

Exhibit A: The NTT Report Fails DQA Standards

A.1) The "science" behind the NTT report was designed to support conservation measures preferred by the NTT rather than review alternative conservation measures in an objective manner.

The opening paragraph of the December 6, 2011 NTT meeting notes states, "the purpose of the meeting was to strengthen the science behind the existing conservation measures." This and subsequent statements reveal that instead of using the objective, scientific method to evaluate and rank the effectiveness of alternative conservation actions, the NTT biased their recommendations by only seeking scientific support for "existing" conservation measures that were preferred by the NTT.

By seeking scientific justification for preferred, predetermined conclusions, the NTT biased approach was outside the realm of standard scientific practice, which is to objectively consider all potential alternatives (hypotheses) and all information available, including contrary data.

Documented discussions of the NTT team from meeting notes and e-mails reveal that virtually the entire focus of the team was discussion of policy, rather than scientific issues, and this deficiency was also noticed in the peer reviews of the report. NTT meeting notes do not contain and references to scientific papers, data, or measured discussion of alternative conservation measures. Instead, the discussions were focused almost entirely on justification of preferred conservation measures and finding the documentation to bolster these.

The following excerpt from a Dec 13, 2011 11:52 AM e-mail from Raul Morales (the NTT team leader for BLM) to the NTT illustrates how the NTT and the National Policy Team sought to bolster support for its preferred conservation measures rather than develop an objective evaluation of alternatives (underline added for emphasis):

“I just wanted to update everyone on what has happened since my last email to you all. There was an NPT call shortly before Thanksgiving. I was not on this call but what the NPT [National Policy Team] charged me to do was to reconvene small team of NTT members (mainly scientist folks) and with the help of a WAFWA (Western Association of Fish and Wildlife Agencies) appointed scientist (former Colorado Division of Wildlife Director, Tom Remington) they asked that we further strengthen the science underpinnings to our conservation measures. Also, that this effort needed to be completed before the release of the NOI which happened last Friday.”

“In addition, comments had been received from other external reviewers, and reviewers suggested the measures needed to be grounded in the best available

science to be defensible. In addition, the US Fish and Wildlife Service (USFWS) wanted to ensure the science is strong so the conservation measures could effectively inform policy negotiations at the National Policy Team level.”

“So, the National Policy Team agreed the next step was for the National Technical Team to reconvene and review how the conservation measures are supported by existing science.”

The excerpt is contrary to the portrayal of the NTT report as an objective scientific review of alternatives. Instead, the NTT chose to rationalize pre-determined conclusions. Further, the NTT made selective use of published papers, reports, and opinion that supported their preferred conservation measures while ignoring other sources of information that did not. The NTT meeting notes and e-mails contain numerous instances where the scientific rationale for particular conservation measures or restrictions were based upon nothing more than subjective opinion of the NTT authors. As a result, the NTT does not represent "a summary of the best available scientific information for the conservation of Sage-Grouse" as stated by Secretary Salazar in his December 18, 2012 letter to Representative Hastings. Instead, the NTT report represents a partial presentation of scientific information to justify a narrow range of conservation measures that will be imposed as land use regulations by the BLM.

A.2) The NTT report represented a narrowing of policy and management alternatives.

Rather than address the specific underlying, and mitigatable cause and effect mechanisms that can result in population level impacts to GRSG, the NTT unnecessarily narrowed the range of policy alternatives by recommending one-size-fits-all policy and management solutions (i.e. blanket setback distances, NSO requirements, and seasonal restrictions.) The 3% threshold, a four-mile NSO around leks, and seasonal restrictions are unnecessarily restrictive in light of available scientific information (see Ramey, Brown, and Blackgoat 2011 for an extensive review) and recently released, data-driven scientific studies that focus on prioritized conservation efforts. *See* Coates et al. 2014; Kirol et al. 2014; Applegate and Owens 2014, Ramey, Thorley, and Ivey 2014.

In addition, the NTT fails to acknowledge that greater sage-grouse (“GRSG”) populations naturally fluctuate as a result of regional climate/weather patterns. The significance of this error of omission is obvious: it is not possible to meet the condition that GRSG populations or any population of any species for that matter) are always stable or increasing for mitigation credit to be given. A more reasoned and scientifically defensible, data-driven approach would be to quantify using reproducible, statistical inference the influence of the primary drivers of GRSG populations including weather patterns, predation, hunter harvest, and habitat quality and availability, and then determine the degree of influence that anthropogenic disturbances have on the population against that background (their effect size and significance). This is a proven, data-driven approach (Bottrill et al. 2008, Boyd et al. 2014, Deriso et al. 2008, Dzialak et al. 2011,

Messmer et al. 2013, Fedy et al. 2014, Copeland et al. 2014) rather than the NTT approach which is not quantitative or reproducible but driven by surmise and speculation.

A.3) If BLM is to develop a truly objective and effective conservation strategy for GRSG, the following alternatives need to be considered:

Conservation measures and best management practices (“BMPs”) must be organized around specific threats to GRSG and address their cause and effect mechanism(s).

A broader range of conservation alternatives and a greater diversity of choices needs to be available for decision-makers to implement conservation alternatives suitable to local conditions.

All scientific information and data, not just selective use of information, needs to be made available and considered by BLM in developing the science based conservation alternatives. The agency must employ a strong inference approach (hypothesis testing) rather than rely on subjective opinions and selective use of information as advocated in the NTT Report.

Rather than the NTT approach, BLM should formulate multiple, alternative hypotheses regarding the specific cause and effect mechanisms of each threat. Then the agency should deduce testable (e.g. potentially falsifiable) predictions, and establish thresholds for testing these against the available scientific data. This strategy of strong inference has the greatest potential for rapid advancement of scientifically informed decision making (Platt 1964; Rehme et al. 2011). This is especially important to adaptive management as proposed by the BLM.

a) Organize BMPs around threats so they address specific cause and effect mechanisms.

A more potentially effective strategy for developing conservation measures (including BMPs) is to organize them in such a way that they address the specific cause and effect mechanisms that underlie each threat that is potentially deleterious to GRSG. In this way, BMPs may be seen as a set of alternatives that can be used singly, or in combination, to address specific threats, as local circumstances require. An example of this rational, science-based approach is described in the text and Table 1 of Ramey, Brown, and Blackgoat (2011).

b) Site specific conditions must be taken into account

We hope that BLM will acknowledge the importance of site-specific conditions in determining the most effective and efficient mitigation that can be applied. For example, topography influences sound transmission, while the technology being employed at a production site affects all aspects of noise being generated, including time on site, staffing needed, and amount of truck traffic. Therefore, taking into account local conditions can increase the options available for effectively mitigating oil and gas development.

c) Tracking and testing effectiveness of BMPs

Establishing a single database for tracking and testing the effectiveness of previously required BMPs would provide a good starting point for the evaluation of any existing or newly proposed BMPs.

d) Compare the effectiveness of current versus proposed BMPs

Prior to new BMPs being imposed, it would be advisable for the BLM to describe why currently required BMPs are inadequate, as compared to new ones (such as those proposed in Appendix D), and how much of an improved response from GRSG populations can be expected from the new BMPs. This approach would provide a more defensible scientific and quantitative basis for any new BMPs. We emphasize here the importance

A.4) The NTT report is biased.

A.4.1) The NTT report presents a biased view of oil and gas development: "*that impacts are universally negative and typically severe.*" The NTT report selectively presented information, while ignoring information contrary to their preferred conservation measures, including information that was presented to the NTT during its August 2011 meeting. As a result, three key assertions in the NTT report are both biased and in error.

Those assertions include “The primary potential risks to GRSG from energy and mineral development are:

- 1) Direct disturbance, displacement, or mortality of grouse.
- 2) Direct loss of habitat, or loss of effective habitat through fragmentation and reduced habitat patch size and quality.
- 3) Cumulative landscape-level impacts (Bergquist et al. 2007, Walston et al. 2009, Naugle et al. 2011). There is strong evidence from the literature to support that surface disturbing energy or mineral development within priority GRSG habitats is not consistent with a goal to maintain or increase populations or distribution. None of the published science reports a positive influence of development on GRSG populations or habitats. Breeding populations are severely reduced at well pad densities commonly permitted (Holloran 2005, Walker et al. 2007a). Magnitude of losses varies from one field to another, but findings suggest that impacts are universally negative and typically severe.”¹

These statements are not supported by the data. Instead, they are based upon:

- a) A subjective interpretation of results by the authors of the cited studies (i.e., where no hypothesis testing was used). In other words, the authors of the cited studies did not

¹ NTT Report at 18-19.

use the scientific method but instead, opined about their results, often in a manner that was confirmatory of particular interpretations, rather than using an objective, hypothesis-testing approach to falsify alternative hypotheses and explanations.

b) The frequently repeated but erroneous assumption that a temporary decrease in lek counts immediately adjacent to active wells is equivalent to a population decline. The alternative hypothesis, that displacement from affected leks is temporary or that birds, particularly juveniles, relocate elsewhere, was not considered²

The NTT report cannot cite statistically valid population estimates from multiple populations that show declines specifically due to oil and gas development because no such data exist.

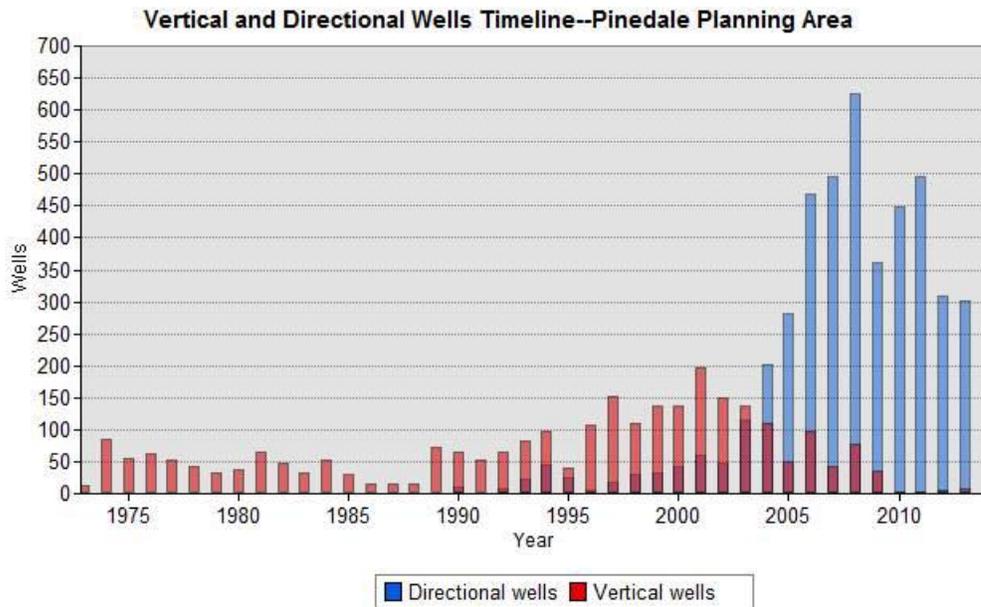
A.4.2) The NTT report does not present any credible description of the specific mechanisms that explain why GRSG could be affected to the point that population declines could occur. This is a key issue addressed in the scientific review published by Ramey, Brown, and Blackgoat 2011. In that paper, the authors articulate the specific cause and effect mechanisms that underlie each threat, as well as the experimental data required to test them, and the specific types of mitigation required to ameliorate them. The NTT report, in contrast, made unsupported blanket statements and regulatory prescriptions that did not address specific threats and their underlying mechanisms.

