

Exhibit A: The COT Report Fails to Meet DQA Standards

A. Science

1) The COT Report is not a scientific document.

1.1) The COT Report is not a scientific document, as it contains no original data or quantitative analyses used in developing the report, nor is there a comprehensive and unbiased review of *all* of the available scientific literature. Instead, the COT Report provides a limited and selective review of the scientific literature and unpublished reports on GRSG as a basis for its conservation objectives and proposed actions. As a result, outdated information and beliefs are perpetuated in the COT Report (i.e. purported impacts are not necessarily representative of actual impacts due to less intensive energy development, newer technologies, and required mitigation measures).

2) The ESA requires that decisions must be based upon best available scientific and commercial data, and not "best available science."

2.1) The COT Report states that, "*All proactive voluntary conservation efforts should use the best available science.*" However, to be consistent with the ESA and the IQA, this language needs to be changed to *best available scientific and commercial data*.

2.2) Although the COT Report makes the claim that it lists, "*sources of data used by states to develop Priority Areas for Conservation (PAC) maps for each state,*" no details on the data files were provided. Lacking are the location of where these data are archived, who is responsible for curation, the conditions under which those data were shared with the COT, and attributes of these data (i.e. methods of collection and associated metadata). In short, while the COT Report makes claims about how "*this report delineates reasonable objectives, based upon the best scientific and commercial data available at the time of its release,*" none of the cited sources of data are publicly accessible. It is a violation of the IQA that the underlying data used in such a highly influential document are not specified, or available for independent analysis by informed members of the public.

3) Credit for Restoration is based on substandard data and methods.

3.1) The COT Report proposes that no credit be received for restoration efforts until there is demonstrated sage-grouse use or positive population trend. However, the COT Report says nothing about: 1) how many years of monitoring will be required to show positive trends, 2) how much of a population increase would be required, 3) how these data would be adjusted for natural population fluctuations and the uncertainty of statistically invalid trends estimated from only counting males at a nonrandom sample of leks.

5.2) Of the three issues above, the most critical one that the COT Report does not acknowledge is the fact that male lek counts provide only a crude, non-random, and statistically-invalid estimate of population trends. These issues are well documented

(Walsh et al. 2004; WAFWA 2008). Statistically robust alternative methods exist for estimating population trends (i.e. the sentinel lek count method or stratified random sampling, as proposed and tested by Garton et al. 2007); however, the COT Report makes no mention of this superior method or alternatives. The continued use of this substandard method for gathering data and estimating population trends compromises the ability of any grouse. That lack of resolution translates into the potential for *no credit* to be given for restoration and mitigation efforts (because the resolution is inadequate to determine if these conservation measures result in positive changes to GRSG populations).

B. Threats

4) The COT Report overstates some threats to GRSG while downplaying others.

4.1) The COT Report made a number of dramatic statements about the status of GRSG, however, it failed to acknowledge that in the 2010 ESA-listing decision, data from states revealed that there were an estimated 535,542 GRSG occupying 13 states and provinces in western North America. Moreover, the COT Report omits any mention of hunting as the most well documented source of GRSG mortality, with a documented 207,433 GRSG killed between 2001 and 2007, and on-going GRSG hunting continues to this day. In contrast, proposals are put forth to regulate activities that have never been shown to cause GRSG population decline. The COT Report's approach elevates hypothetical threats to the level of real threats while selectively ignoring known sources of GRSG mortality.

5) The population predictions used in the COT Report's threats analysis were based on an analysis that contains methodological bias and error.

5.1) The COT Report's threats analysis, population definitions, current and projected numbers of males, and probability of population persistence, are entirely based on the paper by Garton et al. (the 2009 and 2011 versions of this paper are virtually identical). It is the most frequently cited paper in the COT Report and the basis of population predictions in the USFWS 2010 listing decision, where it was cited 62 times. Other scientists who have reviewed Garton et al. (2009, 2011) have reported serious methodological biases and mathematical errors in that paper (see reviews commissioned by the Colorado Division of Wildlife and summarized by CESAR 2012; copies of the reviews and report by CESAR are attached). It is unconscionable, and indicative of an inadequate peer review and editorial process, that all of the reviewer comments were ignored by the USFWS in the 2010 listing decision and in the final published version of Garton et al. (2011). The data and programs used in that highly influential paper are not public, and therefore, the results are not reproducible.

