



December 12, 2016

VIA FAX (303-239-3799)

Ruth Welch
State Director
Colorado State Office
Bureau of Land Management
2850 Youngfield St.
Lakewood, CO 80215

***Re: Protest of BLM Colorado State Office, Tres Rios Field Office February 9, 2017
Competitive Oil and Gas Lease Sale.***

Dear Director Welch:

The Center for Biological Diversity (the “Center”) and Sierra Club hereby file this Protest of the Bureau of Land Management’s (“BLM”) planned February 2017 Oil and Gas Lease Sale and both Determinations of NEPA Adequacy, DOI-BLM-CO-S010-2017-0001-DNA and DOI-BLM-CO-S010-2016-0039-DNA, in the Tres Rios Field Offices pursuant to 43 C.F.R. § 3120.1-3. We formally protest the inclusion of each of the 17 parcels, covering 17,631.540 acres:

| | | |
|----------|----------|----------|
| COC78157 | COC78163 | COC78169 |
| COC78158 | COC78164 | COC78170 |
| COC78159 | COC78165 | COC78171 |
| COC78160 | COC78166 | COC78172 |
| COC78161 | COC78167 | COC78173 |
| COC78162 | COC78168 | |

All cited references in this protest and hard copies of Exhibits A-F have been delivered to BLM’s Colorado State Office via Federal Express delivery.¹

PROTEST

¹A corrected list of references is appended at the end of this protest (updated from the version on the CD of references). An additional reference not included in the CD is being submitted with this protest.

I. Protesting Parties: Contact Information and Interests:

This Protest is filed on behalf of the Center for Biological Diversity and Sierra Club, and their board and members, by:

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The Center is a non-profit environmental organization with over 48,500 members, many of whom live and recreate in Colorado. The Center uses science, policy and law to advocate for the conservation and recovery of species on the brink of extinction and the habitats they need to survive. The Center has and continues to actively advocate for increased protections for species and their habitats in Colorado. The lands that will be affected by the proposed lease sale include habitat for listed, rare, and imperiled species that the Center has worked to protect including rare, endangered and threatened species like Colorado River endangered fish species (Colorado pikeminnow, razorback sucker, humpback chub, and bonytail), Gunnison's sage-grouse, and big game such as mule deer and elk. The Center's board, staff, and members use the public lands in Colorado, including the lands and waters that would be affected by actions under the lease sale, for quiet recreation (including hiking and camping), scientific research, aesthetic pursuits, and spiritual renewal.

The Sierra Club is a national nonprofit organization of approximately 625,000 members dedicated to exploring, enjoying, and protecting the wild places of the earth; to practicing and promoting the responsible use of the earth's ecosystems and resources; to educating and enlisting humanity to protect and restore the quality of the natural and human environment; and to using all lawful means to carry out these objectives. The Rocky Mountain Chapter of the Sierra Club has approximately 17,000 members in the state of Colorado. The Sierra Club has members who live and recreate in the Tres Rios Field Office. Sierra Club members use the public lands in Colorado, including the lands and waters that would be affected by actions under the lease sale, for quiet recreation, scientific research, aesthetic pursuits, and spiritual renewal. These areas would be threatened by increased oil and gas development that could result from the proposed lease sale.

II. Statement of Reasons as to Why the Proposed Lease Sale Is Unlawful:

BLM's proposed decision to lease the parcels listed above is procedurally and substantively flawed for the reasons discussed below and in the following attachments:

(1) the Center and Sierra Club's comments on the DNA for the proposed February 2017 lease sale, incorporated here by reference and attached as Exhibit A;

(2) Rocky Mountain Wild et al.'s comments on the DNA for the proposed February 2017 lease sale, incorporated here by reference and attached as Exhibit B;

(3) the Center's scoping comments for the proposed February 2017 lease sale, incorporated here by reference and attached as Exhibit C;

(4) the Center et al.'s June 13, 2016 comments on the proposed November 2016 lease sale (parcels for which were deferred until the February 2017 lease sale), incorporated here by reference and attached as Exhibit D;

(5) the Center's December 2015 protest of the proposed February 2016 lease sale (parcels for which were deferred until the November 2016 lease sale, which were then deferred until the February 2017 lease sale), incorporated here by reference and attached as Exhibit E.

A. BLM's Determination of NEPA Adequacy Is Erroneous

BLM's preparation of Determination of NEPA Adequacy is wholly improper and violates NEPA. The DNAs improperly tier to the Final Environmental Impact Statement for the Tres Rios Field Office and San Juan National Forest Land and Resource Management ("RMP-FEIS"), but the RMP FEIS fails to address site-specific impacts that could foreseeably result from new leasing, including impacts on wildlife, water resources, geological hazards, and air quality. Nor does it provide a complete analysis of the cumulative impacts of new oil and gas development, including greenhouse gas emissions, to properly support a DNA. Further, new information has arisen since the RMP was adopted and revised, revealing significant, reasonably foreseeable effects that BLM has never considered in any NEPA review, which we discuss in greater detail below.

NEPA requires agencies to undertake thorough, site-specific environmental analysis at the earliest possible time and prior to any "irretrievable commitment of resources" so that the action can be shaped to account for environmental values. Pennaco Energy, Inc. v. United States DOI, 377 F.3d 1147, 1160 (10th Cir. 2004). Oil and gas leasing is an irretrievable commitment of resources. S. Utah Wilderness All. v. Norton, 457 F. Supp. 2d 1253, 1256 (D. Utah 2006). Thus, NEPA establishes "action-forcing" procedures that require agencies to take a "hard look," at "all foreseeable impacts of leasing" before leasing can proceed. Center for Biological Diversity v. United States DOI, 623 F.3d 633, 642 (9th Cir. 2010); N.M. ex rel. Richardson v. BLM, 565 F.3d 683, 717 (10th Cir. 2009). Chief among these procedures is the preparation of an environmental impact statement ("EIS"). Id.

BLM, however, did not prepare an EIS; nor did BLM even bother to prepare an EA for the proposed lease sale. Instead BLM's decision to proceed with the February 2017 lease sale is based solely on the broad brush analysis contained in the RMP-FEIS regarding some general potential effects on resources throughout the planning area. As we pointed out in our previous comments, the RMP provides only a highly general overview of the range of possible impacts on a very broad scale and therefore does not contain the required analysis of environmental impacts likely to occur from oil and gas development *in the areas to be leased*. For example, the RMP's analysis does not provide any sense of how specific streams and watersheds in the proposed action area would be impacted by increased oil and gas development, including already impaired streams and watersheds. Nor does it discuss how the proposed lease sale could worsen poor air quality in those areas that already have significant well development, or significantly alter and industrialize relatively pristine or rustic landscapes and degrade prime habitat for wildlife.

Instead, BLM presupposes that it can auction off the parcels and issue the leases first, and then fulfill its NEPA obligations after the leases enter into the development stage. As we have stated in previous comments, this approach to NEPA has already been rejected by the courts. See Richardson, 565 F.3d at 688 (rejecting BLM's position that it was not required to conduct any site-specific environmental reviews until the issuance of an APD and holding that "NEPA requires BLM to conduct site-specific analysis before the leasing stage").

BLM Instruction Manual 2010-117 specifically directs BLM to conduct site-specific analysis of lease parcels in NEPA documentation.² See, e.g., IM 2010-117 § III(E) ("The IPDR Team will complete site-specific NEPA compliance documentation for all BLM surface and split estate lease sale parcels..."); *id.* ("Most parcels that the field office determines should be available for lease will require site-specific NEPA analysis."). IM 2010-117 also calls upon BLM to consider a host of factors in deciding whether to propose parcels for lease, each of which calls for site-specific analysis. For example, BLM must consider whether "[c]onstruction and use of new access roads or upgrading existing access roads to an isolated parcel would have unacceptable impacts to important resource values."³ Other considerations include whether:

- In undeveloped areas, non-mineral resource values are greater than potential mineral development values.
- Stipulation constraints in existing or proposed leases make access to and/or development of the parcel or adjacent parcels operationally infeasible, such as an NSO parcel blocking access to parcels beyond it or consecutive and overlapping timing restrictions that do not allow sufficient time to drill or produce the lease without harm to affected wildlife resources.
- Parcel configurations would lead to unacceptable impacts to resources on the parcels or on surrounding lands and cannot be remedied by reconfiguring.

² Bureau of Land Management, IM 2010-117, Oil and Gas Leasing Use Planning and Lease Parcel Reviews (2010).

³ IM 2010-117 § III(C)(4).

- The topographic, soils, and hydrologic properties of the surface will not allow successful final landform restoration and revegetation in conformance with the standards found in Chapter 6 of the Gold Book.
- Leasing would result in unacceptable impacts to specially designated areas (whether Federal or non-Federal) and would be incompatible with the purpose of the designation.

Each of these factors should be analyzed with respect to the parcels at issue, given their relative isolation and undeveloped nature (e.g., parcels COC78162, 78163, 78164, 78165, 78166, 78167, 78168, 78169, 78170, 78171, 78172), proximity to sage-grouse critical habitat or importance to sage-grouse recovery (see section A.4 and B.4 below), and special designations, including ACEC-designation (parcel COC78171), State Wildlife Area designations (e.g., parcels COC78162, 78163, 78164, 78167, 78168), Potential Conservation Area (PCA) designations by the Colorado Natural Heritage Program at Colorado State University (e.g., parcels COC78161, 78166, 78168, 7817)⁴, and Colorado Parks & Wildlife Important Bald Eagle Area designations (COC78172, 78173).⁵

Moreover, IM 2010-117 directs BLM to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources.”⁶ Such an evaluation would necessarily require a consideration of site-specific resource uses.⁷ BLM cannot proceed with new leasing without the requisite “hard look” of site-specific impacts, including consideration of all factors set forth in IM 2010-117 and consideration of alternatives that would allow BLM to meaningfully examine unresolved resource use conflicts. See S. Utah Wilderness All. v. United States DOI, 2016 U.S. Dist. LEXIS 42696, 14-15 (D. Utah Mar. 30, 2016) (failure to comply with IM 2010-117 can result in NEPA violation); see also Cotton Petroleum Corp., 870 F.2d 1515, 1527 (10th Cir. 1989) (failure to follow internal guidance document can constitute arbitrary and capricious decisionmaking).

Furthermore, even at the programmatic level, the meager analysis BLM has provided thus far is unlawfully deficient. Aside from failing to analyze site-specific impacts, the RMP-FEIS fails to thoroughly address the water depletion, greenhouse gas, and public health impacts of increased horizontal drilling and hydraulic fracturing, fail to discuss adequate mitigation, and

⁴ See Colorado Natural Heritage Program (CNHP), San Miguel PCA Report, available at http://www.cnhp.colostate.edu/download/documents/pca/L4_PCA-San%20Miguel%20Basin_11-29-2015.pdf; CNHP, Big Gypsum Valley PCA Report, available at http://www.cnhp.colostate.edu/download/documents/pca/L4_PCA-Big%20Gypsum%20Valley_11-29-2015.pdf; Plateau Creek PCA Report, available at http://www.cnhp.colostate.edu/download/documents/pca/L4_PCA-Plateau%20Creek_11-29-2015.pdf (noting special values of San Miguel Basin PCA, Big Gypsum Valley PCA, and Plateau Creek PCA).

⁵ See Rocky Mountain Maps showing conflicts between species and special areas for 2/9/2017 Colorado lease sale parcels, available at <https://drive.google.com/drive/folders/0B1itEUsz7CwZTWNZSE5OTGpka1U>; Rocky Mountain Wild Maps showing existing oil and gas development near for 2/9/2017 Colorado lease sale parcels, available at <https://drive.google.com/drive/folders/0B1itEUsz7CwZVmlKRzAyaHNxWm8?usp=sharing>.

⁶ *Id.* § III(E).

⁷ *Id.*

sets forth toothless stipulations with open-ended exceptions. We discuss in greater detail BLM's failure to consider the following significant impacts:

1. The RMP-EIS Fails to Fully Analyze Greenhouse Gas Emissions and Social Cost of Carbon

A Determination of NEPA Adequacy is improper because the RMP-EIS fails to fully quantify greenhouse gas emissions that would result from new oil and gas development. As we explained in our previous comments, the RMP-FEIS does not quantify methane leakage from pipelines and other fugitive sources, nor does it adequately discuss mitigation for these greenhouse gas sources. It also fails to quantify GHG emissions from construction, venting, flaring, transportation, refining, and end-user combustion.⁸ Lastly, as explained in the Center's previous comments, the RMP-EIS fails to analyze the social cost of carbon, a useful tool for evaluating the cumulative climate change impacts of greenhouse gas emissions.

Development of the leases will cause, directly and indirectly, greenhouse gas emissions that could amount to millions of metric tons of carbon dioxide equivalent. NEPA requires BLM to inform the public of the "significance" of these emissions, 40 C.F.R. § 1502.16(a)-(b); for example, BLM must "evaluate the[ir] severity." Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 352 (1989). To serve NEPA's "twin aims" of informing agency decisionmakers and the public, this evaluation must be in terms that will meaningfully inform these intended audiences of the magnitude and consequences of these effects. Natural Res. Def. Council v. Nuclear Regulatory Comm'n, 685 F.2d 459, 487 n.149 (D.C. Cir. 1982) rev'd on other grounds sub nom. Balt. Gas & Elec. Co. v. Natural Res. Def. Council, 462 U.S. 87, 106-107 (1983); Columbia Basin Land Prot. Ass'n v. Schlesinger, 643 F.2d 585, 594 (9th Cir. 1981).

Here, the RMP-EIS is deficient in multiple respects. First, the RMP-EIS does not take into account the full lifecycle emissions of oil and gas extracted within the planning area. Its greenhouse gas analysis omits emissions transportation of extracted product to market or to refineries (including methane leakage), refining and other processing, and combustion of the extracted end-use product, failing to disclose the full scope of greenhouse gas emissions that could result from new leasing.

The RMP-EIS's scant treatment of the climate change effects of the proposed action runs directly counter to the CEQ's recently finalized climate change guidance. CEQ's guidance "[r]ecommends that agencies quantify a proposed agency action's projected direct and indirect GHG emissions, taking into account available data and GHG quantification tools that are suitable for the proposed agency action."⁹ The CEQ climate guidance notes that "[q]uantification tools

⁸ See RMP-FEIS at 364-65 (quantifying GHGs only from drilling rig engines, hydraulic fracturing engines, compressor engines, and well pad separators/heaters).