A.4.3) Contrary to assertions made in the NTT report, data and analyses from the State of Wyoming, which were (available to the NTT, show that population trends across the state synchronously fluctuate, showing peaks in male lek attendance in 2000 and 2007. Additionally, the most heavily developed region, the Upper Green River Basin (Pinedale Planning Area) has consistently been above state-wide trends in male lek attendance (Wyoming Game and Fish 2012). Additionally, the earliest study cited in support of the blanket approach (Holloran 2005) did not acknowledge that the BLM had intentionally waived stipulations on the Pinedale Anticline in order to facilitate research on impacts without these stipulations. Therefore, the impacts reported by Holloran (2005) do not correspond to impacts under stipulations required at the time, nor account for current and dramatically reduced impacts under more recent and stringent stipulations. And finally, Holloran's (2005) population scenarios and predictions of population decline have simply failed to come true (see additional discussion of this issue in Section 6 below), yet the NTT report continued to rely on the predictions of that study that have been falsified by new information. If conservation measures are to be science-based, all evidence must be taken into account, including contrary evidence. The NTT report has failed in this most basic requirement of science.

A.4.4) The NTT Report recommendations relied on research from past periods dominated by intense drilling in heavily developed areas (e.g. Pinedale), and where older, denser development (e.g. Jonah field) and more invasive technologies were used, along with little mitigation or no restoration (i.e. Lyon 2000; Lyon and Anderson 2003; Holloran 2005). Since that time, oil and natural gas operations have

² See, e.g. Ramey, Thurley and Ivey 2014.

changed dramatically. New technologies such as directional and horizontal drilling combined with advanced hydraulic fracturing have greatly reduced surface disturbance and hence, impacts to GRSG habitat have been reduced. Whereas in 2000, the majority of wells were vertical, today virtually all of the wells are horizontal or directional, which enables fewer wells and less surface disturbance.



In addition, multiple wells are drilled from a single well pad, with companies achieving up to 49 wells in the Pinedale area per pad. Companies are also clustering development, and using centralized facilities, all of which reduce surface disturbance and impacts to GRSG. Yet the NTT is relying on science from an era that no longer exists. Surely that is not the best available, relevant science as required by the DQA.

While GRSG have been found to avoid areas of intensive development, such avoidance is not uniform among locations, or among individual birds, especially when there is a lower density of development, or in older fields that have already been developed (Harju et al. 2010; Taylor et al. 2010; Ramey, Brown, and Blackgoat 2011; Applegate and Owens 2014). The impact of the oil and gas operations on GRSG is not as clear-cut, nor as negative, as the NTT report claims. Since the NTT persists in viewing operations as they existed fifteen or more years ago, it is viewing oil and natural gas in a biased manner not supported by reality or relevant science.

A.4.5) The NTT report did not cite either Taylor et al. 2010 or Ramey, Brown, and Blackgoat 2011 even though both of these papers were made available to the BLM as discussed herein.

A.4.6) The issue of independence and transparency was raised previously in public comment by the American Petroleum Institute but not subsequently addressed by BLM.

Neither of these documents employ a hypothesis testing approach or mention the term. The data used in several of the most influential monograph papers are not publicly available, which precludes an independent assessment and is contrary to the Data Quality Act, the Department of the Interior's information quality guidelines requiring that reproducibility "shall generally require sufficient transparency about data and methods that an independent reanalysis could be undertaken by a qualified member of the public," (Department of the Interior 2002)), as well as recent White House policy directives (Obama 2009; Holdren 2010, 2011).

The review standards established by the National Academies address these issues and may be found at <http://www.nationalacademies.org/coi/index.html>. By implementing these standards, National Academy of Sciences has sought to diversify its review panels with independent experts from diverse disciplines and backgrounds in order to "conceive new ways of thinking about a problem" and "to provide a balance of perspectives." The narrow and outdated viewpoints expressed in the NTT Report exemplify the consequences brought on by lack of independence that the National Academies have long sought to avoid in their reviews.

A.5) Comments by one of the most influential members of the NTT could be construed as having a less than objective viewpoint.

NTT e-mails written by a highly influential member of the NTT and GRSG program leader for the USFWS, Dr. Pat Diebert, were obtained from a FOIA request by the State of Idaho.

In the e-mails (below), Diebert expressed the following opinions that demonstrate a bias against non-federal conservation efforts and bias in favor of imposing scientifically unjustified regulations:

- 1) against regulatory assurances provided by instructional memoranda,
- 2) for greatly expanded buffers around priority habitat,
- 3) for greatly expanded buffers around leks,
- 4) for a requirement that off-site mitigation be required for existing leases (that would have been illegal if implemented),
- 5) for arbitrary addition of grazing restrictions, and
- 6) against non-lethal wild horse and burro management.

In the following passage (on page 1135), Diebert apparently did not consider Instructional Memoranda (IMs) to be enough of a regulatory mechanism for the conservation of GRSG, without addressing the specifics of these or whether they meet the standards of PECE policy.

Comment [p6]: I think this was placed here as a reminder that the IM already calls for this. But, it shows up again later. My only concern is again, that IMs are not enough for regulatory mechanisms. If this reference is for more than a reminder/placeholder, policy is necessary. [Diebert].

Comment [UF&WS8]: This is added after discussions with folks regarding surface disturbance. It's a key point that should not be lost (although it might be better worded!)

In the following passage (page 1138), a recommendation was made for offsite mitigation on existing leases and purported to be "science-based" when no data or supporting scientific literature were cited:

Route construction within priority habitat areas will be limited to realignments of existing designated routes to enhance other resources only if that realignment maintains or enhances sage grouse habitat. Use existing roads, or realignments as described above, to access valid existing rights that are not yet developed. If valid existing rights cannot be accessed via existing roads, then any new road constructed must be built to the absolute minimum standard necessary, and the surface disturbance added to the total disturbance in the priority area. If that disturbance exceeds 2.5 % for that area, then off-site mitigation is necessary (see discussion above). [Deibert] (subject to valid existing rights requiring access) [Deibert]– {science based} [Note: the text strike outs were inserted by Diebert.]

Note that earlier on this same page, there was a suggested arbitrary cap on route density based on so-called professional judgment that is nothing more than subjective opinion: "Reduce route density to a maximum of 2 mi/mi²) in priority sage-grouse habitat areas. (citation/professional judgment)"

In the following passage (page 1142 of FOIA response), Diebert apparently attempted to expand the NTT report recommendation to include a 12-mile radius buffer around leks (or a total of 452 square miles surrounding *each* lek). This proposed change was made without any sound scientific basis. If implemented, a 12 mile radius buffer would encompass an area nearly 400 times larger than that current 0.6 mile buffer and 9 times the land surface area of the NTT's final proposed 4 mile buffer.

“Managing landscapes (12 mile radius around leks) of priority habitats for 70% sagebrush and 30% potential habitat approximates the amount of sagebrush habitat necessary for increased likelihood of habitat use, nest success, and population persistence (citations). Within priority sage-grouse habitat areas where current sage-grouse habitat is less than 70%, the conservation focus for habitat restoration should include an objective that achieves >70% of sage-grouse habitat in advanced structural stages and appropriate amounts of understory vegetation relative to site potential. (citation) ~~The remaining 30% could include areas of juniper encroachment, non-sagebrush shrublands that are periodically used by sage-grouse, annual grasslands, degraded native plant communities, and non-native perennial grasslands that potentially can be rehabilitated or enhanced and is capable of supporting sagebrush or currently helps to maintain sage-grouse.~~” [Deibert]

Additionally, Diebert added llamas and alpacas to the grazing species that need to be managed for GRSG, even though there is no scientific research cited that suggests these species are an issue for GRSG (from page 1143). Poor scholarship was then exhibited by Diebert and the Team in citing Briske et al. 2011 in support of certain restrictions, when that paper makes no mention of horses, llamas, alpacas or goats as needing grazing regulation to protect GRSG. This is another example of how the poor scholarship in the NTT which simply sprinkled references into the text to support preferred conservation measures.

A.6) Voluntary conservation efforts on private land were treated as inferior to federal land acquisition and management by the NTT report. The NTT Report assumes that voluntary conservation measures on private land are inferior to federal land management, and requires a regulatory "command and control" approach, including the transfer of private lands into the federal domain (land tenure adjustment). Similarly, the NTT Report assumes that local and State GRSG plans are similarly inferior as there is no mention of these in the NTT Report and reference to appropriate regional plans and involvement of stakeholder groups was deleted from the draft cover letter on Instructional Memoranda as follows:

~~"All RMPs containing Greater Sage-grouse occupied habitat must consider these measures, including when the plan is being revised, amended, or supplemented. following regionally appropriate, science based conservation measures shall be incorporated into BLM land use planning efforts, utilizing coordinated and cooperative stakeholder engagement."~~

[Note: this excerpt is from page 1,499-1,500 of the file, SG NTT Emails Fall 2011 Attachments_Redacted.pdf.]

The importance of voluntary conservation on private land and its contribution to species recovery has been recognized by numerous scholars of the Endangered Species Act, including the current Deputy Assistant Secretary of Fish and Wildlife and Parks, Michael Bean, who has authored multiple papers on the subject (i.e., Bean 1998, 1999, 2002).

The NTT report's bias against conservation on private land is contrary to the numerous published papers by ESA scholars for voluntary conservation incentives on private land, rather than typical federal regulatory "command and control" which has failed in large measure to recover species (Adler 2008, 2011; Baur et al. 2009; Bean 1998, 1999, 2002; Keystone Center 2006; Paulich 2010; and most recently, Ruhl 2012). In addition, there is a broad range of first and second generation conservation measures available to private landowners and cooperating agencies, beyond conservation easements. These are detailed below. None of these were discussed as viable alternatives to federal acquisition of private land or encumbering it in perpetuity with conservation easements as recommended in the NTT Report. The list below illustrates the broad range of incentive-based conservation alternatives available for private land but not considered in the NTT report:

First Generation Incentive Mechanisms

1. Habitat Conservation Plans
2. Safe Harbor Agreements
3. Candidate Conservation Agreements
4. Candidate Conservation Agreements with Assurances
5. Fee simple acquisition

Second Generation Incentive Mechanisms

Conservation Easements:

6. Conservation Easements (in perpetuity, tax benefit)
7. Term conservation Easements (i.e., 20 to 30 years, no tax benefit))
8. Post development and restoration conservation easements (currently used on some reclaimed mine sites in Colorado)

Market-Based Approaches:

9. Subsidies/tax credits in exchange for specific conservation efforts
10. Conservation Banking
11. Tradable development rights
12. Conservation leasing

Information-Based Programs:

13. Technical assistance for private land conservation, mitigation, and habitat enhancement
14. Government-private quasi-partnerships and collaborative planning efforts

Performance-Based Programs:

15. Performance bonds (promotes innovation and is suited to local conditions rather than relying on one-size-fits-all restrictions)

A.6.1) This issue above was raised previously in public comment by the American Petroleum Institute but not subsequently addressed by BLM. This is also a key issue to many stakeholders because the NTT appears to be insensitive to private landowners who may not wish to encumber their land, but also the needs of local governments that seek to maintain their property tax base (rather than have private lands acquired by the federal government).