6) The COT Report's ranking of threats to populations and GRSG Management Zones is subjective.

6.1) There is no evidence of any reproducible, quantitative methodology used in assigning rankings to threats in each population and GRSG management zone (Table 2), or in discussion of specific PACs in Appendix 1. Instead, the ranking of threats in the

COT Report is entirely subjective.

6.2) The ranking of threats in the draft COT Report was initially determined by a vote count of opinions of COT members, with the threats ranked from A through H, depending upon the presumed "severity" of the threat and how "imminent" the threat was (Table 1, below). "Unknown" was a category used in both reports for the cases of inadequate information. In the final COT Report however, the ranking system changed. In most cases the draft COT Report threat rankings of A to D (or "*substantial, imminent*" to "*moderate, non-imminent*"), and F to G (or "widespread, low severity" and "slight threat", were collapsed in the final COT Report of "Y" (or the "*threat is present and widespread*"). The draft COT Report threat ranking of "E" (or threat "*localized, substantial*") was made equivalent to "L" (or "*threat present but localized*") in the final COT Report. And a draft COT Report ranking of "H" (or "unthreatened") became "L" (or "*threat present but localized*").

Table 1. Comparison of threat rankings from Table 2 of the draft and final COT Reports.	
Draft COT Report	Final COT Report
A = Substantial, Imminent	Y = threat is present and widespread
B = Moderate, Imminent	Y = threat is present and widespread
C = Substantial, non-imminent	Y = threat is present and widespread
D = Moderate, Non-imminent	Y = threat is present and widespread
E = Localized, Substantial	Y = threat is present and widespread
F = Widespread, Low Severity	Y = threat is present and widespread
G = Slight threat	Y = threat is present and widespread, or L = threat present but localized
H = Unthreatened	L = threat present but localized, or N = threat is not known to be present
U = Unknown	U = Unknown

6.3) The COT Report does not present any data that could be used in a rigorous evaluation of the threats. There is no evidence that any quantitative methodology was used to assign rankings in the final COT Report such that an independent reevaluation of the rankings would be reproducible. Moreover, these new rankings were not consistently applied. For example, the new ranking of "L" ("*threat present but localized*") in the final COT Report was applied to the Wyoming Basin population for the threats of mining, and conifers, even though the previous category was "H" ("unthreatened"). This arbitrary reassignment of threat ranking between drafts elevated the perceived threat level to this population and others. Similarly, the final COT Report assigned the previous threat category of "G" ("slight threat") to either "Y" ("*threat is present and widespread*") or to "L" ("*threat present but localized*").

If threats are to be evaluated objectively for each population, then data and reproducible methodologies are required, rather than subjective assessments used in COT Report.

interested party to objectively evaluate the effectiveness of conservation measures undertaken to benefit sage

7) The COT Report uses new, subjective terms to evaluate risks to GRSG.

7.1) The COT Report uses new, subjective terms from the *Significant Portion of the Range Policy* to qualitatively describe the status of populations of a species being considered for ESA listing: *redundancy*, *resiliency*, and *representation*. To this list, the COT Report added a new, subjective term: *resistance*. None of these terms are quantifiable and all are open to arbitrary interpretation. Others have also recognized this deficiency and have pointed it out to the USFWS. See Alaska Oil and Gas Association and American Petroleum Institute's comments on *Draft Policy on Interpretation of the Phrase "Significant Portion of its Range" in the Endangered Species Act's Definitions of "Endangered Species" and "Threatened Species," Docket No. FWS-R9-ES-2011-0031* (Failure to clearly articulate how vulnerability assessment decisions are made undermines their credibility and erodes public confidence in the agencies responsible for developing the assessments. Sheldon et al. 2001, USDOJ 2007). USFWS must provide quantitative definitions for "redundancy," "resiliency," and "representation" for use in the COT Report.

