

Too Little and Too Late

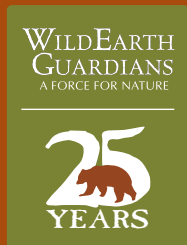
Inadequate Regulatory Mechanisms and the Plight of the Gunnison Sage Grouse

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EXECUTIVE SUMMARY

While elected officials have recently touted state and local regulations as the ideal solution to address the decline of the Gunnison sage grouse and its habitat, these regulations have historically proven inadequate to protect the bird and indeed have played a role in the species' decline. Due to habitat loss and degradation, the Gunnison sage grouse now occupies just 7% of its original range and is reduced to a tiny fraction of its original population (USFWS 2013). Human population expansion and rural sprawl have already taken a significant toll on key habitats for Gunnison sage grouse, and resulting habitat fragmentation from this type of development continues. Pervasive cattle grazing has reduced grasses used for hiding cover by Gunnison sage grouse below levels necessary to evade predators, representing one of the most serious problems facing Gunnison sage grouse in the species' heavily declining satellite populations. Several of the remaining populations are at risk from encroaching oil and gas development and other threats.

Against the background of a potential 'endangered' listing of the bird, state and local governments and federal land managers have made some efforts, albeit inadequate ones, to emplace regulations that might stave off Endangered Species Act regulation. Some political leaders have argued that these local regulations are an adequate substitute for the protections of the Endangered Species Act.

This report evaluates the efficacy of state and local conservation measures that are currently in place based on their effectiveness according to the best available science and the certainty of the measures' implementation. Key findings of this report include:

- Habitat loss and fragmentation from new development and infrastructure is the primary threat to the species, yet no local, state or federal regulations limit new development and infrastructure below thresholds for persistence for Gunnison sage grouse populations.
- Habitat degradation caused by livestock grazing and its elimination of appropriate levels of vegetation cover in nesting and brood-rearing habitats create problems for Gunnison sage grouse yet are not addressed by local, state, and federal regulations.
- Local regulations rely almost entirely on requiring permits to be issued for development in key habitats, but provide no certainty that such permits for projects destructive to grouse habitat will be withheld, even when it is clear that such projects will contribute to population declines.
- Rural sprawl, property subdivision, and development of homes and related infrastructure are the most significant threat in the Gunnison Basin population, but even in Gunnison County where permitting requirements apply to most sage grouse habitats, development harmful to sage grouse continues to be permitted.
- In some counties, the 0.6-mile lek buffers where building permits are required, even if fully enforced, do not ensure the continued existence of sufficient habitat to allow viable sage grouse populations and indeed leave more than 96% of nesting habitat surrounding the lek unprotected.
- Conservation easements provide some protection from subdivision and building construction, but 82.6% of private lands classified as potential Gunnison sage grouse habitats lack easements.

- Half of the Gunnison sage grouse habitat is federal land. Despite the plight of the Gunnison sage grouse being far more dire than that of the greater sage grouse, the Bureau of Land Management (BLM) does not have adequate Gunnison sage grouse habitat protections in its land-use plans, and made no effort so far to insert them over the 14-year period since the Gunnison sage grouse became a candidate for protection under the Endangered Species Act. The BLM committed very recently to amending its land-use plans include stronger conservation measures for the species. Other federal agencies manage a smaller proportion of the species' remaining habitat, but have similarly failed to include adequate grouse protections in their land-use plans.
- The highly-touted eleven-county agreement on Gunnison sage grouse conservation contains not one implementable conservation measure for sage grouse, and only binds participating counties to continue to talk about sage grouse conservation at an unspecified future date.

Seven populations of Gunnison sage grouse currently persist. The single, quasi-stable population in the Gunnison Basin is estimated at 4,160 birds centered in Gunnison County, while the other six populations are isolated, fragmented, and already nearing extinction. Gunnison County and federal agencies in the Gunnison Basin are doing much more than most other counties to conserve Gunnison sage grouse, but given ongoing habitat losses, even with current regulations the survival of the Gunnison Basin population remains at risk. Given the uncertainties faced by all remaining populations, decisive conservation action has come too late, and protective measures are too little. Thus, a Gunnison sage grouse listing under the Endangered Species Act is necessary. Based on 2012 lek surveys, total population estimates were only 172 total birds for the San Miguel population, 103 birds for Monticello – Dove Creek, 54 birds for the Piñon Mesa population, 98 birds in the Crawford population, and at least 54 birds for the Cerro/Sims/Cimarron population¹ (USFWS 2013).

The bottom line is that additional and more effective conservation measures are required in order to eliminate threats to Gunnison sage-grouse and reduce the species' risk of extinction, regardless of the question whether the best mechanism to achieve this is Endangered Species Act listing or some combination of other regulatory mechanisms. Now is the time to take decisive conservation action to put the Gunnison sage grouse on the path to recovery, and all relevant agencies and interested parties need to work together to achieve this end. The longer we delay the adoption of adequate regulations to protect the species, the more difficult it will become to prevent extinction and achieve recovery. Immediate and decisive action by all parties to adopt adequate regulatory mechanisms is the only way to move toward a situation in which the protections of the ESA are not needed. It is doubtful that this is possible over the next six months, but doing so can certainly ensure much faster recovery and removal from the Endangered Species List.

Cover photo: Noppadol Paothong. Inset photos: Erik Molvar (top), Flickr Creative Commons (lower two).

¹ No birds were counted at leks on Sims Mesa in recent years, but this subpopulation is officially of unknown status.

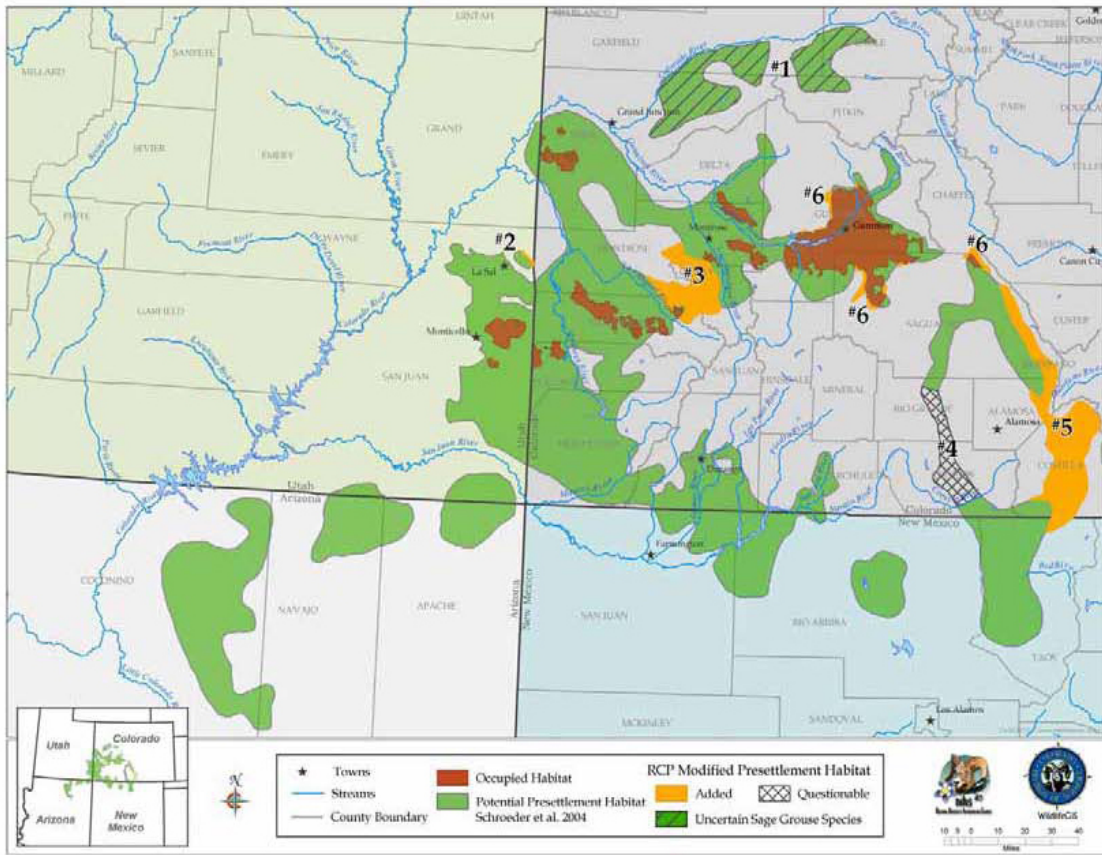


Figure 1. Map of historic and current Gunnison sage grouse range, from Apa et al. (2005).

I. INTRODUCTION

The Gunnison sage grouse is a smaller cousin to the greater sage grouse that inhabits sagebrush steppe habitats in southwestern Colorado and eastern Utah. Much of the sagebrush habitat required by Gunnison sage grouse was destroyed prior to 1958, primarily through overgrazing, and later burning and herbicide treatments (Rogers 1964). Gunnison sage grouse went extinct in New Mexico and Arizona during this period. Between 1958 and 1993, an additional 384,676 acres of sagebrush habitat was destroyed in southwestern Colorado alone (Oyler-McCance et al. 2001). Overall, Gunnison sage grouse are no longer found on 93% of their original range (USFWS 2013). As of 2013, there were an estimated 4,773 Gunnison sage grouse remaining in the wild, some 4,160 of which were in the Gunnison Basin population (USFWS, pers.

comm.). The other six “satellite” populations – which are located in what was originally the heart of the species’ range – are at varying levels of risk for inbreeding, and all are considered to be at extreme risk of extirpation.

The total Gunnison sage grouse population has averaged fewer than 5,000 breeding individuals for the last decade (USFWS 2013). The largest population, in the Gunnison Basin, hovers around 4,000 birds. *Id.* Although the Gunnison Basin population may be of sufficient size to persist **in the absence of threats** (Apa et al. 2005, USFWS 2013), this population faces continued threats that put it at risk of extinction over the long term.

All of the six remaining populations outside of the Gunnison Basin are very small, isolated, and at risk of extinction, even in the absence of further threats, based on the

population viability analysis in the Rangewide Conservation Plan, an overall declining population trend, population declines since the RCP population viability analysis was completed, and 2011 population estimates (USFWS 2013).

Further, six of the seven populations may have effective sizes low enough to induce inbreeding depression, and all seven may be losing adaptive potential (Stiver et al. 2008). Combined with the threats to the species, inbreeding depression and loss of adaptive potential may compromise the long-term viability of the species (USFWS 2013).

With limited population size and existing threats to the bird, there are currently no strongholds for population persistence, including the Gunnison Basin (Wisdom et al. 2011).

Multiple studies have suggested that species viability could depend on 5,000 or more individuals (Traill et al. 2010; Frankham et al. 2002) and, while others have questioned this figure (Flather et al. 2011), the same critics agree that species persistence likely depends on populations numbering thousands, not hundreds, of individuals (Flather et al. 2011; *see also* Soulé 1987; Allendorf and Ryman 2002). The total population of the Gunnison sage grouse is already below this threshold, and likely to drop far below the threshold if the remaining small populations are extirpated, or the Gunnison Basin population declines in response to threats in the future.

Maintaining and increasing the size of the Gunnison Basin population is important in order to ensure the long-term persistence of the species through providing insurance against catastrophic events (e.g. drought, disease, extirpation of the six small populations outside the Basin), increasing adaptive potential, and allowing for translocations to augment the small populations.

Increasing the size of the six small populations outside of the Gunnison Basin is essential to ensuring their persistence over the short term (as they are currently vulnerable to extirpation due to inbreeding depression and random demographic or environmental events). These small populations retain 25%

of the overall genetic diversity of the species and collectively represent a substantial pool of individuals needed to buffer catastrophic, unforeseen losses possible in the Gunnison Basin (Apa et al. 2005: 2-3).

Based on its declining numbers and its recognition as a unique species of grouse, the Gunnison sage grouse was placed on the Candidate Species list for Endangered Species Act protection with a ‘warranted, but precluded’ finding in January of 2000. In 2003, the priority number for the species was changed through a Candidate Notice of Review from 5 to 2 (on a scale of 1 to 12, with 1 being highest priority) in response to increasingly imminent and serious threats. In April of 2006, the U.S. Fish and Wildlife Service (Service) published a finding that the species was “not warranted” for Endangered Species Act protection. This conclusion was found by subsequent court rulings to be the result of political tampering by Julie MacDonald, a Bush administration appointee, as a result of a lawsuit by San Miguel County, Colorado and conservation groups. The lawsuit was settled and a new listing deadline was set for June of 2010, when the Gunnison sage grouse was returned to the Candidate Species list with a new ‘warranted, but precluded’ finding. Legal challenges by conservation groups ultimately forced the Service to clear its backlog of 252 candidate species found to be “warranted” for protection but “precluded by higher priorities,” because the Service was not making ‘expeditious progress’ in working through the backlog of “higher priority” species awaiting Endangered Species Act protection. A legal settlement between WildEarth Guardians and the Service requires the agency to make a final determination on the Gunnison sage grouse by September 2013. After exhausting its legally permitted extensions of time, the Service requested an additional six month delay in May 2014, which WildEarth Guardians agreed to in exchange for agency commitments to improve conservation measures for the species. The final listing determination for the species is due November 12, 2014.

The Gunnison sage grouse is distinct from the greater sage grouse in several ways. It has

a slightly smaller body size (Hupp and Braun 1991) and has significantly different plumage, breeding displays, and vocalizations (Young 1994) when compared to the greater sage grouse. Yet the Gunnison sage grouse is similar to greater sage grouse in its behavior and ecology (Young 1994). Relatively few specific studies have been conducted on the Gunnison sage grouse to determine appropriate conservation measures and allowable levels of impact that can be sustained without significant consequences, but a great many scientific studies have delved into these same subjects for the closely-related greater sage grouse. The Crawford Area Gunnison Sage-Grouse Conservation Plan (p. 31) addresses the matter this way:

In recent years, a number of scientific studies have been published on the effects of oil and gas development on sage-grouse. While the studies have primarily focused on GRSG, we feel that with the lack of specific data on GUSG, the studies on GRSG provide the best available science.

The San Miguel Conservation Plan includes virtually identical language.

Sage grouse are known as landscape species, requiring vast tracts of undisturbed sagebrush habitat (Holloran 2005, Connelly et al. 2011, Knick and Connelly 2011). Sagebrush is the key habitat component, providing food and cover for most of the year, but forbs and insects become important dietary components during early brood-rearing (Connelly et al. 2011). Leks, where mating displays and breeding occur in early spring, are key habitats, and also are the hub of nesting activity (Autenreith 1985). Brood-rearing activities occur initially in uplands near the nest site, and later along riparian corridors and wet meadows that stay green as surrounding habitats dry out throughout the summer (Hanser et al. 2011). Wintering habitats are also important for the survival of the bird (Doherty et al. 2008). Sage grouse exhibit strong fidelity to lek sites (Emmons and Braun 1984) and even individual nest sites (Berry and Eng 1985, Fischer et al. 1993).

This fidelity to lek sites is so strong that when Blue Mesa Reservoir was created by damming the Gunnison River in 1966, Gunnison sage grouse returned to the site of their inundated lek for several years and displayed on the reservoir ice.² There is a tendency for sage grouse to return to habitats degraded by human developments even when using these habitats reduces survival or reproductive success, and for this reason population declines often lag 2 to 10 years behind the act of habitat destruction (Holloran 2005, Walker et al. 2007, Harju et al. 2010).

With the exception of National Park Service lands, most federal lands (comprising a little more than 50% of the Gunnison sage grouse proposed Critical habitat) are managed for multiple uses. These multiple uses include many activities, such as livestock grazing, mountain biking and off-road motorized vehicle use, oil and gas development, and powerline siting, all of which are potentially detrimental to Gunnison sage grouse habitats. Private lands are typically managed for agricultural purposes (such as haying and livestock grazing), which themselves are not always compatible with grouse habitat needs, and these private lands are subject to subdivision and rural residential development that can eliminate habitat values entirely. County and state regulations tend to be limited to zoning and permitting requirements, which may, or may not, address rural roadbuilding or structural construction but rarely provide management or even guidance for other land uses.

When the Service made findings that the species was warranted for protection under the Endangered Species Act, one of the principle threats the agency identified was 'inadequacy of regulatory mechanisms' (USFWS 2010). In order to constitute an adequate regulatory mechanism that can prevent the need to list the species, there must be a high degree of certainty that the conservation measure will be implemented, and that it will be effective based on the best

² Jessica Young, biologist with Western State College, as interviewed by High Country News in an article titled, "Last dance for the sage grouse?" by Hal Clifford, published February 4, 2002.

available science under the USFWS' Policy for Evaluating Conservation Efforts when Making Listing Decisions (or 'PECE policy'). For the reasons outlined below, the inadequacy of regulatory mechanisms to protect the Gunnison sage grouse and its most important habitats has yet to be corrected.