⁹ CEQ, Final Guidance on the Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in NEPA Reviews at 4 (2016), available at https://www.whitehouse.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf.

are widely available, and are already in broad use in the Federal and private sectors, by state and local governments, and globally.”¹⁰

The agencies should quantify the potential lifetime CO₂e emissions from all phases of oil and gas development. This quantification should include emissions from the associated drilling, completion, production, transportation, and ultimate consumption phases.¹¹ The CEQ Guidance notes that “[f]or actions such as a Federal lease sale of coal for energy production, the impacts associated with the end-use of the fossil fuel being extracted would be the reasonably foreseeable combustion of that coal.”¹² This logic should hold with equal force for oil and gas leasing, and thus these combustion emissions should be quantified. Emissions from “connected actions,” e.g., from development of private subsurface, and from the construction and operation of gathering and transmission infrastructure should also be quantified as part of this process.¹³

BLM’s claim that such quantification is too speculative or uncertain is belied by recent efforts by other federal agencies in quantifying emissions.¹⁴ The EAs for a recent lease sale in the Wayne National Forest, as well as one in Utah, undercut BLM’s assertion here that GHGs cannot be quantified at the leasing stage.¹⁵ See also High Country Conservation Advocates v. United States Forest Serv., 52 F. Supp. 3d 1174, 1196 (D. Colo. 2014) (decision to forgo calculating mine’s reasonably foreseeable GHG emissions was arbitrary “in light of the agencies’ apparent ability to perform such calculations”).

Moreover, NEPA requires “reasonable forecasting,” which includes the consideration of “reasonably foreseeable future actions...even if they are not specific proposals.” N. Plains Res. Council, Inc. v. Surface Transp. Bd., 668 F.3d 1067, 1079 (9th Cir. 2011) (citation omitted). It is reasonably foreseeable that opening this acreage to oil and gas leasing would result in the commercial production of oil and gas. BLM has ample information to inform a greenhouse gas emissions analysis, including figures for total wells and well pads, average length of gathering lines, and total compressor stations, and other figures estimated in the Reasonably Foreseeable Development Scenario for the Tres Rio Field Office. That “the development potential of the oil

¹⁰ CEQ Guidance at 12 (citing CEQ’s inventory of Greenhouse Gas Accounting Tools, available at https://ceq.doe.gov/current_developments/GHG-accounting-tools.html).

¹¹ CEQ Guidance at 14:

“NEPA reviews for proposed resource extraction and development projects typically include the reasonably foreseeable effects of various phases in the process, such as clearing land for the project, building access roads, extraction, transport, refining, processing, using the resource, disassembly, disposal, and reclamation.”

See also *id.* at 16 n.43 (citing DOE’s life-cycle GHG emissions study for exports of liquefied natural gas, and thus implicitly endorsing the view that a life cycle analysis is the appropriate method).

¹² *Id.* at 16 n.42.

¹³ See *id.* at 13.

¹⁴ See, e.g., USEPA, Draft Environmental Assessment for National Pollutant Discharge Elimination System (NPDES) General Permit for Eastern Gulf of Mexico Offshore Oil and Gas Exploration, Development, and Production, 4-33 – 4-37 (2016).

¹⁵ U.S. Bureau of Land Management, Environmental Assessment for Oil and Gas Leasing, Wayne National Forest, Marietta Unit of the Athens Ranger District, Monroe, Noble, and Washington Counties, Ohio (October 2016); See also BLM, West Desert District, Fillmore Field Office, Environmental Assessment, August 2015 Oil and Gas Lease Sale, pp. 27-28 (Dec. 2015); U.S. Bureau of Land Management, Greenhouse Gases Estimate (West Desert District Nov 2015 Lease Sale), http://www.blm.gov/style/medialib/blm/ut/natural_resources/airQual ity.Par.38

and gas resource in the area of the leases is under considerable uncertainty” is not a rational basis for cutting off the required analysis. *See* May 2016 DNA Response no. 6. “Because speculation is . . . implicit in NEPA,” agencies may not “shirk their responsibilities under NEPA by labeling any and all discussion of future environmental effects as crystal ball inquiry.” *Id.*

The RMP-FEIS also fails to provide any analysis of the impact or severity of greenhouse gas emissions. One widely used approach to evaluating the impact of GHG emissions is to estimate the costs of those emissions to society. The federal Interagency Working Group on the Social Cost of Carbon has developed estimates of the present value of the future costs of carbon dioxide, methane, and nitrous oxide emissions as a proxy for the magnitude and severity of those impacts.¹⁶ These tools are easy to use by agencies, easy to understand by the public, and supported by years of peer-reviewed scientific and economic research. The EPA and other federal agencies have used these social cost protocols to estimate the effects of rulemakings on climate, and certain BLM field offices have used these tools in project level NEPA analysis. These protocols estimate the global financial cost of each additional ton of GHG pollution emitted to the atmosphere, taking into account factors such as diminished agricultural productivity, droughts, wildfires, increased intensity and duration of storms, ocean acidification, and sea-level rise. The Council on Environmental Quality has explicitly endorsed these tools, explaining that they were “[d]eveloped through an interagency process committed to ensuring that [these] estimates reflect the best available science and methodologies and used to assess the social benefits of reducing carbon dioxide emissions across alternatives in rulemakings, [the social cost protocols] provide[] a harmonized, interagency metric that can give decision makers and the public useful information for their NEPA review.”¹⁷

Analysis of the social cost of greenhouse gases plays an important—and otherwise unfilled—role regardless of whether BLM engages in a broader cost benefit analysis. Because BLM cannot identify the physical consequences of the greenhouse gas emissions caused by the leases, BLM must use “generally accepted” methods to discuss those impacts. 40 C.F.R. § 1502.22(b)(4). The social cost protocols, developed by a consortium of federal agencies specifically to address the impact of federal actions, are precisely such a generally accepted method. These include tools to quantify the social costs of methane, contrary to BLM’s claim.¹⁸ Given BLM’s failure to adopt any other method for discussing these impacts, BLM’s failure to use the social cost protocols was arbitrary and contrary to NEPA’s requirements.

¹⁶ *See* Interagency Working Group on the Social Cost of Carbon, United States Government, *Technical Support Document: Technical Update on the Social Cost of Carbon for Regulatory Impact Analysis – Under Executive Order 12866* (May 2013) at 2 (hereinafter 2013 TSD); Interagency Working Group, Addendum to Technical Support Document on Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12866: Application of the Methodology to Estimate the Social Cost of Methane and the Social Cost of Nitrous Oxide (August 2016), available at https://www.whitehouse.gov/sites/default/files/omb/inforeg/august_2016_sc_ch4_sc_n2o_addendum_final_8_26_16.pdf (last visited October 30, 2016).

¹⁷ Council on Environmental Quality, Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews at 33 n.86 (August 1, 2016), available at https://www.whitehouse.gov/sites/whitehouse.gov/files/documents/nepa_final_ghg_guidance.pdf.

¹⁸ *See* Exhibit C at n.223, n.224 & accompanying text.

Here, where BLM has not identified any alternative method, use of the social cost protocols is required. In 2014, the district court for the District of Colorado faulted the Forest Service for failing to calculate the social cost of carbon, refusing to accept the agency's explanation that such a calculation was not feasible. High Country Conservation Advocates v. U.S. Forest Service, 52 F.Supp.3d 1174 (D.Colo. 2014) (a decision the agency decided not to appeal, thus implicitly recognizing the importance of incorporating a social cost of carbon analysis into NEPA decisionmaking). In his decision, Judge Jackson identified the IWG's SCC protocol as a tool to "quantify a project's contribution to costs associated with global climate change." Id. at 1190.¹⁹ To fulfill this mandate, the agency must disclose the "ecological[,] ... economic, [and] social" impacts of the proposed action. 40 C.F.R. § 1508.8(b). Simple calculations applying the SCC to GHG emissions from this project offer a straightforward comparative basis for analyzing impacts, and identifying very significant costs.²⁰

Finally, any emissions from opening up new areas to leasing should be considered significant given the need to eliminate or reduce emissions from fossil fuel development already in production. A recent study by Oil Change International shows that meeting the Paris climate goals requires a managed decline in *currently operating* fossil fuel production activities.²¹ Specifically:

- The potential carbon emissions from the oil, gas, and coal in the world's currently operating fields and mines would take us beyond 2°C of warming.
- The reserves in currently operating oil and gas fields alone, even with no coal, would take the world beyond 1.5°C.²²

Based on these findings, the report recommends: "No new fossil fuel extraction or transportation infrastructure should be built, and governments should grant no new permits for them."²³

Beginning the phase-out of public fossil fuel production by ceasing new onshore leases would have a significant effect on U.S. contributions to greenhouse gas emissions, allowing us to meet targets under the Paris Agreement. The first systematic quantitative assessment of the emissions consequences of a cessation of federal leasing (both onshore and offshore) found that:

[U]nder such a policy, U.S. coal production would steadily decline, moving closer to a pathway consistent with a global 2°C temperature limit. Oil and gas extraction would drop as well, but more gradually, as federal lands and waters

¹⁹ See also *id.* at 18 (noting the EPA recommendation to "explore other means to characterize the impact of GHG emissions, including an estimate of the 'social cost of carbon' associated with potential increases in GHG emissions.") (citing Sarah E. Light, *NEPA's Footprint: Information Disclosure as a Quasi-Carbon Tax on Agencies*, 87 Tul. L. Rev. 511, 546 (Feb. 2013)).

²⁰ It is important to note that, although the 2010 IWG SCC protocol did not address methane impacts, the 2013 IWG Technical Update explicitly addresses methane impacts. Thus, it is appropriate to calculate a SCC outcome that takes into account the full CO₂e emissions associated with the proposed leasing.

²¹ Oil Change International, *The Sky's Limit: Why the Paris Climate Goals Require a Managed Decline of Fossil Fuel Production*, 5 (2016), available at http://priceofoil.org/content/uploads/2016/09/OCI_the_skys_limit_2016_FINAL_2.pdf.

²² *Id.*

²³ *Id.*

represent a smaller fraction of national production, and these resources take longer to develop. Phasing out federal leases for fossil fuel extraction could reduce global CO₂ emissions by 100 million tonnes per year by 2030, and by greater amounts thereafter.²⁴

The looming threat of catastrophic climate disruption, and the need for swift action to reduce its worst effects, including a halt to *all* new fossil fuel production, requires the BLM to take a hard look at the climate consequences of the proposed lease sale and to find those effects significant.

2. The RMP-EIS Fails to Consider the Impacts of Oil and Gas Development on Mule Deer and Other Big Game

All of the parcels are near or overlap with mule deer and other big game habitat, including migration corridors, critical winter range, winter concentration areas, severe winter range, and summer range.²⁵ Reliance on the DNAs for the proposed lease sale is inappropriate, given significant new information concerning the effects of oil and gas development on mule deer and other big game that was not considered in the RMP-EIS.

Residential and energy development has reduced all ungulates across the West. The low-elevation valleys and mountain foothills, once important habitat for ungulates, are filled with cities and towns.²⁶ The same is true in Colorado, according to CPW's research, particularly on winter ranges.²⁷ Between 1980 and 2010, western Colorado saw a 37% increase in residential land-use in mule deer habitat, primarily on their winter range.²⁸ The resulting lack of high-quality winter range is limiting robust mule deer population growth in Colorado.²⁹

A dearth of high-quality, long-term, and controlled studies makes it difficult to evaluate with precision the role of oil and gas development in mule deer habitat and population decline.³⁰ Clearly, mule deer demonstrate avoidance of roads and oil and gas infrastructure, with as-yet

²⁴ Erickson, Peter and Michael Lazarus, How Would Phasing Out U.S. Federal Leases for Fossil Fuel Extraction Affect CO₂ Emissions and 2°C Goals? 1, 31-32, Stockholm Environment Institute Working Paper 2016-02 (May 2016).

²⁵ See Rocky Mountain Maps showing conflicts with game species for 2/9/2017 Colorado lease sale parcels, available at <https://drive.google.com/drive/folders/0B1itEUsz7CwZLWNITU15U0tRQTQ?usp=sharing>; Rocky Mountain Wild, Colorado February 2017 Sale Notice Screen Spreadsheet (2016), available at <https://drive.google.com/file/d/0B1itEUsz7CwZR09BektzaVN1c1k/view?usp=sharing>.

²⁶ Polfus, J. L., and P. R. Krausman. 2012. Impacts of residential development on ungulates in the Rocky Mountain West. *Wildlife Society Bulletin* 36:647-657.

²⁷ Johnson, H.E., J.R. Shushinsky, A. Holland, E.J. Bergman, T. Balzer, J. Garner, and S.E. Reed. 2016. Increases in residential and energy development are associated with reductions in recruitment for a large ungulate. *Global Change Biology*, doi: 10.1111/gcb.13385 ("Johnson et al. 2016").

²⁸ Johnson et al. 2016.

²⁹ Bergman, E. J., P. F. Doherty, G. C. White, and A. A. Holland. 2015. Density dependence in mule deer: a review of evidence. *Wildlife Biology* 21:18-29; Johnson et al. 2016.

³⁰ Hebblewhite, Mark. 2011. Effects of Energy Development on Ungulates. *Energy Development and Wildlife Conservation in Western North America* 71-94. Island Press, Washington D.C.

inadequately-understood consequences for migration, energy budgets, adult and fawn survival, and population.³¹

Some of the best available long-term, controlled studies evaluate mule deer population density before and after oil and gas development in the Sublette mule deer herd near Pinedale, Wyoming.³² The Sublette mule deer study compared mule deer density in control and development zones, and found mule deer densities declined 30% in the development area, as opposed to 10% in the control area.³³ Sawyer and Strickland found that “the observed decline of mule deer in the treatment area was likely due to gas development, rather than drought or other environmental factors that have affected the entire Sublette Herd unit.”³⁴

The Sublette example is particularly important when considering energy development’s effects on mule deer populations, their winter range, and their migration patterns in western Colorado. Even in its relatively early stages compared to Wyoming, the most recent spatial analysis of already-occurring effects on mule deer in western Colorado finds energy development has the second-largest effect on deer recruitment, exceeded only by residential development.³⁵

Although the precise connections between energy development and population-level effects are still imperfectly understood, it is demonstrated that oil and gas development affects mule deer habitat use and migration patterns by causing site avoidance, particularly in daytime,³⁶ and creating “semi-permeable” barriers to migration routes.³⁷ CPW is currently engaged in multiple research efforts to evaluate energy development effects on migration, deer response to energy development, and fawn survival in developed and undeveloped areas.³⁸ Those studies have thus far documented how individual deer alter their migration speed and timing in response

³¹ Hebblewhite 2011; Sawyer, H., Kauffman, M.J., Middleton, A.D., Morrison, T.A., Nielson, R.M., and Wyckoff, T.B. 2013. A framework for understanding semi-permeable barrier effects on migratory ungulates. *Journal of Applied Ecology* 2013:50, doi:10.1111/1365-2664.12013; Lendrum, P.E., Anderson, C.R., Long, R.A., Jie, J.G., and Bowyer, R.T. 2012. Habitat selection by mule deer during migration: effects of landscape structure and natural-gas development. *Ecosphere* 3(9):82.