7.2) Much of the "science" being relied upon by the USFWS and BLM in decision making on GRSG was produced by a small number of researchers. Ironically, the COT Report recommends further investment in research. This equates to the authors recommending further funding for their own work and creates at least the appearance of a conflict. These researchers write papers together and review each other's work (including their own) and subsequently serve on the highly influential NTT and COT teams (CESAR 2012). This is inconsistent with accepted scientific practice and the Department of Interior's Data Quality guidelines. Instead, the COT Report needs to foster greater independence by suggesting "*key research projects*" and then allowing an independent scientific and policy team to prioritize and solicit competitive proposals. Such an approach would avoid any appearance of cronyism.

8) The COT Report does not evaluate any of its proposed conservation actions under the Policy for Evaluation of Conservation Efforts (PECE).

8.1) To date, the COT Report has avoided mention of which conservation measures would meet the PECE requirement or any quantitative criteria by which they could be objectively evaluated. This leaves open to question the effectiveness of numerous conservation actions that have been recommended by the COT Report.

The COT Report is notable in recommending that conservation plans should "*use local data on threats and ecological conditions, including status of local sage-grouse populations and their associated habitats.*" However, the COT Report fails to acknowledge the practical limitations of obtaining population trend data and how such data limitations could ultimately have the unintended consequences of justifying "*enforceable temporary measures,*" or preventing the allocation of credit for mitigation

effort, simply because the data do not provide sufficient resolution (or statistical confidence) to detect increasing trends. It is scientifically unreasonable for the COT Report to require population monitoring as the basis of regulation, when it knows full well that the data and methods for estimating population trends are inadequate for the task.

8.2) The COT Report's proposed objective to "*Develop and implement proactive, voluntary conservation actions,*" is consistent with numerous papers by ESA scholars. The COT Report also proposes that "*Sage-grouse conservation strategies should consider using the criteria identified in the FWS/NOAA Fisheries Policy for Evaluation of Conservation Efforts (PECE) when Making Listing Decisions (Federal Register/Vol. 68, No. 60/Friday, March 28, 2003; Appendix B) to help evaluate its likely implementation and effectiveness.*" However, the COT Report does not provide a single example of a GRSG conservation plan that is consistent with the PECE Policy. Nor does it appear that any GRSG conservation plans have been approved by the USFWS. To date, the USFWS has not provided specific comment on conservation plans (that this reviewer was able to find), such that local agencies may at least be assured of approval under PECE if the plans are modified in specific ways to suit the USFWS. Thus, there is no reasonable assurance that the substantial investments that state and local governments, or private landowners, have undertaken can be expected to secure a PECE approval.

Similarly, there is no assurance from the USFWS that specific conservation measures recommended in the COT or NTT reports (both of which include USFWS staff as authors), if adopted, would meet the PECE policy. The USFWS should be expected to follow its own policies.

9) The COT Report erroneously evaluates threats using a single category for all energy production, despite substantial differences in the type and permanence of impacts.

9.1) The COT Report does not acknowledge the fact that renewable energy projects (wind, solar, and geothermal) have a uniformly permanent impact on the landscape (solar arrays and wind turbines), while oil and natural gas development has a mix of temporary and permanent impacts. Blending these two vastly different types of energy production into one threat category is contrary to the best available scientific and commercial data because specific threats and their underlying cause and effect mechanisms are not adequately addressed, and counter-productive to GRSG conservation.

9.2) Furthermore, while projected oil and natural gas development were based on *actual* well data, known deposits, and lease sales that overlap GRSG habitat, wind development is primarily based on undeveloped and unleased commercial wind *potential* (i.e. as in Doherty et al. 2011). Thus, it is erroneous for the COT Report to base its threats ranking on a combined analysis of two vastly different types of energy development, one of which is primarily based on speculation.

9.3) In order to be unbiased, the COT Report should have analyzed the two types of

energy development separately, then overlaid their projected impacts to GRSG in a common unit that reflects each development's impact(s) to GRSG.

9.4) In regard to mining, the COT Report purports that dust from surface mining activities indirectly impact sage-grouse. No such study has been conducted on the relationship between dust and sage-grouse. The FWS should be compelled to provide such data or remove this erroneous and unsupported statement from the COT Report.

10)The COT Report relies on erroneous information for priority habitat mapping and evaluation of threats. For example, the Colorado Plateau Management Zone and associated PACs are not well mapped and do not show evidence of connectivity.