II. THE INADEQUACY OF OPTIONAL GUIDELINES

There are a number of optional sets of guidelines assembled in conservation plans that have been proposed by state and local working groups, comprised of a broad diversity of interest groups including those—such as ranching and mineral industries—that have contributed to the decline of the Gunnison sage grouse through habitat loss and degradation. These vary by their basis in science and their effectiveness, with the San Miguel Basin and Crawford Area conservation plans getting strong marks for adhering to the best available science, while the Rangewide Conservation Plan espouses proposed conservation measures that are far weaker than the recommendations of the best available science. These conservation plans have a common deficiency, however: No governmental body is fully implementing them. Their recommendations are not explicitly required by any state, local or federal regulation, and the conservation plans themselves acknowledge that they are recommendations only, and are not intended to be implemented as requirements.

There are no recorded instances of federal, local or state governments requiring the full implementation of any one of these locally-generated plans. This is a crippling flaw. Unless the Service can conclude that existing regulatory mechanisms are adequate to protect the bird, that listing factor alone can and will require the bird be listed under the Endangered Species Act.

A. Inadequacies of the Rangewide Conservation Plan

The State of Colorado's Rangewide Conservation Plan (RCP), published in 2005, was the first effort at comprehensively codifying Gunnison sage grouse protection measures. Recommendations in this plan are being incorporated in a partial and piecemeal fashion into Candidate Conservation Agreements with Assurances, documents that give private landowners the assurance that Endangered Species Act requirements will not otherwise apply on their lands if the bird is listed. Recommendations in this plan are also being incorporated in a partial and piecemeal fashion into federal land management plans.

A substantial body of scientific literature was published after the Rangewide Conservation Plan was finalized, and many of these studies reveal that the proposed conservation measures in the Rangewide Conservation Plan are inadequate to maintain healthy sage grouse populations. The need to update the RCP to incorporate relevant findings of recent research is widely recognized, and is in fact one of the aims of the 11-County Agreement on Gunnison sage grouse, although the agreement fails to establish a timeline or identify funding to update the plan. Until the RCP is updated to incorporate recent science, it cannot provide adequate guidance on what conservation measures are adequate to conserve the species. When the plan is updated, it should be done in close coordination with the USFWS in order to ensure that conservation measures in the plan are adequate to recover the species.

1. Inadequate Buffers to Protect Breeding and Nesting Habitat

Throughout the Rangewide Conservation Plan, restrictions were recommended for activities that potentially impact Gunnison sage grouse and their habitats, including roads, housing, powerlines, fences, and surface-disturbing activities related to oil and gas development. However, the recommended restrictions apply only within 0.6 mile of active leks. This lek buffer is now known to be completely inadequate to

prevent major impacts to sage grouse populations.

No scientific study has ever recommended a 0.6-mile radius for protecting breeding or nesting habitat for sage grouse. Male greater sage grouse use shrubs <1 km (0.6 mi) from a lek for foraging, loafing, and shelter (Rothenmeier 1979, Autenreith 1981, Emmons and Braun 1984), but there is no science to indicate that preventing human disturbances within 0.6 mile of a lek will eliminate or minimize negative population impacts on sage grouse.

Numerous studies on the impacts of various types of development on greater sage grouse indicate that human intrusions into sage grouse nesting habitat within 4 miles of the lek have significant impacts on grouse populations. The best available science has recorded significant negative impacts from individual producing (post-drilling) oil and gas wells drilled within 1.9 miles from active leks (Holloran 2005), and standard energy development within 2 miles of a lek is projected to reduce the probability of lek persistence from 87% to 5% (Walker et al. 2007). Measureable impacts from coalbed methane fields extend out to 4 miles (Walker 2008), and new research has recorded effects as far away as 12.4 miles from leks (Taylor et al. 2012). According to Taylor et al (2012: 27),

“... female sage-grouse that visit a lek use an approximately 9-mi (15-km) radius surrounding the lek for nesting; a 2-mi (3.2-km) radius encompasses only 35-50% of nests associated with the lek (Holloran and Anderson 2005, Tack 2009). While a lek provides an important center of breeding activity, and a conspicuous location at which to count birds, its size is merely an index to the population dynamics in the surrounding habitat. Thus attempting to protect a lek, without protecting the surrounding habitat, provides little protection at all.”

Assuming a circular buffer from a single centerpoint, an 0.6-mile lek buffer would cover 1.13 square miles, while a 4-mile buffer

covers 50.27 square miles. The Rangewide Conservation Plan assumes that 90% of Gunnison sage grouse nest within a 4-mile radius of the lek, while Apa (2004) recorded 87% of Gunnison sage grouse nesting activity within this radius. Assuming for the sake of argument that a 4-mile buffer takes in the most important nesting habitat, then by area, a 0.6-mile lek buffer protects less than 4% of the most important nesting habitat for birds using the lek.

The Wyoming Game and Fish Department, using lek buffers of 0.25 mile, 0.5 mile, 0.6 mile, 1.0 mile, and 2.0 mile, estimated lek persistence of 4, 5, 6, 10, and 28 percent, respectively (Apa et al. 2008). Taylor et al. (2012: 27) examined sage grouse dynamics in the Powder River Basin and found, “For oil and gas development, the signal is strongest within a 12.4-mi (20-km) radius of a lek, and it is much stronger at this radius than at any smaller radii.”

The Rangewide Conservation Plan only requires protective buffers of 0.6 miles around leks in designated core habitat; this corresponds to a 6% probability of lek persistence (Apa et al. 2008). By comparison, the Bureau of Land Management (BLM) National Technical Team report recommends a 4-mile lek buffer for siting industrial development in greater sage grouse habitat (NTT 2011), a prescription in greater accord with the science. Impacts on grouse populations when they are sited much farther than 0.6 mile from the lek. Aldridge et al. (2011) examined Gunnison sage grouse nesting habits and recommended that roads and residential developments be sited more than 1.5 miles from crucial nesting habitat, not just the lek sites themselves; this would mean lek buffers for Gunnison sage grouse of 5.5 miles, assuming the 4-mile radius for nesting observed by Apa (2004).

2. Inadequate Limits on Livestock Grazing

Improper livestock grazing is consistently recognized as a human-caused impact contributing significantly to Gunnison sage grouse habitat degradation. According to USFWS (2013: 2503), “grazing management has likely resulted in degraded habitat

conditions for Gunnison sage-grouse in portions of the Gunnison Basin.”

The Rangewide Conservation Plan recommends the maintenance of 4 to 6 inches of remaining grass stubble height in breeding and nesting habitat to provide sufficient hiding cover for sage grouse. This recommendation was based on two Gunnison sage grouse studies, Young (1994) and Apa (2004). This recommendation differs markedly from the recommendations of Connelly et al. (2000), which recommended 18 cm (over 7 inches) of residual stubble height for greater sage grouse hiding cover in the same habitats. It is important to note that Connelly et al. (2000) included sage grouse habitats on the Colorado Plateau, and that its focus on the Great Basin encompassed lands with similar or lower site potential for tall grass as the range of the Gunnison sage grouse.

The findings of Connelly et al. (2000) were subjected to the rigors of the peer-review scientific literature, while Young (1994) and Apa (2004) were correctly classified by the Service as “Grey Research Based on Data” (USFWS, no date). However, Young (1994) is a PhD dissertation that was subjected to the review of a committee of PhD reviewers and subjected to a dissertation defense, and is based on data analysis that was statistically rigorous according to the standards of its time, so it can be accorded a similar level of scientific integrity as Connelly et al. (2000).

Young (1994) was a study primarily focused on sexual selection in Gunnison sage grouse, and how the evolution of behavioral and plumage differences in male and female Gunnison sage grouse resulted in the unique characteristics that eventually led to this bird’s formal recognition as its own separate species, distinct from the greater sage grouse. It includes a chapter describing nesting and summer habitat of Gunnison sage grouse. While noting important differences in breeding displays, Young (1994: 31) concluded, “Females in the Gunnison Basin, Colorado share similar ecological traits and habitat preferences with sage grouse studied throughout their range.” Young (1994) examined sagebrush height and density, finding that sage grouse hens chose nest sites

under significantly taller shrubs and with significantly greater sagebrush density in the surrounding area. The conclusions of this study regarding sagebrush were limited to comparative height and density; height and density thresholds critical for nest selection or success were not identified. Successful nest sites were found to have greater percent cover of grasses than unsuccessful nests, and brood rearing habitats were found to have a greater percent cover as well, measured by aerial estimate of proportion of the soil surface shaded by grasses. Grass heights were not measured, however, and no recommendations were made regarding residual grass height in this study to support the 4 to 6 inch stubble height recommendation in the Rangewide Conservation Plan.

Apa (2004) is listed as a Draft of a “Preliminary Report” by the Colorado Division of Wildlife, and apparently was never finalized. Thus, this report is weaker from a scientific perspective than either Young (1994) or Connelly et al. (2000). This CDOW study included measures of habitat use, but explicitly made no effort to measure habitat availability (Apa 2004: 4), and thus is purely descriptive in nature and does not represent a scientific test of the habitat thresholds required by Gunnison sage grouse. Apa (2004: 25) observed that mean grass height for nesting habitat across the study of 10.1 cm was less than the recommended 18 cm published in Connelly et al. (2000), while other vegetation characteristics met the Connelly et al. thresholds for vegetation.

The Rangewide Conservation Plan further recognizes that this study was conducted during a drought year, and therefore grass cover recorded during this study are likely shorter and sparser than would occur during a period of average or greater precipitation. Apa (2004: 30) himself reported,

Portions of Colorado have been experiencing and are categorized as extreme drought since 1997. Therefore many of the understory vegetation characteristics summarized in this report will exhibit the impact of extreme drought. Most notably grass cover and height and forb cover and

height would be impacted.

Even so, the observational data from Apa (2004: 50) indicates that a significant number of sites exceeded the 18 cm threshold for grass height recommended by Connelly et al. (2000), even during this period of extended drought. Prather (2010) found for her Utah study on Gunnison sage grouse that residual grass cover in occupied habitats averaged 23 cm, greater than the Connelly et al. (2000) standard, while unoccupied habitats averaged 15 cm stubble height, less than the Connelly recommendation. Finally, the lack of a ‘use versus availability’ analysis (or ‘resource selection function’) prevents a science-based critical threshold for grass height from being derived from this study, and Apa (2004) does not attempt to recommend any particular residual grass height standard for the range of the Gunnison sage grouse, even while arguing in the absence of definitive data that it is unlikely that grass heights in Colorado would meet the Connelly et al. standard.

Apa (2004: 28) recorded an average nest success of 24% across the range of the species, compared to 40-60% nest success established for healthy populations. If the lower-than-recommended grass height found in this study represented inadequate hiding cover (as suggested by Connelly et al. 2000), the result would be greater nest predation as a contributing cause to depressed nest success found in this study. The data available are not sufficiently detailed to tease out the comparative contributions of predation and food availability to lower nest success during this drought year, however.

While it is possible to argue that Colorado Division of Wildlife biologists who drafted the Rangewide Conservation Plan recommended a lower stubble height requirement for sage grouse hiding cover in response to political pressure from the agriculture industry to minimize restrictions on cattle grazing in Gunnison sage grouse habitats, it is equally possible that the weaker residual grass standard was a best guess based on an eagerness to focus on local studies to the exclusion of more wide-ranging but more scientifically rigorous, published studies. Regardless, the scientific literature does not

support a 4- to 6-inch grass height as adequate to provide hiding cover for a nesting sage grouse. Indeed, a 4-inch grass height would be sufficient to hide only the legs of a grouse.

B. Colorado Oil and Gas Conservation Commission Rules

The Colorado Oil and Gas Conservation Commission has adopted a series of rules under its 1200 series (Protection of Wildlife Habitats) that apply to Gunnison sage grouse. These rules mandate additional procedure but do not impose mandatory requirements that are significant in the context of Gunnison sage grouse conservation.

Rules for Sensitive Wildlife Habitat include Gunnison Sage-grouse Production Areas that have been designated by the state and cover a significant portion of the species’ occupied range. For these Production Areas, the Colorado Parks and Wildlife Department must be consulted on terms and conditions for drilling permits, and a sliding scale of conservation measures may (or may not) be applied. These range from avoiding sensitive habitats, to permitting development with restrictions to minimize impacts, to allowing development with undefined compensatory mitigation. Conditions of Approval may (or may not) include one or more Best Management Practices to reduce impacts. All conservation actions are at the discretion of state officials, and waivers to exempt oil and gas development from conservation measures can also be given.

For Restricted Surface Occupancy areas, including lands within 0.6 mile of a sage grouse lek, operators “shall avoid” siting developments, “to the maximum extent technically and economically feasible.” This is the legal equivalent of “a definite maybe.” Under conditions when siting oil and gas facilities within 0.6 mile of an active sage grouse lek imposes an additional cost or technical challenge to an oil company, these protections would presumably be waived. Even if these protections “excluded” rather than “avoided” industrial development within 0.6 mile of leks without the option of a waiver, the 0.6 mile lek buffer is insufficient to prevent significant harm to sage grouse,

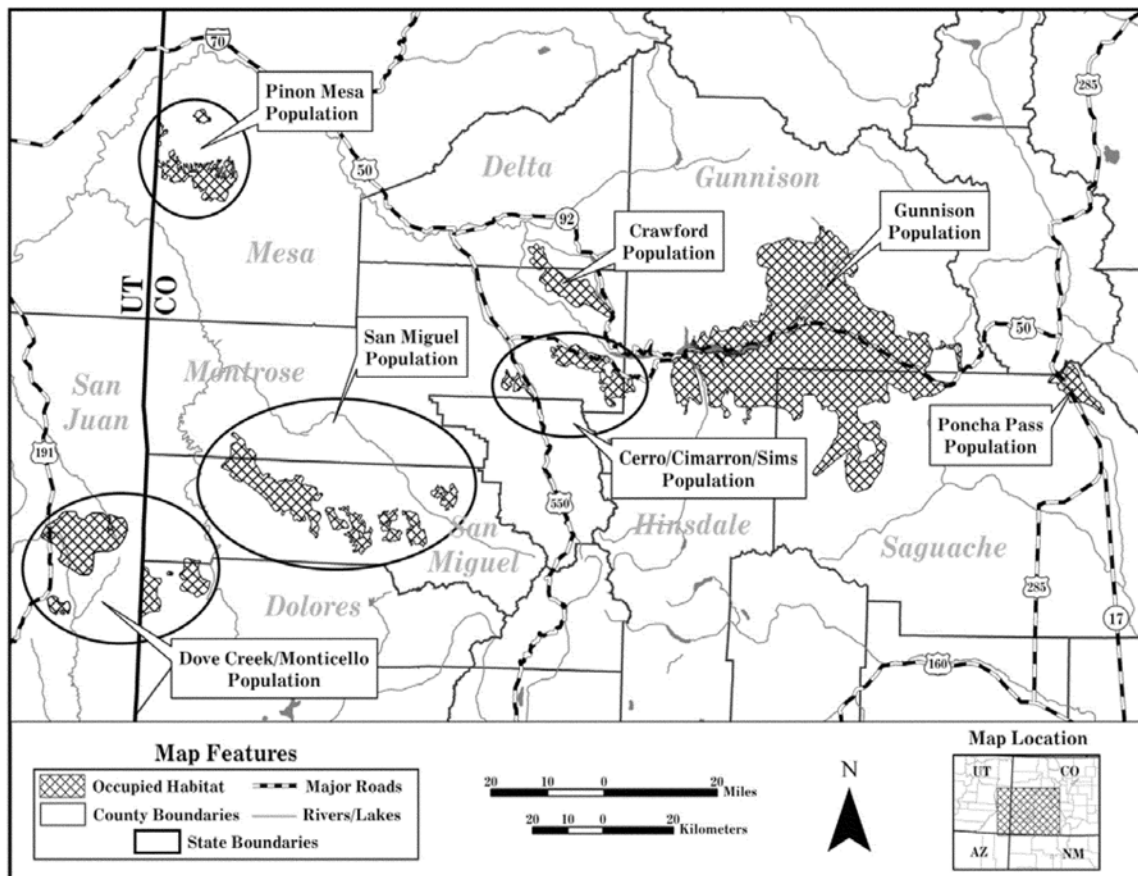


Figure 2. Gunnison sage grouse populations, USFWS (2013).

during either the breeding or nesting phase (see Section II(A) above for additional detail).

A series of best practices are mandated for both Sensitive Wildlife Areas and Restricted Surface Occupancy Zones, but these measures do not address the primary threats to sage grouse.

C. Area-Based Conservation Plans: Stronger, but Still Optional

Local working groups drafted Sage Grouse Conservation Plans for the Crawford area and for San Miguel County. These plans have a much stronger foundation in science than the Rangewide Conservation Plan. “No Surface Occupancy” buffers for oil and gas development are set at 4 miles to protect breeding and nesting habitat around lek sites, rather than the 0.6-mile buffers in the Rangewide Conservation Plan and Gunnison

County ordinances. This approaches a scientifically defensible buffer distance. Both Conservation Plans prevent new road construction within 0.8 mile of leks, and large-scale transmission would be required to stay 1.5 miles from leks. This allows both types of impacts to occur in prime nesting habitat (most of which is within 4 miles of the lek site), but significantly improves upon the 0.6-mile buffers in the Rangewide Conservation Plan. The San Miguel Basin plan recommends avoiding development entirely in important seasonal habitats for sage grouse. However, for all the good intentions of these proposed conservation measures, they are recommendations only, and no ordinance or regulation exists to require implementation.