A.7) Errors of omission

A.7.1) The NTT Report did not acknowledge or make use of best available scientific and commercial data in its report, specifically that which shows the substantially lessened impacts of oil and gas operations on GRS as a result of new technologies and BMPs that address specific threats.

A.7.2) The NTT omitted mention of information provided to them during their meetings. Most importantly, in Appendix 5 of the NTT meeting notes of August 2011, a powerpoint presentation titled: *Managing Oil and Natural Gas* was presented. This

presentation was included in the meeting notes that were released under FOIA. The presentation documented BLM's process for permitting drilling, as well as: 1) documentation of interim reclamation, 2) final reclamation and restoration, 3) fluid mineral conservation measures in priority GRSG habitat, 4) best management practices (BMPs) to minimize wildlife habitat fragmentation and loss on local and landscape levels, 5) reductions in pad size to minimize disturbance, 6) use of oak and plastic mats, 7) interim reclamation of well pads, 8) interim reclamation of roads, 9) development planning to reduce impacts, 10) use of directional drilling and multiple wells drilled from one pad, 11) one point of access for each well pad, 12) burial of water, gas, and electrical lines, 13) the use of liquids gathering systems to reduce truck traffic, noise, disruption of wildlife and the fragmentation of their habitat.

A.7.3) The NTT Report also failed to mention readily available technical information on modern oil and gas well technology and wildlife mitigation best management practices, including that which *had been compiled by the BLM and released on its website:*

http://www.blm.gov/bmp/technical_info_pdfs_ppt_text/WO1_WildlifeMgmt_BMPs_Slideshow.pdf

http://www.blm.gov/bmp/Technical_Information.htm

Ignoring this information has created a situation where the NTT Report, and agencies such as the BLM that rely on the Report, are not considering actual operations as they exist today and thereby exaggerating the impact from oil and natural gas development.

A7.4) BLM's strategy and subsequent revisions or amendments to RMPs should incorporate information and knowledge not only from experts in wildlife biology but also engineers and other industry specialists who develop and implement the types of technological innovations that improve the efficiency of oil and natural gas operations and reduce their environmental impacts.

A.7.5) The NTT Report did not cite or otherwise make use of a key scientific review paper by Ramey, Brown, and Blackgoat (2011) "*Oil and gas development and greater GRSG (Centrocercus urophasianus): a review of threats and mitigation measures*", even though copies of this paper were personally handed to Director Abbey and Assistant Director Poole by the lead author on September 16, 2011. The paper, was published in 2011 in a refereed journal, *The Journal of Energy and Development* (Volume 35, Number 1, Pages 49-78).

A.7.6) The NTT Report virtually ignored one of the primary threats to GRSG: predation. Research has shown that predators of GRSG are generalists, meaning that they prey on other species as well, and in some cases their populations are subsidized by human sources of food. GRSG eggs are preyed upon by red foxes, coyotes, badgers, ravens, and black-billed magpies. Common predators of juvenile and adult GRSG include golden eagles, prairie falcons (as well as other raptors), coyotes, badgers, and bobcats.

Younger birds (especially broods) are preyed upon by ravens, red fox, northern harrier, ground squirrels, snakes, and weasels. However, of these predators, ravens, a major predator on GRSG eggs and broods, are the most abundant and have the greatest impact.

The NTT Report included an error of omission by ignoring a substantial body of literature about raven predation on GRSG (and other species), its deleterious effect on survivorship and recruitment, and the integrated management strategies that can reduce losses of GRSG. In fact, the word "raven" was mentioned only once in the NTT report (on page 63) and only in regards to suggesting that there be "*no tanks at well locations within priority areas (minimizes perching and nesting opportunities for ravens and raptors).*" Moreover, there were only two references to predation of any sort on GRSG. In contrast, the body of literature ignored by the NTT Report includes but is not limited to: Boarman 1993; Boarman 2003. Boarman et al. 1995; Boarman and Heinrich. 1999; Boarman et al. 2006; Bedrosian and Craighead 2010; Bui 2009; Cagney et al. 2010; Christiansen 2011; Coates 2007; Coates and Delehanty. 2004; Coates et al. 2008; Coates and Delehanty 2010; Conover et al. 2010; Cote and Sutherland 1997; DeLong 1995; Gregg et al. 1994; Heinrich et al. 1994; Moynahan et al. 2007; Preston 2005; Ramey, Brown, and Blackgoat 2011; Schroeder and Baydack. 2001; Snyder et al. 1986, Sovada et al. 1995; Watters et al. 2002; and Webb et al. 2009.

The NTT Report avoided mention of management of GRSG predators in areas of greatest risk of predation, and chose instead to treat this threat as a byproduct of human activities that can be regulated by such means as land health assessments and emphasizing vegetation cover as a means to measure and mitigate livestock use; or increasing landscape level habitat connectivity. Such passive control will do nothing to reduce the immediate and long-term threat of high raven populations.

In the same way, the NTT Report's recommended conservation measures fail to address the fundamental fact that predators, such as ravens, are heavily subsidized by humans, to the point where they exceed historic levels in some areas by as much as 1,500%. In such cases, management of some predator populations, especially where predators like ravens are abundant and GRSG mortality is high, is needed to ensure that GRSG populations are not depressed by a known and easily mitigated source of mortality.

This point is underscored by the fact that USDA-APHIS Animal Damage Control began controlling ravens in landfills across southern Wyoming in 2012 at the request of the Wyoming Game and Fish Dept., using the avicide DRC-1339 (Wyoming Game and Fish 2012, USDA/APHIS/Wildlife Services 2013). Large raven populations cause a variety of health and safety problems at landfills and industrial sites, and the food subsidy that ravens gain from these also results in a higher than natural population density of this species.

Ravens are clever and highly adaptable in their behavior, which allows them to opportunistically exploit food resources associated with humans, e.g. landfills, road kill, unattended food, and in some cases, livestock operations. As a result of these and other unintended food subsidies, raven populations have greatly expanded in the West. This, in

turn, has impacted many species, including desert tortoises, marbled murrelets, least terns, California condors, and GRSG (please refer to the list of studies ignored by the NTT Report above). While reducing subsidies available to predators is one approach, it is unlikely to be effective unless coupled with active / lethal control of raven populations (Coates and Delehanty 2010). Case in point, Coates and Delehanty (2004), reported a 73.6% nest success in GRSG following raven control compared to a mean expected nest success of 42.6% (based on 14 studies from 1941-1997).

BLM cannot rely on the selective use of information, nor should it ignore a major body of literature and experimental data on predator management.

A.7.7) Recommendations for management of priority habitat were made without any quantification of priority habitat or consistent definition of what constitutes an active lek. Under *Objectives*, the NTT Report fails to provide any quantifiable, biological basis for areas that are considered to be priority GRSG habitats that it proposes to protect from anthropogenic disturbance with recommended conservation measures. For at least one of the components of priority GRSG habitats, migration and connectivity corridors, the NTT Report admits on page 52 that it cannot be defined: “Almost no information is available regarding the distribution and characteristics of migration corridors for sage-grouse (Connelly et al. 2004).”

The significance of this data deficiency is clear and has far reaching implications:

- First, without a precise definition or clear cut criteria, there is potential for large areas that have a zero or near zero probability of GRSG use to be defined as essential to migration and connectivity, even though there may be no empirical data demonstrating their regular use by GRSG or their importance to population viability. This has the secondary effect of diverting resources away from higher priority habitat and threats of greater importance, while imposing unnecessary and scientifically indefensible regulatory burdens, as detailed in our analysis of the proposed 4-mile buffers and 3% NSOs.
- Second, data show that GRSG behavior can be affected by certain types of anthropogenic disturbance more than others, which can result in localized avoidance, but the effect of any of these disturbances or development on migration rates is unknown. However, data from Lyon (2000), Bush (2009), Tack et al. (2011), and more recent papers, all reveal that GRSG traverse (fly) over or around roads, agricultural areas, and oil and gas development, and distances up to 300 km from their natal lek.
- Third, experience with other ESA listings has shown that imprecisely defined characterizations of essential habitat, such as “priority habitat,” have a strong likelihood of being re-designated as “critical habitat.” This means that errors and flawed scientific analyses become institutionalized in regulatory decisions, regardless of their lack of accuracy. And once such designations are institutionalized, they are difficult to revise, even when new data become

available. Inevitably this results in litigation to correct the errors, such as the case of *Agua Caliente vs. Scarlett* (bighorn sheep critical habitat was reduced by nearly half because it was not scientifically or legally defensible).

A.8) In addition to the outdated information and perceptions regarding the oil and natural gas industry (identified above), and errors of omission (identified above), the NTT Report relied on outdated information and perceptions regarding the dispersal ability of GRSG, which have been grossly underestimated. Recent research, using genetics and GPS tracking devices, has revealed that GRSG disperse, and in some cases migrate, over much greater distances than previously thought. The implications of this increased dispersal ability for management of the birds are that: 1) there is greater genetic and demographic connectivity of populations than previously thought, and 2) that GRSG disperse over or around roads, rivers, agricultural fields, and oil and gas development. Collectively, this new information changes how populations are defined, namely that models previously relied upon (i.e. Knick and Hanser 2011), which underestimate this dispersal ability, are in error.

The following excerpt illustrates the emphasis on connectivity in the NTT Report, and reliance on Knick and Hanser (2011):

- Conserve, enhance or restore sage-grouse habitat and connectivity (Knick and Hanser 2011) to promote movement and genetic diversity, with emphasis on those habitats occupied by sage grouse.
- Assess general sage-grouse habitats to determine potential to replace lost priority habitat caused by perturbations and/or disturbances and provide connectivity (Knick and Hanser 2011) between priority areas.
- These habitats should be given some priority over other general sage-grouse habitats that provide marginal or substandard sage-grouse habitat.
- Restore historical habitat functionality to support sage-grouse populations guided by objectives to maintain or enhance connectivity. Total area and locations will be determined at the Land Use Plan level.
- Enhance general sage-grouse habitat such that population declines in one area are replaced elsewhere within the habitat.