Regarding the Colorado Plateau Management Zone and Parachute-Piceance-Roan PAC, the COT Report states, "*Priority habitats are well mapped and include all high use habitat (which includes breeding, summer, and winter habitat within 4 miles of all known leks) and linkage zones to Management Zone 2 to the north. There is no known connectivity with Utah (Management Zone 3 to the west) due to natural habitat fragmentation and large areas of nonhabitat.*" This is in error. There are genetic data that provide evidence of connectivity to Utah contained in Apa (2010). And, as discussed below, the priority habitats are not "well-mapped" but mapped at low resolution and contain large areas of non-habitat and marginal habitat.

The COT Report states, "*The Parachute-Piceance-Roan Basin population appears to be captured within priority areas for conservation, and representation appears to be captured adequately. Priority areas for conservation capture 60 percent of the occupied range in this population and also include 100 percent of all known active leks and all habitats that were modeled "high probability of use" within four miles of a lek that has been active in the last 10 years.*" This statement is a misrepresentation of the best available scientific and commercial data. First, the COT Report does not mention the fact that the PAC contains large areas of marginal habitat and non-habitat in a naturally fragmented landscape produced by dense conifer and aspen stands, shrubs, meadows, and rugged topography. High-resolution vegetation mapping (hyperspectral data) and modeling of the PPR GRSG habitat (using habitat parameters specific to the PPR population) by Garfield County (2012), and previously by Heather Sauls in Garfield and Rio Blanco Counties (2008), both concur with this conclusion. These two habitat-mapping efforts were based on best available data in the public domain. When compared to the low resolution PAC map for the PPR population, these analyses show that approximately 80% of the mapped PAC is non-habitat. Second, the location data upon which the low-resolution Preliminary Priority Habitat Map is based (produced by the Colorado Parks and Wildlife), are not in the public domain, and there is no written assurance that they ever will be accessible for independent review and reanalysis. Furthermore, requests for these data under legally binding data-share and non-disclosure agreements have been met with refusal by CPW. Thus, the CPW maps of the PPR and northwestern Colorado used by the COT Report, and by the BLM in its RMP revisions (including maps based upon Rice et al. 2012 where the data are scaled down to 1-km grid cells resulting in a massive 4,000% loss of information, are not reproducible). Use of

these maps by federal agencies as a basis for decision-making is a clear violation of the Information Quality Act requirements.

The COT Report fails to mention the inconsistency in definition of an "active lek" between that used in the scientific literature and that used to map the PPR PAC. The scientific literature defines an active GRSG lek as locations where two or more males have been observed and documented actively courting females in the last two years (Doherty et al. 2011). The "active lek" criteria applied to the PPR for habitat maps used by the COT Report is: a site where at least one male was observed lekking within the *past 10 years* (whether the lek was surveyed or not before or following that observation). Moreover, the COT Report does not acknowledge that the CPW lek-count and lek location data set for the PPR contain numerous missing cells, and that even locations where a single male was observed 7 years ago, with three years of missing data before that, is still considered an "active" lek. It is arbitrary, capricious, and scientifically unreasonable for federal agencies to use inconsistent definitions as a basis for regulatory decisions, and for it to rely on such an arbitrarily low threshold. To further emphasize this point, if no males were in attendance at a lek for potentially nine years, then just how were the un-bred female GRSG going to produce eggs and nest within 4 miles of that "active" lek? Clearly, immaculate conception has not been documented to occur in GRSG.

The COT Report states, "*Redundancy is not captured within this population because it is relatively small (three year running average number of males is 93) and somewhat isolated.*" The COT Report provides no genetic or dispersal data with which to conclude that this population is isolated from other nearby populations. The COT Report does not provide any quantifiable definition of "redundancy," nor any data with which to conclude that the population lacks "redundancy." However, genetic data and analyses do exist for northwestern Colorado and Utah that are contrary to this assertion. Those data have an especially large sample size for the PPR population (n=65). Those data and results (Apa 2010), not mentioned by the COT Report, reveal that levels of genetic diversity in mitochondrial DNA and microsatellite markers are comparable to other populations in Colorado, and there is extensive shared variation among populations. That study reported,

"This analysis of the PPR population compared with 5 other Greater Sage-grouse populations in Colorado revealed that the genetic make-up of PPR is generally consistent with the other 5 populations. Using mtDNA sequence data, 5 of the 8 haplotypes found in PPR (66% of the PPR birds) were also found in the other populations in Colorado."