	Urban/ Commercial Development (Easements/ ROWs)	Oil and Gas Development	Renewable Energy Development	Mining	Roads	Powerlines	Improper Livestock Grazing	Predation (facilitated by infrastructure, disturbance)	Genetic risks/small population size
County Regulations									
Eleven-County Agreement	None	None	None	None	None	None	None	None	None
Delta County	None	None	None	None	Optional Inadequate	None	None	None	None
Dolores County	Optional Inadequate	None	None	None	None	None	None	None	None
Gunnison County	Optional Inadequate	Optional Inadequate	None	Optional Inadequate	Mandatory Adequate*	Mandatory Adequate	None	None	None
Hinsdale County	None	None	None	None	Optional Adequate*	None	None	None	None
Mesa County	Optional Inadequate	None	None	Optional Inadequate	None	Optional Inadequate	None	None	None
Montrose County	Optional Inadequate	None	None	Optional Inadequate	None	None	None	None	None
Ouray County	Optional Inadequate	None	None	Optional Inadequate	Mandatory Inadequate*	None	None	None	None
Saguache County	Optional Inadequate	None	None	None	None	None	None	None	None
San Juan County (UT)	None	None	None	None	None	None	None	None	None
San Miguel County**	Mandatory Inadequate	Mandatory Inadequate & Optional Adequate	Mandatory Inadequate & Optional Adequate	None	Mandatory Inadequate	Mandatory Inadequate	None	None	None
State and Regional Plans									
Rangewide Conservation Plan	Optional Inadequate	Optional Inadequate	Optional Adequate	Optional Inadequate	Optional Adequate	Optional Inadequate	Optional Inadequate	Optional Inadequate	Optional Adequate
San Miguel Basin Conservation Plan	Optional Inadequate	Optional Adequate	None	None	None	Optional Adequate	Optional Inadequate	Optional Inadequate	Optional Adequate
Crawford Area Conservation Plan	None	Optional Adequate	None	None	Optional Inadequate	Optional Adequate	Optional Inadequate	Optional Inadequate	None

*Adequate regarding seasonal road closures; inadequate regarding new road construction

**Wright's Mesa Zining District only

Table 1. Regulatory measures in local and state plans, and how they address major threats to the existence of Gunnison sage grouse populations, either individually or rangewide.

Conservation Measures in Place	Recreational Activity	Poor Habitat Quality (e.g., tree encroachment, invasive weeds)	Fire	Drought and Climate Change	Pesticides	Fences	Water Development	Disease and Parasites	Noise
County Regulations									
Eleven-County Agreement	None	None	None	None	None	None	None	None	None
Delta County	None	None	None	None	None	None	None	None	None
Dolores County	None	None	None	None	None	None	None	None	None
Gunnison County	Optional Adequate	None	None	None	None	Mandatory Inadequate	None	None	Mandatory Adequate for Mining
Hinsdale County	None	None	None	None	None	None	None	None	None
Mesa County	None	None	None	None	None	None	None	None	None
Montrose County	None	None	None	None	None	None	None	None	None
Ouray County	None	None	None	None	None	Optional Inadequate	None	None	None
Saguache County	None	None	None	None	None	None	None	None	None
San Juan County (UT)	None	None	None	None	None	None	None	None	None
San Miguel County	Optional Adequate	Mandatory Inadequate	None	None	None	Optional Adequate	None	None	None
State and Regional Plans									
Rangewide Conservation Plan	Optional Adequate	Optional Inadequate	Optional Inadequate	Optional Adequate	Optional Inadequate	Optional Inadequate	None	Optional Adequate	Optional Adequate
San Miguel Basin Conservation Plan	None	Optional Adequate	None	None	None	Optional Adequate	Optional Inadequate	None	None
Crawford Area Conservation Plan	None	Optional Adequate	None	None	None	Optional Adequate	Optional Inadequate	None	None

Table 2. Regulations in state and local plans and the extent to which they address impacts that collectively threaten the survival of Gunnison sage grouse populations.

III. COUNTY CONSERVATION REGULATIONS

County regulations primarily address the threat of rural subdivision and home development. Current county approaches fail to solve the problem of the cumulative loss and fragmentation of habitat due to development and infrastructure. *See* Tables 1 and 2.

The counties of southwestern Colorado and east-central Utah differ markedly in their approaches to Gunnison sage grouse conservation. Nine counties (Gunnison, Saguache, Delta, Mesa, Montrose, San Miguel, and Dolores in Colorado and San Juan in Utah) are known to have occupied habitat for Gunnison sage grouse (see Figure 2).

Montezuma has no remaining occupied sage grouse habitat or proposed ‘critical habitat’ within its boundaries, but has expressed support for the local efforts of other counties in conserving Gunnison sage grouse. Hinsdale County also asserts that neither occupied habitat nor proposed critical habitat are found within its boundaries, but the Service’s proposed critical habitat rule includes Hinsdale County as a participant, and Hinsdale County has adopted a resolution providing for possible road closures in critical habitat.

Critical habitat is proposed in Grand County, Utah, but to date the county has not participated in the Eleven-County agreement on Gunnison sage grouse and has not adopted regulations protecting the species. A

curious aspect of habitat mapping is that the Piñon Mesa population has considerable occupied habitat along the Colorado border adjacent to Mesa County, but no occupied habitat is shown in Mesa County itself (see Figure 2). It is highly unlikely that Gunnison sage grouse are this assiduous in avoiding the political boundaries of Mesa County, Utah; instead, the likely explanation is that occupied habitat currently occurs in Mesa County but is not officially recognized.

A. Zoning Regulations

The following counties have zoning requirements or “form-based” equivalents: Gunnison, Hinsdale, San Miguel, Mesa, San Juan, and Saguache. Dolores and Delta Counties appear to have none. In Mesa County, the Glade Park Land Use Development Plan explicitly discourages subdivision of rural lands into parcels less than 35 acres in size. In Ouray County, clustering of development is encouraged to avoid rural sprawl, as is the preservation of wildlife habitats. San Miguel County’s Wright’s Mesa Zone Districts also discourage subdivision into parcels smaller than 35 acres, and also direct landowners to avoid development located in wetlands or wildlife habitat areas. This last conservation measure would be a very strong protection for Gunnison sage grouse if it were required. However, “avoidance” by its nature is a recommendation only, and from a legal perspective would have to be changed to “exclusion” to become legally binding and certain in implementation.

B. Building Permit Oversight

Counties vary significantly in their approach to permitting the construction of roads and structures, both of which can have major impacts on Gunnison sage grouse, inside sensitive sage grouse habitats.

1. The Gunnison County Approach

For lands that occur within the Gunnison Sage-grouse Habitat Map, the Gunnison County Land Use Resolution imposes special restrictions that represent the strongest local

conservation requirements within the species’ range. The strongest protection goes to Tier 1 areas, defined by soil mapping as an index to potential habitat type and subtracting lands near roads and subdivisions. According to Gunnison County officials, the Tier 1 areas comprise 58 percent of the Gunnison sage grouse habitats mapped by the Colorado Parks and Wildlife Department (whose mapping does include some undefined quantity of impacted areas that are no longer habitable by sage grouse). In Tier 1 areas, the building envelope may be required to be relocated to avoid or minimize impacts to sage grouse. Review by the county wildlife coordinator is required for both Tier 1 and Tier 2 habitats, which comprise the remainder of state-identified potential habitats. The combination of the two tiers make up the Habitat Map. However, as discussed below, permits for developments such as roads, buildings, and other impacts to sage grouse habitat are allowed and to date have been universally approved in both habitat tiers.

While the Gunnison County Land Use Resolution grants county officials the authority to deny permits in cases where significant impacts cannot be avoided on Tier 1 or Tier 2 habitats, in fact this authority is never exercised. According to county officials, more than 450 permits within key sage grouse habitats have been reviewed by county officials, and as of May 2014 not a single permit has been denied. All requested permits were approved. This indicates a political preference by Gunnison County to allow developments on private property within key Gunnison sage grouse habitats as long as adjustments to the plan are made to reduce, but seldom eliminate, impacts to sage grouse, and/or to require compensatory measures elsewhere, which typically involve reducing threats to sage grouse habitats elsewhere in the county. As discussed below, permitting habitat degradation in one part of the county while reducing the chance of future habitat degradation elsewhere slows the rate of habitat loss and degradation, rather than halting habitat loss and creating a trend toward higher quality habitats that would hopefully support grouse population recovery and expansion.

According to the Standards of Development for Gunnison County, proposed developments that would cause adverse impacts must be mitigated, and “Proposed land use changes that are found to have a significant net adverse impact that cannot be mitigated upon sensitive wildlife habitat, shall be denied.” On its face, this would appear to afford very strong protection to sage grouse and their habitats. However, county employees and commissioners have stated that they have no intention of denying permits due to concerns that the county has no funding for ‘takings’ payments.

Additionally, a broad spectrum of potential projects could count as mitigation, including the purchase of conservation easements. It is not possible to compensate for habitat loss by purchasing conservation easements, because habitat lost on the developed property (loss of sage grouse habitat) cannot be offset by maintaining existing habitat on an easement property (where sage grouse habitat will remain the same). Such an exchange is not a net gain, but rather a net loss, and therefore it is inappropriate to refer to it as mitigation. The net loss of habitat resulting from such a tradeoff is likely result to in population declines. Other options include restrictions on timing of activities to avoid sensitive seasons for grouse, clustering developments, limitations on free-ranging domestic dogs and cats, and avoiding new road construction. Each of these measures reduce the additional impacts imposed by development, but do nothing to increase sage grouse populations or improve habitat over the previous, undeveloped state.

Only provisions for habitat improvement (under the supervision of Colorado Parks and Wildlife) have any potential to increase sage grouse populations off-site to compensate for population decreases resulting from development of occupied habitats on-site. Moreover, such habitat improvement projects are largely speculative and unproven in their benefits to sage grouse at present. Projects not incorporated into current regulations that could potentially improve habitats and support increases in sage grouse populations to compensate for population impacts caused

by habitat loss and degradation include the following:

- Removing existing fences
- Removing existing roads through key habitats
- Removing existing buildings within key habitats
- Converting disturbed lands (such as hayfields) to functional sagebrush habitat
- Burying existing overhead powerlines through sage grouse habitat
- Reducing grazing to meet or exceed the 7-inch stubble height required to provide adequate hiding cover for grouse.

These measures, which have the potential to offer a net improvement of habitat and potentially offset development impacts, are not presently incorporated into the Gunnison County Standards of Development. Because offsetting mitigation practices most frequently maintain existing impact levels rather than improving existing habitats, most developments approved under the Gunnison County standards are likely to result in a net loss in Gunnison sage grouse population numbers when the development and required mitigation are considered together.

In order to meet the regulatory certainty required under the Endangered Species Act, off-setting mitigation should be completed in advance of the onset of construction. Its effectiveness would need to be demonstrated through comparing sage grouse population response in the habitat improvement area versus an untreated, ‘control’ area to demonstrate that the off-setting mitigation actually has resulted in grouse population increases. Then, once sage grouse increases are documented, construction activities projected to result in a corresponding or lesser decrease in sage grouse could be allowed to proceed. This is not the current approach that is being implemented in Gunnison County. Currently, projects move forward with off-setting mitigation that is guessed to have a corresponding positive effect, but which frequently has zero potential to increase populations and in some cases

results in additional (although decreased) population impacts for projects for which off-setting mitigation is applied.

Human population growth in the Gunnison Basin can only be expected to accelerate as a warming climate makes this mountainous area more temperate and attractive compared to overheating climates farther south at low elevations. The Colorado Water Conservation Board (2010) estimated the human population of the broader Gunnison River basin to more than double under all scenarios by 2050. Even in the Gunnison Basin, where the habitat protection level is much stronger than for the satellite populations, there is nothing to prevent the habitats farther than 0.6 mile from active lek sites from filling up with housing developments, roads, fences, and powerlines over time, leaving 96% of Gunnison sage grouse nesting habitat within 4 miles of the lek open to loss and degradation. Thus, the long-term prognosis for resident sage grouse populations would be extirpation even if the 0.6-mile lek buffer were universally enforced (and there are no guarantees that this would happen under even the strongest of the current local regulations).

The Gunnison County Land Use Resolution does include a handful of mandatory measures, which appear to meet Service regulatory certainty requirements. Powerlines must be buried within sage grouse habitat (but it is unclear whether this applies to all mapped habitat or only habitat “near Gunnison sage-grouse leks”), which limits the concentration of avian predator activity in Gunnison sage grouse habitat. This is an important and beneficial standard, as scientific research in Gunnison sage grouse habitats have determined that perch inhibitors are ineffective (Prather 2010). Fences are required to comply with standards to reduce sage grouse collisions, except fences associated with agricultural operations—the very fences that pose the most pervasive threat to sage grouse. These fence standards, where enforced, could reduce but will not eliminate sage grouse fatalities as a result of collisions. Stevens et al. (2013) found that fence collisions are an important source of grouse mortality, and fences on flat areas near leks

were a particularly high risk for causing sage grouse fatalities. Christiansen (2009) also documented an alarmingly high level of fence mortality in Wyoming, and found that marking fences reduced collisions by only 61%, such that 39% of the collision rate on unmarked fences still occurred for marked fence sections. Gunnison County also requires implementation of the Rangewide Conservation Plan provisions (including protections within 0.6 mile of sage grouse leks) in Habitat Map areas, incorporating its improvements, but also its weaknesses (refer to Section II(A)(1) of this report for in-depth analysis).

2. Building Permits in Other Counties

Montrose County requires building permits within 0.6 mile of an active sage grouse lek, and the permit-granting agency is directed to consider the welfare of Gunnison sage grouse or at least wildlife concerns and is encouraged to include mitigation measures in the permit terms and conditions. It is important to note that no county requires that building permits be denied, and only Gunnison County provides an option for them to even be modified, within the area immediately adjacent to a lek. The regulations simply give a regulatory board the authority to deny or to approve construction projects. San Miguel County applies the Rangewide Conservation Plan recommendations on a case-by-case basis (but they are not mandatory) through policy provisions in their Land Use Code. There is no certainty of implementation in these approaches. The Wright’s Mesa Zoning District in San Miguel County does have mandatory requirements for habitat protection; the West End area (which covers the remaining sage grouse habitat in the county) lacks such zoning district requirements.

As noted above, a 0.6-mile lek buffer encompasses less than 4% of the nesting habitat surrounding the lek, leaving the remaining 96% completely unprotected. Over time, with increasing human population, the nesting habitats outside of the 0.6-mile buffer could be allowed to be developed without consideration for the requirements of nesting sage grouse, even in counties that apply 0.6-

mile permitting buffers. Aldridge et al. (2011) tested sage grouse nest selection in the Gunnison Basin and found a significant avoidance of roads and residences. Instead of basing recommendations on distances from leks, these researchers recommended that roads and residential developments be sited more than 1.5 miles away from nesting habitat, rather than basing recommendations on distances from leks.

Similar 0.6-mile lek buffer permit requirements are in place for Ouray County, but in this case the permit would only prevent impacts during the nesting season, so it is questionable whether impact-causing facilities would be actively re-located to avoid or minimize impact to breeding grouse. Indeed, construction of destructive or disruptive facilities would apparently be allowed as long as construction activities occur outside the nesting season. In Dolores County and parts of Mesa County falling within a Wildlife Composite Map, subdivision requests and development proposals require a review of impacts to wildlife, and the recommendations of Colorado Parks and Wildlife must be at least considered by the permitting agency. In Saguache County, permits are required for development that occurs in areas considered to be “significant wildlife habitat,” which presumably would include Gunnison sage grouse breeding and nesting habitats (although the extent to which this is true remains undefined). Delta County requires a review of roads and access permits, but apparently not subdivision or building permits.

Thus, six of eleven counties at least review building permits in the immediate vicinity of active sage grouse leks, and could theoretically deny the permit or require modifications for the project to benefit Gunnison sage grouse. However, these regulations can in no way be construed as preventing permits from being issued for projects that would significantly impact, or even extirpate, sage grouse breeding populations. They only create a process under which sage grouse welfare might be prioritized, considered, or ignored by the permitting committee. In the remaining counties, the local governments have denied

themselves the authority to protect sage grouse habitat in the context of permitting.

Grand County, Utah, may have occupied Gunnison sage grouse habitat, but applies zoning only to the town of Moab and has no provisions for sage grouse conservation in its Land Use Code. This county is not a participant in the 11-county agreement on Gunnison sage grouse. San Juan County, Utah has the dubious distinction of not only failing to put into place any limitations on human land use that would be helpful to Gunnison sage grouse, but also of making it a matter of policy that the rights of private property owners to develop and use their lands in whatever way they see fit trump any other land-use considerations in the county. This lack of county regulations could be worse for Gunnison sage grouse viability only if the destruction of Gunnison sage grouse habitat was actively encouraged by county ordinance.