A.8.1) GRSG dispersal occurs over greater distances than previously thought, and this has implications for the NTT's proposed conservation measures

We acknowledge that managing habitats to retain connectivity is an important long-term goal of conservation efforts for many species, including GRSG. However, it is clear that the dispersal abilities have been consistently underestimated in the development of habitat use and population persistence models (i.e. Garton et al. 2009, 2011; Knick and Hanser 2009, 2011; Makela and Major 2011). Therefore, it is important for the BLM and the NTT to acknowledge recent genetic data and results by

Bush (2009) and Bush et al. (2011) utilized assignment tests to identify the source population of GRSG that had dispersed, and isolation-by-distance measures to quantify the overall degree of genetic linkage among populations. Ongoing studies (including Tack et al. 2011) have employed satellite global positioning system transmitters to

reveal dispersal of GRSG over much greater distances (over 100km and some up to 300 km) and more frequently than previously thought. This requires a recalibration of assumptions used in habitat connectivity models (Lyon 2000; Bush 2009; Tack et al. 2011; Thompson 2012; Harju et al. 2010). Moreover, GRSG are able to disperse over and around areas of fragmented habitat and human development such that presumed movement corridors do not necessarily require the same high-level of protection as Priority Habitat and could be classified as General Habitat or as a third, less restrictive category that takes into account this new information.

Finally, Zink (2014) analyzed mitochondrial DNA and microsatellite data and found that GRSG populations were not isolated or genetically bottlenecked (with the exception of the Washington state population). Extinction predictions that figured prominently in the ESA listing decision (Garton et al. 2009, 2011) were overestimated because long distance dispersal and gene flow (even when as low as one successful breeding migrant per generation among populations) will tend to maintain effective population sizes over time, as well as increase the potential for re-colonization should a population become locally extirpated. As API has commented in the Land Use Plan Amendment processes, these studies are highly significant. More recent studies that have utilized analyses of empirical data have revealed even greater connectivity of populations (i.e. Thompson 2012 and Zink 2014).

A.9) One size fits all neither benefits GRSG nor local communities.

A9.1) Conservation measures must be tailored to local circumstances. The NTT Report recommended numerous one-size-fits-all regulatory prescriptions such as four-mile buffers, 3% percent anthropogenic disturbance thresholds, and BMPs, and made no allowance for recommendations to include county-level GRSG conservation plans that tailor conservation measures to local conditions, including unique habitat and threats, and socio-economic conditions. Instead, the only "local" plans mentioned in the NTT Report are state-level plans.

The strategy of excluding local GRSG plans and locally-appropriate conservation measures from the implementation of the NTT Report can also be found in Secretary Salazar's response to Chairman Hastings: "The BLM believes that no single set of conservation objectives will apply across the entire multi-state range, or even within the area of a single state. Greater Sage-Grouse conservation efforts need to be defined at a local scale and be supported by the best available science." It is also inconsistent with DOI's response to question #12, " As noted in the NTT Report, in some cases conservation measures identified in the Report will need to be modified based on local ecological conditions or new information."

BLM violates its multiple use mandate if it follows the NTT' Report's one-size-fits-all recommendations, focusing entirely on GRSG and excluding local communities (as equals at the table) in developing locally appropriate conservation measures.

A.9.2) As proposed, the BMPs listed in Appendix D are unnecessarily restrictive, are not supported by scientific information, and do not address specific cause and effect mechanisms that are known to be deleterious to GRSG. Additionally, no comparative analysis is provided that demonstrates the inadequacy of currently required BMPs under local conditions with those proposed in Appendix D. There is currently no administrative mechanism at BLM that allows the agency to track and test the effectiveness of previously required BMPs. Establishing such a database and making it public would provide a good starting point for the evaluation of any newly proposed BMPs. It is arbitrary and capricious for BLM to require untested BMPs while imposing new ones and additional (untested) conservation measures.

As noted previously, BLM must organize BMPs around threats, and local, site-specific conditions must be taken into account to develop scientifically defensible conservation measures.

A.9.3) The NTT Report puts GRSG above people and other resources in proposing to defend sage brush stands against fire. For example, "On critical fire weather days, pre-position additional fire suppression resources to optimize a quick and efficient response in sage-grouse habitat areas." If implemented, this NTT Report recommendation would represent a violation of BLM's multiple-use mandate and a violation of the public trust in that agency to protect human life and property as its first priority. It is also inconsistent with Federal Wildland Fire Management Policy which states, "[F]irefighter and public safety is the first priority...." Federal Wildland Fire Management Policy at 8.

This issue of prioritizing GRSG for fire suppression above human life and property was previously identified by API in its March 23, 2012 comments to BLM.

The advocacy of single-minded GRSG experts in development of the NTT, under the banner of GRSG conservation, not only violates the BLM's multiple use mandate, but could result in the institutionalization of bias against human safety and property in favor of GRSG. The exclusion of local plans and local decision makers in the process further underscores this issue while undermining the BLM's mission: "To sustain the health, diversity, and productivity of America's public lands for the use and enjoyment of present and future generations."

A.10) Disturbance thresholds recommended by the NTT Report are arbitrary and do not have a sound scientific basis.

If conservation measures are to be science-based, all scientifically defensible alternatives must be weighed, all evidence must be taken into account (including contrary evidence), and the studies that recommendations are based upon must be reproducible. As demonstrated below, the NTT Report resoundingly failed to do this in its recommendations regarding:

- 3% surface disturbance thresholds
- 4-mile NSO (no surface occupancy) buffers,
- noise limited to less than 10 decibels above 20-24 dBA, and

- 70% sagebrush cover in priority habitat.

The scientific "support" for four-mile NSO buffers and 3% surface disturbance thresholds is based on the erroneous assumption that a temporary disturbance of GRSG from a local area under development equates to a population decline.

A.10.1) It is incorrect for the NTT Report to claim that the cited studies "present the most complete picture of cumulative impacts and provide a mechanistic explanation for declines in populations" when these studies never documented a population decline. See Exhibit B: Studies Cited in the NTT Report Fail to Meet DQA Standards.

A.10.2) The NTT Report omits any mention of the fact that more recent and stringent stipulations are found in the Pinedale Planning Area, along with:

1) more extensive mitigation and restoration efforts in the Pinedale Planning Area (see <http://www.wy.blm.gov/jio-papo/index.htm> for a list of mitigation projects and data on surface disturbance and reclamation efforts),

2) advances in technology and efficiency documented in Ramey et al. (2011) and BLM presentations to the NTT, "Managing Oil and Gas" and "Best Management Practices" (available in Appendix 5, pp 48-55 of the August 29 to September 2, 2011 meeting summary) have been implemented since Holloran's (2005) study was conducted (from 1997 to 2003).

A.10.3) The 3% anthropogenic disturbance threshold is based upon biased opinion and selective citation of information rather than data.

The "professional judgment" calling for a 3% anthropogenic disturbance threshold in priority habitats does not address specific threats, nor take into account the type of disturbance, local conditions, or mitigations that are to be used. This professional judgment is not the result of an independent quantitative assessment but is the opinion of a small number of collaborators who share a similar point of view.

A.10.4) The one well per section requirement lacks a sound scientific basis. NTT Report failed to mention that Holloran (2005) made very specific recommendations regarding one well per section that were not based upon his testing of that threshold in his analysis. See Exhibit B: Studies Cited in the NTT Report Fail to Meet DQA Standards. BLM cannot rely on unsupported opinion and irreproducible analyses as the basis for recommendations made in the NTT Report.

No mention is made in the NTT Report of the fact that five years after the original Holloran study was released (Holloran 2005), Holloran et al. (2010) did not document any population loss, only temporary displacement of GRSG. See Exhibit B: Studies Cited in the NTT Report Fail to Meet DQA Standards.

There has been no decline in the GRSG population in the Pinedale Planning Area (Upper

Green River Basin). Instead, data and analyses performed by the Wyoming Department of Game and Fish reveal that between 1990 and 2012 there has been a consistent increase in GRSG (measured in male lek attendance and male density per square mile; Wyoming Game and Fish 2012). The information relied upon by the NTT Report is simply wrong. *See Exhibit B: Studies Cited in the NTT Report Fail to Meet DQA Standards.*

A.10.5) The four-mile NSO does not have a sound scientific basis. The NTT Report portrays the cited studies as documenting the negative effects of oil and natural gas development with a great deal of scientific certainty but fails to mention any of the methodological issues with these studies (detailed in this Challenge), or the fact that none reported a population-level decline in GRSG (rather than a localized effect on rates of male lek attendance near the disturbance). *See Exhibit B: Studies Cited in the NTT Report Fail to Meet DQA Standards.*

Like previous studies, Tack (2009) did not report a population level effect. Instead, he compared probabilities of occurrence between males at small and large leks, with varying levels of human impact. As discussed previously, it is erroneous to assume that a local displacement of males from leks to other areas equates to a population-level negative impact.

The primary rationale presented by the NTT Report, that the majority of nests are located within four miles of a lek and therefore a NSO area is a minimally required conservation measure in priority habitat, is not sound. Yet, there are no data that show that a four-mile buffer addresses any specific threat to GRSG (e.g. predation, functional disturbance of leks from noise or activity), or that such a buffer would result in any quantifiable benefit to GRSG in terms of increased survivorship or reproduction. Instead, the presumed necessity of four-mile NSO buffers is solely based upon the subjective opinions expressed in the NTT Report and the citation of correlative studies regarding local lek counts, none of which can identify any causal mechanism for what was only shown to be a localized and transient effect, rather than a population wide permanent negative effect. The supposed population wide-effect is assumed by cited authors and the NTT Report but has never been demonstrated. The 4-mile NSO is not only indefensible, it diverts valuable conservation effort away from specific threats in specific circumstances, in favor of a one-size-fits all approach that does not address specific threats or their underlying mechanisms.

The presumed necessity of the four-mile buffer is clearly refuted by data from the Pinedale Planning Area (Wyoming Game and Fish 2012, and supporting Wyoming Game and Fish GRSG lek count data). These data clearly show a population increase, despite the fact that intensive energy development has occurred in the Jonah, Labarge, and Pinedale Anticline, and much of it in excess of a 3% disturbance threshold and within four miles of leks that remained active (see well data from the Wyoming Oil and Gas Conservation Commission, disturbance data from the PAPO JDMIS and PDMIS databases, and lek location and count data from Wyoming Game and Fish Department).

The NTT Report also presents a case that because a majority of GRSG hens captured at a

particular lek nest within four-miles of that lek, a blanket four-mile NSO is required around every lek. That requirement is regardless of the quality, extent, or actual occupancy of the habitat contained therein. Each such four-mile NSO buffer would result in over 50 square miles per lek of land that would be off-limits (50.24 square miles to be exact), even if there were only one or two male GRSG in attendance, and regardless of whether that attendance is continuous from year to year. The practical effect of such a restriction would be to "protect" vast areas of non-habitat and marginal habitat, with no demonstrable benefit to GRSG. And finally, the definition of an active lek is left by the NTT Report as arbitrarily vague and inconsistent. For the reasons detailed above, the four-mile NSO buffer recommended by the NTT Report is neither scientifically nor legally defensible under the DQA. *See also* Exhibit B: Studies Cited in the NTT Report Fail to Meet DQA Standards.