³² Sawyer, H., R. Nielson, and D. Strickland. 2009. Sublette Mule Deer Study (Phase II): Final Report 2007. Western Ecosystems Technology, Inc. Cheyenne, Wyoming, USA.

³³ *Id.*

³⁴ *Id.*

³⁵ Johnson et al. 2016.

³⁶ Lendrum 2012.

³⁷ Sawyer, H., Kauffman, M.J., Middleton, A.D., Morrison, T.A., Nielson, R.M., and Wyckoff, T.B. 2013. A framework for understanding semi-permeable barrier effects on migratory ungulates. *Journal of Applied Ecology* 2013:50, doi:10.1111/1365-2664.12013 (“Sawyer 2013”).

³⁸ Anderson, C. R. 2015. Population Performance of Piceance Basin Mule Deer in Response to Natural Gas Resource Extraction and Mitigation Efforts to Address Human Activity and Habitat Degradation. in C. D. o. P. a. Wildlife, editor., Colorado (“Anderson 2015”); Anderson, C.R. 2016. Piceance Mule Deer & Energy Development: Demographic influences and mitigation. Colorado Parks and Wildlife, presentation to Garfield County, Colorado. http://www.garfield-county.com/oil-gas/documents/energy-advisory-board/2016/F-D-EAB%20Chuck%20Anderson_Piceance%20deer-energy%20development_Oct%202016.pdf (“Anderson 2016”); Anderson, C.R. and Bishop, C.J. 2014. Migration Patterns of Adult Female Mule Deer in Response to Energy Development. *Transactions of the 79th North American Wildlife and Natural Resources Conference* 47-50; Lendrum, P.E., Anderson, C.R., Monteith, K.L., Jenks, J.A., and Bowyer, R.T. 2013. Migrating Mule Deer: Effects of Anthropogenically Altered Landscapes. *PlosOne*, 8:5:e64548 (“Anderson & Bishop 2014”).

to development.³⁹ A 2015 Wildlife Research Report published by CPW found that, during an active drilling phase in the Piceance Basin, deer behavior was compromised by 25% (at nighttime) and by 50% (during day time) in critical mule deer winter range.⁴⁰

CPW has also collected data, from 2012 through 2014, in order to evaluate mule deer fawn survival in developed and undeveloped landscapes.⁴¹ This data has not yet been published, but CPW has disclosed preliminary data to Garfield County a strong increase in fawn predation and mortality associated with oil and gas development.⁴² The preliminary data disclosed to Garfield County shows 39% predation mortality and 53% total mortality in the undeveloped study area, versus 49% predation mortality and 63% total mortality in the developed study area.

In addition, it is well-documented that human development causes direct habitat loss and fragmentation through the construction of infrastructure, and indirect habitat loss through deer avoidance of infrastructure and related activities; these consequences likely reduce the carrying capacity of the landscape.⁴³ A recent study shows that oil and gas development causes significant habitat loss in the Piceance Basin of Colorado:

Energy development drove considerable alterations to deer habitat selection patterns, with the most substantial impacts manifested as avoidance of well pads with active drilling to a distance of at least 800 m. Deer displayed more nuanced responses to other infrastructure, avoiding pads with active production and roads to a greater degree during the day than night. In aggregate, these responses equate to alteration of behavior by human development in over 50% of the critical winter range in our study area during the day and over 25% at night.⁴⁴

Additionally, mule deer may suffer higher mortality rates in developed landscapes because of increased vehicle collisions and accidents (i.e., entrapment in fences); moreover, increased road densities expose mule deer to more hunters, poachers and predatory domestic pets.⁴⁵

Mule deer also need migration corridors that are protected from human development. An ongoing mule deer study by members of the Wyoming Migration Initiative has found that mule deer migration patterns are altered by human development – herds will move faster, stop less to feed, and detour around developed portions of their route.⁴⁶ Moreover, herds that can't migrate

³⁹ Lendrum 2012; Lendrum, P.E., Anderson, C.R., Monteith, K.L., Jenks, J.A., and Bowyer, R.T. 2013. Migrating Mule Deer: Effects of Anthropogenically Altered Landscapes. *PlosOne*, 8:5:e64548.

⁴⁰ Anderson 2015.

⁴¹ Anderson 2015.

⁴² Anderson 2016.

⁴³ Johnson et al. 2016.

⁴⁴ Northrup, J. M. et al. Quantifying spatial habitat loss from hydrocarbon development through assessing habitat selection patterns of mule deer, *Global Change Biology* (Aug. 2015), available at <http://onlinelibrary.wiley.com/doi/10.1111/gcb.13037/epdf>.

⁴⁵ Johnson et al. 2016.

⁴⁶ Sawyer 2013.

in search of the most nutritious grasses just end up smaller in number, plain and simple.⁴⁷ As a result, Wyoming Game and Fish Department is working to further protect migration routes in the state, for instance, no more than four oil and gas well pads allowed in a migration corridor and no development allowed in corridors narrower than a quarter mile. Although initial CPW research suggests that existing Piceance development levels are largely influencing the timing (not the fact) of deer migration,⁴⁸ CPW acknowledges that a “threshold in development intensity” may have greater effects on migration behavior.⁴⁹

Stipulation 3.10.2, which is proposed for many of the parcels, however, lacks any specific, objective criteria for limiting development intensity near migration corridors or other big game habitat. The wording of this stipulation is so broad and general as to provide no meaningful guidance as to how many oil and gas well pads in a migration corridor should be allowed or what density of surface disturbance is permissible:

In order to provide for healthy ungulate populations capable of meeting state population objectives, anthropomorphic activity and improvements should be designed to maintain and continue to provide effective habitat components that support critical life functions. This includes components of size and quality on the landscape providing connectivity to seasonal habitats (wildlife travel corridors), production areas, severe winter range, and winter concentration areas, along with other habitat components necessary to support herd viability.

In contrast, the Little Snake Field Office provides for a controlled surface use stipulation requiring for parcels which overlie a medium priority habitat a stipulation requiring “a 5 percent disturbance limitation and a POD illustrating a strategy to leave large blocks of undisturbed habitat.”⁵⁰

Finally, the RMP-EIS should take into account new information indicating that sagebrush—which wintering mule deer are highly dependent on⁵¹—is nearly impossible to restore, such that fragmentation of sagebrush communities from oil and gas development is likely to be permanent and reclamation ineffective. Section A.4 below describes this new information in more detail. Thus, oil and gas development could have more significant effects on mule deer and other big game than previously anticipated in the RMP-EIS.

3. The RMP-EIS Fails to Consider the Direct, Indirect and Cumulative Impacts from Colorado River Withdrawals for Fracking and Other Unconventional Drilling Methods on Endangered Fish Populations and Water Supply

⁴⁷ Edwards, M., Mule Deer Struggling To “Surf The Green Wave” Of Migration (Nov. 20, 2015) available at <http://wyomingpublicmedia.org/post/mule-deer-struggling-surf-green-wave-migration>.

⁴⁸ Anderson & Bishop 2014.

⁴⁹ Anderson 2016; Sawyer 2013.

⁵⁰ See BLM Colorado February 2017 White River, Little Snake, & Kremmling Field Offices Lease Sale EA, Attachment D, Exhibit LS-107.

⁵¹ RMP-EIS at 100 (“Some of the highest densities of wintering mule deer on the SJNF and TRFO are found in sagebrush shrubland habitats.”).

As stated in our previous comments, BLM must perform an adequate environmental review of the significant impacts that oil and gas development is likely to have on the Colorado pikeminnow, razorback sucker, bonytail, and humpback chub (“endangered fish”) and the Colorado River ecosystem. Significant new information has arisen since the adoption of the RMP-EIS and the 2008 Programmatic Biological Opinion for Water Depletions Associated with Bureau of Land Management's Fluid Mineral Program within the Upper Colorado River Basin in Colorado (“Western Colorado PBO”),⁵² which is designed to address any depletions resulting from oil and gas development within the Tres Rios Field Office and other western Colorado field offices (excluding areas within the San Juan River Basin). Likewise, new information has arisen since BLM’s adoption of the Programmatic Biological Opinion for Water Depletions Associated with BLM’s Fluid Mineral Program and Other Actions Authorized by BLM on Public Lands within the San Juan River Basin (“San Juan PBO”).⁵³ BLM’s approval of the RMP-EIS relied on these programmatic biological opinions (collectively “PBOs”). However, as discussed further in Section B.2 below, the PBOs and the RMP-EIS did not consider several important factors that may affect the endangered fish in a manner or to an extent not previously considered.

Cumulative impacts are those impacts on the environment resulting from “the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency . . . or person undertakes such other actions.” 40 C.F.R. § 1508.7. By all accounts, the impacts stemming from future oil and gas leasing and development of the parcels at issue are cumulative with the impacts from development of neighboring planning areas. Thomas v. Peterson, 753 F.2d 754, 759 (9th Cir. 1985) (reasoning that effects of proposed road and of timber sales that road was designed to facilitate were cumulative actions for which comprehensive analysis was required). Indeed, under NEPA, BLM has an obligation to consider the effects of neighboring lease sales and oil and gas development projects as cumulative impacts of any future development stemming from leasing in the neighboring vicinity of these parcels. 40 C.F.R. §§ 1508.7, 1508.8.

A foreseeable cumulative impact from oil and gas development occurring throughout the Colorado River Basin is water withdrawals from the Colorado River necessary for fracking and horizontal drilling techniques. Indeed, millions of gallons of water are withdrawn from the Colorado River for oil and gas extraction, potentially impacting endangered fish in the Colorado River. The loss of adequate flows in the endangered fishes’ habitat within the Upper Colorado River Basin is so serious that the Fish and Wildlife Service has determined that any depletion of Upper Basin stream flows adversely affects and jeopardizes the endangered fish.⁵⁴ Any depletion should therefore also be deemed significant under NEPA.

⁵² USFWS, Programmatic Biological Opinion for Water Depletions Associated with Bureau of Land Management's Fluid Mineral Program within the Upper Colorado River Basin in Colorado (2008).

⁵³ USFWS, Programmatic Biological Opinion for Water Depletions Associated with BLM's Fluid Mineral Program and Other Actions Authorized by BLM on Public Lands within the San Juan River Basin in Colorado (2008).

⁵⁴ U.S. Bureau of Land Management, Ch. 3: Affected Environment, White River FEIS at 3-71 (2015) (“The FWS has determined that any federally authorized depletion from the Upper Colorado River Basin has an adverse effect on listed Colorado River fishes.”) (Chapter 3); Biological Opinion for BLM Resource Management Plan (RMP), Price Field Office (PFO), 138 (Oct. 27, 2008), available at: http://www.blm.gov/style/medialib/blm/ut/price_fo/Planning/rod_approved_rmp.Par.2742.File.dat/Price%20Biological%20Opinion.pdf. (“The USFWS determined that any depletion will jeopardize their continued existence and will likely contribute to the destruction or adverse modification of their critical habitat”) (citing USDI, Fish and Wildlife

BLM must analyze under NEPA the effects of the massive water demand resulting from relatively new horizontal drilling techniques in the Upper Colorado River Basin (the “Upper Basin”) which would impact watersheds affected by future development of the parcels at issue here. Specifically, this analysis should address the water depletion effects of new leasing on specific water supplies and watersheds. For example, Dry Creek crosses or is near parcels COC78167, 78168, 78169, 78170, 78162, 78163, 78164, and 78165; Navajo River crosses parcel COC78173; and Plateau Creek flows past parcels COC78159, 78160, and 78161. In addition, it must address significant cumulative impacts from drilling throughout the Upper Basin on local water supplies and on the Colorado River endangered fish. Section B.2 below discusses significant water depletion effects that have not been addressed in the PBOs or RMP-EIS.

4. BLM Must Consider Site-Specific Impacts on Gunnison Sage-Grouse and Alternatives to Address “Unresolved Conflicts ” Concerning Sage-Grouse Habitat

Lease parcels COC78167, COC78168, and COC78169 are adjacent to Gunnison sage-grouse critical habitat, while parcels COC78170, 78162, 78163, 78164, and 78165 are only within a few miles of this critical habitat. BLM, however, has failed to analyze or acknowledge site-specific impacts to the species that could result from its leasing decision. As noted above, IM 2010-117 requires the consideration of site-specific impacts at the leasing stage, including the consideration of “unacceptable impacts to important resource values.”⁵⁵ Moreover, despite that BLM is still developing a range-wide RMP Amendment for Gunnison Sage-Grouse habitat, which could change management direction for these parcels, BLM has nonetheless proceeded to offer these parcels for sale, in violation of IM 2010-117’s directive to “study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources” in an EIS, or even an EA.⁵⁶ The failure to study site-specific impacts to Gunnison sage-grouse and alternatives to the proposed leasing, despite specific agency direction requiring such analysis, is arbitrary and capricious, violates NEPA, and prejudices the consideration of alternative management direction for these parcels that may be adopted through the Gunnison Sage-Grouse RMP Amendment process.

The Gunnison sage-grouse was listed as a threatened species under the Endangered Species Act in November 2014. *See* U.S. Fish and Wildlife Service, Threatened Status for Gunnison Sage-Grouse, Final Rule, 79 Fed. Reg. 69,192 (Nov. 20, 2014). Approximately 88 to 93 percent of the species’s historical range has been lost since Euro-American settlement, and “[t]his contraction in the birds’ range indicates the vulnerability of all the populations to extirpation.” Gunnison Sage-Grouse Listing Rule, 79 Fed. Reg. at 69,228. The listing rule found that “the persistence of Gunnison sage-grouse is dependent on large and contiguous sagebrush habitats, that human development and disturbance contribute to the decline of this needed

Service, Region 6 Memorandum, dated July 8, 1997); Biological Opinion for BLM Resource Management Plan (RMP), Vernal Field Office (VFO), 113 (Oct. 23, 2008), available at: http://www.blm.gov/style/medialib/blm/ut/vernal_fo/planning/rod_approved_rmp.Par.4719.File.dat/VernalBiologicalOpinion.pdf. (same).

⁵⁵ IM 2010-117, § III(C)(4).

