Alliance for Tribal Clean Energy • CalWild • Central Oregon LandWatch • Conservation Colorado • Conservation Lands Foundation • GreenLatinos • Montana Environmental Information Center • National Parks Conservation Association • Natural Resources Defense Council • New Mexico Wild • Sierra Club • The Wilderness Society • Western Resource Advocates • Wild Montana

April 18, 2024

Attn: Draft Solar PEIS
Jeremy Bluma, Senior Advisor
National Renewable Energy Coordination Office
Bureau of Land Management
1849 C Street NW
Washington, D.C. 20240

Re: Comments on the Draft Programmatic Environmental Impact Statement for Utility-Scale Solar Energy Development (DOI-BLM-HQ-3000-2023-0001-RMP-EIS)

Dear Mr. Bluma:

On behalf of our members and supporters, Alliance for Tribal Clean Energy, CalWild, Central Oregon LandWatch, Conservation Colorado, Conservation Lands Foundation, GreenLatinos, Montana Environmental Information Center, National Parks Conservation Association, Natural Resources Defense Council, New Mexico Wild, Sierra Club, The Wilderness Society, Western Resource Advocates, and Wild Montana submit these comments on the Draft Programmatic Environmental Impact Statement for Utility-Scale Solar Energy Development (Draft Solar PEIS) that the Bureau of Land Management (BLM) released for public comment on January 19, 2024.[1]

The 245 million acres of public lands managed by BLM offer some of the best untapped solar resources in the United States that can make significant contributions to the clean energy transition. Public lands are critical to achieving the national goals of 25 gigawatts (GW) of renewable energy on public lands by 2025, a carbon-free power sector by 2035, and net-zero emissions economy-wide by 2050, but only with smart planning and development. If solar energy development on BLM-administered lands reaches the reasonably foreseeable development scenario (RFDS) for the 11-state planning area through the year 2045, this could displace more than 123 million metric tons of carbon *per year*, or the equivalent of permanently closing over thirty coal-fired power plants.

For these reasons, our organizations fully support this effort to expand and update the 2012 Western Solar Plan to better guide utility-scale solar development across the West and, as explained below, we urge BLM to select a version of Alternative 5 with improved exclusion

[1] 89 Fed. Reg. 3,687 (Jan. 19, 2024).

criteria and more robust mitigation. We also urge BLM to maintain and implement a process for continuously designating low-conflict priority development areas—such as Solar Energy Zones (SEZs) or other designated leasing areas (DLAs)—in all future land use planning. Under this approach, BLM can advance our national clean energy goals *and* protect sensitive lands, species, habitats, and communities.

The Western Solar Plan is a key component of BLM's comprehensive conservation and climate plan for public lands, which includes the rights-of-way (ROW) regulations for solar and wind energy (Renewable Energy Rule),[2] proposed public lands conservation rule (Public Lands Rule),[3] and other regulatory, planning, and policy actions. BLM must harmonize these actions to balance our solar energy and conservation needs on public lands. If done right, this suite of initiatives will phase out fossil fuels, responsibly ramp up renewable energy, protect and restore public lands for climate and ecological resilience, center input from local communities and tribes in decision-making, and support communities in economic transition.

To that end, we advocate a "smart from the start" approach to solar planning and development that (1) identifies previously disturbed lands with relatively few environmental, social, and cultural resource conflicts and directs solar projects to those lands; (2) prohibits solar development in sensitive areas, including but not limited to National Landscape Conservation System (NLCS) lands, important wildlife corridors and habitats, and places of cultural, historical, and spiritual significance; and (3) fully mitigates unavoidable adverse environmental and social impacts. A smart from the start approach also requires meaningful tribal consultation and community engagement to ensure BLM does not impede a just and fair transition to clean energy and perpetuate the environmental justice problems associated with fossil fuel development. If BLM adopts a thoughtful, science-based, and inclusive approach to solar planning in the beginning, there will be fewer environmental conflicts, more community support, and faster solar deployment in the end.

The Draft Solar PEIS proposes several improvements to the Western Solar Plan that are consistent with smart from the start principles and important steps in the right direction. We fully support the plan's expanded geographic scope covering five additional states, for example, and commend BLM for focusing solar development near existing and planned transmission facilities. We also support limiting solar development to previously disturbed lands and believe Alternative 5, although needing some improvement, is a good first step that will provide BLM with ample siting flexibility to avoid significant impacts to important resource values and meet the estimated acreage needs under the RFDS. In addition, we support many of the updated programmatic design features in Appendix B and the concept of areas of special concern

[2] Rights-of-Way, Leasing, and Operations for Renewable Energy, 88 Fed. Reg. 39,726 (June 16, 2023). On April 11, 2024, BLM announced the final Renewable Energy Rule and published the unofficial prepublication version here: https://www.blm.gov/sites/default/files/docs/2024-04/BLM-Final-Renewable-Energy-Rule-Unofficial-Prepublication.pdf. All future citations to the prepublication version of the rule are referred to as the "Prepublication Renewable Energy Rule."