A.10.6) Noise limits recommended in the NTT Report are biased downward.

What is being proposed for noise thresholds is an "impossible to achieve" standard found in an idyllic wilderness setting, on quiet days when the wind does not blow, the leaves do not rustle, birds do not sing, humans are completely absent, streams are not close by, and no aircraft fly overhead. While this may be appropriate for management of anthropogenic sound in the wilderness areas of some national parks (Lynch et al. 2011), it is not appropriate and would be impossible to achieve on most of the BLM lands in the West that are administered for multiple uses.

There are no data to justify the minimum sound levels used as a basis in Blickley et al.'s (in press) recommendations, or the supposed "disruptive activities" that an increase of 10dbA above these would cause. There are no data to show that the minimum levels recommended by the NTT Report occur for extended periods of time in any of the GRSG core areas, including the Pinedale Planning Area.

The NTT Report, or cited studies, did not present the results of other studies of noise generated by the oil and natural gas industry (especially in the Pinedale Planning Area), even though those studies and data were available at the time the NTT Report was being prepared (i.e., Harvey 2009).

The cited studies were biased in a way to find a measurable impact, the speakers were increased from two to four during the course of the study, and the sound pressures measured in front of the speakers, and effect on GRSG, were made without regard to the increased sound gradient created by their close distance (i.e. due to the physics of sound attenuation over distances, also known as the inverse square law, where sound decreases four times for every doubling of distance from its source) as compared to leks at the required BLM setback distances of 0.25 or 0.6 miles.

A scientifically defensible, alternative approach to studying the effects of noise on GRSG is outlined in laboratory and field experiments by Ramey, Brown, and Blackgoat (2011). Those approaches, when combined with sound modeling conducted by certified engineering firms, based on local environmental and land use conditions and professional standards, would provide a comprehensive approach to identifying and effectively

mitigating noise that would adversely affect GRSG populations. These would be based upon demonstrated cause and effect mechanisms of different noise characteristics (i.e., frequencies, duration, and sound pressure levels). Until such appropriate studies and modeling are done, BLM does not have sound data to support the noise restrictions in the NTT Report.

a) The noise thresholds proposed by the NTT Report represent a precautionary approach based on an undemonstrated assumption that there is a deleterious, population-level decline in GRSG as a result of noise associated with oil and gas operations. This is a clear violation of the DQA which required reproducible results based upon data, not presumed effects based upon potential effects.

b) The NTT Report promotes the arbitrary and capricious application of restrictions to one industry and not another.

Using the same rationale as proposed in the NTT Report (and supporting literature), BLM should establish "no-fly zones" for commercial, recreation, military, and research aircraft over or near GRSG core areas. Establishing "no-fly zones" would eliminate this source of anthropogenic noise that would exceed proposed limits. However, the lack of such restrictions underscores the fact that the NTT Report singled out and proposed limits only to the oil and natural gas industry, despite the fact that aircraft can produce noise levels that exceed the proposed thresholds (Wyle 2008; Barber et al. 2010); more than 50% of recordings in national parks document some form of aircraft noise (Fristrup et al. 2010); and the "Airport lek" in Wyoming is an active lek adjacent to the Jackson Airport (Wyoming Game and Fish lek location and count data). A similar argument could be made concerning noise from traffic unrelated to the oil and gas industry.

A.10.7) The NTT Report presents no scientific data that a one-size-fits-all goal of 70% sagebrush cover in Priority Habitat is scientifically defensible or achievable, would result in stable GRSG populations rather than addressing specific threats, and would not result in irreparable harm to other species (including candidate or sensitive species), and would not unnecessarily have a negative effect on local economies.

A.10.8) Conservation measures were developed based on guesswork.

The meeting summary from **Monday, August 29, 2011** clearly shows that the NTT was proposing conservation measures without the benefit of knowing how priority and general GRSG habitat were being mapped, nor what those maps would eventually look like [emphasis added]:

“Raul Morales, Sage-Grouse National Technical Team Lead, welcomed everyone to the workshop and thanked them for coming. He said the first priority is to develop conservation measures for the important, high priority sage-grouse habitat areas. Raul noted this group will not be developing the priority areas, which is a separate, ongoing effort, but this group should think about how the conservation measures will be applied to those areas. Raul said the second priority for the week is to determine how to manage for those sage-grouse habitat areas

that fall outside of the priority areas.”

“Raul noted that each day there would be a presentation on one of BLM’s programs and then the group would work together to develop conservation measures related to that program. Raul said the measures should be based on science and that politics should be left out; politics will be addressed when the National Policy Team reviews the document. Raul said it is important to create a defensible document and annotate throughout the document when recommendations are based on science, inferred from science, or based on professional judgment.”

NTT meeting notes from Tuesday, December 6, 2011 (page 6) state:

“The group discussed disturbance thresholds extensively. Key points and questions that emerged from discussion included:

There is a lot of research (at least 14 papers) related to disturbance impacts from oil and gas, and the take home message is that there are no positive benefits from disturbance and impacts are typically severe.”

However, the NTT Report did not cite 14 papers in support of this assertion, nor do any of the papers on this subject use the language that "impacts are typically severe." If this were the case, then why has GRSG lek attendance and male density increased in the Pinedale Planning Area and been consistently above statewide averages since 1990?

The statements below underscore the fact that the NTT Report could cite no studies that actually demonstrate a measurable demographic impact on the study population(s). Therefore, proposed thresholds were arbitrary and based on opinion rather than upon rigorous testing of different thresholds against empirical demographic data.

"What is the correct metric to use to generate recommendations on disturbance thresholds?"

"Most studies on oil and gas disturbance impacts are correlative and observational. This presents an issue for this NTT effort because we are taking observational/correlative research and trying to extract thresholds to influence implementation on the ground."

"There are no studies that cite 5% cumulative impacts as acceptable. In addition, we know from a GIS modeling effort that 5% disturbance is too much."

The NTT Report cites no such GIS modeling effort. BLM cannot base restrictions upon data and studies that are not public. As shown below, if the "research" on

disturbance was based on pads per acre, then it is unacceptable for the NTT to convert that number (which is never stated) into an arbitrary 2.5 or 3 percent disturbance threshold.

"There is no support for a 2.5% disturbance threshold in the literature. The science on disturbance is based on number of well pads/acre."

The statement below shows that the impacts of oil and gas development are limited, yet the NTT erroneously assumed that any "impact" to an individual or locally affected GRSG is unacceptable and leads to a population decline. From a demographic perspective, if yearlings move to nearby areas, with no associated density dependent mortality, then there will be no population decline. And if imprinted females remained in disturbed areas and presumably die at a higher rate, what matters most is that the affected proportion of the population must be large enough, and at a rate of mortality high enough, to have any detectable effect on rate of population growth. Neither of these have been demonstrated by the cited studies in the NTT Report.

"In general, disturbance causes two types of impacts: 1) yearlings move, and 2) imprinted females that stay die at higher rates."

The statement below underscores the arbitrary nature of the NTT Report's disturbance thresholds, which are based upon opinion:

"What is the most appropriate metric to use? Acres disturbed or number of disturbances over a spatial extent?"

The NTT Report does not cite the "concept paper" below because it refutes the basis for 2.5 or 3% surface disturbance threshold(s). This is an example of selective citation of information in the NTT Report:

"A concept paper in Casper, Wyoming on thresholds of energy development showed a 3% disturbance can be tolerated."

The NTT and the NTT Report cite Naugle's book chapter in support of disturbance thresholds but does not acknowledge that Naugle himself is an author on three chapters in this book, *Energy Development and Wildlife Conservation in Western North America*, which he is also the editor of. Also, three of Naugle's former graduate students were authors on four chapters: K. Doherty, B. Walker, and J. Tack. Therefore, in producing this book, Naugle was in a position of reviewing his own work as well as that of his former graduate students and close collaborators. Such a collection of chapters cannot be reasonably viewed as independent or unbiased.

"Naugle's book chapter reviews the science on disturbance thresholds."

The statements below illustrates the arbitrary nature of the NTT Report's recommendation on disturbance thresholds. These were made without a sound scientific basis. There is no rigorous testing behind consideration of any of the surface disturbance thresholds (except a potential paper that was not cited in the NTT Report, the above mentioned concept paper). Additionally, the NTT was clearly was having issues with definitions, and in this case, wildfire was arbitrarily included in the 3% disturbance cap.

"Should one additional well pad in each section (so a total of two well pads) trigger mitigation?"

"Can we apply the oil and gas threshold (from existing scientific research) to all human disturbance?"

"Should anthropogenic disturbances be in a separate category than natural disturbances? What constitutes an anthropogenic disturbance?"

The NTT meeting notes from Wednesday, December 7, 2011 (listed below) further indicate the arbitrary nature of recommended disturbance thresholds. In the final version of the NTT, just two weeks later, the NTT recommended a 3% disturbance cap and that disturbance include "diffuse disturbance", including the acreage in livestock grazing and that burned in wildfires. However, none of the cited literature actually tested for combinations of discrete and diffuse disturbance, therefore its utility is speculative. BLM cannot rely on speculation as a basis for its decision-making.

"Whether the 2.5% disturbance threshold was meant to apply toward disturbances that could not be identified as 1 discrete disturbance."

"Science exists to support the disturbance threshold of 1 disturbance/640 acres, but not necessarily for a 2.5% disturbance threshold."

"Although solid literature exists to support the 1 well/640 acre threshold, this disturbance is not good."

"Whether the disturbance objective should be restated to generally exclude large anthropogenic disturbances from priority habitats and manage other disturbances below 2.5%."

"Whether the 2.5% threshold should be used as a trigger for mitigation."

"Justifying the 2.5% threshold based on the best professional judgment that evolved based on the NTT's exhaustive review of literature."

Again, it must be emphasized that these are examples of the speculation that underly the NTT Report recommendations on disturbance thresholds. And the so-called "science" behind the 1 well/640 acres is merely opinion expressed in an unpublished dissertation

for which the underlying data are not publicly available (see A10.4 above and Exhibit B discussion of Holloran 2005's recommended disturbance threshold of 1 well per section/640 acres).

A.11) The presumption that peer review of the NTT Report was adequate is rebutted for the reasons listed below:

In the following excerpt from a December 18, 2012 letter from Secretary Salazar of the Department of the Interior to Representative Hastings, BLM gives a false impression that a rigorous peer review was conducted on the NTT.

“Q: Was the NTT Report document peer reviewed according to the Department’s Data Quality Act requirements? If yes, please provide copies of all peer review documents.

R: The BLM followed the Department’s Data Quality Act policy and sought a peer review commissioned by the Nevada Department of Wildlife Director, Mr. Ken Mayer. Mr. Mayer serves on the National Greater Sage-Grouse Planning Strategy National Policy Team. Mr. Mayer commissioned an outside review of the conservation measures in a draft version of the NTT Report by six scientists. A report of their comments is enclosed. A subset of the National Technical Team members met in Phoenix from December 6-8, 2011, to address many of these scientists’ comments and further articulate and document the scientific basis for the recommended conservation measures. These were incorporated into the final NTT Report.”