⁵⁶ *Id.* § III(E).

habitat, and that such impacts negatively affect the survival and persistence of Gunnison sage-grouse.” *Id.* Numerous activities on BLM land and minerals contribute to loss of these sage-grouse habitats, including road-building, power lines, livestock grazing practices, invasive plants, fire, and leasable minerals (i.e. oil and gas development). Oil and gas development has numerous adverse effects on Gunnison sage-grouse habitat, behavior, and population:

Energy development impacts sage grouse and sagebrush habitats through direct habitat loss from well pad construction, seismic surveys, roads, powerlines and pipeline corridors, and indirectly from noise, gaseous emissions, changes in water availability and quality, and human presence. The interaction and intensity of effects could cumulatively or individually lead to habitat degradation and fragmentation (Suter 1978, pp. 6–13; Aldridge 1998, p. 12; Braun 1998, pp. 144–148; Aldridge and Brigham 2003, p. 31; Knick *et al.* 2003, pp. 612, 619; Lyon and Anderson 2003, pp. 489–490; Connelly *et al.* 2004, pp. 7–40 to 7–41; Holloran 2005, pp. 56–57; Holloran *et al.* 2007, pp. 18–19; Aldridge and Boyce 2007, pp. 521–522; Walker *et al.* 2007a, pp. 2652–2653; Zouet *et al.* 2006, pp. 1039–1040; Doherty *et al.* 2008, p. 193; Leu and Hanser 2011, pp. 270–271). Increased human presence resulting from oil and gas development can also impact sagegrouse either through avoidance of suitable habitat or disruption of breeding activities (Braun *et al.* 2002, pp. 4–5; Aldridge and Brigham 2003, pp. 30–31; Aldridge and Boyce 2007, p. 518; Doherty *et al.* 2008, p. 194). The development of oil and gas resources requires surveys for economically recoverable reserves, construction of well pads and access roads, subsequent drilling and extraction, and transport of oil and gas, typically through pipelines. Ancillary facilities can include compressor stations, pumping stations, electrical generators and powerlines (Connelly *et al.* 2004, p. 7–39; BLM 2007, p. 2–110). Surveys for recoverable resources occur primarily through loud seismic exploration activities. These surveys can result in the crushing of vegetation. Well pads vary in size from 0.10 ha (0.25 ac) for coal-bed natural gas wells in areas of level topography to greater than 7 ha (17.3 ac) for deep gas wells and multi-well pads (Connelly *et al.* 2004, p. 7–39; BLM 2007, p. 2–123). Pads for compressor stations require 5–7 ha (12.4–17.3 ac) (Connelly *et al.* 2004, p. 7–39). Individually, impacts from well pads, infrastructure, and ancillary features may be small; however, the cumulative impact of such development can be significant.

The amount of direct habitat loss within an area of oil and gas development is ultimately determined by well densities and the associated loss from ancillary facilities. Roads associated with oil and gas development were suggested as the primary impact to greater sage-grouse due to their persistence and continued use even after drilling and production ceased (Lyon and Anderson 2003, p. 489). Declines in male greater sage-grouse lek attendance were reported within 3 km (1.9 mi) of a well or haul road with a traffic volume exceeding one vehicle per day (Holloran 2005, p. 40). Because of reasons discussed previously, the effects of oil and gas development to Gunnison sage-grouse are expected to be similar to those observed in greater sage-grouse. Sage-grouse also may be at increased risk

for collision with vehicles simply due to the increased traffic associated with oil and gas activities (Aldridge 1998, p. 14; BLM 2003, p. 4–222).

Habitat fragmentation resulting from oil and gas development infrastructure, including access roads, may have greater effects on sage-grouse than habitat loss associated with drill sites. Energy development and associated infrastructure works cumulatively with other human activity or development to decrease available habitat and increase fragmentation. Greater sage-grouse leks had the lowest probability of persisting (40–50 percent) in a landscape with less than 30 percent sagebrush within 6.4 km (4 mi) of the lek. These probabilities were even less in landscapes where energy development also was a factor.⁵⁷

The Fish and Wildlife Service found, in considering the adequacy or inadequacy of existing regulatory mechanisms to safeguard Gunnison sage-grouse, that existing BLM RMPs, including the Tres Rios RMP in effect at the time, were inadequate as regulatory mechanisms. Existing “RMPs provide only partial protection for Gunnison sage-grouse in terms of land use allocation decisions specific to the species and its habitat and, therefore, are considered inadequate to protect the species.”⁵⁸ In particular, with regard to fluid mineral development, “[t]here is currently no regulatory mechanism in effect which assures that future lease sales in occupied habitat on BLM administered lands will not occur or that operations on federal leases are conducted in a manner consistent with protection of the Gunnison sage-grouse.”⁵⁹ Moreover, FWS found that “[g]iven the already small and fragmented nature of the populations where future oil and gas leases are likely to occur, additional development within occupied habitat would negatively impact those populations by contributing to further habitat decline.”⁶⁰

In part in response to this finding of inadequate regulatory mechanisms for BLM lands and minerals, the Colorado and Utah BLM have undertaken a range-wide RMP Amendment process for Gunnison Sage-Grouse habitat, encompassing the Tres Rios Field Office, with a draft RMP Amendment and EIS released in August 2016. This amendment process may result in amendments to the Tres Rios RMP: “BLM has committed to completing plan amendments throughout the range of the Gunnison Sage-grouse, in order to increase regulatory certainty that adequate conservation measures are in effect on BLM lands for this species through the Gunnison Sage-grouse Range-wide Plan Amendment. As the TRFO contains occupied and unoccupied Gunnison Sage-grouse habitat, this RMP may be amended through that effort.”⁶¹

Despite that existing RMP stipulations and other safeguards may be inadequate to protect Gunnison sage-grouse, however, BLM has failed to analyze the site-specific impacts of new leasing on the parcels at issue. Neither the RMP-EIS nor the Forest Service’s biological opinion for the RMP took into account the potential site-specific effects of oil and gas development or

⁵⁷ Gunnison Sage-Grouse Final Listing Rule, 79 Fed. Reg. 69,192, 69,255-56 (Nov. 20, 2014).

⁵⁸ *Id.* at 69, 283.

⁵⁹ *Id.* at 69,284.

⁶⁰ *Id.* at 69,284.

⁶¹ BLM, Record of Decision, San Juan National Forest and Tres Rios Field Office Land and Resource Management at I-10-11, available at https://www.blm.gov/style/medialib/blm/co/field_offices/san_juan_public_land/land_use_planning/approved_lrmp.Par.21966.File.dat/Part%20I%20-%20Record%20of%20Decision.pdf (2015).

made any determination as to whether stipulations adopted in the RMP would adequately protect Gunnison sage-grouse at the site-specific level. Indeed, the biological opinion noted: “Use of the NSO and/or the CSU [adopted in the RMP] does not preclude all effects to grouse, and would only apply to future leases for oil and gas development. At this programmatic level, we do not have sufficient information about where, when, or to what extent, actions may occur that may affect GUSG or its occupied critical habitat.”⁶² The referenced stipulations only limit development within critical habitat, although sage-grouse and their critical habitat may be adversely affected in areas outside of, but near, critical habitat. Contrary to BLM’s suggestion, that development within critical habitat will be avoided is not determinative of whether a significant impact will result from new leasing. *Cf. Greater Yellowstone Coal. v. Flowers*, 359 F.3d 1257, 1275 (10th Cir. 2004) (“The fact that FWS has not designated this, or any, territory as the bald eagle’s ‘critical habitat’ does not alone persuade us that its potential destruction should not be considered ‘significant’ for purposes of NEPA.”); *see also id.* at 1275-76 (no jeopardy finding is neither determinative).

The biological opinion also notes the potential for impacts to unoccupied habitat, but the potential effects of new development on sage-grouse survival and recovery have never been analyzed by BLM or FWS:

We know GUSG have used areas of mapped unoccupied habitat, and some areas are mapped incorrectly as unoccupied habitat (pers comm. Charlie Sharp March 26, 2014). We conclude that there is some low likelihood of GUSG presence within unoccupied habitats on the TRFO, and we cannot completely eliminate the potential for effects to individuals within mapped unoccupied habitat. However, we cannot effectively anticipate all possible situations where implementation of the LRMP may cause effects to GUSG, especially in these areas adjacent to occupied habitat where individual may or may not be present.

Future section 7 consultation may reveal site specific or cumulative effects that we cannot foresee at this time. Since the effects of an individual action (i.e. application for a permit to drill) will not be known until an application is received by BLM, the amount, extent, and magnitude of effects associated with implementation of that action cannot be reasonably anticipated.⁶³

Site-specific study, however, would allow BLM to determine whether Gunnison sage-grouse presently inhabit mapped unoccupied habitat, potential adverse effects to these species, and appropriate stipulations and other mitigation measures to reduce or avoid those effects. Delaying study of these potential impacts does not comport with NEPA’s requirement to study all reasonably foreseeable effects. *See Utahns v. United States DOT*, 305 F.3d 1152, 1175 (10th Cir. 2002); *see also* 40 C.F.R. § 1501.2 (requiring agencies to “integrate the NEPA process with other planning at the earliest possible time to insure that planning and decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts”).

⁶² RMP-EIS, Appendix Y at 32.

⁶³ *Id.* at 34.

IM 2010-117 specifically directs BLM to consider whether “[c]onstruction and use of new access roads or upgrading existing access roads to an isolated parcel would have unacceptable impacts to important resource values.” IM 2010-117 § III(C)(4). Mapping provided by Rocky Mountain Wild indicates that the proposed parcels are “isolated,” as only a few abandoned wells and no active wells are within the vicinity of the lease parcel and very few roads serve these areas.⁶⁴ Without site-specific analysis, however, BLM cannot determine whether “unacceptable impacts,” would result to important Gunnison sage-grouse habitat values from new road construction or road improvements. Likewise, without site-specific analysis it is impossible for BLM to determine whether “[p]arcel configurations would lead to unacceptable impacts to [sage-grouse habitat] resources on the parcels or on surrounding lands and cannot be remedied by reconfiguring.” IM 2010-117 § III(C)(4).

Additional analysis is also required, because as explained in Exhibit B, existing leasing stipulations are inadequate to mitigate oil and gas development effects on sage-grouse, and new information reveals that oil and gas development will result in significant impacts to Gunnison sage-grouse, which have not been considered in the Tres Rios RMP-EIS.⁶⁵

In addition, a recent scientific study confirms the established finding that sage-grouse lek attendance is negatively related to oil and gas density, regardless of sagebrush cover and precipitation.⁶⁶ Green et al. examined greater sage-grouse lek attendance, oil and gas well, and habitat and precipitation data from Wyoming over the period 1984 to 2008, and, consistent with numerous prior studies, that lek attendance declines are closely associated with the density of oil and gas development:

Oil and gas development correlates well with sage-grouse population declines from 1984 to 2008 in Wyoming, which is supported by other findings (Doherty et al. 2010b, Harju et al. 2010, Hess and Beck 2012, Taylor et al. 2013, Gregory and Beck 2014). As with other studies, we also found support for 4-year lag effects of oil and gas development on lek attendance (Walker et al. 2007, Doherty et al. 2010a, Harju et al. 2010, Gregory and Beck 2014). This result suggests that development likely affects recruitment into the breeding population rather than avoidance of wells by adult males or adult survival. Adult sage-grouse are highly philopatric to lek sites (Dalke et al. 1963, Wallestad and Schladweiler 1974, Emmons and Braun 1984, Dunn and Braun 1985, Connelly et al. 2011a), and males typically recruit to the breeding population in 2–3 years. We would expect a delayed response in lek attendance if development affects recruitment, either by reducing fecundity or avoidance of disturbance by nesting females, as adult males die and are not replaced by young males.

⁶⁴ Rocky Mountain Wild Maps showing existing oil and gas development near for 2/9/2017 Colorado lease sale parcels, available at <https://drive.google.com/drive/folders/0B1itEUsz7CwZVmlKRzAyaHNxWm8?usp=sharing>.

⁶⁵ Exhibit B at 5-11, 14-15.

⁶⁶ Green, Adam et al., Investigating Impacts of Oil and Gas Development on Greater Sage-Grouse, *Journal of Wildlife Management* (2016), DOI: 10.1002/jwmg.21179 (“Green et al. 2016”).

On average, lek attendance was stable when no oil and gas development was present within 6,400m (Fig. 4). However, attendance declined as development increased.⁶⁷

Importantly, Green et al. confirmed that declines in sage-grouse populations may continue even within Wyoming's "core areas," where density of wells is limited to one pad per square mile. Yet the Tres Rios RMP-EIS fails to regulate the density of allowable oil and gas facilities in the planning area and the areas proposed for leasing.

Moreover, significant impacts would result from the permanent loss of sagebrush habitat, which is critical to Gunnison sage-grouse survival and recovery.⁶⁸ Recent studies show that sagebrush communities, such as those found within the areas to be leased, are nearly impossible to restore. Drilling sites have not been restored to pre-drilling conditions even after having 20 or 50 years to recover.⁶⁹ A recent study postdating the RMP-EIS found that 50 years or more would be required to recover sagebrush on disturbed sites, and that restoring heterogeneous soil conditions with patchy nutrient conditions, was necessary for recovery of large sagebrush and ecosystem resiliency.⁷⁰ There is no evidence, however, that any measures required by the Tres Rios RMP-EIS ensure attainment of these conditions. *See* IM 2010-117 (directing site-specific analysis of whether "[t]he topographic, soils, and hydrologic properties of the surface will not allow successful final landform restoration and revegetation in conformance with the standards found in Chapter 6 of the Gold Book, as revised").

BLM's response to comments suggests that additional measures would be considered at the Application for Permit to Drill (APD) stage,⁷¹ but waiting until then to consider additional protective measures may be too little too late. As FWS has previously noted, BLM's authority to move drilling or other facilities to avoid sensitive resources under 43 C.F.R. § 3101.1(c) at the APD stage is too limited and "would have little to no conservation benefit to Gunnison sage-grouse because sage-grouse respond to nonrenewable energy development at much further distances" than the maximum distances at which facilities can be re-sited under 43 C.F.R. § 3101.1(c).⁷² Moreover, a project-by-project analysis could sweep under the rug potential cumulative effects of new leasing and development within the several parcels at issue here—these parcels (COC78162, 78163, 78164, 78165, 78167, 78168, 78169, and 78170) are all very near or contiguous to each other and cover a total area of over 6,600 acres.

BLM's decision to offer proposed lease parcels before the range-wide Gunnison sage-grouse amendment process is completed, and without the preparation of an EA or EIS, also

⁶⁷ Green et al. 2016 at 9.

⁶⁸ 79 Fed Reg. at 69,208, 69,216.

⁶⁹ Lester, Liza, Sagebrush Ecosystem Recovery Hobbled By Loss Of Soil Complexity At Development Sites, Ecological Society of America (Jan. 26, 2015), available at <http://www.esa.org/esa/sagebrush-ecosystem-recovery-hobbled-by-loss-of-soil-complexity-at-development-sites/>.

⁷⁰ *Id.*; Minnick, Tamara J., Plant-soil feedbacks and the partial recovery of soil spatial patterns on abandoned well pads in a sagebrush shrubland. Ecological Applications, 25(1), 2015, pp. 3–10, available at <http://onlinelibrary.wiley.com/doi/10.1890/13-1698.1/full>.

⁷¹ DNA DOI-BLM-CO-S010-2016-0039-DNA, Attachment E at Comment 1.