C. Addressing the Impacts of Roads

Seasonal road closures on county roads traversing occupied Gunnison sage grouse breeding and nesting habitats have been adopted by Gunnison and Montrose Counties, and in Hinsdale County, seasonal road closures “may” apply. In addition, Ouray County has adopted seasonal road closures within 0.6 miles of active leks, a distance that while not sufficiently distant to prevent significant impacts to breeding birds on the lek and offers almost no protection to nesting hens, is nonetheless better than nothing. Roads have been found to have a significant impact on breeding and nesting sage grouse populations (Lyon and Anderson 2003, Holloran 2005, Aldridge et al. 2011), and road traffic similarly contributes impacts of its own beyond the mere existence of the road and its contribution to habitat fragmentation (see, e.g., Holloran 2005). Aldridge et al. (2011) identified significant impacts on sage grouse use of nesting habitat when open road density exceeds 0.5 linear mile of road per square mile of habitat.

It is reasonable to suppose that seasonal road closures will substantially reduce the impacts of the road closed to vehicle traffic on sage grouse using surrounding habitat.

This is a county conservation measure that can reasonably be anticipated to reduce impacts to sage grouse and their habitats, even though scientific studies have yet to demonstrate that seasonal road closures completely eliminate the impact of roads as a significant problem for breeding and nesting sage grouse.

D. Oil and Gas Impacts

Only Gunnison County addresses the impacts of oil and gas development in its plans and ordinances. In its Land Use Resolution, Gunnison County states that oil and gas development “Shall not cause significant degradation of wildlife or sensitive habitat.” Oil and gas development potential is considered low in Gunnison County, so this is regarded at present as a minor threat to this sage grouse population. Geothermal development, however, is a greater threat as witnessed by a recent proposal. It is unclear that a county permit is required for oil and gas development, however, so it is difficult to see how this provision is anything more than an aspirational goal statement. However, because all other counties have no provisions or even goals regarding limiting the impacts of oil and gas development on Gunnison sage grouse, Gunnison County is significantly ahead of other counties in this regard.

The San Miguel and Dove Creek-Monticello grouse populations have a significant degree of oil and gas leasing, yet state and county regulations do not address the threat of oil and gas development, which represents a real and significant prospect for habitat destruction in these areas.

E. Overhead Powerlines

Gunnison County is the only local government with strong and scientifically sufficient conservation measures regarding overhead powerlines, requiring new lines to be buried when located inside sage grouse habitat. San Miguel County’s Wright’s Mesa Zoning District prohibits distribution lines within 0.6 mile of active leks and large transmission lines within 0.93 mile of leks, while Ouray County at least classifies

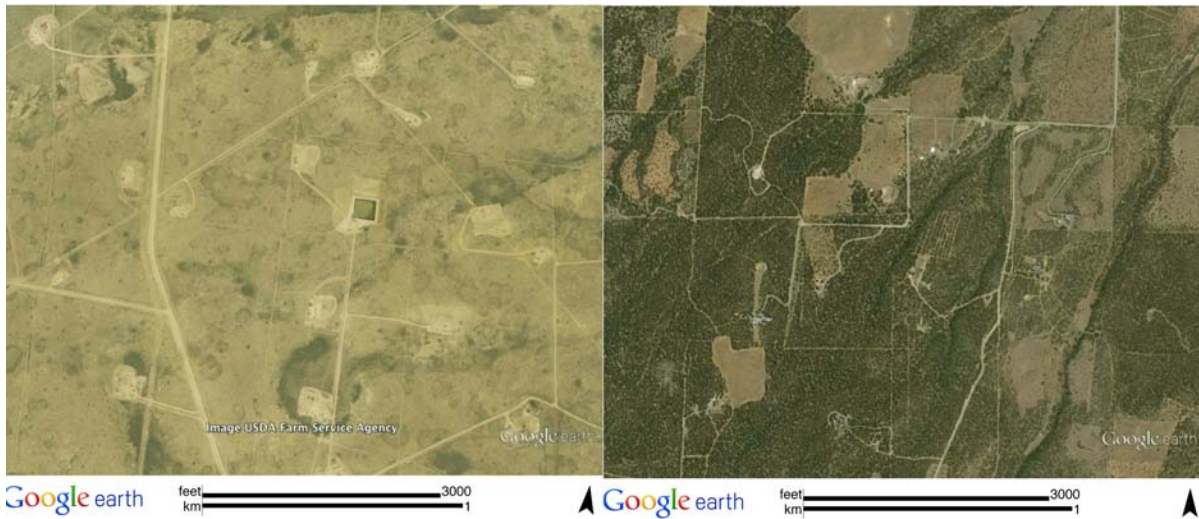
powerlines as conditional uses, which requires specific approval at which time the issue of impacts to Gunnison sage grouse could be raised. The other seven counties with proposed critical habitat for the species have no regulations whatsoever that could help protect Gunnison sage grouse sensitive habitats from impacts associated with powerlines.

F. Optional Local Conservation Measures and Why They Fail to Avoid Listing

Historically, local governments are reluctant to enforce county ordinances stringently when they might infringe on private activities on private lands or the development of private property. It is important to note that the vast majority of regulations guiding sage grouse conservation are not mandatory requirements, but simply the triggering of a permitting process when subdivision or construction expected to have an impact is proposed inside key sage grouse habitats. In some cases consultation with Colorado Parks and Wildlife is triggered, giving that agency the opportunity to voice its opinion. Under the current suite of local regulations, however, the permitting body is almost never required to deny a permit because it would have a negative, perhaps even disastrous, impact on a Gunnison sage grouse population. After considering the impacts, and perhaps the opinions of a wildlife agency, the permitting agency remains free to approve the destruction of Gunnison sage grouse habitat through approving building permits, roads, powerlines, and other infrastructure in almost all cases. For this reason, current local regulations fail the “regulatory certainty” test that is required to make a showing that existing regulatory mechanisms are adequate and Endangered Species Act protections are unnecessary.

G. How the Colorado State Legislature Limited County Conservation Efforts

The Colorado legislature has played a major role in preventing the types of local regulations that might otherwise provide real protection for Gunnison sage grouse habitat.



Figures 3 and 4. At left, Figure 3 shows oil and gas development on 40-acre well spacing in the Continental Divide–Creston Field of Wyoming. Sage grouse are virtually extirpated in this field. At right, Figure 4 shows a rural subdivision near Colona, Colorado, demonstrating a similar pattern of road and site development and habitat fragmentation.

The division of rural properties into small lots and their subsequent development into housing subdivisions is a significant threat to Gunnison sage grouse across the region, and can result in negative impacts resulting from increased traffic, human activity, fences that kill birds through collisions, and potentially introduce cats and dogs which can prey on sage grouse. By removing the authority of local governments to impose zoning regulations on parcels smaller than 35 acres, the Colorado State Legislature effectively eliminated the single most important tool that county governments had to prevent habitat fragmentation and rural sprawl from degrading Gunnison sage grouse habitats. This is a significant problem. In Gunnison County, for example, 93% of occupied Gunnison sage grouse habitat is on land parcels larger than 35 acres (USFWS 2013), which means that subdivision is possible without regulation.

As shown in Figures 3 and 4, the habitat fragmentation of a rural subdivision broken up into 40-acre lots is comparable to a dense oil and gas field at 40-acre well spacing. In western Wyoming, Holloran (2005) conducted a study in the Pinedale Anticline and Jonah Fields to determine thresholds of oil and gas development that result in sage grouse declines. At the time, the Jonah Field was

drilled to 40-acre well spacing, with 16 wells per square mile (comparable to a rural subdivision with a home on every 40 acres). Holloran found that when the density of well sites exceeded one per square mile, sage grouse lek populations declined significantly. While no study has examined the impacts of housing density, it is reasonable to suppose that a similar result would be found, as (like wellpads) homes have daily vehicle traffic and are hubs of human activity. In addition, the Holloran study found that in the Jonah Field, where well densities were one per 40 acres at the time, sage grouse populations would be extinct within 19 years if the level of human impact remained the same. Subdivisions into parcels of 40 acres are not subject to county permitting and regulation, and thus local governments cannot apply Gunnison sage grouse conservation measures when subdivisions are developed at this threshold.

Of course, the state moratorium on regulating subdivisions with parcels of 35 acres or more only affects counties that would otherwise have adopted protective regulations.

Conservation Measures in Place in Federal Land and Resource Management Plans	Urban/Commercial Development (Easements/ROWs)	Oil and Gas Development	Renewable Energy Development	Mining	Roads	Powerlines	Improper Livestock Grazing	Predation (facilitated by infrastructure /disturbance)	Genetic risks/small population size
BLM Resource Management Plans									
Gunnison RMP	Optional Inadequate	Optional Inadequate	Optional Inadequate	Optional Inadequate	Optional Inadequate	Optional Inadequate	Optional Inadequate	None	Optional Inadequate
Uncompahgre RMP	None	Optional Inadequate	None	None	None	None	None	None	None
San Juan/San Miguel RMP	None	Optional Inadequate	None	None	None	None	None	None	None
Grand Junction RMP	None	None	None	Mandatory Inadequate*	None	None	None	None	None
Monticello RMP	Optional Adequate	Optional Inadequate	Optional Adequate	Optional Inadequate	Optional Inadequate	Optional Adequate	Optional Inadequate	Mandatory Inadequate**	Optional Inadequate
San Luis RMP	None	None	None	None	None	None	None	None	None
National Forest Land and Resource Management Plans									
Grand Mesa, Uncompahgre and Gunnison National Forest Plan	None	Optional Inadequate	None	None	None	None	None	None	None
National Parks Service General Management Plans									
Curecanti National Recreation Area and Black Canyon National Park General Management Plan	None	None	None	None	None	None	None	None	None

*areas within 1/4 mile of lek unsuitable for coal leasing, no other mandatory measures

**Mandatory to bury powerlines or retrofit to prevent perching by raptors. Other measures that might help to limit predation are optional.

Table 3 (above). Regulations in federal plans to address major threats to Gunnison sage grouse that imperil the species at a rangewide or individual population scale.

Table 4 (below). Regulations in federal plans to address threats to Gunnison sage grouse that collectively imperil the species at a rangewide or individual population scale.

Conservation Measures in Place in Federal Land and Resource Management Plans	Recreational Activity	Poor Habitat Quality (e.g., tree encroachment, invasive weeds)	Fire	Drought and Climate Change	Pesticides	Fences	Water Development	Disease and Parasites	Noise
BLM Resource Management Plans									
Gunnison RMP	None	Optional Inadequate	None	None	None	None	None	None	None
Uncompahgre RMP	Mandatory Inadequate*	None	None	None	None	None	None	None	None
San Juan/San Miguel RMP	None	None	None	None	None	None	None	None	None
Grand Junction RMP	None	Optional Inadequate	None	None	None	None	None	None	None
Monticello RMP	Optional Inadequate	Optional Inadequate	Optional Inadequate	None	Optional Inadequate	Mandatory Adequate**	Optional Inadequate	None	Optional Inadequate
San Luis RMP	None	None	None	None	None	None	None	None	None
National Forest Land and Resource Management Plans									
Grand Mesa, Uncompahgre and Gunnison National Forest Plan	None	Mandatory Inadequate	None	None	None	None	None	None	None
National Parks Service General Management Plans									
Curecanti N.R.A. and Black Canyon N.P. Plan	None	None	None	None	None	None	None	None	None

*Closure of 0.7 mi. existing roads mandatory, no other mandatory measures in plan to address threat.

**Mandatory provisions for new fences/retrofitting existing fences within 0.6 miles of a lek only, remaining provisions Optional

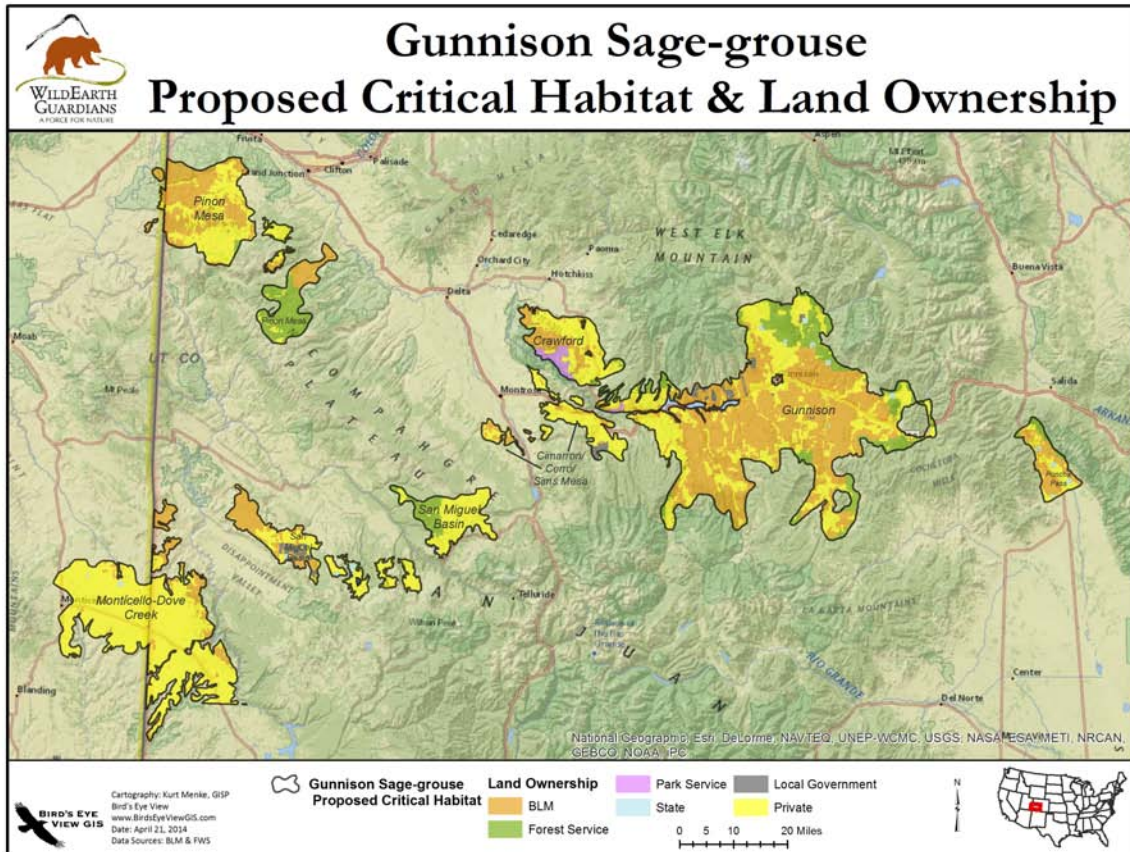


Figure 5.

IV. FEDERAL AGENCIES' FAILURE TO ACT

Federal land management agencies have failed to adequately address threats to Gunnison sage grouse on federal land. Federal land management agencies are responsible for managing 54% of occupied Gunnison sage grouse habitat, and 50.1% of proposed critical habitat. The majority of occupied habitat on federal land is managed by the Bureau of Land Management and the U.S. Forest Service. The National Park Service also manages some occupied habitat. See Figure 5.

Federal land management agencies can put enforceable regulatory mechanisms in place to address the threats to Gunnison sage grouse by including specific direction regarding sage grouse habitat conservation or management in land and resource management plans. There are nine federal land management plans that manage lands within the current range of the Gunnison sage grouse. See Tables 3 and 4. We reviewed all nine of these plans to

determine whether adequate regulatory mechanisms are in place to address threats to Gunnison sage grouse on federal lands.

Below we summarize major problems common to the plans, and then summarize the conservation measures in each individual plan.

A. Common Failings of Federal Land Management Plans

There are a number of problems common to all of the federal land management plans. Two of the plans (the San Juan and Uncompahgre BLM plans) contain no specific conservation measures at all for Gunnison sage grouse. None of the plans include conservation measures that comprehensively address all of the identified threats to the species. See Tables 3 and 4. Several of the plans include specific conservation measures to address at least some of the major threats to the species. However, these conservation measures are typically ineffective due to: 1) inconsistency with the best available science

on what is needed to ameliorate threats to the species, and 2) a high degree of uncertainty regarding what conservation measures (if any) will actually be implemented. The plans fail to put adequate regulatory mechanisms in place to address the major threats to the species. We focus on the top threats to the species in the discussion below.

1. Small Population Size

It is essential for federal land management agencies to implement conservation measures that will not only maintain, but increase the size of each population, in particular the isolated and fragmented satellite populations that teeter on the brink of extirpation. Maintaining and increasing the size of the Gunnison Basin population is important in order to ensure the long-term persistence of the species through providing insurance against catastrophic events (e.g. drought, disease, extirpation of the six small populations outside the Basin etc.), increasing adaptive potential, and allowing for translocations to augment the small populations.

Many of the federal land management plans were completed before the Gunnison sage grouse was recognized as a distinct species and became a candidate for Endangered Species Act protection. Thus, these plans contain no objectives to conserve Gunnison sage grouse. None of the plans include adequate conservation measures to prevent continued declines (see further discussion below).

Conservation measures in most of the plans are applied only to currently occupied habitat, and in most cases only to very small proportions of occupied habitat. All of the management plans allow additional permanent loss of occupied habitat (e.g. to new development and infrastructure). Maintaining or increasing populations will not be possible if permanent loss and fragmentation of occupied habitat continue, particularly for the small populations outside of the Gunnison Basin. Further, most plans do not aim to protect or restore formerly occupied habitat to allow for populations to expand in the future or compensate for permanent loss and fragmentation of occupied habitat.