Contrary to the response above, there is no evidence that accepted standards for scientific peer review were followed in the supposedly scientific peer review of the NTT Report. As an initial matter, the "peer review" of the NTT Report was conducted by Ken Meyer of the Nevada Department of Game and Fish. In searching scientific journals, no evidence was found that: 1) Mr. Meyer has ever served as an editor or associate editor of a scientific journal, 2) has organized a scientific peer review previously using the accepted standards of scientific peer review, 3) served as a peer reviewer at a scientific journal, or 4) has himself ever published a peer reviewed scientific paper in a reputable scientific journal.

a) Most importantly, there is no evidence that each of the comments and issues raised by the "peer reviewers" of the NTT Report were either corrected or rebutted by the NTT, or that any responses by the NTT were ever submitted and subsequently reviewed by Mr. Mayer. If this supposed peer review was conducted properly, Mr. Mayer would have acted in the same role as an editor or associate editor of a scientific journal to accept or reject these responses, or require another round of review with a revised report. Instead, publicly available evidence points to the observation that peer reviewer comments were passed on to the NTT, and a select subset of the NTT subsequently decided amongst themselves which comments and issues they would address or not address. This is not how scientific peer review works. And it does a

disservice to the field of science to call such a casual solicitation and passing on of comments to the NTT a "peer review."

b) Evidence of the inadequacy of the supposed "peer review" of the NTT Report is further illustrated by the fact that substantive issues raised by some of the peer reviewers were never corrected in the NTT Report. To illustrate this deficiency, comments listed below were ignored or inadequately addressed in the final NTT Report (see below).

Peer review of the NTT Report was inadequate because each of the comments received were not incorporated, or rebutted, by the NTT in writing, as is the accepted practice in scientific peer review.

According to the December 18, 2012 letter from Interior Secretary Salazar to Representative Hastings: a scientific peer review of the NTT Report was conducted by six scientists who were organized by Ken Mayer of the National Greater Sage-Grouse Planning Strategy National Policy Team and Nevada Department of Fish and Game.

According to the notes from the NTT meeting on December 6-8, 2011 in Phoenix, the NTT discussed and addressed only a very limited number of comments raised by these reviewers and there is no evidence that the NTT addressed or rebutted specific reviewer comments, or that Ken Meyer, the organizer of the NTT Report's "peer review," had referred the comments, corrections, and rebuttals received.

According to NTT meeting notes provided by Secretary Salazar letter in his letter to Representative Hastings (page 10), only two issues were considered to be key: "Key comments received from reviewers include 1) prohibiting fuels management in known winter ranges is too restrictive, and 2) potential irrelevance of the conservation measure suggesting site potential will be lower than 15%."

However, the following 39 reviewer comments (those available in Secretary Salazar's letter) were not addressed by the NTT and remain valid issues that rebut the scientific accuracy of the NTT Report and the validity of the supposed "peer review" process. Only two out of 41 reviewer issues were addressed by the supposed "peer review" process, whereas a rigorous peer review process would require that all issues raised by peer reviewers be addressed.

1) "There is no discussion of the seasonal requirements of sage-grouse to provide managers a context for their actions. There are limited references to the state-level sage-grouse plans. A good deal of effort went into these plans and they contain valuable information that should be incorporated into the planning process."

2) "There seems to be no focus on identifying the limiting habitats as a first step. How can managers be expected to prioritize their efforts if there is no analysis of which habitats are most limiting?"

- 3) "If we are to maintain sage-grouse habitat it will be critical to identify and understand the risks to each particular habitat type. There seems to be limited discussion of risk analysis in the sections I reviewed."
- 4) "If the document is to be applied across the sage-grouse range it does not make sense to use specific numbers (15% sagebrush cover or 12 inches of precipitation) on plant communities that vary tremendously over even small distances. Use concepts that make ecological sense (site potential or risk factor), rather than trying to simplify our complex landscapes."
- 5) "They develop a list of conservation strategies that apply to priority habitat and don't define it?? The definition they gave could be changed to "to be determined." The devil is completely in that detail. Even using core area is inadequate, in that many "cores" are based only on leks, and may or may not include other important seasonal habitat. I understand the need and desire to have a flexible definition to accommodate variation across the range, but far better to have a base definition to which states can append other criteria as necessary, than to defer the definition."
- 6) "The document is an odd mix of scientific citations and policy decisions, with no real tie between the two. I expected a science document that reviewed the literature, laid out what is known about program area impacts to GRSB, and where the uncertainties lie. The science review would lead to a range of numbers and alternative approaches, which would then segue into a policy document that described the approach chosen. The science team would develop the science document, the program managers the policy outcome emanating from it. This seems a strange blend of policy loosely backed by citations, with no analysis of the science. Because there is no iteration of the rational scientific basis for the very prescriptive strategies, I would anticipate strong blowback by Industry and by Environmental groups, the former finding it over-reaching and the latter inadequate."
- 7) "All activity plans should explicitly address PECE considerations, i.e., the certainty of implementation and certainty of effectiveness. Given the budget situation for the foreseeable future, plan projections of rosy success are often nothing more than happy bullroar. I've seen it too many times before."
- 8) "Space and time (1) A central premise in ecology is the notion that ecological processes unfold in both space and time. Lack of consideration of space, and particularly (in this document) time is a critical mistake that, to me, renders this document problematic, if not dangerous. Let's consider both dimensions and how they might influence the current document...The point of all this is that in ecological systems that operate in both space and time, we cannot categorize either disturbance or management actions in the absence of considering the temporal component."
- 9) "Overlooking the temporal aspects of ecological disturbances such as fire promotes a species-centric focus in which disturbance effects are characterized using the intellectually pedestrian notions of "good" or "bad" without consideration of the

specific temporal context within which these disturbances unfold. This, in turn, reinforces a focus on sage-grouse, rather than a focus on the ecology of the ecosystems to which the integrity of sage-grouse habitat is subservient."

10) "Thus, the appropriate management actions, and in this case the order of appropriate management actions, is strongly tied to ecological site. This concept needs to be specifically addressed to avoid on-the-ground problems for BLM. I would recommend either 1) sufficiently vague language to allow for flexibility at more local scales, 2) explicitly recognizing the need for reliance on ESDs, or, ideally, 3) both."

11) "The document also misses the mark when it comes to larger scale variation associated with inter and intraregional variation in plant community ecology. This is a serious omission."

12) "If this document is to be effective in defining conservation measures on a range-wide basis, it must take into account the considerable large-scale variation in plant community ecology present within the range of sage-grouse. Otherwise, we are faced with species-centric generalizations of the effects of ecological processes that may or may not represent ecological reality."

13) "I would suggest that language directing managers to consider future climate change in determining seeded species be taken out. Present knowledge of climate change is not at the stage (i.e. accurate enough) where we can predict future climate to the extent that we are designing seed mixes based on those predictions and we have enough problems to worry about with restoration success in the present climate."

14) "What happens when potential of the ecological site is at odds with stated sage-grouse habitat requirements? This could be clarified by specifically incorporating Ecological Site Descriptions and not using cut-off values such as 15% sagebrush canopy cover."

15) "The notion that grazing privileges in sage-grouse areas should be retired when base property is transferred or a current operator is willing to retire such privileges assumes grazing is automatically a problem and can't be used as a tool for habitat management. It also assumes that grouse are the highest and best use of the land...this HAS to be addressed before these guidelines become policy or serious problems will arise. What about FLPMA...where does it fit into the picture?"

16) "The notion that no treatments will be allowed in known winter range seems a bit draconian. What if winter habitat is also breeding habitat? Dave Dahlgren's research has demonstrated how small patch-scale sagebrush reduction treatments can be used to create beta diversity that improves grouse habitat while retaining sagebrush dominance at large scales. Again, the issue of spatial scale."

17) "Document suggests not using fire to treat sagebrush in less than 12-inch precipitation zones. I generally agree with this, but at the same time I have a problem

with making these broad generalizations about ecosystems, the properties of which vary strongly across sites and over time."

18) "Almost all of the emphasis is on preventing additional habitat loss or degradation on BLM land, with relatively little effort spent on strategies to improve existing habitat."

19) "The document suffers from a 1-size fits all approach that lacks context. Lumping all sage grouse seasonal habitats in all locations across the range regardless of population size or relative importance of the population into either "priority sage grouse habitats" or "general sage grouse habitats" strikes me as tremendously over simplistic. When combined with very prescriptive direction, it may lead to strong opposition, which may lead to weak application of the IM. The definition for priority habitat is circular, in that "highest conservation value to maintain sustainable Greater sage grouse populations" is also not defined. There are as many definitions for core areas as there are states, most at present are lek-based and therefore don't consider brood rearing or winter habitats unless they occur within whatever buffer is used. The definition for general habitat is occupied habitat, so in that case why not just use occupied habitat? I would expand that however to include 'unoccupied but potentially suitable habitat.'"

20) "Priority habitat must be defined before this document goes out for wider review, rather than kicking that can down the road. The elements that must be included would be lek/nesting habitat (rather than using arbitrary buffers may want to include proportions of nesting hens included and let the buffer vary with habitat quality and local characteristics), late brood- rearing habitats, and winter concentration areas. It would be far preferable to have a base definition that is amended locally, than to have no definition and allow each state and potentially Field Office to develop their own."

21) "There is no performance aspect or adaptive management component. The document begins by stating that the following conservation measures are designed to achieve population and habitat objectives stated in this report, yet that is the only time population and habitat objectives are mentioned. What happens if the conservation measures don't achieve population and habitat objectives? Some type of rigorous adaptive management must be the final conservation strategy, where the effectiveness of these measures, and the degree to which sage grouse habitat and populations are conserved by these measures (in the face of other threats), are constantly evaluated and reassessed. There is a sentence on monitoring that says a monitoring strategy for sage-grouse and sagebrush will be developed for adaptive management purposes, but this ignores the critical feedback aspect of adaptive management, where data collections feed back to change management strategies where necessary."

22) "Structural range improvements, including fencing, corrals, livestock handling structures etc., are prohibited within priority habitats unless they conserve, enhance or restore sage grouse habitat. It is impossible to determine whether they conserve, enhance or restore sage grouse habitat or not without some explicit criteria as to when

they do and when they don't that is context and scale relevant."

23) "I have always had a problem with this "Rangeland Health" thing. I understand it to a point, but the reality is that the health is in the eye of the beholder. Is a big sagebrush/bunchgrass habitat with 10% sagebrush cover and good perennial grass densities less healthier than 20% sagebrush cover and less perennial grasses? Remember, good long-lived perennial grass densities are the best way to suppress cheatgrass fuel loads that is critical in protecting sage grouse habitats. The 20% big sagebrush cover may very well be suppressing the much needed long-lived perennial grasses. Also, plant measurements taken by numerous individuals, even with a strict protocol, have high error, so in many cases the data you analyze does not represent on-the-ground situations. You risk not achieving stated goals and objectives due to this disconnect between data collected and on-the-ground realities."