⁷² 79 Fed. Reg. at 69,284.

violates IM 2010-117's directive that BLM "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources." IM 2010-117 § III(E). Those conflicts are still being resolved in the range-wide Gunnison sage-grouse amendment process. New leasing before the resolution of these conflicts prejudices the consideration of additional management prescriptions needed to "increase regulatory certainty that adequate conservation measures are in effect on BLM lands" for Gunnison sage-grouse--measures BLM had promised it would consider in its Record of Decision for the 2015 Tres Rios RMP revision.⁷³ As Fish and Wildlife Service and Colorado Parks and Wildlife noted in their comments on the proposed lease sale, additional Gunnison Sage-grouse protections may be identified in the plan amendment process that are not currently contained with the Tres Rios RMP, and therefore, not currently applied to any parcels currently under consideration for leasing.⁷⁴ Exhibit B describes various proposed measures that could eventually apply to the parcels at issue, but only if leasing is delayed until the amendment process is completed.⁷⁵ Moreover, as those agencies also point out, oil and gas development may result in increased noise, truck traffic, new access roads, and other associated human disturbance for parcels near critical habitat, which existing regulatory mechanisms are inadequate to avoid or mitigate.⁷⁶ The imposition of new measures resulting from the Gunnison sage-grouse amendment process, however, would likely be foreclosed once the parcels are leased if those measures are inconsistent with any lease stipulations.

In sum, BLM must analyze in an EIS, or at minimum, an EA: (1) site-specific impacts of its leasing proposal on Gunnison sage-grouse and its habitat, and (2) alternative uses and management prescriptions for those lease parcel areas that are adjacent to or near Gunnison sage-grouse critical habitat to address unresolved conflicts, in compliance with IM 2010-117.

5. The RMP-FEIS Does Not Describe Effective Mitigation

As described in Exhibit A, the Determination of NEPA Adequacy is also flawed because numerous stipulations set forth in the RMP-FEISs and applied to the proposed lease parcels are inadequate or vague, or contain broad and general exceptions without any objective criteria for how they should be applied.⁷⁷ Significant impacts could result from the application of these extremely general stipulations. The EISs fail to acknowledge these effects, and their conclusions that stipulations would avoid or reduce significant impacts are unsupported.

In addition, setbacks for water resources are inadequate, despite that many parcels are crossed by streams.⁷⁸ BLM's response to comments regarding this issue ignores the need for larger setbacks to protect streams that may be critical to vegetation and wildlife, even though they may not be municipal water supplies or "major rivers."⁷⁹ For example, Dry Creek passes

⁷³ *Id.*

⁷⁴ See DNA DOI-BLM-CO-S010-2016-0039-DNA, Attachment E at Comments 5 & 8.

⁷⁵ Exhibit B at 14-15.

⁷⁶ See *id.*

⁷⁷ Exhibit A at 16-17.

⁷⁸ Exhibit A at 16-17.

⁷⁹ See DNA DOI-BLM-CO-S010-2017-0001-DNA, Attachment E, Response 9.a.iv. DNA DOI-BLM-CO-S010-2016-0039-DNA does not respond to this issue at all.

through or near parcels near critical habitat for Gunnison sage-grouse. Any spills or leaks that reach this creek could adversely affect this imperiled species.

B. BLM and Fish and Wildlife Service's Must Consult Over the Impacts of the Proposed Oil and Gas Leasing on Threatened and Endangered Species Pursuant to ESA Section 7

BLM cannot proceed with leasing the parcels at issue until it has consulted with Fish and Wildlife Service regarding the impacts of oil and gas leasing development on the Gunnison sage-grouse and the four Colorado River endangered fish. Lease parcels COC78167, COC78168, and COC78169 are adjacent to Gunnison sage grouse critical habitat, while parcels COC78170, 78162, 78163, 78164, and 78165 are only within a few miles of this critical habitat. Leasing is reasonably certain to lead to oil and gas development on these parcels, which would adversely affect Gunnison sage grouse and their critical habitat, such that Section 7 consultation over these effects is required.

Likewise, because all of the parcels proposed for lease are within the Upper Colorado River Basin, leasing is reasonably certain to result in water depletion and water contamination impacts on the endangered fish, compelling consultation under Section 7. Moreover, to the extent BLM relies on existing programmatic consultations for the Fluid Mineral Program to comply with its Section 7 duties--i.e., the Western Colorado and San Juan PBOs--such reliance is misplaced in light of new information revealing that water depletions from oil and gas development may affect listed species and their critical habitat in a manner or to an extent that was not considered in the PBOs.

1. Background on ESA Section 7

Congress enacted the ESA to provide “a program for the conservation of . . . endangered species and threatened species.” 16 U.S.C. § 1531(b). Section 2(c) of the ESA establishes that it is “the policy of Congress that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act.” 16 U.S.C. § 1531(c)(1). The ESA defines “conservation” to mean “the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this [Act] are no longer necessary.” 16 U.S.C. § 1532(3). Section 7(a)(1) of the ESA explicitly directs that all federal agencies “utilize their authorities in furtherance of the [aforesaid] purposes” of the ESA. 16 U.S.C. § 1536(a)(1).

Section 7 of the ESA requires BLM, in consultation with the Fish and Wildlife Service (“FWS”), to insure that any action authorized, funded, or carried out by the agency is not likely to (1) jeopardize the continued existence of any threatened or endangered species, or (2) result in the destruction or adverse modification of the critical habitat of such species. 16 U.S.C. § 1536(a)(2). For each proposed federal action, BLM must request from FWS whether any listed or proposed species may be present in the area of the agency action. 16 U.S.C. § 1536(c)(1); 50 C.F.R. § 402.12. If listed or proposed species may be present in such area, BLM must prepare a

“biological assessment” to determine whether the listed species may be affected by the proposed action. Id.

If BLM determines that its proposed action may affect any listed species or critical habitat, the agency must engage in formal consultation with FWS. 50 C.F.R. § 402.14. To complete formal consultation, FWS must provide BLM with a “biological opinion” explaining how the proposed action will affect the listed species or habitat. 16 U.S.C. § 1536(b); 50 C.F.R. § 402.14. If FWS concludes that the proposed action will jeopardize the continued existence of a listed species, or result in the destruction or adverse modification of critical habitat, the biological opinion must outline “reasonable and prudent alternatives.” 16 U.S.C. § 1536(b)(3)(A).

BLM’s oil and gas leasing proposal is an agency action under the ESA. Action is broadly defined under the ESA to include all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies, including the granting of leases, and actions that will directly or indirectly cause modifications to the land, water, or air. 50 C.F.R. § 402.02

Agencies are required to reinitiate ESA consultation if (1) the amount or extent of taking specified in the incidental take statement is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) the action is modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or (4) a new species is listed or critical habitat designated that may be affected by the identified action. 50 C.F.R. § 402.16.

2. BLM and FWS Must Reinitiate Consultation over the Programmatic Biological Opinion Governing Fluid Mineral Development Water Depletions

Leasing of the parcels at issue would foreseeably entail significant water depletions within the Upper Colorado River Basin, increased surface disturbance, and toxic spills from hydraulic fracturing and horizontal drilling, all of which can adversely affect endangered fish that inhabit areas within and downstream of the lease areas. All of the parcels except parcel COC78173 fall within the Upper Basin and outside the San Juan River Basin and therefore fall under the Western Colorado PBO. While the Western Colorado PBO is designed to address any depletions resulting from oil and gas development within the Tres Rios Field Office and other western Colorado field offices, BLM cannot rely on that consultation for its Section 7 compliance for the reasons discussed below. To the extent that approval of the lease sale would rely on the Western Colorado PBO, such reliance is arbitrary and cannot constitute BLM’s Section 7 compliance. BLM must either reinitiate consultation on the PBO or initiate section 7 consultation on the lease sale.

The Western Colorado PBO does not take into account the enormous water depletion effects of horizontal drilling and other unconventional well development techniques. The PBO is also unreliable in numerous other respects due to significant new information revealing that the Fluid Mineral Program may have effects on the endangered fish in a manner or to an extent not previously considered. This includes new information about (a) the potential for increased oil and gas development and horizontal drilling within emerging shale plays, including the Mancos

shale play in the Piceance Basin, and the Gothic Shale Gas Play in southwest Colorado's Paradox Basin; (b) climate change effects on Upper Colorado River Basin stream flows; (c) long-term drought and increased water demand which have drastically reduced water supplies; (d) mercury and selenium pollution effects on the endangered fish; (e) declining humpback chub and Colorado pikeminnow populations and failure to meet these populations' recovery targets; (f) the Recovery Program's failure to meet recommended stream flows necessary for recovery of the endangered fish; and (f) BLM's failure to adequately monitor and track actual water use and depletions in the Upper Colorado River Basin, which could result in higher water use and greater depletions in the RMP and leasing area than anticipated in the Western Colorado PBO.

a. New Drilling, Fracking, and Horizontal Drilling Will Require Greater Water Depletions Than Previously Anticipated.

While the 2008 Western Colorado PBO is designed to address any depletions resulting from oil and gas development within western Colorado field offices, it did not consider the likely increase in horizontal drilling and other unconventional drilling practices that deplete enormous amounts of water to develop the Gothic Shale Gas Play (GSGP) and the Paradox Basin. Nor did it consider the use of these water-intensive practices throughout the rest of the programmatic action area, including the Grand Junction, Little Snake, Uncompahgre, White River, Gunnison and Colorado River Valley Field Offices.⁸⁰

New Information Reveals the Increased Potential for Horizontal Drilling and Fracking in the Paradox Basin and their Greater Water Depletion Effects

BLM's Programmatic Biological Assessment (PBA) which informed the Western Colorado PBO estimated very low average water use per well within the Dolores River Basin. The PBA assumed that 1.1 acre-feet per well would be used to develop a single conventional well within the San Juan Public Lands Center, which includes the Dolores River Basin, and that a total of 700 wells would be developed over a 15-year period within this sub-watershed of the Upper Colorado River Basin.⁸¹

The Tres Rios RMP-EIS--published in 2013, five years after the PBO was adopted--however, reveals the potential for water use within the Dolores River Basin that could be many times higher than this amount:

Substantial quantities of water are projected to be used in the drilling, fracturing, and completion process for both the [Gothic Shale Gas Play] and Paradox conventional development (Table 3.5.4). The major river basins affected by the projected development in the PLAA are the Dolores and San Juan River Basins. [Gothic Shale Gas Play] gas wells in the Paradox Basin would use approximately 7.9 to 13.1 acre-feet of water per well in the drilling and completion process. This level of water consumption is 6 to 11 times the amount of water used to drill and

⁸⁰ BLM Instruction Memorandum CO-2011-022 (April 11, 2011) ("All of the estimates in the PBO were based on using conventional vertical drilling technology.").

⁸¹ BLM, Programmatic Biological Assessment for BLM's Fluid Minerals Program in Western Colorado re: Water Depletions and effects on the Four Endangered Big River Fishes: Colorado Pikeminnow, humpback chub, bonytail, and razorback sucker, 8 (Nov. 3, 2008).

complete a conventional gas well and 11 to 18 times the amount of water used to drill and complete a CBM gas well. Paradox conventional gas wells would use 3.3 acre-feet of water per well in the drilling and completion process. This level of water use is 2.5 times the amount of water used to drill and complete other conventional wells and five times the amount of water used to drill and complete a CBM well.⁸²

These increased per well water depletions are attributable to the increased water demand of new oil and gas development techniques such as multi-stage fracking and horizontal drilling that were not previously taken into account in the Western Colorado PBO.⁸³ Accordingly, the Tres Rios RMP-EIS estimates the total amount of water depletions within the Dolores River Basin under existing and future leases over a 15-year period to be between 7,555 and 8,840 acre-feet, or approximately 503 acre-feet to 589 acre-feet per year.⁸⁴ This annual depletion rate is approximately ten times the amount of depletions that the PBA projected would occur in the Dolores River Basin (54 acre-feet per year). Moreover, depletions could be much higher as the RMP-EIS did not estimate stream depletions resulting from removal of interconnected groundwater, which operators would likely pump out to facilitate gas extraction.⁸⁵

However, despite that projected depletions for oil and gas development in the Tres Rios planning area far exceed the Western Colorado PBO's depletion limit for the Dolores River sub-basin, BLM and FWS did not consider this increased water use in their consultation over the Tres Rios RMP, but simply "tiered to" and relied on the Western Colorado PBO.⁸⁶ In the absence of a valid consultation over Fluid Mineral Program water depletions in the Tres Rios planning area and Dolores River sub-basin, BLM and FWS must reinitiate consultation on the Western Colorado PBO, or separately consult over these water depletion effects.

The Western Colorado PBO Fails to Consider Increased Horizontal Drilling Within the Piceance Basin

Water use within other areas of the Upper Colorado River Basin have also been grossly underestimated in the Western Colorado PBO, because it fails to take into account increased horizontal drilling that could be used to develop the Mancos/Mowry and Niobrara shale plays. These increased water depletion impacts throughout the entire Upper Basin could alter the Service's analysis of the Fluid Mineral Program's depletion effects on the endangered fish, as all BLM-authorized fluid mineral development activity within the Basin is part of a single programmatic action that impacts the endangered fish.

For example, in the White River planning area, the Western Colorado PBO projects that new vertical wells would consume 2.62 acre-feet per well, while in the Grand Junction planning area, vertical wells would require require 0.77 acre-feet of water per well. But BLM water depletion logs indicate that between FY2011 and FY2015, the average depletion for horizontal

⁸² Tres Rios RMP-EIS at 244.

⁸³ See Tres Rios RMP-EIS at 19, 491-92.

⁸⁴ *Id.* at 245.

⁸⁵ *Id.*

⁸⁶ Tres Rios RMP-EIS, Appendix Y, Conference Opinion at 3.

wells in BLM's western Colorado field offices was 26.45 acre-feet of water per well in the field offices covered by the PBO.⁸⁷ Indeed, in FY2015 horizontal drilling in the Grand Junction Field Office resulted in a violation of the Western Colorado PBO's Incidental Take Statement (ITS) water depletion limit in the Colorado River sub-basin—under the ITS, water depletions are a surrogate for take. In FY2015, an operator drilled eight horizontal wells in the Grand Junction Field Office, which consumed a total of 620.87 acre-feet of water.⁸⁸ The total amount of water depleted in the Colorado River sub-basin by all horizontal and vertical wells was 691.09 acre-feet of water, which exceeds the 379 acre-feet annual projection for this sub-basin by 1.8 times.⁸⁹

This drastic increase in the use of water-intensive horizontal drilling techniques was not considered in the Western Colorado PBO, nor in BLM's consultations over the recent White River, Kremmling, Little Snake, and Grand Junction RMP amendments or revisions, which only relied on the Western Colorado PBO regarding the RMPs' water depletion effects.