[3] Conservation and Landscape Health, 88 Fed. Reg. 19,583 (Apr. 3, 2023).

presented in Appendix H.

Despite these improvements, the Draft Solar PEIS falls short in ways that will ultimately inhibit permitting efficiency. Most notably, it does not designate new or expanded SEZs where BLM can streamline the permitting process and provide certainty and predictability to interested stakeholders. Instead of focusing on priority development areas, BLM is simply eliminating the variance areas and replacing them with "solar application areas," where the potential for unforeseen conflicts and associated permitting delays is essentially the same. Relatedly, many of the exclusion criteria are unmapped or dependent upon outdated resource management plans (RMPs) to protect important resources and values, creating uncertainty about the true scope and suitability of the solar application areas and degree of resource protection.

Faster deployment of utility-scale solar on public lands is critical to achieving our clean energy goals, but this will happen only with smart planning that steers utility-scale solar development to clearly delineated, low-conflict lands. We therefore strongly urge BLM to continue promoting solar development in existing SEZs or other DLAs and commit to designating more of these priority areas in future land use planning at the pace and scale needed to meet our long-term solar energy needs on public lands. To start, however, BLM should select a modified version of Alternative 5 that incorporates more robust exclusion criteria and mitigation measures. This approach will help prevent unnecessary or undue degradation (UUD), protect important resources and values, and honor tribal sovereignty, yet still provide BLM with the flexibility needed to meet our national clean energy goals on public lands.

Against this backdrop, we begin with comments on foundational procedural issues, followed by comments on specific aspects of BLM's proposed solar plan, as briefly summarized below:

- Follow a smart from the start approach to solar development that prioritizes and facilitates projects in clearly delineated areas with the least environmental and social conflicts;
- Thoughtfully coordinate the final solar plan with other ongoing rulemaking and planning efforts to form a comprehensive, equitable, and effective conservation and climate plan for public lands;
- Meaningfully consult with sovereign tribal nations and engage with local communities during all phases of solar planning and development;
- Strengthen the resource-based exclusion criteria in order to prevent UUD and ensure that designated solar application areas avoid resource conflicts to the maximum extent possible;
- Bolster the programmatic design features and areas of special concern to prevent UUD and ensure that approved projects fully avoid, minimize, and offset adverse impacts; and
- Select a modified version of Alternative 5 that incorporates our recommendations above.

Finally, in response to BLM's statement in Appendix C that it may consider refinements to the

RFDS, which underpins its estimate of needed acreage for solar development within the 11-state planning area, we conducted an in-depth analysis of the RFDS and determined that the RFDS acreage estimate is fundamentally sound on a reasonable path to net zero, but raised several issues BLM should address before the final PEIS.

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I. Foundational issues regarding the updated Western Solar Plan.

In the face of climate pressure, a rapid transition to a renewable energy economy is essential, and public lands should play a substantial role in facilitating that transition. Both Congress and the Biden Administration have set laudable goals to permit 25 GW of renewable energy projects on public lands by 2025, achieve a carbon pollution-free electricity sector by 2035, and reach net-zero emissions economy-wide no later than 2050.[4]

This update to the Western Solar Plan responds to our national renewable energy goals but does not go far enough to ensure responsible and efficient solar development on public lands. We urge BLM to follow our recommendations below, which lay the foundation for a smart solar plan on public lands. Under this approach, BLM-managed lands will play a key role in the equitable transition away from fossil fuels to meet our clean energy goals, while keeping important wildlife habitat, ecosystems, and landscapes intact.

a. BLM should follow a smart from the start approach that prioritizes solar development in clearly delineated areas with the least environmental and social conflicts.

The undersigned organizations all support a smart from the start approach to renewable energy planning and development that accelerates the clean energy transition while maximizing conservation values, promoting equitable outcomes for diverse communities, and mitigating unavoidable impacts. Although the Draft Solar PEIS takes steps in the right direction, BLM can and should do more to ensure solar development occurs in places with the lowest risk of impacting important resource values on public lands.

The cornerstone of a smart from the start approach is to identify clearly delineated, low-conflict priority areas—like SEZs—that are appropriately sized to meet the RFDS,[5] then prioritize development in these areas and deprioritize or exclude development elsewhere. So rather than abandon the SEZ approach,[6] the final plan and record of decision (ROD) should establish a framework to aggressively designate, expand, and promote priority development areas in the future. In this way, BLM can meet our national clean energy goals and still protect intact landscapes and ecosystems.