Obviously, plans completed before Gunnison sage grouse was recognized as a distinct species and became a candidate for ESA protection cannot be expected to have adequate objectives and conservation measures to conserve the species. However, the agencies have had ample opportunity to amend their old management plans to remedy this deficiency. These same agencies are several years into amending and revising land-use plans to increase protections for greater sage grouse across that species' range. The Gunnison sage grouse is even more rare and imperiled. Further, it is far from clear that these problems will be remedied when plans are revised (*see, e.g.*, discussion under the Monticello RMP below).

To effectively ensure the long-term persistence of the species, federal land management plans must include objectives and conservation measures aimed not only at maintaining existing population numbers and area of occupied habitat, but increasing both population numbers and area of occupied habitat. This is important for the Gunnison Basin population and absolutely critical for the small populations outside of the Gunnison Basin.

2. New Development and Infrastructure

The USFWS identified development and infrastructure (urban and commercial) as the primary threat to the species, and found that cumulative habitat loss and fragmentation from other types of development and infrastructure (e.g. energy, roads, powerlines) that occur on public lands poses a threat to the species. Federal agencies can make a critical contribution toward addressing this threat by limiting additional new development and infrastructure on public lands. This is needed to ensure that cumulative levels of habitat loss and fragmentation do not exceed thresholds of sage grouse persistence at a landscape scale, particularly given that some level of additional permanent loss and fragmentation of habitat is inevitable due to new development on private land.

None of the existing federal land management plans have conservation measures in place that effectively address the cumulative impacts of habitat loss and

fragmentation. The Candidate Conservation Agreement (CCA) for the Gunnison Basin Population recognized this lack in the existing federal land management plans in the Gunnison Basin. One of the primary goals of that agreement was to develop conservation measures to address the cumulative impacts of habitat loss and fragmentation. (See further discussion of the CCA in Section IV(B)(1) below).

Existing federal management plans include a variety of conservation measures aimed at reducing the impacts of individual developments, but do not place any limit on the total amount of new development and infrastructure that can be built within occupied habitat for the Gunnison sage grouse. All of the available science on greater and Gunnison sage grouse suggests that there are threshold levels of infrastructure and development beyond which populations can no longer persist. See Section II(A). Given that the six small populations outside of the Gunnison Basin are already vulnerable to extirpation in the foreseeable future even without additional loss and fragmentation of habitat, it is unlikely that they can sustain major additional development or infrastructure within or adjacent to occupied habitat.

Existing federal management plans do not set any areas of occupied habitat aside from major new development and infrastructure. None of the plans include mechanisms to limit new development and infrastructure to levels below thresholds for persistence of Gunnison sage grouse populations. A number of strategies exist that can be used to ensure that infrastructure and development do not exceed thresholds for persistence for sage grouse populations. For example, federal agencies are using disturbance caps and limits on the density of structures, to ensure that infrastructure and development remain below thresholds of tolerance for greater sage grouse (National Technical Team 2011; see further discussion in Section V(A) and (B)). Another approach is to avoid any additional net fragmentation of priority habitat, an approach described in the Gunnison Basin Candidate Conservation Agreement (see discussion in Section IV(B)(1) below for further discussion

of this approach). Although these approaches are not perfect (see further discussion in Sections V(A) and (B)), they are reasonable attempts to account for the cumulative impacts of development and infrastructure, an essential element of adequate regulatory mechanisms to conserve the species that is completely absent from all of the existing land management plans.

Existing plans have some measures in place aimed at reducing the impacts of new developments and infrastructure on Gunnison sage grouse. However, these measures cannot compensate for the lack of a strategy to limit the cumulative impacts of new development and infrastructure. Further, these measures are inadequate due to inconsistency with the best available science and a high degree of uncertainty regarding whether they will actually be implemented.

A number of the existing plans require avoidance of surface disturbance and construction of structures within a protective buffer around leks. Several plans prohibit direct destruction of leks, or place a protective buffer around the area within 0.25 mile of leks. The largest buffer implemented through existing management plans protects the area within 0.6 miles of leks. This 0.6-mile lek buffer has frequently been implemented in project- or activity-specific plans, in areas where the overarching management plan has lesser protections in place for leks (see further discussion in Section IV(D) below). As discussed previously, avoiding development within 0.6 miles of a lek will not prevent extirpation of leks, protects less than 4% of the nesting habitat associated with a lek, and will not prevent significant population declines due to behavioral avoidance of otherwise suitable habitat near structures and roads (see Section II(A)(1)). It is well established that smaller lek buffers (e.g., ¼ mile) have little or no conservation benefit (Apa et al. 2008). In addition, in many of the plans, the lek buffer does not apply to all types of major surface disturbance and development. For example, in the San Juan/San Miguel RMP, the lek buffer prohibits construction of permanent oil and gas structures, but does not prohibit construction of other major structures (e.g.

powerlines) or roads. Most plans also implement seasonal closures around breeding and nesting habitat or other key seasonal habitats. However, seasonal closures do nothing to prevent permanent loss and fragmentation of habitat and associated impacts that stems from development that takes place outside of the breeding and nesting season. Further, most of the plans include very broad and vague criteria allowing for exception, modification and waiver of the 0.6-mile lek buffer and seasonal limitations on disturbance resulting in very little certainty regarding whether, and under what circumstances, lek buffers will actually be implemented.

A number of the plans also include a set of guidelines and best management practices aimed at minimizing and mitigating the impacts of development. Although these may reduce the negative impacts of development to some level, they cannot compensate for the lack of a strategy to limit cumulative habitat loss and fragmentation from new development and infrastructure. Further, they are optional, at the discretion of the agency to implement or not, creating uncertainty that they will be consistently implemented.

3. Existing Development and Infrastructure

The Service finds that existing development and infrastructure has negatively impacted Gunnison sage grouse. It is essential for the BLM to take further action to not only avoid additional habitat loss and fragmentation from new infrastructure, but also to increase the size of intact, unfragmented habitat patches through reducing the footprint of existing development and infrastructure. None of the existing federal land management plans have specific measures in place aimed at reducing the footprint of existing development. Federal land management agencies in the Gunnison Basin have taken steps toward reducing the impacts of existing development and infrastructure on lands occupied by the Gunnison sage grouse through the Gunnison Basin Federal Lands Travel Management Plan (see discussion of this plan under Section IV(E)(1) below). The Gunnison Basin Candidate Conservation Agreement also

recognizes the need to reduce existing net fragmentation at a landscape scale (see further discussion in Section IV(B)(1) below). The approaches taken in these plans are a step in the right direction, and should be replicated and improved upon as part of a programmatic amendment of the federal land management plans to put adequate regulatory mechanisms in place to conserve Gunnison sage grouse.

4. Improper Grazing Management

According to Connelly et al. (2000), residual grass stubble heights of 7 inches are required to provide adequate hiding cover for greater sage grouse during the nesting and early brood rearing periods. Later, Hagen et al. (2007) used the data from 17 previous studies that recorded grass cover in sage grouse habitats and concluded that sage grouse selected areas averaging at least 7 inches of residual grass cover. For the Gunnison sage grouse, Prather (2010) determined that areas in occupied habitats in southeastern Utah had grass heights averaging 9 inches, while unoccupied habitats had grass heights that averaged less than 6 inches. Finally, Foster et al. (2014) found that the presence of livestock did not have a negative effect on nesting sage grouse in Montana, but grass heights for each of the three years of this study were taller than the 7-inch threshold recommended by Connelly et al. (2000). This body of research presents a compelling case that the 7-inch stubble height recommendation is the appropriate grazing management target to provide hiding cover for sage grouse, yet not one single BLM or Forest Service plan requires this level of grass cover to be maintained.

Heavy livestock grazing can also result in a lack of forbs that form a key high-nutrition food source during the nesting and early brood-rearing periods (Gregg et al. 2008). None of the federal plans have requirements to maintain adequate levels of forbs to supply the dietary needs of sage grouse hens and chicks during this important stage of the life cycle.

It is possible to argue that sufficiently tall grass heights and sufficient abundances of forbs might collaterally be achieved through some other grazing management strategy.

Percent forage utilization is the most applicable possibility. However, the most restrictive of the BLM plans, the Monticello RMP, sets a generous (to the cattle) limit of 50% grass utilization by livestock in key sage grouse habitats. However, Braun (2006) recommended a maximum 25% forage utilization standard for livestock, a recommendation echoed by Holechek et al. (2010) as a maximum utilization for sustainable grazing. Clary (1995:24) made the following recommendation for grazing in riparian areas: "If utilization guidelines are used, those rates that do not exceed 30% of the annual biomass production will likely maintain production the following year." None of the federal plans appear to adopt a forage utilization standard that is sustainable in the context of sage grouse conservation, or one that would assure the maintenance of adequate grass cover.

5. Predation (facilitated by infrastructure and disturbance)

Predation on sage grouse is correlated to habitat quality and quantity (Hagen 2011). Given an adequate amount of quality habitat, sage grouse should be able to coexist with predators. Habitat must provide sufficient hiding cover at nests, visibility at leks, and feeding areas adequate in quantity and size to minimize risks associated with increased travel and time spent in riskier habitats (Hagen 2011). In a landscape context, when quantity and/or quality of habitat are diminished predators may gain an advantage over their prey and affect populations. In addition, changes in the species composition and abundance of predator communities may affect nest success and survival of ground nesting birds (Hagen et al. 2011). These changes may be induced by anthropogenic developments in sage grouse habitat. Predator populations may respond positively to anthropogenic food sources such as road-killed animals and dump sites, as well as additional shelter and nest substrates (Hagen et al. 2011). Increased predation pressure in fragmented habitats has been well documented for grouse in Europe (Hagen et al. 2011).

Colorado Parks and Wildlife (CPW) identified predation as a potential limiting factor in successful recruitment in the San Miguel Basin. In 2010, CPW began to implement a short-term predator control effort, due to very low levels of recruitment and evidence of predation in the Miramonte subpopulation of the San Miguel Basin population, and concern that extinction of the San Miguel Basin population was becoming a real possibility. Hagen et al. (2011) suggest that short-term predator control may be warranted in instances when habitat restoration cannot be achieved in a timely manner, or when translocated individuals suffer higher mortality rates than individuals native to an area.

However, this must be coupled with a long-term plan to address the underlying causes of the high levels of predation and low levels of recruitment. Predator control cannot be effective beyond use as a temporary measure to improve low vital rates resulting from above average predation rates in a sink population (Hagen 2011). Predator populations will quickly rebound once control efforts stop, and it is not desirable or feasible to continue predator control over long-time periods (Hagen 2011).

Thus, in order to address issues of predation, it is essential that federal land management agencies have a plan to increase habitat quality and quantity to a level that will allow long-term coexistence with predators, and to ensure that predator populations are kept within the range of natural variability through addressing anthropogenic causes of increased predator populations. Essential elements of such a plan include proper grazing management and reduction of human infrastructure at a landscape scale. None of the RMPs have effective strategies to manage Gunnison sage grouse habitat in a manner that reduces the threat of predation.

B. Federal Plans Covering Multiple Regions or Agencies

In addition to the individual land-use plans discussed in the following section of this report, conservation measures for Gunnison sage grouse may be implemented on federal

lands in Gunnison through the Gunnison Basin Candidate Conservation Agreement, the Colorado Public Lands Health Amendment, and a BLM Instruction Memorandum on Gunnison sage grouse.

1. Gunnison Basin Candidate Conservation Agreement

The recently completed Candidate Conservation Agreement for Gunnison sage grouse (*Centrocercus minimus*) Gunnison Basin Population (CCA) is valuable in that it recognized and attempted to address some of the gaps in existing conservation efforts, including inconsistent application of the RCP, the need to make the RCP conservation measures actionable, and the need to account for the cumulative effects of habitat loss and fragmentation. In addition, where the CCA incorporates measures (such as stubble height standards for livestock grazing), these RCP measures may themselves be inadequate for reasons discussed in Section II(A).

However, the Gunnison Basin Candidate Conservation Agreement CCA was specifically designed to work in concert with ESA listing. The CCA is designed to function primarily to facilitate streamlined Section 7 consultation for project proposals on federal lands in Gunnison sage grouse habitat once the species is listed under the Endangered Species Act. The primary incentive for land managers to implement the CCA conservation measures is efficiency gains from streamlined ESA consultation. Without ESA listing, the primary incentive for implementation of the conservation measures ceases to exist. Further, activities on federal lands likely to have major impacts to Gunnison sage grouse are excluded from the CCA. The scope of the CCA is specifically limited to discretionary actions on federal lands that are likely to have insignificant or discountable effects to the species or habitat, and that can be closely managed to avoid, minimize and/or mitigate negative effects to the species or habitat. Major federal actions that are likely to have significant impacts to the species, including, but not limited to:

- 1) energy and minerals development,
- 2) right of ways and easements >5 acres,

- 3) utility rights-of-way and easements > 25 feet permitted area width,
- 4) rights-of-way and easements > 0.5 miles of aboveground infrastructure, and
- 5) agency-implemented actions resulting in > 1 acre of permanent ground disturbance,

are specifically not covered by the CCA.

The developers of the CCA agreed that these types of projects may have significant impacts that may warrant additional consideration and thus should go through the full Section 7 consultation process (rather than streamlined Section 7 consultation) once the species is listed under the ESA. The CCA also does not apply to federal lands outside of the Gunnison Basin. Thus, the CCA cannot be considered a regulatory mechanism to conserve the species and prevent the need for listing.

Although the CCA is not a regulatory mechanism, some of the concepts introduced by the CCA may be useful to consider in developing strategies to address some of the current major gaps in existing conservation measures. For example, the CCA recognized the need to account for cumulative habitat loss and fragmentation at a landscape scale. The CCA divided occupied habitat in the Gunnison Basin into Tier 1 (generally characterized by two or more overlapping seasonal habitats and minimal existing permanent development) and Tier 2 habitat (generally the more fragmented areas on the landscape). In Tier 1 habitat, the goal of the CCA is to reduce existing net fragmentation (defined as reduction of continuity and or quality of habitat, including both direct habitat conversion and indirect/functional impacts). In Tier 2 habitat the goal of the CCA is to avoid additional net fragmentation. Accounting for the cumulative effects of habitat loss and fragmentation is a key element of adequate conservation measures that is missing from existing plans. Thus, although the CCA was not designed to function as a regulatory mechanism in the absence of ESA listing, it does include some concepts that could be built upon and incorporated into adequate regulatory mechanisms through a programmatic federal

plan amendment to put in place adequate conservation measures to conserve Gunnison sage grouse.

In working to build upon the useful concepts in the CCA, it is important for federal agencies to:

- Apply conservation measures to all projects (including all major development projects)
- Recognize that more stringent conservation measures are needed in the small populations outside the Gunnison Basin, and that no additional direct or functional loss of occupied habitat for these populations is acceptable.
- Comprehensively address the threats to the species.
- Ensure a high degree of certainty that conservation measures will actually be implemented.
- Ensure that all conservation measures are consistent with the best available science.
- Consider use of disturbance caps and limits on the density of structures to put concrete limits on net habitat loss and fragmentation.
- Use caution in relying on offsite mitigation to limit net habitat loss and fragmentation, as it is difficult to ensure the effectiveness of offsite mitigation.

2. Bureau of Land Management Instruction Memoranda

In addition to land use planning, the Bureau of Land Management uses Instruction Memoranda (IMs) to provide instruction to district and field offices regarding specific resource issues. IMs are typically of short duration (1 to 2 years) and intended to address resource concerns by providing direction to staff until the resource issue can be addressed in a long-term management plan or other planning document. They can provide a benefit to imperiled species by putting interim conservation measures in place to temporarily restrict activities that might pose a threat to a species in the short term.

IMs can also provide direction for planning processes (e.g management plan revisions or other long-term plans). Typically, IMs do not mandate specific outcomes for long-term planning processes, but instead require a process to be followed. As a consequence of their short duration and the fact that they do not mandate specific outcomes, IMs alone cannot implement adequate regulatory mechanisms to conserve species and prevent the need for ESA listing.

The BLM's Colorado office has issued three Instruction Memoranda to provide instruction to district and field offices regarding Gunnison sage grouse. The BLM Washington Office recently issued a fourth Memorandum covering both Colorado and Utah.

IM CO-2005-038 was issued in 2005, and stated BLM's intent and commitment to assist with and participate in the 2005 Rangewide Conservation Plan. IM CO-2010-028 was issued in 2010 and provided guidance to Colorado BLM Field Offices on sage grouse habitat management for proposed activities and resource management planning. These two IMs have expired and have not been re-issued. The guidance in these two IMs was largely superseded by IM CO-2013-033, issued in July of 2013, which itself was replaced by the Washington IM 2014-100, issued in June of 2014.

IM 2014-100 provides updated direction regarding management and ongoing planning actions in Gunnison sage grouse habitat. Although it provides direction that should result in improvement in conservation measures for Gunnison sage grouse on BLM lands (over those included in BLM's RMPs), it also contains cause for concern.

Most importantly, it commits the BLM to long-overdue plan amendments to update Gunnison sage grouse protections throughout the species' range in Colorado and Utah. If BLM instead waited to revise each of the RMPs on the normal schedule, this would have taken a minimum of several years and potentially decades. Coupled with the fact that the IM does not put adequate interim protections in place

for the species, even with the new schedule there may be further loss of population numbers or contraction of the species occupied habitat while plan amendments are being prepared, ultimately making it much more expensive and difficult to recover the species.