Moreover, recently, on June 8, 2016, the U.S. Geological Survey published a report re-assessing the total technically recoverable reserves in the Mancos shale play in the Piceance Basin, including the Niobrara strata of the play.⁹⁰ According to the report, the Mancos shale play's total technically recoverable natural gas reserves are over 40 times greater than the USGS's 2003 estimate and is the second-largest in the U.S., behind the Marcellus shale.⁹¹ Specifically, 66.3 trillion cubic feet of natural gas, 74 million barrels of oil and 45 million barrels of natural gas liquids are potentially recoverable.⁹² While tight gas in the younger, shallower Mancos shale intervals is produced primarily from vertical and directional wells in which the reservoirs have been hydraulically fractured, the tight gas and continuous oil and gas in the older and deeper intervals of the Mancos shale are produced mostly from horizontal wells that have been hydraulically fractured.⁹³ These reserves underlie large areas of the Grand Junction, White River, Royal Gorge, Colorado River Valley, Uncompahgre, and Gunnison Field Offices, all of which fall under the Western Colorado PBO.⁹⁴

Increasing interest in the Mancos Shale Play should therefore be expected given its enormous production potential. Water depletions throughout the entire Upper Colorado River Basin could therefore exceed projected water use estimates in the Western Colorado PBO. Indeed, since the 2003 USGS assessment, more than 2,000 wells have already been drilled and completed in one or more intervals of the study area.⁹⁵ A review of BLM oil and gas projects in

⁸⁷ See Water Depletion Logs which are completed, pursuant to requirements within the PBO, on an annual basis by the BLM to estimate water depletion resulting from fluid minerals development on BLM lands in western Colorado.

⁸⁸ *Id.*

⁸⁹ *Id.*

⁹⁰ Assessment of Continuous (Unconventional) Oil and Gas Resources in the Late Cretaceous Mancos Shale of the Piceance Basin, Uinta-Piceance Province, Colorado and Utah (2016) ("USGS 2016"), available at <http://pubs.usgs.gov/fs/2016/3030/fs20163030.pdf>.

⁹¹ See *id.*

⁹² *Id.*

⁹³ *Id.*

⁹⁴ Center for Biological Diversity, Map of Mancos Shale relative to BLM Field Offices (2016).

⁹⁵ *Id.*

western Colorado indicates that operators are planning a number of projects involving horizontal drilling, which would most likely target the Mancos shale.⁹⁶

Accordingly, Mancos shale drilling projects could increase within the Upper Basin, but the Western Colorado PBO does not take into account this expansion in new development potential. Because the RMPs for the Piceance Basin field offices overlapping the Mancos shale play do not limit total new wells that may be drilled, the greater amount and availability of technically recoverable oil and gas reserves could result in the development of many more new wells in the Upper Basin than assumed in the RMPs and the Western Colorado PBO. For example, the RFDs for the Colorado River Valley and White River RMPs did not take into account Mancos shale drilling (other than exploratory wells) and thus such drilling is not considered in the PBO.⁹⁷ Further, a substantial portion of new wells would be horizontal wells, as the lower strata of the Mancos formation would likely be accessed via horizontal drilling, but again, the Western Colorado PBO does not take into account the extraordinarily higher water use of horizontal wells. Water depletions throughout the entire Upper Colorado River Basin could therefore exceed projected water use estimates in the Western Colorado PBO, both at the basin-wide and sub-basin levels.

BLM and FWS must reinitiate consultation over the increased water depletion effects of horizontal drilling and increased oil and gas development potential of the Gothic and Mancos shale plays.

b. Climate Change Is Reducing Stream Flows in the Upper Colorado River Basin.

The Western Colorado PBO does not analyze or even mention climate change and its potential to reduce stream flows in the Upper Basin, which could amplify the effects of water depletions on the endangered fish and reduce the effectiveness of the Endangered Fish Recovery Program (e.g., by reducing the availability of water to supplement natural flows in dry years). The best available scientific data indicate that climate change is resulting in higher temperatures in the Colorado River Basin, reduced snowpack, diminished runoff, and more frequent and intense droughts, which have already reduced and will continue to reduce stream flows in the Basin. As shown in the Center's attached literature review (Exhibit F), ample studies document these effects and predict continuing flow declines.⁹⁸

⁹⁶ See Center for Biological Diversity, Spreadsheet of Horizontal Well Projects in Colorado (listing horizontal well projects listed in BLM's NEPA register and projected water use) (Exhibit G).

⁹⁷ See White River RMP FEIS at K-358 ("Development of the Mancos and Niobrara outside the Rangely Field in Rio Blanco County in the WRFO are not [] currently well defined and are exploratory in nature. This development is in the initial stages of the exploration phase to determine of the maturity of the reservoir and the potential viability of the Niobrara within the WRFO."); see also Colorado River Valley RMP FEIS at 4-576 ("To date, use of horizontal drilling in relation to the deep marine shales [i.e., Niobrara, Mancos, and Eagle Basin formations] has been limited and is considered experimental. As a result, the development intensity, timing, and location of development of the deep marine shales was considered too speculative for quantitative impact analysis in connection with this planning process.").

⁹⁸ Wolf, Shaye Ph.D. Impacts of Climate Change on the Colorado River Basin, Center for Biological Diversity (March 10, 2016) (Exhibit F).

In the Colorado River basin, temperatures have increased roughly by 2° F, and “additional decades of warming are ‘locked in’ regardless of any behavioral changes that may or may not be implemented by the world’s governments”—roughly an additional 5° F of warming can be expected in the basin by 2050.⁹⁹ Recently, researchers for the first time used historical data to show temperature-driven stream flow declines in the Upper Basin. As described in the Center’s attached literature review (Exhibit F):

An empirical study of the influence of precipitation, temperature, and soil moisture on upper Colorado River basin streamflow over the past century found that warmer temperatures have already resulted in flows less than expected based on precipitation levels (Woodhouse et al. 2016). Consistent with past research, the study found that cool season precipitation explains most of the variability in annual streamflow. However, temperature was highly influential in determining streamflow under certain conditions. The study concluded that “[s]ince 1988, a marked increase in the frequency of warm years with lower flows than expected, given precipitation, suggests continued warming temperatures will be an increasingly important influence in reducing future UCRB water supplies.” The researchers warned that “streamflow forecasts run the risk of overprediction if warming spring and early summer temperatures are not adequately considered.”¹⁰⁰

According to the study’s press release it is the “first to examine the instrumental historical record to see if a temperature effect [on stream flows] could be detected.”¹⁰¹ The study’s lead author highlighted its significance: “If we have a warmer spring, we can anticipate that the flows will be less relative to the amount of snowpack[.]...What we’re seeing is not just the future – it’s actually now. That’s not something I say lightly.”¹⁰²

In addition to reducing the overall amount of water in the Upper Colorado River Basin, these climate change effects would worsen effects from toxic spills by increasing the concentration of pollutants and toxic contaminants. Climate change is also likely to exacerbate mercury and selenium pollution effects on the Colorado pikeminnow. Mercury deposited into soil from coal burning and selenium will increasingly run off into streams with increased heavy rainfall events.¹⁰³ More frequent and severe wildfire events will result in increased charring of soil, releasing mercury and selenium that can wash off into streams.¹⁰⁴ Warmer water conditions will hasten the conversion of mercury into toxic methylmercury.¹⁰⁵

⁹⁹ Colorado River Research Group, *Climate Change and the Colorado River: What We Already Know* (Oct. 2016), available at http://www.coloradoriverresearchgroup.org/uploads/4/2/3/6/42362959/crrg_climate_change.pdf.

¹⁰⁰ *Id.* at 2.

¹⁰¹ American Geophysical Union, *Colorado River Flows Reduced by Warmer Spring Temperatures* (March 9, 2016), available at <http://news.agu.org/press-release/colorado-river-flows-reduced-by-warmer-spring-temperatures/>.

¹⁰² *Id.*

¹⁰³ National Wildlife Federation, *Swimming Upstream: Freshwater Fish in a Warming World*, 19 (2013), available at <http://www.nwf.org/~media/PDFs/Global-Warming/Reports/NWF-Swimming%20Upstream-082813-B.ashx>.

¹⁰⁴ *Id.*

¹⁰⁵ *Id.*

BLM and the Service must reinitiate consultation on the Fluid Mineral Program in light of new evidence that climate change and warming temperatures are reducing Colorado River stream flows and may affect the endangered fish and its critical habitat in a manner and to an extent not previously considered.

c. Persistent Drought Conditions and Increasing Water Demand Have Reduced Water Supply

Compounding this threat to the endangered fish are persistent drought conditions that have diminished natural flows in the Colorado River Basin and reduced water storage that is needed to supplement Upper Basin flows. The period from 2000 to 2015 was the lowest 16-year period for natural flow in the last century, and one of the lowest 16-year periods for natural flow in the past 1,200 years, according to paleorecords.¹⁰⁶ As a result, water storage in the Colorado River system reservoirs have declined “from nearly full to about half of capacity,” and led to local shortages in the Upper Colorado’s sub-basins.¹⁰⁷

Further, population growth will increase water demand for agriculture and municipal uses, making it increasingly difficult to ensure sufficient water availability for the endangered fish, which rely on the release of stored water, especially in dry years.¹⁰⁸ An ever widening gap between water supply and water demand is weakening the Colorado River water supply system’s reliability and ability to buffer the system in dry years.¹⁰⁹ According to the U.S. Geological Survey, “increased water demand and declining water availability make the restoration of endangered fish habitat extremely challenging.”¹¹⁰ This growing gap between supply and demand in the Upper Colorado River Basin must be taken into account in a reinitiated consultation.

d. Mercury and Selenium Are Adversely Impacting the Endangered Fish

New scientific information regarding (a) mercury and selenium effects on fish reproduction and population viability, (b) mercury and selenium concentrations in Upper Colorado and White River fish, (c) the potential role of oil and gas development in mercury contamination levels in the White River, (d) the potential for development of the Mancos shale play to increase selenium pollution, and (e) the relationship between climate change and mercury and selenium toxicity constitutes new information revealing that the Fluid Mineral Program may have effects on the endangered fish to an extent that was not considered in the Western Colorado PBO, and requires reinitiation of consultation over the Fluid Mineral Program.¹¹¹

Mercury contamination is harming Colorado pikeminnow populations

¹⁰⁶ Bureau of Reclamation, Managing Water in the West: SECURE Water Act Section 9503(c) Report to Congress, Chapter 3, Colorado River Basin at 3-64 (2016) (Chapter 3)

¹⁰⁷ *Id.*

¹⁰⁸ *See id.* at 3-7, 3-8.

¹⁰⁹ *Id.* at 3-10, 3-12.

¹¹⁰ USGS, Effects of Climate Change and Land Use on Water Resources in the Upper Colorado River Basin, 5 (2010), available at <https://pubs.usgs.gov/fs/2010/3123/pdf/FS10-3123.pdf>.

¹¹¹ 50 C.F.R. § 402.16(b).

The Western Colorado PBO's discussion of the environmental baseline for, and threats to, the Colorado pikeminnow and razorback sucker contains no discussion whatsoever of environmental and tissue mercury contamination or the resulting toxicity and reproductive impairment to the endangered fish. Significant new research since the 2008 PBO has demonstrated that elevated levels of mercury in Colorado pikeminnow muscle tissue, including within the Upper Colorado River Basin, are at concentrations likely to cause reproductive and behavioral impairment to the fish.¹¹²

Mercury is a potent neurotoxin shown to cause numerous reproductive and endocrine impairments in fish in laboratory experiments, including effects on production of sex hormones, gonadal development, egg production, spawning behavior, and spawning success.¹¹³ Concentrations of mercury in Colorado pikeminnow in the Upper Basin are documented to be well in excess of the thresholds for reproductive impairment and population-level impacts.¹¹⁴ 2008-2009 muscle tissue averages were 0.60 mg/Kg Hg for Colorado pikeminnow in the Upper Colorado basin and 0.95 mg/Kg Hg for Colorado pikeminnow in the White River – well above the 0.2 mg/kg threshold of concern.¹¹⁵

Mercury deposition and accumulation in critical habitat is attributable to a number of local and global factors, including air emissions from coal-fired power plants both in the immediate region and around the world.¹¹⁶ In addition, because of discrepancies in mercury concentrations between pikeminnow in the Yampa and White Rivers, research suggests that “[i]t is possible that there is some localized sources of mercury contamination into the White River drainage connected with oil and gas exploration and development.”¹¹⁷

Once mercury is deposited on land or water, it is converted into a biologically available form, methylmercury (MeHg) by bacteria. Methylmercury “bioaccumulates in food chains, and particularly in aquatic food chains, meaning that organisms exposed to MeHg in their food can build up concentrations that are many times higher than ambient concentrations in the environment.”¹¹⁸ Once it accumulates, mercury is a potent neurotoxin, affecting fish in many ways, including brain lesions, reduced gonadal secretions, reproductive timing failures, reduced

¹¹² USFWS, Upper Colorado River Endangered Fish Recovery Program, Colorado pikeminnow (*Ptychocheilus lucius*), 5-Year Review: Summary and Evaluation 21 (2011) (“[T]he recovery goal revision needs to consider the impacts of mercury. . . the majority (64 %) of Colorado pikeminnow may be experiencing some reproductive impairment through mercury exposure.”) (“Colorado Pikeminnow 5-year Review”); USFWS, Biological Opinion for the Four Corners Power Plant and Navajo Mine Energy Project at 76 & Table 3 (April 8, 2015) (“Four Corners Biological Opinion”)

¹¹³ USFWS, Draft 2014-2015 Assessment of Sufficient Progress Under the Upper Colorado River Endangered Fish Recovery Program in the Upper Colorado River Basin, and of Implementation of Action Items in the December 20, 1999, 15-Mile Reach Programmatic Biological Opinion and December 4, 2009, Gunnison River Basin Programmatic Biological Opinion, 10 (Oct. 7, 2015) (“Sufficient Progress Assessment”)

¹¹⁴ See Barb Osmundson and Joel Lusk, Field assessment of mercury exposure to Colorado pikeminnow within designated critical habitat (May 5, 2011) (“Osmundson & Lusk 2011”)

¹¹⁵ See Four Corners Biological Opinion at 76 & Table 3; see generally Beckvar, N., T.M. Dillon, and L.B. Reads, Approaches for linking whole-body fish tissue residues of mercury or DDT to biological effects threshold, Environmental Toxicology and Chemistry 24:2094-2105 (2005)

¹¹⁶ See Four Corners Biological Opinion at 73-74; Osmundson & Lusk 2011 at 9-10.

¹¹⁷ *Id.* at 29.