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[4] Energy Act of 2020, 43 U.S.C. § 3004(b); Exec. Order No. 14,057, *Catalyzing Clean Energy Industries and Jobs Through Federal Sustainability*, § 101 (Dec. 8, 2021), 86 Fed. Reg. 70,935 (Dec. 13, 2021); Exec. Order No. 14,008, *Tackling the Climate Crisis at Home and Abroad*, §§ 101, 201, 205(b)(i) (Jan. 21, 2021), 86 Fed. Reg. 7,619 (Feb. 1, 2021).

[5] *See* Draft Solar PEIS ch. 2.2 & tbl. 2.2-1 at 2-32 to -34, Appendix C (estimating that the RFDS requires 697,809 acres of BLM lands by 2045); *see infra* Section IV.

[6] *See* Draft Solar PEIS ch. 2.3.2 at 2-35 ("Therefore, under this Programmatic EIS, none of the Action Alternatives include a process for identifying or analyzing new SEZs. Instead, the various Action Alternatives in this Programmatic EIS identify lands available for application. The suitability for any particular solar energy development ROW application would be evaluated using site- and project-specific analysis, tiering to this Programmatic EIS as appropriate.").

Accordingly, consistent with BLM's regulations for wind and solar projects, the solar plan should explicitly retain a protocol for designating new or expanded SEZs and the ROD should amend resource management plans (RMPs) to require consideration of new SEZs in all future land use planning.[7] The final solar plan should also establish a mandatory time frame for designating new priority areas that are appropriately sized to meet increasing market demands and the acreage needs in the 11-state planning area under the RFDS.[8] Unfortunately, BLM did not follow through on its previous promise in the 2012 solar plan to "assess the need for new or expanded SEZs at least once every 5 years" in response to "existing solar market conditions" and "existing and planned transmission systems,"[9] which is a primary reason for SEZs not realizing their full potential. Instead, citing the mixed results of SEZs since 2012, BLM is mostly abandoning the priority area approach even though SEZs "have recently seen increased development interest."[10] We urge BLM to reconsider this decision and to identify and prioritize new SEZs in the future.

To be clear, however, we are not asking BLM to replicate all aspects of the prior SEZ approach. For priority areas to succeed, BLM must work diligently and continuously to identify sufficient areas to facilitate a clean energy transition. While we recognize this will be a heavy lift, BLM should remember it will have many opportunities before 2050 to review and update the Western Solar Plan and to continue designating additional priority areas in other land use planning efforts in order to meet market demand. For this reason, BLM should not be pressured now to simply open vast amounts of public land to solar development that in many cases will not be developed for many years, if ever. We believe that a bolstered version of Alternative 5—with its focus on previously disturbed lands and proximity to transmission—would best fulfill

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[7] *See* 43 C.F.R. § 2802.11 (process for designating new DLAs); BLM, Approved Resource Management Plan Amendments/Record of Decision (ROD) for Solar Energy Development in Six Southwestern States, Appendix B.4.5 at 168-72 (Oct. 2012) (identification protocol for new or expanded SEZs) ("2012 Solar Plan ROD"); *see also* Prepublication Renewable Energy Rule at 176-77 (to be codified at 43 C.F.R. § 2802.11).

[8] *See* Draft Solar PEIS Appendix C.

[9] 2012 Solar Plan ROD Appendix B.4.5 at 168-72.

[10] Draft Solar PEIS ch. 2.3.2 at 2-35; *see* 88 Fed. Reg. at 39,728 (BLM has seen "greater levels of competitive interest" in DLAs in the last two years after it started offering competitive leases on its own accord); *see, e.g.*, U.S. Dep't of Interior, Press Releases, *Biden-Harris Administration Holds Record-Breaking Auction for Solar Energy Development* (June 28, 2023), https://www.doi.gov/pressreleases/biden-harris-administration-holds-record-breaking-auction-solar-energy-development; BLM, Press Releases, *BLM Colorado solar lease bids for more than $200,000* (Apr. 28, 2023), https://www.blm.gov/press-release/blm-colorado-solar-lease-bids-more-200000. In abandoning the SEZ approach, BLM forgets that the initial lack of interest had little to do with the SEZs themselves. In fact, key factors contributing to the delayed interest in SEZs were (1) the time needed to implement the 2012 solar plan from scratch and promulgate the 2016 competitive leasing rule; and (2) the Trump administration's failure to request any competitive lease offers. BLM has also abandoned the concept of SEZs right as it is eliminating the requirement to conduct competitive lease sales in SEZs, which is intended to increase developer interest in such areas. *See* 88 Fed. Reg. at 39,728.