"The mtDNA neighbor-joining network (Fig. 2), which was constructed using Fst genetic distances among populations, suggests that PPR is more closely related to North Park, Cold Springs, and Blue Mountain, than to Middle Park and Eagle. The fact that PPR is not shown to have branch lengths longer than the other Colorado populations suggests that it is not genetically distinct from all other Colorado Greater Sage-grouse populations."

Additionally, the levels of genetic variation are comparable to those in other populations in Colorado, and indistinguishable when the most appropriate measure; expected heterozygosity is used (as DNA obtained from feathers are more likely to contain closely related individuals and

bias results towards heterozygote deficiency, making expected heterozygosity based on allele frequencies and more representative parameter).

The COT Report states, *"There is some potential for connectivity to the north to the Wyoming Basin population in Management Zone 2. Linkage habitats have been included in mapping efforts."* The data, however, are contrary to assertions made in the COT Report in justification of its arbitrary linkage habitat maps. Instead, the data reveal a broader genetic linkage, including nearby populations and in Utah. This conclusion is more consistent with recent genetic and GPS tracking studies that show GRSG can disperse over much greater distances and over/around land uses that were previously thought to contribute to fragmentation (i.e. Bush 2009; Bush et al 2011; Tack et al. 2011; Thompson 2012). As noted previously in this review, linkage habitat maps used by the COT Report are purely speculative and cannot be relied upon as a basis for decision-making.

Data on lek locations and attending male numbers from Colorado Parks and Wildlife (CPW) show that currently active (2012) GRSG leks occur on, or immediately adjacent to, roads, pipeline corridors, and well pads in the area. This is a direct contradiction to, and refutation of, assertions in the COT Report that, *"Representation and redundancy are at risk within this population due to its small size, energy development and the associated infrastructure, especially road development."* And, *"Advances in drilling technology and rapid natural gas demand and subsequent rising prices have led to a significant increase in natural gas drilling activity. Road and infrastructure are also ranked high as they are closely related to energy production."* While oil and gas development can contribute to GRSG avoidance and mortality in specific ways (see review by Ramey, Brown, and Blackgoat 2011), it is counter-productive to conservation efforts for the COT Report to make wholesale negative assertions.

The COT Report states, *"A large majority of PACs are privately owned, mostly by energy companies. Energy and mineral development is the highest ranked threat to sage-grouse in this area."* However, the fact that much of the land in the PPR is privately owned by energy companies means that adequate funding is available for implementation of mitigation and habitat restoration efforts to benefit GRSG populations. This has been the case for the Pinedale Planning Area of Wyoming, where oil and gas development, mitigation, and GRSG numbers have all increased (lek count data from Wyoming Game and Fish). These are facts not acknowledged by the COT Report.

C. Land Use

11) The COT Report proposes "enforceable temporary measures."

11.1) The COT Report proposed that if adequate regulatory mechanisms cannot be implemented by specific deadlines, *"then enforceable temporary measures should be considered in order to ensure threats will be at least temporarily ameliorated until such time that an effective regulatory mechanism can be implemented."* However, the COT Report fails to mention what those "enforceable temporary measures" would include,

which agency would be charged with enforcing them, if they would be enforced on private land, or the criteria that would be used to determine if they are an *"adequate regulatory mechanism."* The language of the COT Report is similar to that of activists and litigants, who in 2012, called upon the Western Governors for an *"enforceable interstate compact to effectuate their collective commitment to sage-grouse conservation"* and *"regulate private land uses that threaten Sage-grouse."* And that these enforceable measures be imposed *"to ensure that private land owners meet their stewardship obligations for sage-grouse."*

11.2) An unintended consequence of the COT Report is that it provides an administrative record that litigants can then use in court to argue that additional regulation is needed for GRSG. The fact that the COT Report fails to provide any detail on enforceable measures leaves open their interpretation to the Court. The COT Report, by failing to provide detail and guidance, has effectively abrogated its stated responsibility to *"serve as guidance for federal land management agencies, state sage-grouse teams, and others in focusing efforts to achieve effective conservation for this species."*