¹¹⁸ Four Corners Biological Opinion at 73.

ability to feed, suppressed reproductive hormones, reduced egg production, reduced reproductive success, and transfer of mercury into developing eggs.¹¹⁹ Although the precise effects vary with relative concentrations, mercury and selenium may have synergistic toxic effects at certain ratios.¹²⁰

The Service has acknowledged that its recovery planning for the Colorado pikeminnow needs updating to reflect this new information regarding mercury:

In addition, the recovery goal revision needs to consider the impacts of mercury. Beckvar et al. (2005) associated studies involving survival, growth, reproduction, and behavior and recommended that 0.2 mg/kg in whole fish be viewed as protective, while adverse biological effects are more likely at higher concentrations. Based on this threshold, the majority (64 %) of Colorado pikeminnow may be experiencing some reproductive impairment through mercury exposure. Management strategies for controlling anthropogenic mercury emissions are necessary as atmospheric pollution can indirectly affect this endangered species, its critical habitat, and its recovery by ambient air exposure, deposition into aquatic habitat and bioaccumulation in diet and in fish tissues.¹²¹

Moreover, the Service's 2015 Sufficient Progress Assessment for the Recovery Program acknowledges that population viability studies show that mercury- and selenium-related reproductive impairment is likely to influence population levels in the San Juan Basin,¹²² but no comparable analysis has yet been done for the higher levels of contamination present in Upper Colorado River Basin fish.

The significant difference in mercury concentrations in fish found in the neighboring Yampa and White Rivers also offers significant new information potentially relevant to the effect of BLM-authorized oil and gas development. Osmundson and Lusk found very high (average 0.95 mg/Kg WW) mercury concentrations in Colorado pikeminnow and in the White River, and lower (0.49 mg/Kg) concentrations in the neighboring Yampa.¹²³ Based on this discrepancy, they noted:

The Yampa and White rivers are relatively close geographically in northwestern Colorado. Because of this proximity, it is interesting that the Yampa River had the lowest mercury concentrations in Colorado pikeminnow while the White River had the highest mercury concentrations. If most of the mercury was from aerial wet and dry deposition, the two drainages should be similar. This difference may indicate a localized source/s of mercury contamination into the White River

¹¹⁹ See Lusk, Joel D., USFWS, Mercury (Hg) and Selenium (Se) in Colorado Pikeminnow and in Razorback Sucker from the San Juan River, 17 (2010), available at https://www.fws.gov/southwest/sjrip/pdf/DOC_Evaluation_Hg_Se_SJR_pikeminnow%20or_razorback_SJRI BC_2010.pdf.

¹²⁰ Four Corners Biological Opinion at 103.

¹²¹ Colorado Pikeminnow 5-year Review at 21; *see also* Significant Progress Assessment at 10-11.

¹²² Sufficient Progress Assessment at 10-11.

¹²³ Osmundson & Lusk 2011 at 21 & Table 2.

drainage. There are currently >2,600 gas and oil wells in Rio Blanco county. It is possible that there is some localized sources of mercury contamination into the White River drainage connected with oil and gas exploration and development.¹²⁴

Although site-specific information for the Upper Basin planning areas appears scarce, there is scientific as well as circumstantial evidence that oil and gas operations can contribute to mercury contamination.¹²⁵ The Western Colorado PBO does not consider the effect of oil and gas development within the White River watershed on the threat to Colorado pikeminnow and razorback sucker from mercury toxicity.

Nor does the PBO give any consideration to the multiple ways in which climate change will exacerbate mercury and selenium contamination and toxicity. Climate change can foreseeably be predicted to increase heavy rainfall events and ensuing runoff, increase pollutant concentrations due to reduced flows during low-flow periods, and contribute to increased methylmercury conversion due to higher temperatures.

Selenium pollution is harming the endangered fish

Selenium harms the endangered fish and other aquatic species through bioaccumulation in the food chain. Concentrations of 3µg/g in the food chain have been found to cause gill and organ damage in certain fish and may lead to death.¹²⁶ These bioaccumulative effects resulting in direct toxicity to juvenile and adults are known as “Type 1” effects. Moreover, selenium bioaccumulation can result in maternal transfer of selenium to fish egg yolks and lead to developmental abnormalities, known as “Type 2 effects.”¹²⁷ Waterborne concentrations of selenium in the 1-5 µg/L range can bioaccumulate and lead to Type 1 and/or Type 2 effects.¹²⁸

Recent studies reveal significant exposures of the endangered fish to selenium. In one study analyzing selenium concentrations of 26 fish specimens collected from designated critical habitat in the Gunnison River, one Colorado pikeminnow specimen exhibited concentrations in muscle plugs that exceeded the 8 micrograms per gram dry weight toxicity guideline for selenium in fish muscle tissue.¹²⁹ Several species, including the razorback sucker and Colorado pikeminnow, exhibited selenium exposures in excess of the critical concentration at which Type 1 health effects begin to occur.¹³⁰

¹²⁴ *Id.* at 29 (citations omitted).

¹²⁵ See U.S. EPA, National Risk Management Research Laboratory, Mercury in Petroleum and Natural Gas: Estimation of Emissions from Production, Processing, and Combustion, EPA/600/SR-01/066 (Oct. 2001); Visvanathan, C., Treatment and Disposal of Mercury Contaminated Waste from Oil and Gas Exploration Facilities (1993) available at <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.549.9515&rep=rep1&type=pdf>

¹²⁶ Lemly, A.D., Appalachian Center for the Economy & the Environment and Sierra Club, Aquatic hazard of selenium pollution from mountaintop removal coal mining, 3 (2009) (“Lemly 2009”).

¹²⁷ Lemly 2009 at 3 ; Hamilton, S.J., Review of residue-based selenium toxicity thresholds for freshwater fish, *Ecotox. Environ. Saf.* 56: 201-210 (2003).

¹²⁸ See *id.*

¹²⁹ May, Thomas W. and Michael J. Walther, USGS, Determination of selenium in fish from designated critical habitat in the Gunnison River, Colorado, March through October, 2012, Open-File Report 2013-1104, 2 (2013)

¹³⁰ *Id.*

In the Lower Gunnison River Basin, 2014 data indicated a range of dissolved selenium (chronic values) from 0.97 µg/L to 16.7 µg/L along the Uncompahgre River. Out of 18 sites in the lower Gunnison that were considered, the Colorado water-quality standard for chronic dissolved selenium of 4.6 µg/L was exceeded at two sites.¹³¹ In regards to acute values, the range measured was from 1.1 µg/L for a portion of the Uncompahgre River to 125 µg/L along a portion of Loutzenhizer Arroyo, with 125 µg/L being well in excess of any criteria for instantaneous selenium measurements.¹³² In another 2015 study, mean concentrations of selenium in various fish species in the lower Colorado River Basin exceeded the risk for maternal transfer to eggs, while selenium concentrations in various species of macroinvertebrate prey exceeded the risk value for larval fishes.¹³³ Average selenium concentrations in the studied fish species were found to be 2- to 4-fold higher than the risk threshold for piscivorous (fish-eating) wildlife, with samples exceeding this threshold in 81-100% of cases depending on the species. The risk value for larval fishes, who either absorb selenium via maternal transfer to eggs or through invertebrate diet, was exceeded in 56-100% of cases depending on the adult species (with risk posed to larvae due to maternal transfer), and 86-100% of cases among invertebrates (with risk posed to larval fishes through diet). Thus, the transfer of selenium toxicity from invertebrates to fish to piscivores is readily observable.¹³⁴

Natural erosion and runoff, as well as selenium leaching into irrigation runoff, are the primary sources of this toxic pollutant. The weathering of Cretaceous marine shales can produce high selenium soils, which are present in many areas of the western U.S.¹³⁵ Most notable of these Cretaceous shales is the Mancos Shale, which is found in Colorado, Utah, Wyoming, New Mexico, and Arizona. Irrigation of selenium-rich soils for crop production in arid and semi-arid regions can mobilize selenium and move it off-site in surface water runoff or via leaching into groundwater.

e. Population Numbers of the Endangered Fish Are Declining

Colorado pikeminnow populations are in decline throughout the Green River and Colorado River Basin, indicating that the Recovery Plan for the endangered fish has not been effective and that the impacts of water depletions could be more severe than previously anticipated.

According to Fish and Wildlife Service, the latest 2014 Colorado River sub-basin population number of 501 is “cause for great concern,” and catch of sub-adults and adults in 2013 and 2014 “were near lowest observed in the history of the project.”¹³⁶ 2015 catch numbers

¹³¹ Henneberg, M.F., 2014 annual summary of the lower Gunnison River Basin Selenium Management Program water-quality monitoring, Colorado: U.S. Geological Survey Open-File Report 2016-1129, 25 p. (2016), <http://dx.doi.org/10.3133/ofr20161129>.

¹³² *Id.*

¹³³ Walters, David M., et al. Mercury and selenium accumulation in the Colorado River food web, Grand Canyon, USA. *Environmental Toxicology and Chemistry*, 34(10):2385-2394, 2390 (2015).

¹³⁴ *Id.*

¹³⁵ Lemly, A.D., Guidelines for evaluating selenium data from aquatic monitoring and assessment studies. *Environ. Monitor. Assess.* 28(1):83-100 (1993)

¹³⁶ Sufficient Progress Assessment at 23, 36.

are within the same range, which suggests that the population estimate for 2015 will be similar to the 2014 estimate.¹³⁷ Preliminary data show that the Green River sub-population is “in decline throughout the entire Green River Subbasin” and has fallen under 2,000, below the minimum viable population of 2,600 adults.¹³⁸ The Yampa River portion of the sub-basin population also “remains low and may be in further decline.”¹³⁹ Recent studies show that Colorado pikeminnow declines in the Yampa River are linked to “persistent high densities of nonnative predators (e.g., smallmouth bass and northern pike),” and that northern pike are outnumbering Colorado pikeminnow by three to one.¹⁴⁰

Humpback chub numbers are also low. Fish and Wildlife Service is “concerned that wild populations of humpback chub in Black Rocks and Westwater Canyon of the Colorado River (near the Colorado-Utah state line) have not recovered from declines detected in the late 1990’s. The reason for those population declines is uncertain.”¹⁴¹ After this steep reduction, the Black Rocks/Westwater population continued to decline.¹⁴² In 2008, the population “dropped below the population size downlist criterion (MVP = 2,100 adults) for the first time.”¹⁴³ In 2011 and 2012, the core population estimates were 1,846 and 1,718, respectively.¹⁴⁴

The Desolation/Gray Canyons population in the Green River has also not met the population-size downlist criterion, and was observed to be “trending downward” based on 2006-2007 population estimates.¹⁴⁵ This trend has been attributed to “increased nonnative fish abundance and habitat changes associated with dry weather and low river flows.”¹⁴⁶ The 2014 estimate is 1,863 adults, substantially below the 2,100-adults recovery criterion.¹⁴⁷ Further, the proportion of captured individuals in 2015 that were first-year adults was 7.9%, continuing “a significantly declining trend in this metric since the 2001–2003 sampling period.”¹⁴⁸ This “significant decline” in the percentage of captured individuals that were first-year adults “may be an indication that the future stability of the population is uncertain.”¹⁴⁹

Finally, the two smaller Yampa Canyon and Cataract Canyon populations do not indicate “self-sustaining” populations. “[I]t is not known if pure humpback chubs occur in Yampa

¹³⁷ See USFWS, Monitoring the Colorado Pikeminnow Population in the Mainstem Colorado River via Periodic Population Estimates, 3 (Nov. 2015), available at <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2015/rsch/127.pdf> (showing similar capture rates of pikeminnow in 2014 and 2015).

¹³⁸ Sufficient Progress Assessment at 7.

¹³⁹ *Id.*

¹⁴⁰ *Id.* at 8.

¹⁴¹ *Id.* at 36.

¹⁴² *Id.* at 13.

¹⁴³ *Id.*

¹⁴⁴ *Id.* at 13-14.

¹⁴⁵ *Id.* at 12.

¹⁴⁶ *Id.* at 23.

¹⁴⁷ *Id.* at 12.

¹⁴⁸ USFWS, Colorado River Recovery Program, FY 2015 Annual Project Report, Project No. 129, Humpback chub population estimates for Desolation/Gray Canyons, Green River Utah, p. 4 (Nov. 13, 2015), available at <http://www.coloradoriverrecovery.org/documents-publications/work-plan-documents/arpts/2015/rsch/129.pdf>.

¹⁴⁹ *Id.*

Canyon.”¹⁵⁰ The Cataract Canyon population is “small,” decreasing by over half, from 150 wild adults in 2003 to 66 in 2005 such that population estimates are no longer possible.¹⁵¹

These declining population numbers are new baseline conditions, such that the endangered fish could be more vulnerable to water depletion and other oil and gas development effects than previously assumed. These downward trends also strongly suggest that the Endangered Fish Recovery Program is not achieving recovery targets nor adequately offsetting water depletion effects as intended.

f. The Recovery Program Is Failing to Meet Recommended Flows

A consistent pattern of failing to meet recommended flows in the Colorado River’s 15-Mile Reach requires BLM and the Service to reinitiate consultation over the Fluid Mineral Program.

The Recovery Program establishes minimum recommended flows within various segments of the Upper Colorado River Basin that should be maintained to ensure recovery of the endangered fish.¹⁵² The Western Colorado PBO’s effects analysis assumes that, at the very least, the minimum recommended flow of 810 cubic feet per second (cfs) for dry years will be maintained within the 15-Mile Reach of the Colorado River within Colorado’s Grand Valley in the Grand Junction Field Office.¹⁵³ The 15-Mile Reach extends from the confluence of the Gunnison River in Grand Junction to Palisade, Colorado, fifteen miles upstream.¹⁵⁴ According to the Service, when flows drop below 810 cfs, “habitat becomes compromised to the point that adult pikeminnow likely vacate the 15-Mile Reach to points downstream where flows increase either due to tributary input from the Gunnison River or irrigation return flow.”¹⁵⁵ The 15-Mile Reach is one of the most important habitats to the Colorado pikeminnow and razorback sucker,¹⁵⁶ providing important spawning grounds for both species and year-round habitat for the Colorado pikeminnow.¹⁵⁷

In its discussion of the environmental baseline, the Western Colorado PBO notes various recommended flows for the Colorado River sub-basins, including minimum flows for wet years, wet-average years, dry-average years, and dry years.¹⁵⁸ The PBO notes that in some recent years,

¹⁵⁰ Sufficient Progress Assessment at 11.

¹⁵¹ *Id.* at 14.

¹⁵² See *id.* at 41; USFWS, Final Programmatic Biological Opinion for Bureau of Reclamation’s Operations and Depletions, Other Depletions, and Funding and Implementation of Recovery Program Actions in the Upper Colorado River above the Confluence with the Gunnison River, 54 (Dec. 1999) (“Colorado River PBO”), available at <http://www.coloradoriverrecovery.org/documents-publications/section-7-consultation/15mile/FinalPBO.pdf>.

