minimal sagebrush cover.		
21	(ADH) 7. Power-wash all firefighting vehicles, to the extent possible, including engines, water tenders, personnel vehicles, and ATVs prior to deploying in or near sage-grouse habitat areas to minimize noxious weed spread.		
21	(ADH) 8. Minimize unnecessary cross-country vehicle travel during fire operations in sage-grouse habitat.		
21	(ADH) 9. Minimize burnout operations in key sage-grouse habitat areas by constructing direct fireline whenever safe and practical to do so.		
21	(ADH) 10. Utilize retardant and mechanized equipment to minimize burned acreage during initial attack.		
22	(ADH) 11 As safety allows, conduct mop-up where the black adjoins unburned islands, dog legs, or other habitat features to minimize sagebrush loss.		