24) "It is very difficult to modify grazing systems in the arid west. With such variations in forage productions the climate does not offer annual predictions, therefore livestock are put out on the range during drought years in the same manner as during rare wet years. Our rangelands simply do not provide the flexibility to accommodate the livestock producer without some kind of financial hardship. Most livestock producers are lacking winter allotments and have to feed or supplement their stock at a high cost, therefore they are chewing at the bit to get their livestock back on the range early and keep them out their as long as possible. One of the best ways to manage livestock is to get the cowboy back on the horse and to focus on the distribution part of the management."

25) "You want this effort to be achievable then be careful when placing the livestock industry on the defensive, the only ones that make out are the lawyers. I once had a livestock operator in Colorado tell me that it was "hard to swallow someone coming in and decreasing his equity in such a closed minded fashion, how would they like it if I came in and took out a bedroom and bathroom out of their home". He ended up selling his property to a developer. If this mentality is consistent out there, wildlife in general could pay a price."

26) "How many of these wet meadows are private? How does this affect the ability to meet these management goals? Here they are discussing building fences, earlier they discussed removing fencing. Is fencing harmful to sage grouse? Again, simply placing a cowboy back on the range will reduce hot season grazing! Building a fence around so many riparian areas will only increase maintenance and repair which may add disturbances to the overall area and in most cases place the livestock producer in a position where they are spending time repairing fence on top of farming/mechanic duties rather than moving and actively managing livestock. Don't these fences just add perches for predators?"

27) "Is the Federal Government going to go into the business of managing their own livestock? In the part about retiring grazing permits I have this question: Only about 7% of Nevada is considered mountain brush habitat, whereas Wyoming big sagebrush

is the major plant community. Where is the fuels management? The removal of livestock will most likely result in increased bunchgrasses/fuel loads in the mountain brush habitats. These fuel loads will probably result in increased wildfires in these habitats that will burn critical sagebrush communities. In the Wyoming big sagebrush communities, the perennial bunchgrasses are largely gone and cheatgrass is now the dominant herbaceous vegetation. Whether cheatgrass is 1” high or 12” high it will still produce seed and build seed banks. Even though wildfires occur with the presence of livestock, the reduction of such grazing would result in extreme build-ups of fuel loads. Again, resulting in further loss of critical shrub communities. The simple removal of livestock will not result in the return of healthy big sagebrush/bunchgrass communities, especially in Wyoming big sagebrush communities."

28) "Seems like the first thing to do [Retirement of Grazing Privileges] is to assess the effects of retiring the grazing. If the result of no grazing is increased risk of fire, then it might be worth reconsidering."

29) "Woefully inadequate measures [for Wild Horse and Burros Management]. While managing wild horses and burros to AML levels in priority sage grouse habitats would be a good start, the AML levels themselves must be re-evaluated and in almost all cases lowered to conserve sage grouse habitat."

30) "Pretty short addressing of the horses/burros issue. If you are going to mention fencing, water hole dispersal etc., with livestock then even with a proper management level of horses you need to address hot season use and the degradation of these water holes by horses and burros."

31) "I do think some additional flexibility is called for [in section on Minerals]. The exceptions to the NSO state that if the entire lease is within 3.1 miles of a lek or a winter concentration area (which will not be uncommon), then the pad must be placed in the "most distal" part of the lease. Depending on topography and other habitat aspects, the most distal portion of the lease may or may not be the best place to put the pad from a sage grouse perspective, and some exception that is demonstrably beneficial to sage grouse should be allowed."

32) "I generally support the BMPs as mandatory conditions of approval, but the process needs to recognize that Industry frequently finds better ways to do things more quickly than BMPs are modified, so any mandatory aspect needs to allow for better approaches to be approved."

33) "Prioritizing off-site mitigation to priority habitat areas, and to the population impacted makes sense, but the whole question of when mitigation is required, to what degree, and even what constitutes mitigation needs a great deal more development. This document is silent on that, which leaves it entirely to field discretion. The currency of mitigation needs to be developed, with credit given for mitigation over and above that required."

34) "Prohibiting Fuels Management treatments in known winter range is too restrictive. There may be situations where the fuels treatment is small enough or in higher precipitation zones with ample forage where treatments will be beneficial (i.e., where winter range is also brood habitat). Similarly, excluding fire in areas with less than 12-inches of annual precipitation is also too restrictive, as size of treatment definitely matters."

35) "Clarify/define the terms "native seeds" and "non-native seeds". Does this mean locally collected seeds, the same species of seeds collected from anywhere (BLM has had problems in the past with, for example, sagebrush seed being planted that was collected hundreds of miles away from where it was collected. Not good.), or truly exotic species?"

As the accepted practices in scientific peer review were not followed by the NTT (i.e. authors must accept comments by incorporating them into a revised report and provide a rebuttal to each of the review comments that they disagree with, stating the reasons for the disagreement) the BLM must correct the record by stating that the NTT Report was not peer reviewed.

36) From the NTT Report draft, section on Emergency Stabilization and Rehabilitation, the reviewer comment was made regarding the following statement in the NTT Report: "Consider potential changes in climate when proposing post-fire seedings using native plants. Selecting native plants adapted to a warmer climate with more variable precipitation should be considered given the longevity of native plants."

Reviewer comment: There is no basis for this suggestion. To date there is no research I am aware of showing that plant species are changing their ranges. And the movements are likely to be so slow that managers will be able to adapt without introducing new species (in other words those species will have become part of the system by the time we need to actively consider them in seeding mixes). We have enough trouble establishing the existing native species on most sites. I know Interior is under pressure to "respond " to climate change, so if you must, put in a statement to the effect that species mixes will be adjusted as information on changes in species ranges becomes available."

[The final language in the NTT Report did not address this issue with their minor changes: "Consider potential changes in climate (Miller at al. 2011) when proposing post-fire seedings using native plants. Consider seed collections from the warmer component within a species' current range for selection of native seed. (Kramer and Havens 2009)."]

37) "It is very theoretical to suggest using species that are more adapted to warmer or drier climates (assisted succession) in a management plan. Are you suggesting seeding Wyoming big sagebrush in a mountain big sagebrush zone? This approach,

which we have worked with for 10+ years, suggests that it works. Do you really want to make management decisions of this magnitude off of a theory? ... Far too often seed mixes are put together under what looks good on paper or someone's ecological site description, rather than what are the chances we can get this species established and help prevent further degradation! After all, this effort is to protect and enhance sage grouse habitat, right?"

38) "In the effort to restore sagebrush densities, it should be noted that there are levels of big sagebrush which are detrimental to big sagebrush itself. Once the big sagebrush reaches higher percent covers, long-lived perennial grasses will decrease, cheatgrass will then be the void and fire will follow. It always amazes me how many folks miss the point that cheatgrass starts under the shrub, excellent safe-site with litter and moisture, and then mines the site out into the interspaces. Sagebrush does not suppress cheatgrass."

39) "Sagebrush over-stories should be more defined and managed by the local resource managers specific to the site since it is of "highest priority". I truly see the concern because we are not very good at restoring or protecting sagebrush, but sitting back and hoping that the sagebrush community is not destroyed has not worked. We aged big sagebrush communities (both mountain and Wyoming) and found the ages from 20-75 yrs of age. Mountain big sagebrush built small numbers of seed banks but really not enough to sustain itself without some type of outside help. No seed banks were recorded from Wyoming big sagebrush communities. The return of Wyoming big sagebrush on our 28 yr old plots is absent, yet the mountain big sagebrush community had various return rates from 15% cover in 10 years to only 8% cover in 15 yrs at another site. These goals and objectives need to be flexible and more lenient or they will never be achieved for some habitats. The reality is that in many of these habitats we would be ecstatic to have 10% sagebrush cover!!!"

A.12) The recommendations in the NTT Report were tailored to be consistent with ongoing settlement negotiations with environmental litigants. A Dec 13, 2011 11:52 AM, e-mail with the Subject: The latest on the NTT Report from Raul Morales (<rmorales@blm.gov>), the NTT team lead for BLM, provides evidence that the NTT Report recommendations were influenced by ongoing settlement negotiations with environmental litigants over land use plans, rather than an unbiased assessment of conservation alternatives:

This small team met last week in Phoenix for 2 1/2 days and we are currently in the process of formatting and updating the NTT report to reflect the efforts of the science team last week. Our timeframe is to complete the "updated" draft NTT report by COB tomorrow so I can ship it back to DC. Due to concerns by solicitors in DC the NTT report will look different. However the content is generally the same and due to the science review we did make changes to the Goals and Objectives section, some conservation measure in fluid minerals have been updated (i.e. 2.5% has been changed to 3% with rationale). The Policy recommendation change has undergone significant

clarification again based on solicitor concerns in DC. The solicitor concerns with the Policy recommendation piece stems from ongoing litigation discussions they currently having with litigants over BLM's recently completed LUPs. Once I have the updated NTT report I will ship out this new report to everyone. WO is planning to soon issue (after the receive the newest NTT report) a BLM-wide IM that will explain how to use the conservation measures in planning.

A.13) Use of strong inference is absent from the NTT Report.

A.13.1) A truly scientific approach, (the scientific method or "strong inference approach" i.e. Platt 1964) is needed to address threats to GRSG or much effort will be wasted, to the detriment of GRSG, as well as collateral economic damage to affected communities and economic activity. The NTT Report is touted as a scientific review document and includes an appendix on "Scientific Inference." However, there is no mention of the term "hypotheses" or "hypothesis testing" in Appendix B or anywhere else in the NTT Report, or potential falsification of hypotheses which are central to the scientific method. The NTT Report mentions the scientific method in one sentence but clearly misrepresents its definition and application. Instead, the primary papers cited in support of NTT Report recommendations rely on a subjective interpretation of results or blind acceptance of model selection results.

A.13.2) The NTT Report fails to mention the most basic requirement of scientific inference: that the cited studies, whether published or not, be *reproducible*, and that requires that the data be publicly available. The approach emphasized in the NTT Report is to rely on so-called "quality" published, peer-reviewed studies, and when these do not exist, "managers have to resort to best professional judgment (opinion) and/or unpublished studies." However, none of the data sets used in the studies cited in the NTT Report to justify the four-mile buffer, 3% disturbance cap, or noise levels, are in the public domain.

A.13.3) As noted earlier in this document, BLM needs to correct its description of science in the NTT Report and utilize the scientific method.

Specifically, the BLM needs to revise the NTT Report by formulating multiple, alternative hypotheses regarding the specific cause and effect mechanisms of each threat identified by the FWS in its 2010 listing decision. Then the agency could deduce testable and potentially falsifiable predictions from those hypotheses, and establish thresholds for testing these against the available data. This strategy of strong inference has the greatest potential for rapid advancement of scientifically-informed decision making (Platt 1964; Rehme et al. 2011). This is especially important to adaptive management as proposed by the BLM. Furthermore, the BLM must disclose the scientific uncertainty that is present concerning specific cause and effect mechanisms affecting GRSG persistence in its Land Use Plan amendments.