¹⁵³ PBO at 42, 48.

¹⁵⁴ PBO at 4.

¹⁵⁵ See Sufficient Progress Assessment at 34-35; Osmundson, Douglas B. & Patrick Nelson, USFWS, Relationships Between Flow and Rare Fish Habitat in the ‘15 Mile Reach’ of the Upper Colorado River Final Report, 6 (1995), available at <http://www.coloradoriverrecovery.org/documents-publications/technical-reports/isf/OsmundsonNelson1995.pdf> (“Osmundson 1995”).

¹⁵⁶ PBO at 36, 42; Colorado River PBO at 25, 32, 45; Osmundson 1995 at 6.

¹⁵⁷ PBO at 36; Colorado River PBO at 31-32.

¹⁵⁸ PBO at 41-44.

recommended flows have not been met in the 15-Mile Reach.¹⁵⁹ However, the PBO's effects analysis assumes that the lowest recommended flow for dry years (810 cfs) will be maintained; this minimum flow is the baseline by which the PBO determined the Fluid Mineral Program's depletion effects on the Colorado pikeminnow.¹⁶⁰

The Endangered Fish Recovery Program's latest Sufficient Progress Assessment indicates that recommended flows for dry years in the 15-Mile Reach of the Colorado River were not met in 2012 and 2013.¹⁶¹ Flows also fell short of recommended levels in 2015, despite it being a dry-average precipitation year. In April, May, August and October 2015, the 15-Mile Reach missed the recommended minimum average flows for those months for dry-average precipitation years.¹⁶² This average year shortfall (following a "wet-average" year) strongly suggests that minimum recommended flows for later dry years will almost certainly not be met when water will be scarcer, and as declining stream flows overall due to climate change weaken the Recovery Program's ability to supplement natural flows in dry years.¹⁶³ Indeed, in the period since the Western Colorado PBO was adopted, between 2009 and 2015, the Recovery Program has failed to meet mean monthly recommended flows in the 15-Mile Reach in over half of all months.¹⁶⁴ This new information strongly suggests that critical habitat within the 15-Mile Reach is likely to be unsuitable for the Colorado pikeminnow and razorback sucker in dry years, and that flow depletions from oil and gas development will only exacerbate these unsuitable conditions and reduce these species' chances of recovery.

The Recovery Program's continuing pattern of failing to meet recommended flows is new information revealing that the Fluid Mineral Program may have effects on the endangered fish to an extent that was not considered in the Western Colorado PBO or any of the RMPs that rely on the PBO in this leasing decision.

Finally, for many of the same reasons noted above, BLM cannot rely on the San Juan PBO for its Section 7 compliance regarding water depletion effects on the endangered fish in connection with leasing of parcel COC78173. The San Juan PBO fails to take into account the increased water depletion effects of horizontal drilling and other new oil and gas extraction

¹⁵⁹ See *id.* at 42-44 (e.g., "Since the publication of the spring flow recommendations in 1991, peak 1-day average flows through the 15-mile reach have been below 12,900 cfs approximately one-third of the years through 2006 and these targets have not been met."); *id.* at 42 ("Mean monthly flows have...dropped below 810 cfs [the minimum flow for drought years] for at least one of the summer-time months during 7 of the last 17 years (1991-2007).").

¹⁶⁰ *Id.* at 48.

¹⁶¹ See Sufficient Progress Assessment at 34 (noting average monthly flows significantly below 810 cfs in 15-mile reach in 2012 and 2013); *id.* at 31 (recognizing need to reduce the amount of time flows drop below 810 cfs in the 15-Mile Reach).

¹⁶² Compare Colorado River PBO at 40-41 (recommended mean monthly stream flows for 15-Mile Reach) with U.S. Geological Survey, Surface Water Monthly Statistics (1991 - 2016) & Email from Tom Chart, FWS, Director, Upper Colorado River Endangered Fish Recovery Program to Wendy Park (July 15, 2016) (chart indicating dry, average, and wet precipitation years).

¹⁶³ See n. 415 above & accompanying text (noting ability to buffer Colorado River system will become more difficult as streamflows decrease).

¹⁶⁴ See Center for Biological Diversity's comparison of USGS monthly mean flow data to recommended flow (spreadsheet showing 15-Mile Reach flows and months with shortfall) (Exhibit G).

techniques. As noted above, the Tres Rios RMP-EIS projected increased deployment of these techniques in the Gothic Shale Gas Play and the Paradox Basin, and estimated that approximately 50 acre-feet per year of water depletions would occur in the San Juan River Basin, compared to 40 acre-feet projected in the 2008 San Juan PBO. This figure does not take into account stream depletions that would result from the removal of interconnected ground water to enhance the extraction of gas, so annual depletions could be much higher.¹⁶⁵ BLM and FWS's consultation over the Tres Rios RMP, however, improperly relied on the San Juan PBO which did not take into account this increased water use.

In addition, the San Juan PBO fails to fully take into account new information concerning climate change effects and increasing water scarcity and drought severity within the Upper Basin. It wholly fails to acknowledge mercury contamination within the Upper Basin and its effects on the endangered fish. New information concerning selenium contamination and effects on the endangered fish has arisen. Further, it fails to consider new information concerning endangered fish population declines in the Upper Basin, and the Recovery Program's failure to maintain flows upstream, which are necessary for the recovery of the Colorado River sub-basin population. BLM must reinitiate consultation on the San Juan River PBO, in light of all of these new circumstances.

3. *Allowing New Leasing While BLM Evaluates New Information Concerning the Endangered Fish Violates BLM's Consultation Duties and Risks Violation of ESA Section 7(d)*

Recently, in BLM's response to the Center and Sierra Club's protest of the Colorado State Office's Grand Junction Field Office December 8, 2016 lease sale, BLM stated its intent to prepare a new programmatic biological assessment on the Fluid Mineral Program, while at the same time allowing the December lease sale to go forward. BLM, however, cannot have it both ways—relying on the PBO to support new leasing, while also revising its analysis. Under these circumstances, proceeding with new leasing violates BLM's obligations to consult before its proposed action and insure against jeopardy.

As an initial matter, BLM's protest response asserts that the "2008 PBO is still suitable to support the decision to lease parcels in the Upper Colorado River Basin area," on the flawed basis that the PBO's overall basin-wide depletion threshold had not been exceeded.¹⁶⁶ This ignores the fact that the PBO's Colorado River sub-basin depletion threshold was exceeded in FY2015, in violation of the PBO. BLM's implicit position that the PBO does not establish sub-basin depletion limits (in contrast to its prior suggestion)¹⁶⁷ is contrary to common sense and the PBO. Depletions in a particular sub-basin may significantly affect local endangered fish

¹⁶⁵ Tres Rios RMP-EIS at 245.

¹⁶⁶ BLM, Protest Decision on December 2016 Oil and Gas Competitive Lease Sale, 13 (Dec. 7, 2016) ("December Protest Decision").

¹⁶⁷ See BLM, Protest Decision on Center for Biological Diversity's Protest of May 12, 2016 Competitive Oil & Gas Lease Sale (May 12, 2016) ("Moreover, consistent with the 2008 PBO, average annual depletions, regardless of the drilling technology employed, would not be allowed to exceed 369 acre-feet [i.e., Little Snake Field Office's projected water depletion] without further BLM and Fish and Wildlife Service analysis and reinitiated Section 7 consultation.").

populations; otherwise, there would be no reason for the PBO to analyze the effects of depletions at the sub-basin level, or to require BLM to track and report depletions to FWS by sub-basin, as it does.

More troublingly, BLM's assertion that the 2008 PBO still validly supports its leasing decision does not square with BLM's recognition, in the same decision, of "the need to consider new information and re-evaluate changing conditions on the Upper Colorado River" and to "prepar[e] an updated Programmatic Biological Assessment (PBA)."¹⁶⁸ The PBA, BLM notes, "may consider information about new drilling techniques and re-examine the extent and location of fluid mineral reserves by river basin. The PBA will also evaluate how climate change and contaminants (specifically selenium and mercury) are affected by water depletions associated with BLM's fluid mineral program."¹⁶⁹ As the foregoing section shows, all of these factors are important considerations on the long-term viability of the endangered fish, which must be considered *before* any new depletions are allowed. And given FWS's finding that any water depletion is likely to jeopardize the endangered fish, BLM cannot dismiss the effects of any depletions resulting from its leasing decision. New depletions could result in significant adverse effects on the fish before BLM and FWS have had a chance to evaluate their potential effects in light of these significant new circumstances. In addition, BLM has never consulted over the depletion and spill effects of new leasing in the particular areas at issue. Leasing of the parcels here could have localized effects on endangered fish downstream which have not been considered in any prior consultation, given the much higher water depletion effects and increased surface water contamination risks that could result from increased fracking, horizontal drilling, and wastewater and frack fluid transport and storage in the leasing areas.

In the absence of a valid Section 7 consultation covering the Fluid Mineral Program and BLM's leasing decision, BLM is in violation of its Section 7 duties to both consult over the lease sale's depletion effects on the endangered fish and to insure against jeopardy to the species, before auctioning new leases. 16 U.S.C. § 1536(b). Waiting until the APD stage to consult violates BLM's duty to initiate consultation "at the earliest possible time," when meaningful consultation is possible now. *See* 50 C.F.R. § 402.14(a) ("Each Federal agency shall review its actions at the earliest possible time to determine whether any action may affect listed species or critical habitat."); *The Wilderness Society v. Wisely*, 524 F. Supp. 2d 1285, 1302 (D. Colo. 2007) (requiring Section 7 consultation before BLM's decision to resume oil and gas leasing where it was "possible... to engage in meaningful conference"); *Colorado Envtl. Coal. v. Office of Legacy Mgmt.*, 819 F. Supp. 2d 1193, 1223 (D. Colo. 2011) (requiring same for uranium leasing decision).

Indeed, the law is clear that, in the context of oil and gas leasing, "agency action" under the ESA includes not just the legal transaction of lease issuance, but also all resulting post-leasing activities from exploration, through production, to abandonment:

we hold that agency action in this case entails not only leasing but leasing and all post-leasing activities through production and abandonment. Thus, section 7 of

¹⁶⁸ December Protest Decision at 13.

¹⁶⁹ *Id.*

the ESA on its face requires the FWS in this case to consider all phases of the agency action, which includes postleasing activities, in its biological opinion. Therefore the FWS was required to prepare, at the leasing stage, a comprehensive biological opinion assessing whether or not the agency action was likely to jeopardize the continued existence of protected species, based on "the best scientific and commercial data available." 16 U.S.C. § 1536(a)(2).

Conner v. Burford, 848 F.2d 1441, 1453 (9th Cir. 1988).

The Ninth Circuit's decision in *Conner v. Burford* is similarly clear that the consultation requirement is not obviated by uncertainty about the precise location and extent of future drilling: "Although we recognize that the precise location and extent of future oil and gas activities were unknown at the time, extensive information about the behavior and habitat of the species in the areas covered by the leases was available."¹⁷⁰ Similarly, the inclusion of a general Threatened and Endangered Species stipulation in the standard lease terms cannot substitute for the ESA Section 7 obligation to prepare a comprehensive biological opinion at the initial leasing stage:

Appellants ask us, in essence, to carve out a judicial exception to ESA's clear mandate that a comprehensive biological opinion -- in this case one addressing the effects of leasing and all post-leasing activities -- be completed before initiation of the agency action. They would have us read into the ESA language to the effect that a federal agency may be excused from this requirement if, in its judgment, there is insufficient information available to complete a comprehensive opinion and it take upon itself incremental step consultation such as that embodied in the T & E stipulations. We reject this invitation to amend the ESA. That it is the role of Congress, not the courts.

Id. at 1455.

The BLM's refusal to consult at the lease stage, and proposal to defer consultation to the APD stage, is precisely the sort of incremental step consultation decisively rejected as inconsistent with the ESA in *Conner v. Burford*.¹⁷¹

BLM should cancel the lease sale and halt all new leasing until an adequate consultation on the Fluid Mineral Program and proposed lease sale has been completed.

4. *BLM and FWS Must Consult Over the Leasing Action's Effects on Gunnison Sage-Grouse*

¹⁷⁰ *Id.* at 1453.

¹⁷¹ Further, there is no assurance that BLM would even consult under Section 7 at the APD or site-specific stage. Instruction Memorandum 2010-023 allows projects to go forward without Section 7 consultation if (1) the project or well operator has signed a Recovery Agreement under terms set forth by the PBO, if the project or APD is located in the Yampa or Colorado river sub-basins; or (2) if the project is located in the White, Dolores, or Gunnison river sub-basins. Accordingly, BLM typically does not perform Section 7 consultation for water depletions at the APD stage.

As detailed more fully in Exhibit E, unoccupied habitat may be essential to recover the Gunnison sage-grouse, yet neither the DNA for the proposed lease sale nor the Tres Rios RMP FEIS to which it tiers contains any analysis of whether parcel COC78158 is suitable and/or necessary for recovery of viable Gunnison sage-grouse populations, or whether this parcel must include conditions to minimize disturbance to neighboring sage-grouse populations.¹⁷² The same can also be said for parcels COC78167, 78168, 78169, 78170, 78162, 78163, 78164, and 78165, which are all adjacent to or near critical habitat, as well as parcels 78159, 78160, 78161, 78166, 78171, and 78172, which are all within historical sage grouse habitat. The mere inclusion of a stipulation that BLM “may recommend modifications” pursuant to future ESA Section 7 consultation does not satisfy either BLM’s requirement to consult now, at the time of lease issuance, or to analyze the effects of its actions under NEPA. BLM must address how leasing within unoccupied areas may affect recovery of Gunnison sage-grouse under NEPA and ESA Section 7.

We strongly urge BLM to cancel the proposed lease sale, or prepare a legally adequate EIS for this proposed oil and gas leasing action and consult under Section 7 of the ESA prior to allowing the proposed action to move forward. Thank you for your consideration of these comments.

Sincerely,



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¹⁷² See Exhibit E at 33-35.

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Exhibits

- Exhibit A: Center for Biological Diversity and Sierra Club's comments on the Determination of NEPA Adequacy for the proposed Colorado February 2017 lease sale
- Exhibit B: Rocky Mountain Wild et al.'s comments on the Determination of NEPA Adequacy for the proposed Colorado February 2017 lease sale
- Exhibit C: Center for Biological Diversity's scoping comments for the proposed Colorado February 2017 lease sale
- Exhibit D: Center for Biological Diversity June 13, 2016 comments on the proposed Colorado November 2016 lease sale
- Exhibit E: Center for Biological Diversity December 2015 protest of the proposed Colorado February 2016 lease sale
- Exhibit F: Wolf, Shaye Ph.D. Impacts of Climate Change on the Colorado River Basin, Center for Biological Diversity (March 10, 2016)