The Instruction Memorandum prevents leasing for oil, gas, and coal while the plan amendment is being prepared, an important measure that avoids committing important habitats to future industrial use. However, the conservation measures in the IM are not adequate to ensure against potentially devastating additional permanent loss and fragmentation of occupied Gunnison sage-grouse over the short-term while RMP revisions and amendments are being completed, or over the long-term if these measures are ultimately incorporated into RMPs without significant changes.

Specifically, while the IM states, “[t]he BLM will focus any type of development in nonhabitat areas. Disturbance will be focused outside of a 4-mile buffer around leks. The BLM intends that little or no disturbance occur within the 4-mile buffer, except for valid existing rights, and except where benefits to the GUSG are greater compared to other available alternatives.” The statement of intent is a positive step, and the 4-mile buffer is potentially adequate according to the known science regard disturbance impacts to sage grouse. In order to satisfy ESA requirements, the BLM must make these measures mandatory requirements instead of aspirational goal statements.

It is again important to highlight that the small populations outside of the Gunnison Basin likely cannot sustain any further direct or functional loss of occupied habitat over the short term (until population numbers and the area of occupied habitat have successfully been increased). Although this IM discourages the placement of development and infrastructure within 4 miles of Gunnison sage grouse leks, it does not prohibit major new development or infrastructure within occupied habitat.

At minimum, BLM should take a precautionary approach, and completely

prohibit new development and infrastructure in occupied habitat for the small populations outside of the Gunnison Basin. Putting a similar prohibition on major new development and infrastructure in Tier 1 habitat in the Gunnison Basin would be invaluable in helping to maintain that population at current levels. These provisions will help to ensure against declines while RMPs are being amended or revised, and help to avoid foreclosure of management options in the future that will otherwise result from further loss and fragmentation of occupied habitat.

In order to maintain the small populations outside of the Gunnison Basin, BLM must avoid authorization of developments and infrastructure that have the potential to result in not only direct, but also functional loss of occupied habitat. The IM does not prevent placement of oil and gas wells, powerlines, or roads directly adjacent to occupied habitat. The areas of habitat occupied by populations outside of the Gunnison Basin are so small that placement of major new developments adjacent to habitat could result in functional loss of occupied habitat, due to behavioral avoidance of otherwise suitable habitat in proximity to structures and roads. The Gunnison Basin Candidate Conservation Agreement (at page 4) appropriately recognizes the need to prevent net direct or indirect/functional loss of occupied habitat while this IM does not.

The IM also does not provide clear assurance that BLM will put effective measures in place to limit habitat loss and fragmentation due to development at a landscape scale. The IM states that Gunnison sage grouse habitat within 4 miles of leks will be managed to “...minimize disturbance to Gunnison sage- grouse during critical seasonal time periods and minimize the footprint of any project, habitat fragmentation across the landscape, and cumulative effects on the associated population....” However, the IM relies on the disturbance guidelines in the Rangewide Conservation Plan to achieve this objective, which are not adequate to ensure against a cumulative level of habitat loss and

fragmentation across the landscape that will exceed thresholds of tolerance for Gunnison sage grouse. In order to achieve this aim, BLM must set concrete limits on the total amount of habitat loss and fragmentation allowed across Gunnison sage grouse habitat, either through use of disturbance caps and limitations on the density of structures (as discussed in the National Technical Team Report for Gunnison sage- grouse), or through limits on net habitat loss and fragmentation, building upon the approach outlined in the Gunnison sage grouse Candidate Conservation Agreement. The IM does acknowledge the need to consider recent science, including the National Technical Team report, and leaves open the possibility of putting in place more stringent protections than those outlined in the IM through RMP amendment or revision processes. Thus, there is potential for this limitation of the IM to be addressed.

The IM relies upon continued implementation of the grazing guidelines in the Rangeland Conservation Plan to ameliorate the threat posed by improper grazing management. The RCP approach may not be adequate to fully ameliorate the threat posed by grazing as discussed previously in Section II(A)(2).

Finally, the BLM's authority to implement the necessary conservation measures to protect Gunnison sage grouse from development of existing oil and gas leases and mining. This IM commits to adding critical language through RMP revision processes describing recent Interior Board of Land Appeals decisions that give BLM discretion to require additional conservation measures during the development phase on existing oil and gas leases. However, the BLM notes that new conservation measures required on existing leases must be consistent with the applicable land use plan and not in conflict with the rights granted to the leaseholder. It may not be possible to implement the conservation measures needed to prevent significant impacts of oil and gas development on existing leases, and ensure that such leases do not contribute to an unacceptable

cumulative level of habitat loss and fragmentation at a landscape scale, under these circumstances.

As acknowledged by the IM, the BLM also has limited authority to address impacts that may result from exploration and development of mining claims under the 1872 Mining Act. This may limit the ability of BLM to conserve the San Miguel Basin population of Gunnison sage grouse in particular, as roughly 52% of the occupied habitat for the San Miguel Basin population on San Juan Public lands is covered by a combination of existing oil and gas leases or active mining claims (GIS data used to calculate acreage of existing oil and gas leases and active mining claims in San Miguel Basin available upon request).

This IM provides some benefit to the species and some encouragement that BLM is moving toward improving its management of Gunnison sage grouse. Although it does not mandate specific outcomes for long-term planning processes, it does put some good benchmarks in place for these processes, in particular the commitment to consider new science and information (e.g. the NTT report) and use that information to inform its planning processes. However, it is not in itself an adequate regulatory mechanism to conserve Gunnison sage grouse in most respects, and does not dispel several major concerns about BLM's approach to Gunnison sage grouse conservation.

C. The Colorado Public Land Health Standards

For all Colorado RMPs, a 1997 plan amendment adopting the Colorado Public Land Health Standards ("Land Health Standards") was adopted as an amendment to all Colorado BLM Resource Management Plans. The Land Health Standards govern livestock grazing and associated permitted activities (such as fences, range improvements, and vegetation treatments). While the Land Health Standards do not address Gunnison sage grouse specifically, this plan amendment includes the following standards:

STANDARD 3 – Healthy, productive plant and animal communities of native and other desirable species are maintained at viable population levels commensurate with the species and the habitat’s potential.

STANDARD 4 – Special status, threatened and endangered species (federal and state), and other plants and animals officially designated by the BLM, and their habitats are maintained or enhanced by healthy, native plant and animal communities.

P. 6. These standards appear to require the BLM to take actions necessary to maintain key habitats for the benefit of wildlife including (in relevant part) the nesting and brood-rearing habitats of Gunnison sage grouse.

Unfortunately, this has yet to occur. For example, maintaining adequate residual grass height in the context of livestock grazing is necessary to provide hiding cover for hens and chicks using these habitats (see Section II(A)(2) of this report). However, while increasing the residual stubble height requirement for the benefit of sage grouse habitats would appear to be required under each of the Colorado plans governing Gunnison sage grouse habitats according to the Land Health Standards, BLM has thus far resisted the implementation of strong stubble-height requirements. This failure indicates that the Land Health Standards constitute more of a discretionary goal statement than a mandatory requirement, at least as interpreted by BLM.

The BLM’s failure to implement the Land Health Standards in ways that benefit Gunnison sage grouse can most readily be measured by its failure to maintain minimum viable populations of sage grouse in the westernmost five populations of Gunnison sage grouse, located largely on federal lands with the exception of the Dove Creek – Monticello population. These populations are well below the long-term minimum viable population, ranging from 5,000 to 10,000 individuals (Lande 1995), and even remain substantially below the 500-bird effective population required to prevent inbreeding and

trend toward extinction as found by Reed and Bryant (2000).³ Based on these population numbers, BLM is clearly failing to provide the habitat to support viable populations of Gunnison sage grouse for the western populations of the bird, with BLM-permitted activities such as livestock grazing and oil and gas development playing a central role in population declines. Thus, the of the Colorado Public Land Health Standards regarding viability are judged to be ineffective for lack of implementation.

D. Individual Federal Land Management Plans

None of the eight federal land management plans contain adequate specific conservation measures to address the threats to Gunnison sage grouse. Several of the plans were completed before Gunnison sage grouse was determined to be a distinct species, and thus before land managers were aware of the species’ restricted range, small population size and declines. Thus, it is unsurprising that these plans do not contain adequate conservation measures to conserve the species. Federal land management agencies amend these long-term management plans periodically (ideally every 10 to 15 years).

Three of these plans are currently undergoing revision (Grand Junction, San Juan/San Miguel, Uncompahgre). These revision processes have not been completed, and have the potential to improve conservation measures to address threats to Gunnison sage grouse, though it is not clear from review of draft documents that the revised plans will put adequate regulatory mechanisms in place to conserve the species. The Monticello BLM RMP was revised recently, after the Gunnison sage grouse

³ It is important to note that effective population size (N_e) is the number of breeding adults, adjusted to the assumption that each of the adults has an equal probability of breeding. In sage grouse, one or two males may dominate the breeding at each lek, skewing the actual effective population number lower than the number of birds on the lek. For example, Deibert (1995) found that at a sage grouse lek with 169 total birds and 73 males displaying, only 3 males did all the breeding, resulting in an effective population size (N_e) of only 11.5.

became a candidate for Endangered Species Act protection. Despite knowledge of the proposed listing, this plan does not contain adequate conservation measures to conserve the species.

Federal land management agencies also have the authority to amend individual plans or groups of plans at any time to address new resource management issues. For example, the Bureau of Land Management is currently revising management plans across the western U.S. to improve conservation measures for greater sage grouse. Land management agencies have only recently recognized the need to amend land management plans across the range of the Gunnison sage grouse to improve conservation measures for the species, despite having ample opportunity to do so during the 14 years since the Gunnison sage grouse was recognized as a distinct species and became a candidate for protection under the ESA. This contributed to the Service's determination that existing regulatory mechanisms are inadequate to conserve the species. Federal land management agencies must take immediate action to amend all of the management plans across the range of the Gunnison sage grouse to incorporate adequate regulatory mechanisms to conserve the species. This is essential to ensuring the long-term persistence of the species.

1. Gunnison BLM Resource Management Plan

The Gunnison BLM Field Resource Management Plan does not include sufficient conservation measures to ameliorate the threats to Gunnison sage grouse on federally managed public land. Habitat for the Gunnison Basin and Cerro/Sims Mesa populations is located within the Gunnison Field Office.

The Gunnison RMP was finalized in 1983, before the Gunnison sage grouse was even identified as a unique species. Due to public interest in conservation of 'upland game birds' at the time, this plan has an admirable objective to maintain or improve identified sage grouse brood rearing habitat, nesting areas and winter habitat, such that approximately 9,000 sage grouse could be supported on public land alone. However,

conservation measures in the plan fall far short of what is needed to reach this objective or even to maintain the Gunnison Basin and Cerro/Sims Mesa populations at current levels. The Gunnison Basin population, combining both federal and private lands, currently stands at less than half the BLM population objective, despite more than thirty years of application of the conservation measures in the Gunnison BLM RMP, providing a objective proof of the plan's ineffectiveness.

The Gunnison RMP provides some minimal specific protection from development for areas within ¼ mile of leks and narrow strips of riparian vegetation identified as important brood-rearing habitat (totaling roughly 2,667 acres). In addition, the Gunnison BLM has implemented a No Surface Occupancy buffer preventing construction of roads and structures within a 0.6-mile radius of active leks in activity level plans (see previous discussion of inadequacy of 0.6-mile lek buffers in Section II(A)(1)).

These measures leave the vast majority of Gunnison sage grouse habitat largely unprotected from development and infrastructure, with the exception of minimum habitat management guidelines in the RMP (to be incorporated into all activity plans) that are aimed at maintaining sagebrush cover in nesting, brood rearing, and winter habitat. Although these provisions have likely provided some conservation benefit to the species, sagebrush cover requirements alone are not sufficient to prevent population declines in response to new industrial development and associated infrastructure. It is well established that sage grouse may avoid otherwise suitable sagebrush habitat in proximity to developments and infrastructure, including roads, oil and gas wells, and powerlines (see previous discussion in Sections IV(A)(2) and (3)). Thus, even if developments don't reduce sagebrush cover below the levels specified in the plan, they may result in functional loss of large areas of nesting, brood rearing and winter habitat. Finally, exceptions to the minimum guidelines for habitat management are allowed when it can be demonstrated that short-term impacts will be offset by long-term benefits to sage

grouse and their habitat. Exceptions may result in authorization of projects with short-term negative impacts that are essentially certain, in exchange for restoration activities will have an unproven and thus unknown long-term result for sage grouse.

The Gunnison RMP has no conservation measures in place to reduce the footprint or impacts of existing development and infrastructure. Gunnison BLM has taken limited steps toward reducing the impacts of existing development and infrastructure on lands occupied by the Gunnison sage grouse through the Gunnison Basin Federal Lands Travel Management Plan and the Gunnison Basin Candidate Conservation Agreement (see discussion of these plans under Sections IV(E)(1) and IV(B)(1), respectively).

The Gunnison RMP includes only one specific provision to protect Gunnison sage grouse from improper grazing management, a requirement that a 4-inch minimum stubble height be maintained in riparian areas that have been identified as important for sage grouse brood rearing, from June 15 through July 31, and a 2-inch minimum stubble height be maintained at all other times in these areas. This standard is limited to narrow strips of brood rearing habitat, leaving the majority of sage grouse habitat, including nesting habitat, without protection from improper grazing management. Further, this requirement is not consistent with the best available science (see Section II(A)(2)). Finally, there is uncertainty as to whether and how this standard will be implemented, due to substantial flexibility allowed in the plan for allotments covered by grazing plans and agreements and in methods required to bring allotments up to standard. There are no other grazing requirements specific to sage grouse in the plan, though general grazing management standards for uplands apply in other types of habitat. These include provisions for establishment of allotment activity plans, and establishment of maximum use levels and minimum stubble height requirements for areas without allotment activity plans. The inadequate 4- to 6-inch stubble height standard from the Rangeland Conservation Plan is the strongest protection against overgrazing that is contained within individual grazing permits.

2. Uncompahgre BLM Resource Management Plan

The Uncompahgre BLM Field Office has failed to put sufficient conservation measures in place to ameliorate the threats to Gunnison sage grouse on federal land. Habitat for the Crawford, Cerro/Sims Mesa and San Miguel Basin populations is located within the Uncompahgre Field Office.

The Uncompahgre RMP is currently undergoing revision. Gunnison sage grouse conservation was identified as a key issue to address in the planning process. The BLM is currently preparing a draft RMP and EIS. BLM indicated that it will consider designation of two areas of occupied Gunnison sage grouse habitat as Areas of Critical Environmental Concern in the draft RMP. Although there is potential for the revised plan to include adequate conservation measures for Gunnison sage grouse, this cannot be determined until the plan is finalized.

Until the revised RMP is finalized, the San Juan/San Miguel RMP and the Uncompahgre Basin RMP govern management of Gunnison sage grouse in the Uncompahgre Field Office. The San Juan/San Miguel and Uncompahgre Basin RMPs were finalized in 1985 and 1989 respectively, both prior to Gunnison sage grouse being recognized as a unique species. There are no conservation measures for Gunnison sage grouse in the Uncompahgre Basin RMP, and very limited conservation measures in the San Juan/San Miguel RMP. The San Juan/San Miguel RMP was amended more recently through a 1991 oil and gas amendment, and both plans were amended relatively recently through the Dry Creek Travel Management Plan Amendment (2009) and the Uncompahgre Travel Management Plan Revision (2010). These plans also contain few conservation measures for Gunnison sage grouse. The plans that currently govern Gunnison sage grouse management in the Uncompahgre BLM Field office do not contain adequate conservation measures to address the threats to the Crawford, Cerro/Simms Mesa and San Miguel Basin populations of Gunnison sage grouse.

The Uncompahgre RMP has no conservation measures in place to address the

threat posed by new development and infrastructure. The San Juan/San Miguel Plan and 1991 oil and gas amendment include completely inadequate conservation measures aimed at reducing the threat posed by oil and gas development, including: 1) no surface occupancy within a 0.25-mile radius of a lek site, and 2) seasonal limitation on oil and gas development at strutting grounds during the breeding season, in crucial winter habitat during winter, and within nesting habitat during the nesting season. These conservation measures do little to prevent loss of leks and significant population declines in response to oil and gas development. Holloran (2005) provides a test of the efficacy of these protections in the face of full-field gas development, and found they resulted in significant population declines with a projection of population extirpation within 19 years. There are no conservation measures in these plans that address the threat posed by other types of development and infrastructure (e.g. roads, powerlines, mining etc.). The more recent Dry Creek and Uncompahgre Travel Management Plan Amendments contain no conservation measures to reduce the threat posed by new road construction in Gunnison sage grouse habitat. Thus, there are currently few protections in place to protect Gunnison sage grouse populations from new development and infrastructure on public lands in the Uncompahgre Field Office.