A.13.4) In order to implement sound, scientific investigations and their use by BLM, it is essential that the proper data be gathered and used in a well-defined and effective adaptive management strategy.

The solution the NTT proposes is for the Western Association of Fish and Wildlife Agencies (WAFWA) to convene a technical group to develop ways to better estimate GRSG distribution and abundance. We find this recommendation to be an abdication of responsibility by the NTT. According to the National Strategy, the NTT is a group of GRSG scientific experts chartered as a scientific and technical forum to:

- Understand current scientific knowledge related to the greater sage-grouse.
- Provide specialized sources of expertise not otherwise available.
- Provide innovative scientific perspectives concerning management approaches for the greater sage-grouse.
- Provide assurance that relevant science is considered, reasonably interpreted, and accurately presented; and that uncertainties and risks are acknowledged and documented.
- Provide science and technical assistance to the RMT and Regional Interdisciplinary Team, on request.
- Articulate conservation objectives for the greater sage-grouse in measurable terms to guide overall planning.
- Identify science-based management considerations for the greater sage-grouse (e.g., conservation measures) that are necessary to promote sustainable sage-grouse populations, and which focus on the threats in each of the management zones.

We further note that a fundamental bias with WAFWA is that it is comprised primarily of career state and federal biologists, and therefore, is not independent of the NTT (or the BLM and USFWS). If BLM continues to rely on such conflicted and non-independent sources of information, confirmation bias is assured to continue in its decision-making process, just as it has in the development of the NTT Report. Confirmation bias is a phenomenon that is frequently found in the interpretation of scientific research (MacCoun 1998; Nickerson 1998; Moore et al. 2010).

A.13.5) The NTT Report's description of adaptive management exhibits a divergence from established guidelines that were designed to foster transparency and accountability in adaptive management.

A.14) BLM is being set up for failure by the NTT Report.

A.14.1) E-mail exchanges among NTT members and BLM staff reveal that there were valid complaints raised by BLM staff about unrealistic goals being set in the NTT Report that BLM could not achieve. This included the immediate effect of shutting down any minor development and potential operations in areas that have a surface disturbance in excess of 3%. Furthermore, Jim Perry of BLM pointed out an important internal inconsistency in the NTT Report that makes it subject to legal

challenge: if 50-70% of the acreage needs to be in sagebrush cover for long-term sage-grouse persistence, then 30-50% non-sagebrush will not cause harm to the birds. However, the fact that NTT added a 3% disturbance cap is not consistent with the 10-16 fold increase allowed under a 50-70% sagebrush requirement where 30-50% is allowed to be in non-sagebrush.

A14.1.1) The following e-mail communications from Jim Perry to the NTT points out this issue and also illustrating why the NTT needed to drop its arbitrary <3% disturbance and 50-70% sagebrush thresholds.

From: Perry, Jim

To: Morales, Raul; Fielder, Dwight

Cc: Kniola, Benjamin E; Bargsten, Travis D; Perry, Jim; Wells, Steven

Subject: RE: NTT Report and Transmittal Letter

Date: Thursday, December 22, 2011 6:28:14 AM

Attachments: 2011_1221_Final_NTT_Report [edits made by NTT].docx

Raul and Dwight,

Thanks for making those edits and for mentioning NSO in the Transmittal memo to the NPT!

I'm confused why the "**Locatable Minerals**" BMPs did not get changed to "**Solid Minerals**" in the Appendix?!?

Last night's edits opens a new, very serious question.... It may be too late to address this in the report, but it is one we will need to address in our outreach to the field....

It appears to me the BLM is being unnecessarily set up for immediate failure across the priority habitats. Nearly all contain roads, pipelines, power lines, homes, farms, well pads, etc.... Science says 30 – 50% in **non-sagebrush** cover is okay (see quote below), but the NTT Report says 3% in anthropogenic features is the NTT recommended maximum (see quote below).

Am I missing something, is it worded poorly, or is this a misapplication of professional judgment and science?

The report now makes this scientifically-based assertion:

Within priority **habitat**, a minimum range of **50-70% of the acreage in sagebrush cover** is required for long-term sage-grouse persistence (Aldridge et al. 2008, Doherty et al. 2010, Wisdom et al. 2011).

That leaves an allowance of **30 - 50% in non-sage-brush** cover. So how was the 3% maximum cap on surface anthropogenic features derived based on "professional judgment"? (see footnote) **3% is a long way from 30 – 50%**

Manage priority sage-grouse habitats so that discrete **anthropogenic disturbances cover less than 3%** of the total sage-grouse habitat **regardless of ownership**.

Anthropogenic features include but are not limited to paved highways, graded gravel roads, transmission lines, substations, wind turbines, oil and gas wells, geothermal wells and associated facilities, pipelines, landfills, homes, and mines. iii

iii Professional judgment as derived from Holloran 2005, Walker et al. 2007, Doherty et al. 2008, Doherty et al. 2011, Naugle et al. 2011a,b.

o In priority habitats **where the 3% disturbance threshold is already exceeded from any source, no further anthropogenic disturbances will be permitted by BLM** until enough habitat has been restored to maintain the area under this threshold (subject to valid existing rights).
Jim

A14.1.2) Dave Naugle's response to Jim Perry's question is below. There are no studies that show 50-70 sagebrush cover is needed for population persistence. In fact, numerous populations fall short of that, especially in the southern part of the range, e.g. the Parachute - Piceance - Roan (PPR) population, which has approximately 12% sagebrush cover and is naturally fragmented by topography, aspen stands, and conifer stands. Additionally, Schroeder et al. (2004) documented numerous historic sightings of GRSG well outside the areas dominated by sagebrush.

From: Dave Naugle
To: Morales, Raul
Subject: RE: NTT Report and Transmittal Letter
Date: Thursday, December 22, 2011 9:52:44 AM

Raul,
You have it right...the 50-70% is a minimum acreage of sagebrush habitat necessary over broad scales to maintain a population. I'm not a big fan of setting "minimums" because that is then the number everybody tries to achieve. In reality, many cores surpass this 50-70% minimum because they were delineated around the best remaining habitats.

The non-sagebrush sites within cores may be naturally fragmented or the result of past anthropogenic impacts. Regardless, we cannot further litter the cores with additional anthropogenic impacts without expecting impacts to populations.

We got off track on the NSO and drainage issue because some view non-sagebrush habitat inside cores as a throw away developable area. But additional impacts anywhere inside cores increases cumulative impacts beyond the site of the new well pad. Thus the limit of 1 pad per square mile and a 3% cap on additional footprint.

We've progressed in our thinking past individual lek buffers to now delineate whole cores at appropriately large scales that encompass all seasonal habitats necessary to support a population. We will still see impacts from 1 pad per square mile and a 3% cap on new anthropogenic disturbances.

I hope these end up being acceptable losses that still respect valid existing rights. I suspect the NTT Team would be very leery of endorsing any additional impacts inside cores.

The NPT can determine if existing laws or other issues preclude NTT recommendations; but that is a policy issue not a technical one.

Happy holidays Raul,
Dave

From: Morales, Raul [mailto:rmorales@blm.gov]
Sent: Thursday, December 22, 2011 8:18 AM
To: Dave Naugle
Subject: Fw: NTT Report and Transmittal Letter
Dave, see Jim's comments below regarding 50-70% sagebrush cover and 3% anthropogenic disturbance.

Let me make sure I can explain this and see if I have it right.

Anthropogenic feature are being limited to 3% to limit direct impacts to sagebrush habitat loss but more importantly impacts to sage grouse (direct or indirect) as a result of these features on the landscape.

The 50-70% sagebrush cover is really a minimum range for healthy habitats and that if the remaining habitat were all anthropogenic then the 50-70% would not be effective to sustainable SG populations. If the remaining 30-50% was in some other plant seral stage (recent burn or annual grassland) at least there is still habitat to be reclaimed or evolve over time back to a sage brush ecosystem.

Do I have this right? Anything you would add so I can be prepared for questions like this in the future?

14.1.3) The final exchange between Naugle and Perry indicate that these issues remain unresolved. However, two additional issues stand out clearly: 1) if the 3% disturbance cap is implemented along with the goal of 50-70% sagebrush cover, then the non-essential remaining 30-50 percent should not be regulated as if it were essential - otherwise the BLM will find itself in a legal challenge; and 2) without having developed its priority habitat and sage brush cover maps first, the NTT Report included guesswork as to the percentages of sagebrush and anthropogenic disturbance.

From: Dave Naugle
To: Morales, Raul
Subject: RE: NTT Report and Transmittal Letter
Date: Thursday, December 22, 2011 12:27:39 PM
Yeah...this is what I'm afraid of, we're cutting individual words and losing context out of email transmissions, never a wise thing to do on big decisions. I'm happy to talk with you all on the phone but this is a poor way to do this. Plus I feel like I'm speaking for the entire NTT which is way out of line. Dave
From: Morales, Raul [mailto:rmorales@blm.gov]
Sent: Thursday, December 22, 2011 1:19 PM
To: Dave Naugle
Subject: Fw: NTT Report and Transmittal Letter

Does what Jim says make sense to you?

From: Perry, Jim

Sent: Thursday, December 22, 2011 12:37 PM

To: Morales, Raul; Fielder, Dwight

Cc: Kniola, Benjamin E; Bargsten, Travis D; Wells, Steven; Perry, Jim

Subject: RE: NTT Report and Transmittal Letter

Raul,

Here are two main points from Dave.... and both statements make sense and are fine with me. But my question is not answered and my concerns remain. Is the NTT report in error? Please see my recommendation at the bottom.

Dave said.....

“You have it right...the 50-70% is a minimum acreage of sagebrush habitat necessary over broad scales to maintain a population. “

“Thus the limit of 1 pad per square mile and a 3% cap on additional footprint.”

The key words from Dave are “additional footprint”

But here is what the NTT Report actually says in the quotes below. (Rather than 50%-70% in sagebrush habitat (the minimum needed on a broad scale to maintain a population based on Science), the priority habitat must already, today, have over 97% in sagebrush habitat or else no development is permitted.) $100\% - 3\% = 97\%$

• Manage priority sage-grouse habitats so that discrete anthropogenic disturbances cover less than 3% of the total sage-grouse habitat regardless of ownership.....

o “In priority habitats where the 3% disturbance threshold is already exceeded from any source, no further anthropogenic disturbances will be permitted by

BLM until enough habitat has been restored to maintain the area under this threshold (subject to valid existing rights).“

o In this instance, an additional objective will be designated for the priority area to prioritize and reclaim/restore anthropogenic disturbances so that 3% or less of the total priority habitat area is disturbed within 10 years.

I do not understand the logic in this....at least not the way it is worded in the NTT report.

RECOMMENDATION:

The report should say something like, ...”the amount of sagebrush habitat in the priority habitat areas, as of the date of this plan amendment, is a baseline, and additional anthropogenic surface disturbances must not increase the anthropogenic surface footprint by more than 3% ”

The NTT bullet points above need to be removed from the report as it conflicts with science.

Jim