The Uncompahgre and Dry Creek Travel Management Plan Amendments provided a small benefit to Gunnison sage grouse, but do not include adequate conservation measures to address the ongoing impacts of existing development and infrastructure. The Uncompahgre Travel Management Plan Revision contains no Gunnison sage grouse specific conservation measures (though it likely provided some benefit to the species by limiting off highway vehicle travel to existing routes yearlong with seasonal restrictions). There is only a small area of occupied Gunnison sage grouse habitat in area covered by the Dry Creek TMP Amendment. This amendment reduced the 2.9 miles of existing roads in occupied habitat in the planning area by 0.7 miles. Existing infrastructure must be further reduced in Gunnison sage grouse

habitat in the field office in order to increase the size of the Crawford, Cerro/Simms Mesa and San Miguel Basin populations. Today, there are inadequate measures to reduce the footprint and impacts of existing development and infrastructure in lands managed by the Uncompahgre Field Office. Moreover, the San Juan/San Miguel and Uncompahgre RMPs contain no conservation measures to protect Gunnison sage grouse from improper grazing management.

3. San Juan/San Miguel BLM Resource Management Plan

The Tres Rios BLM Field Office is currently operating under the San Juan/San Miguel Resource Management Plan and has not put sufficient conservation measures in place to ameliorate the threats to Gunnison sage grouse on federal land. Habitat for the San Miguel Basin and Dove Creek/Monticello populations are located within the Tres Rios Field Office.

The management plans for the Tres Rios BLM Field Office and the San Juan National Forest have undergone revision recently. In September of 2013, the BLM and FS released a joint proposed land and resource management plan for the BLM Tres Rios Field Office and San Juan National Forest. However, a Record of Decision has not yet been issued on the Tres Rios portion of this plan. Until the plan is finalized, the 1985 San Juan/San Miguel RMP governs management of Gunnison sage grouse in the Tres Rios Field Office. We have discussed the inadequacy of this plan in the above section on the Uncompahgre Field Office (the Tres Rios and a portion of the Uncompahgre Field Office fall under the San Juan/San Miguel RMP). It is far from clear that the ongoing revision process will result in a final plan with adequate conservation measures for Gunnison sage grouse. The proposed Tres Rios plan does not contain adequate conservation measures to conserve Gunnison sage grouse (see San Juan forest plan below), thus it is unclear that the lack of adequate conservation measures in the Tres Rios Field Office will be remedied through the plan revision process.

4. Monticello BLM Resource Management Plan

The Monticello RMP was finalized in November of 2008, after Gunnison sage grouse was recognized as a distinct species and became a candidate for ESA protection. Despite this, the Monticello RMP does not include adequate regulatory mechanisms to conserve the Dove Creek/Monticello population of Gunnison sage grouse. This plan does not effectively address the cumulative impacts of habitat loss and fragmentation. The plan includes a variety of conservation measures aimed at reducing the impacts of individual developments, but such conservation measures cannot compensate for the lack of a strategy to limit cumulative habitat loss and fragmentation from new development and infrastructure.

The Monticello Plan applies a number of conservation measures within a 0.6-mile protective buffer around active leks:

- Prohibit construction of power lines or permanent aboveground structures year-round.
- No Surface Occupancy for oil and gas leasing activities. No surface-disturbing activities are allowed.
- Prohibit construction of roads year-round.
- Prohibit construction of wind power turbines year-round.
- Avoid all permitted activities from March 20 to May 15. If impractical to avoid all permitted activities, then no activity from sunset the evening before to 2 hours after sunrise the next morning.
- Prohibit year-round construction of fences. Retrofit visual devices on existing fences to prevent collisions. Where opportunity exists, remove existing fences.
- Unavailable for non-ground-disturbing geophysical work from March 20 to May 15.

Unfortunately, as discussed elsewhere in this report, protecting a 0.6-mile buffer around leks leaves 96% of the nesting habitat without any protection whatsoever, and allows disturbances as close as 0.6 miles to

leks, when scientific studies have shown that facilities within 1.9 miles of leks cause populations to decline, even in the absence of active drilling.

Within 4 miles of active leks, a suite of activities will be “avoided” but not excluded, including new fences, powerlines, wind turbines, and other surface-disturbing activities. These provisions suggest that these types of projects, which have known negative effects on sage grouse would be discouraged, but then again they might be permitted in many cases. This is the definition of regulatory uncertainty, which must be avoided in the context of analysis of the adequacy of existing regulatory mechanisms in Endangered Species Act decisions. This plan includes a goal to limit grazing use levels as necessary to maintain or improve sage grouse habitat, but includes no measureable requirements, leaving grazing management to the whim of individual agency officials. On the Sage Flat, Upper East Canyon, Sage-grouse and Dry Farm allotments, livestock grazing is prohibited from March 20 to May 15, which provides a possible benefit during the breeding and part of the nesting season. Finally, the area within 4 miles of leks is designated as open to oil and gas leasing, without the restrictions on well density and siting that would prevent major impacts to breeding, nesting, or wintering sage grouse.

In addition, this RMP also contains a suite of optional goals, objectives, and best management practices that may, or may not, be applied by land managers to improve conditions for sage grouse. While some of this language is positive, no the RMP provides no regulatory certainty for the sage grouse.

5. Grand Junction BLM Resource Management Plan

The Grand Junction BLM Field Office has not put sufficient conservation measures in place to ameliorate the threats to Gunnison sage grouse on federally managed public land. Habitat for the Piñon Mesa population is located within the Grand Junction Field Office.

The management plan for the Grand Junction BLM Field Office is currently undergoing revision. This revision process is not complete. Improved conservation

measures may be put in place through the revision process. Until a revised plan is finalized, the old Grand Junction RMP guides management in the Grand Junction Field Office. This RMP was finalized in 1987, before the Gunnison sage grouse was recognized as a distinct species.

This plan contains few conservation measures for Gunnison sage grouse. The plan makes sage grouse leks unsuitable for coal leasing, requires that 30% of the sagebrush in vegetation manipulation areas be reserved from treatment, and aims to develop habitat management plans to benefit wildlife in specific areas, including sage grouse, although development of such plans is a low priority. These conservation measures provide limited benefit to Gunnison sage grouse and obviously do not constitute adequate regulatory mechanisms to conserve the species.

6. San Luis BLM Resource Management Plan

The San Luis Resource Management Plan was finalized in 1991, prior to Gunnison sage grouse being recognized as a distinct species. Sage grouse-specific conservation measures are completely absent from the San Luis Resource Management Plan.

7. National Forest Plans

The Grand Mesa, Gunnison and Uncompahgre National Forest (GMUG NF) has not put sufficient conservation measures in place to ameliorate the threats to Gunnison sage grouse on federally managed public land. Habitat for small portions of the Gunnison Basin and other populations are located within the GMUG NF. The GMUG NF Plan was finalized in 1983, prior to Gunnison sage grouse being recognized as a unique species. The GMUG NF began a process to revise this plan, but the process was put on hold in 2009, pending development of a new USFS planning rule. A 1993 oil and gas plan amendment included sage grouse provisions, although this amendment applied to only a portion of the Forest. There are very limited conservation measures for Gunnison sage grouse in the GMUG forest plan.

The only conservation measures in place in the GMUG forest plan that address the

threat posed by new development and infrastructure are completely inadequate stipulations to limit the negative impacts of oil and gas development, including: 1) a seasonal timing limitation on oil and activities in breeding and nesting areas (within 2.5 miles of a lek) during the breeding season, and 2) a controlled surface use stipulation for the area within 2.5 miles of leks. We have previously discussed the inadequacy of seasonal timing limitations in preventing significant negative impacts associated with oil and gas development. The controlled surface use stipulation simply gives the agency the discretion to require avoidance of habitat and design features to minimize impacts of oil and gas development. It does not prevent development within 2.5 miles of a lek, and provides little certainty regarding what type of avoidance or design features will be required. Both provisions are subject to exceptions, modification, and waiver at the discretion of agency staff, resulting in little certainty that they will be implemented. There are no other conservation measures in the GMUG forest plan that address the threats posed by new development and infrastructure.

The only other conservation measure in the GMUG NF plan is a requirement to avoid any vegetation management within 0.5 mile of known sage grouse leks. This protects a small proportion of the nesting habitat within 4 miles of the lek from vegetation management. However, the vast majority of nesting and other seasonal habitat is left unprotected from impacts resulting from vegetation management.

In sum, there are no conservation measures in the plan GMUG forest plan to address the majority of the threats to the species.

The San Juan National Forest completed its Land and Resource Management Plan in 2013. No proposed critical habitat (either occupied or unoccupied) for Gunnison sage grouse falls within the boundaries of the National Forest, so its relevance to the issue of Gunnison sage grouse conservation is questionable. This plan does, however, contain three required standards for Gunnison sage grouse habitat protection: seasonal timing limitations preventing

permitted activities from March through June in nesting habitats and from December through March 15 in wintering habitats, a prohibition on surface-disturbing activities within 0.6 miles of leks, and a requirement that fuel treatments be conducted to protect or enhance sagebrush ecosystems. The shortcomings of timing limitations and the 0.6-mile lek buffer are discussed elsewhere in this report. All other conservation measures for Gunnison sage grouse are optional “guidelines” or Best Management Practices, which are not required and therefore fail the test of certainty in implementation. The BLM’s Tres Rios Resource Management Plan, which is being developed under the same planning process, has not yet been adopted as a final plan.

8. National Park Service Plans

The National Park Service manages a relatively small amount of Gunnison sage grouse habitat, within the boundaries of the Black Canyon of the Gunnison National Monument and Curecanti National Recreation Area. The National Park Service’s mandate differs substantially from the multiple use mandates of the Bureau of Land Management and the National Forest Service. The primary objective for park management is to guide the protection and preservation of natural and cultural environments while permitting ecological process to continue with a minimum of human disturbance. Thus, the National Parks Service may put more emphasis on conserving Gunnison sage grouse than other federal land management agencies.

Management of these two areas is guided by the Black Canyon of the Gunnison National Monument and Curecanti National Recreation Area General Management Plan (GMP), which was finalized in 1997. This general management plan does not include specific management prescriptions to protect resources, but instead provides a framework and broad general direction for park management. Thus, the plan includes no specific conservation measures for Gunnison sage grouse. The plan includes overall goals and objectives aimed at conserving wildlife, including Gunnison

sage grouse and its associated habitat. Yet threats to the species are lower on Park Service lands, due to greater emphasis on permitting ecological processes to continue with a minimum of human disturbance.

E. Federal Activity and Project-Specific Plans

Federal land management agencies have sporadically included additional conservation measures for Gunnison sage grouse in specific activity plans (e.g. travel management plans), or plans for individual projects (e.g. energy development plans), on a case-by-case basis. This has remained the primary mechanism through which the agencies have implemented conservation measures outlined in the Gunnison sage grouse Rangewide Conservation Plan. Conservation measures in such project-specific plans have often been an improvement over those in the federal land management plans, and have provided some benefit to the species. However, without clear and consistent direction in overarching land management plans, implementation of conservation measures in plans for particular projects or activities is left up to the discretion of agency staff. This piecemeal approach cannot comprehensively address all of the threats to the Gunnison sage grouse throughout the species remaining habitat. Further, this approach precludes landscape scale planning that is critical to addressing some of the threats to the species.

For example, this approach can somewhat reduce the impacts of individual major development projects, but cumulative levels of habitat loss and fragmentation from development may still exceed sage grouse thresholds of tolerance at a landscape scale. Finally, this approach does not provide the certainty regarding which conservation measures will ultimately be implemented that is necessary in order to meet the Service’s criteria to support a determination that the species does not require the protections of the ESA. It is critical that agencies apply regulatory mechanisms that conserve the species through a landscape-scale management plan revision or amendment so threats can be addressed comprehensively,

and certainty of implementation can be assured.

We have not reviewed all of the myriad plans authorizing specific activities or projects in Gunnison sage grouse habitat. Here, we provide two examples of such projects and plans to illustrate that some of these plans have implemented conservation measures that are an improvement over those contained in land use plans, but they are limited in their effectiveness due to 1) inconsistency with the best available science on what is needed to ameliorate threats to the species, and 2) a high degree of uncertainty regarding what conservation measures (if any) will actually be implemented.

1. Gunnison Basin Federal Lands Travel Management Plan

The Gunnison Basin Federal Lands Travel Management Plan (which covers the Gunnison BLM Field Office and the Gunnison National Forest) takes important steps toward reducing the impacts of existing development and infrastructure on BLM lands occupied by Gunnison sage grouse. First, the plan substantially reduced cumulative miles of road within Gunnison sage grouse breeding habitat (within 0.6 miles of a lek) and nesting habitat (within 4 miles of a lek). Second, the plan also limits motorized and mechanized travel to designated routes, helping to reduce potential threats posed by off-road vehicle use. Third, the plan implements seasonal closures to all motorized travel (except for access to private inholdings and some administrative access) from March 15 to May 15 each year in breeding and early nesting habitat across 191,000 acres of BLM lands. Under a separate decision, the Forest Service also implemented a seasonal closure restricting motorized travel in the Flat Top Mountain area from December 15 to June 15 to provide additional protection to nesting and brooding sage grouse in the area. This plan constitutes important progress towards decreasing fragmentation from existing roads and reducing traffic-related disturbance in breeding and nesting habitat, and likely benefitted Gunnison sage grouse populations in the Gunnison Basin.

Though the plan is an important step in the right direction, it has some major limitations. First, the plan does not include any specific guidance regarding construction of new roads on BLM lands in Gunnison sage grouse habitat, stating only that new route construction will be analyzed under a separate NEPA process. Thus the plan provides no certainty that new route construction will be avoided in prime Gunnison sage grouse habitat on BLM lands, and no provision for offsetting the impacts of new road construction by reducing existing infrastructure. Second, hundreds of miles of existing routes in Gunnison sage grouse breeding and nesting habitat remain. This existing road infrastructure has ongoing negative impacts to the species that are not addressed by seasonal closures to motorized use. For example, existing roads may facilitate predation and the spread of invasive weeds. In addition, seasonal closures do not apply to administrative or non-motorized use that could result in substantial disturbance during the breeding and nesting seasons. Finally, this plan did not address the impacts of over-the-snow travel by snowmobiles, which may be particularly important during severe winters. The Gunnison Basin Candidate Conservation Agreement recognized and attempted to address some of the above issues (see further discussion under the Gunnison Basin Candidate Conservation Agreement). Thus, although this plan may benefit the species, further improvements are needed to achieve the goal of putting adequate regulatory mechanisms in place to conserve the Gunnison sage grouse.

2. Gunnison Geothermal Lease

The Gunnison BLM and GMUG NF added new geothermal lease stipulations for Gunnison sage grouse prior to leasing a large area of occupied Gunnison sage grouse habitat for geothermal development in 2010. The BLM amended its 1983 Resource Management Plan to add lease stipulations, while the GMUG NF added stipulations without a plan amendment.

Grouse Population	Total Habitat Acres under Easement	Acres Private Land Habitat	% Total Habitat under Easement
Dove Creek - Monticello	6,117	301,020	2.0%
Pinon Mesa	40,322	91,558	44.0%
San Miguel Basin	8,424	48,335	17.4%
Cerro Summit - Cimarron - Sims Mesa	7,769	48,335	16.1%
Crawford	12,135	53,033	22.9%
Gunnison Basin	62,720	235,145	26.7%
Poncha Pass	521	15,920	3.3%
Totals	138,008	793,346	17.4%

Table 5. Conservation easement acreage, data from Lohr and Gray (2013).

The BLM applied a 0.6-mile No Surface Occupancy buffer to all leks. As discussed previously, avoiding development within 0.6 miles of a lek will not prevent extirpation of leks, protects less than 4% of the nesting habitat associated with a lek, and will not prevent significant population declines due to behavioral avoidance of otherwise suitable habitat in proximity to structures and roads. In addition, it does not address the need to protect wintering habitat. The Gunnison Basin Candidate Conservation Agreement (page 4) appropriately recognizes the need to prevent net direct or indirect/functional loss of occupied habitat while this IM does not.

The lek buffer is also subject to waiver, exception and modification at the discretion of BLM staff, making it uncertain that even this inadequate lek buffer will actually be applied. BLM also added a seasonal restriction on construction and drilling activities within 0.6 miles of a lek from March 15 to May 15 to reduce disturbance during the breeding and nesting season. However, seasonal closures do nothing to prevent permanent loss and fragmentation of habitat and associated impacts that stems from development that takes place outside of the breeding and nesting season.

The seasonal closure also does not apply to operation of a geothermal plant, which could result in substantial noise and human disturbance during the breeding and nesting

seasons. Finally, the BLM applied a No Surface Occupancy stipulation in mapped summer-fall habitat, until the project applicant submits a plan to meet resource management objectives through special design, construction, operation, mitigation or reclamation measures, and/or relocation that is approved by BLM. It is unclear what conservation measures would be required for BLM to waive the No Surface Occupancy stipulation in mapped summer/fall habitat, leading to uncertainty about what conservation measures will actually be implemented. In addition, due to the location of the geothermal lease area, it is impossible for a large-scale geothermal development to occur within the lease area without loss and fragmentation of a substantial amount of key habitat (occupied habitat including leks, nesting habitat and summer/fall habitat), regardless of how the project is designed.

In contrast to the BLM, the Forest Service put stipulations in place that are much more likely to effectively ameliorate the negative impacts of development of the geothermal lease. The Forest Service applied a stipulation that prohibits surface occupancy and activities within 4.0 miles of Gunnison sage grouse leks (with an exception for operation and maintenance activities). This lek buffer is more consistent with the best available science and more likely to prevent lek extirpations and population declines in

Population	CI's Completed		CI's in Progress		Total	
	#	Acres	#	Acres	#	Acres
Gunnison Basin	21	29,385	13	28,962	34	58,347
Crawford	1	2,479	2	1,552	3	4,031
San Miguel	2	1,344	1	15,476	3	16,820
Piñon Mesa	3	18,761	0	0	3	18,761
Rangewide Totals	27	51,969	16	45,990	43	97,959

Figure 6. Acreage of private land under Certificates of Inclusion (“CI’s”) in the Candidate Conservation Agreement with Assurances as of April 2014, data courtesy USFWS.

response to geothermal development. In addition, the Forest Service will not consider waiver, exception and modification of this provision within 0.6 miles of leks, and provides much clearer criteria for when waiver, exception and modification will be considered, achieving certainty of implementation.

Although the impacts of major geothermal development on the lease parcel may be reduced somewhat through these conservation measures, geothermal development will have a negative impact on Gunnison sage grouse if it occurs, and ultimately contribute to net increases in habitat loss and fragmentation that result in population declines in the Gunnison Basin.

V. PRIVATE LAND CONSERVATION EFFORTS

Some 49.9% of the proposed critical habitat for Gunnison sage grouse occurs on private lands, and several tools are available to private landowners to undertake a commitment to Gunnison sage grouse conservation. To the extent that these private but legally binding agreements successfully address the threats facing Gunnison sage grouse and their habitats, these private land efforts can be considered as mitigating factors when determining whether Endangered Species Act protections are needed.

Numerous private landowners have enrolled their lands in one or more conservation agreements that address one or more threats to Gunnison sage grouse.

A. Conservation Easements

Conservation easements are voluntary deed restrictions that attach to a property and can limit or prevent future actions that potentially have negative impacts on sage grouse. The terms and conditions of conservation easements vary from easement to easement, but can include various land-use limitations, restricting the ability of current and future owners of the property to engage in practices that result in the subdivision or development of the land in question. The most common type of conservation easement prevents a parcel of land from being subdivided into smaller parcels. Such subdivision commonly leads to rural housing developments, with homes, access roads, fences, and powerlines, all of which are known to fragment and degrade Gunnison sage grouse habitat. Somewhat less commonly, restrictions may be placed on the property limiting how many, what kinds, and where additional buildings may be located on the land. The most restrictive conservation easements may limit the number and/or location of roads, fences, or powerlines, and may also prevent future mineral development in cases where the property owner owns both the land and the mineral estate beneath the

property. A few of these easements specifically address Gunnison sage grouse conservation, while others allow certain levels of additional subdivision of the property.

Lohr and Gray (2013) reported that of the 376,225 acres of private land in Gunnison sage grouse occupied habitat, 118,398 acres (or 31.5%) of private lands inside Gunnison sage grouse occupied habitat had been protected at some level by conservation easements as of the study's publication date. By population unit, percentages of lands with easements ranged from 0% for the Poncha Pass population to 74% for the Piñon Mesa population. Examining the combined acreage of occupied and unoccupied habitats across the range of the Gunnison sage grouse, 17.4% of grouse habitat receives some level of protection under a conservation easement (see Table 5).

It is worth noting that a conservation easement may definitively prevent the subdivision and development of key sage grouse habitats in cases where state and county regulations allow such habitat destruction. So in counties with few to no sage grouse conservation protections, and for lands in more conservation-minded counties that are beyond the 0.6-mile lek buffer where protections might apply, conservation easements are the only reliable backstop short of Endangered Species Act listing protections that can succeed at protecting sage grouse habitats on private lands where county regulations fall short. Unfortunately, 82.6% of sage grouse habitats (occupied or unoccupied) currently lack any protection from a conservation easement.

While conservation easements can be quite effective at addressing subdivision and sometimes home development, for other threats they are of limited assistance. For example, livestock grazing and the associated depletion of grasses needed for hiding cover is not addressed—and indeed, is sometimes encouraged—by conservation easements even when it occurs at levels that are extremely problematic for sage grouse. So-called 'split estate' minerals often underlie private lands, where another entity owns the mineral rights under the land. In many cases the mineral owner (or lessee) has broad authority to

engage in habitat destruction on the surface without needing the agreement of the landowner. Additionally, many aspects of agricultural operations, from fences to off-road vehicle use to conversion of sagebrush habitats to hayfields, have major impacts on sage grouse but are typically not restricted or addressed by conservation easements. Thus, conservation easements can be an important tool for fighting subdivisions, but are not a cure-all for threats to sage grouse habitats.

B. Candidate Conservation Agreements with Assurances

Candidate Conservation Agreements with Assurances (CCAAs) are intended to deliver a similar level of protection for private lands as would be delivered by listing as 'threatened' or 'endangered' under the Endangered Species Act, but give the landowner the option of which conservation measures they are obligated to implement on a landowner-by-landowner basis. The CCAA is designed to work in concert with an endangered or threatened species ESA listing, giving the landowner relative immunity from the provisions of the Endangered Species Act itself so long as the terms of the CCAA are fully implemented.

As of April 2014, some 51,969 acres of private land were enrolled in Candidate Conservation Agreements with Assurances, and an additional 45,990 acres of land were under negotiation for enrollment into CCAAs (see Table 6). Taken together, this represents 12.3% of the combined occupied and unoccupied Gunnison sage grouse habitat found on private land. It is difficult to make generalizations regarding the extent to which existing CCAAs can successfully address threats to the species, because they tend to vary from agreement to agreement, and the provisions of each agreement are not published.

VI. KEY CONSERVATION MEASURES MISSING FROM ALL CONSERVATION EFFORTS

A number of conservation measures identified in the Bureau of Land

Management's National Technical Team Report for greater sage grouse, and supported by published science, are entirely missing from all state, local and federal efforts to protect Gunnison sage grouse and their habitats. The absence of such measures leave the Gunnison sage grouse exposed to activities shown to have major impacts on the species, and can lead to additional population declines. These threats also need to be addressed to render the Gunnison sage grouse secure from extinction.

A. Disturbance Caps

Based on the science available at the time, the National Technical Team (2011) recommended a limit of 3% human disturbance within 4 miles of active sage grouse leks. Subsequent scientific research (Knick et al. 2013) corroborated the validity of this threshold by documenting that 99% of active greater sage grouse leks in the western half of the species' range were surrounded by lands with 3% or less surface disturbance. Yet no state, federal, or local plan incorporates standards or requirements that maintain human disturbance below this 3% threshold, leaving Gunnison sage grouse exposed to levels of human disturbance that are dense enough to cause significant population impacts and would presumably lead to the abandonment of active leks and extirpation of breeding populations.

B. Site Density Limits

Based on published science available at the time, the National Technical Team recommended that restrictions be applied to existing mineral leases and mining operations that allowed a maximum of one wellsite per square mile in priority habitats for greater sage grouse. This site disturbance density is based on research by Holloran (2005), Walker et al. (2007), and Tack (2009), each of whom documented significant negative impacts on greater sage grouse lek populations when site density exceeded one oil and gas wellsite per square mile. Copeland et al. (2013) documented the validity of this threshold statewide across Wyoming, and found that

even sparser densities of development were related to grouse population declines. Presumably, the density of wellsites and the impact of similar densities of homesites would have similar levels of impact on sage grouse, since both homes and wellsite come with access roads, regular vehicle traffic, and human activity at the site, each of which is a factor known to cause disturbance and/or displacement of sage grouse. Yet no state, county, or federal plan caps the density of oil and gas wells, mine sites, and/or homesites at one per square mile in occupied Gunnison sage grouse habitat.

C. Noise Limits

More recently, scientific studies have documented that noise at or near the lek site can have significant negative impacts on sage grouse. Noise can drown out the breeding vocalizations of male sage grouse, interfering with courtship (Blickley and Patricelli 2012). Noise has been found to drive away breeding sage grouse from active leks (Blickley et al. 2012a) and cause elevated levels of stress hormones for the birds that remain (Blickley et al. 2012b), potentially leading to reductions in fitness. According to Blickley et al. (2010),

“The cumulative impacts of noise on individuals can manifest at the population level in various ways that can potentially range from population declines up to regional extinction. If species already threatened or endangered due to habitat loss avoid noisy areas and abandon otherwise suitable habitat because of a particular sensitivity to noise, their status becomes even more critical.”

In Wyoming, natural background noise levels in the Wind River Basin have been established at 22 decibels (dBA) (Patricelli et al. 2012), and in the Upper Green River at 15 dBA (Ambrose and Florian 2014). Wyoming is windier than southwest Colorado, indicating that the ambient natural noise levels for Gunnison sage grouse should be, if anything, lower than those for Wyoming. Patricelli et al. (2012) recommended that human-caused

noise should be limited to no more than 10 dBA above ambient at the lek perimeter. Gunnison sage grouse mating vocalizations differ from those of greater sage grouse (Young 1994). To provide a modicum of protection from noise pollution, noise in Gunnison sage grouse habitat should be limited to a maximum of 32 dBA at the lek perimeter, yet no state, federal or county plan requires or even recommends limits on human-caused noise in sensitive Gunnison sage grouse habitats.

D. Prevention of Future Mineral Leasing and Availability

Based on the best available science and a multitude of scientific studies documenting impacts of mineral development, the National Technical Team (2011) recommended a moratorium on fluid mineral leasing of federal lands, withdrawal from hard-rock mineral exploration and development, and no coal or non-energy minerals leasing in priority habitats for greater sage grouse on federal lands. Despite the plight of the Gunnison sage grouse being far more dire than that of the greater sage grouse, only a temporary moratorium on coal and fluid mineral leasing extending through the recently-announced revision of BLM plans, through Instruction Memorandum 2014-100, exists at present. For several populations (San Miguel, Dove Creek—Monticello), oil and gas development is already starting to encroach on occupied habitat for Gunnison sage grouse, and the potential for uranium and/or gravel mining also poses an immediate threat in some areas.

VII. CONFLICTING REALITIES

The biological reality is that Gunnison sage grouse populations have been declining for many years, that these birds are sensitive to human activity and habitat fragmentation, and need large tracts of undisturbed sagebrush habitat with abundant grass understory to thrive. The political reality is that state and many local governments have

been slow and reluctant to impose conservation regulations to protect the Gunnison sage grouse and its habitat, and the protection measures that have been adopted so far have been biologically inadequate. Thus far, the biological reality and the political reality have not intersected to create space for a solution that maintains viable Gunnison sage grouse populations while garnering broad political support among residents and state and local governments.

Part of the blame for the failure to emplace adequate sage grouse protections and thus avoid the necessity for Endangered Species Act listing falls on partisan politics. Counties with predominantly moderate to progressive politics (i.e., Gunnison and San Miguel Counties) have adopted a number of Gunnison sage grouse protections into regulations. Most county governments across the Gunnison sage grouse range are dominated by right-wing politics, which frame the problem as too much government regulation rather than too few Gunnison sage grouse. This framing of the issue provides little incentive to protect birds and their habitat in local regulations. As a result, these counties have few protections (or none at all) for Gunnison sage grouse. It is no mystery that the satellite populations in these counties are disappearing. The irony is that by resisting the adoption of protections of the local level, right-wing county governments bear a disproportionate responsibility for bringing about the imminent Endangered Species Act listing of the Gunnison sage grouse, and the more intrusive federal regulations and requirements that come with it.

The Endangered Species Act, now in its 41st year, was passed nearly unanimously by a bi-partisan Congress and signed into law with much fanfare by a Republican president. The recent partisan backlash to protecting imperiled species is unfortunate and short-sighted.

Federal land management agencies, particularly the Bureau of Land Management, have also contributed to the need to protect the Gunnison sage grouse under the Endangered Species Act, by

failing to put adequate conservation measures in place in their land management plans, despite ample opportunity to do so over the 14 years since the species first became a candidate for Endangered Species Act listing. The BLM is finally taking action to remedy this failing. However, it remains to be seen whether BLM will recognize what is biologically necessary to conserve the species, and put adequate regulatory mechanisms in place that will be sufficient to ensure the persistence of the species.

The Colorado Parks and Wildlife (CPW) Department also bears a share of responsibility for the current necessity for Endangered Species Act listing of the Gunnison sage grouse. Pressured by politically appointed superiors, CPW biologists have been constrained to recommend only those Gunnison sage grouse protections that are considered politically reasonable, rather than those that are considered biologically necessary based on the best available science. By focusing on what is politically expedient rather than what is biologically necessary, CPW has lulled local governments into an inappropriate sense of complacency by projecting a false narrative that by adopting minimally intrusive conservation measures, an Endangered Species Act listing can be avoided. In doing this, CPW has set up local governments to fail.

In the end, the case can never be made that a single relatively stable population of 4,000 Gunnison sage grouse in the Gunnison Basin is enough to secure the viability of the species as a whole; multiple substantial and stable populations across the region are needed to even attempt to argue the species does not require ESA protections. Presumably, CPW biologists made a political judgment that sugar-coating the situation would provide more and faster adoption of sage grouse conservation measures, and painting a grimmer, but more realistic, picture about what would be needed to recover the species and prevent ESA listing would only cause local governments and landowners to give up the effort. However, by underselling the fundamental types of changes in the

activities that harm sage grouse and their habitats that are needed to protect the remaining Gunnison sage grouse and restore depressed populations to levels that promote their long-term viability, state wildlife officials have lulled local governments and landowners into a sense of complacency and misconceptions of adequacy regarding the effectiveness of their local plans and ordinances. These failures also mean it will take longer to recover the species to a point where Endangered Species Act protections may be removed – the ultimate goal of the Act and conservationists.

VIII. CONCLUSIONS

The listing of the Gunnison sage grouse under the Endangered Species Act is imminent, in light of the fact that the only substantial and relatively stable population of birds is in the Gunnison Basin, that population is subject to substantial threats, and existing regulatory mechanisms rangewide are inadequate. If there were multiple populations of Gunnison sage grouse, each with more than 3,000 birds and with relatively stable population levels over time, a stronger case could be made that this beautiful bird is not in imminent danger of rangewide extinction.

It is also important to recognize, however, that even the prospect of imminent endangered species listing has yet to trigger the adoption of adequate conservation measures for sage grouse. The counties that have done the most for the Gunnison sage grouse, namely Gunnison and San Miguel Counties, have not yet done enough to assure the recovery of the species, and indeed even with today's regulations in place, continued rural development that results in additional reduction and degradation to sensitive sage grouse habitat is expected. Other counties emplaced purely optional conservation measures, or none at all. The State of Colorado did very little to exercise its own authority to require Gunnison sage grouse habitat to be protected.

While a definitive causal link cannot be drawn, it is instructive that Gunnison County has done the most to protect the Gunnison sage grouse and its habitats, and the Gunnison Basin population is relatively stable and fairly substantial today. The “satellite populations”—Crawford, Cerro Summit-Cimarron-Sims Mesa, San Miguel, Piñon Mesa, Dove Creek/Monticello, and Poncha Pass—have substantially lower levels of protections that have only recently been put in place, and they are home to very small and unstable grouse populations. The irony is that the lands west of the Black Canyon of the Gunnison were originally the heart of Gunnison sage grouse range, and the Gunnison Basin was the satellite population. The more robust survival of Gunnison sage grouse in the Gunnison Basin than elsewhere certainly speaks to stronger stewardship for sage grouse habitats here than elsewhere in the range of the species.

As a result of inadequate protections, the listing of the Gunnison sage grouse as ‘endangered’ under the Endangered Species Act is legally required. Once the bird is listed, efforts to provide legally adequate protections will count as progress toward recovery of the species and its removal from the endangered species list. The BLM’s National Technical Team (2011)⁴ recommendations are equally applicable to the Gunnison sage grouse, and when paired with a seven-inch residual grass stubble height requirement they represent a detailed blueprint for minimum conservation measures that would need to be applied to satisfy the legal requirements for adequate regulatory mechanisms under the Endangered Species Act.

Progress toward adequate conservation measures can be made through: 1) building upon concepts in the Gunnison Basin Candidate Conservation Agreement, 2) using relevant findings or recent science (including the BLM’s National Technical Team Report and results of a variety of recent Gunnison sage grouse-specific studies) to develop

biologically adequate conservation measures, and 3) increasing the certainty that existing optional, but biologically adequate, conservation measures will be required to be implemented.

And while federal agencies achieved some protections through the Gunnison Basin Candidate Conservation Agreement, that agreement sidestepped the bird’s biggest threats. For the satellite populations west of the Gunnison Basin, the known threats to sage grouse habitat remain unaddressed. Thus, today the collective conservation measures at the local, state, and federal levels would still have to be classified as “inadequate” for Endangered Species Act purposes, and need to be significantly strengthened and made mandatory before they could be considered “adequate regulatory mechanisms” in an ESA context.

⁴ Available online at <http://www.blm.gov/pgdata/etc/medialib/blm/co/programs/wildlife/Par.73607.File.dat/GrSG%20Tech%20Team%20Report.pdf>.

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