BLM's purpose and need for the solar plan to facilitate improved siting of utility-scale solar energy development on public lands and provide a framework for efficient application processing,[11] yet still provide BLM with plenty of flexibility to carve out future priority areas and responsibly site interim projects.[12] Also, while BLM continues to fill in data gaps, update its inventories required by the Federal Land and Policy Management Act (FLPMA),[13] and hopefully screen the public lands to identify new priority areas, it is critical that the agency takes full advantage of the abundant siting flexibility within solar application areas to avoid adverse impacts to important resource values to the maximum extent possible. The final solar plan should therefore incorporate the initial screening and prioritization processes set forth in 43 C.F.R. § 2804.35 and BLM Instruction Memorandum 2022-027,[14] which have worked well in practice and provide a transparent and objective approach for assigning priority levels to projects based on potential resource conflicts.

The final solar plan should also retain a few key components of the existing variance process and implement the Renewable Energy Rule to ensure BLM uses its siting flexibility in a manner that phases all initial development under the updated plan to areas with the highest energy potential and lowest environmental and social conflicts.[15] Specifically, the updated plan should require BLM and developers to engage early and often at pre-application meetings,[16] preliminary application review meetings,[17] and pre-processing public meetings[18] to ensure development occurs in the lowest conflict places and limited agency resources are directed to projects with the highest likelihood of success. When reviewing applications, the final plan should also require BLM to consider the availability of lands in existing priority areas (i.e., SEZs

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[11] Draft Solar PEIS chs. 1.1 & 1.1.1 at 1-2 to 3; *see* Notice of Intent to Prepare a Programmatic Environmental Impact Statement to Evaluate Utility-Scale Solar Energy Planning and Amend Resource Management Plans for Renewable Energy Development, 87 Fed. Reg. 75,284, 75,285 (Dec. 8, 2022) (key purpose is to "increase opportunities for responsible renewable energy development in priority . . . areas").

[12] *See* Draft Solar PEIS ch. 2.1.1.5 at 2-18 ("Only 8% of the lands available for application [under Alternative 5] would be needed to meet the RFDS projection of lands needed for development.").

[13] 43 U.S.C. §§ 1711(a), 1712(c)(4); *see infra* Section II.d.

[14] BLM Instruction Memorandum 2022-027, *Initial Screening and Prioritization for Solar and Wind Energy Applications and Nominations/Expressions of Interest* (Mar. 17, 2022).

[15] *See* BLM Instruction Memorandum 2023-015, *Variance Process for Solar Energy Applications* (Dec. 2, 2022); 2012 Solar Plan ROD Appendix B.5 at 177-90.

[16] 43 C.F.R. § 2804.10(a); *see* 2012 Solar Plan ROD Appendix B.5.1 at 178.

[17] 43 C.F.R. § 2804.12(b)(4).

[18] *See* 43 C.F.R. § 2804.25(e)(1)-(2). Notably, the Renewable Energy Rule will require a pre-processing public meeting only if there is no other opportunity for early engagement, such as a scoping meeting, Prepublication Renewable Energy Rule at 180 (to be codified at 43 C.F.R. § 2804.25(e)(2)(i), which we oppose. *See* The Wilderness Society et al., Comment Letter on Proposed Renewable Energy Rule at 23-24 (Aug. 15, 2023) ("TWS Comments on Proposed Renewable Energy Rule"), https://www.regulations.gov/comment/BLM-2023-0004-0590; NRDC, Comment Letter on Proposed Renewable Energy at 4 (Aug. 15, 2023) ("NRDC Comments on Proposed Renewable Energy Rule"), https://www.regulations.gov/comment/BLM-2023-0004-0618. These comments are incorporated here by reference.

and other DLAs) that could potentially meet the applicant's needs.[19] And as BLM identifies new and expanded priority areas, BLM should deprioritize project applications in areas that are not previously disturbed or otherwise low-conflict. Relatedly, even after BLM finalizes the updated solar plan, the agency should routinely update the mapped exclusion areas as new science and datasets become available.[20] This approach is consistent with smart from the start principles and BLM's obligations under FLPMA to prevent UUD and manage the public lands for multiple use and sustained yield.[21]

We acknowledge the immense pressure that BLM faces to accelerate the permitting of renewable energy projects to meet the Nation's clean energy goals, but it remains imperative for the agency to protect and restore habitat connectivity, ecosystem resilience, landscape health, and biodiversity on public lands. Now more than ever, the country needs a comprehensive approach to energy and infrastructure development that empowers BLM to increase renewable energy development on public lands but only permit projects in areas with the fewest environmental, cultural, and community conflicts.

b. BLM must coordinate the final solar plan with other rulemakings and planning efforts to ensure a comprehensive and effective climate plan for public lands.

The Western Solar Plan is a critical piece of BLM's conservation and climate policy improvements for public lands, which include but are not limited to the Renewable Energy Rule,[22] proposed Public Lands Rule,[23] Section 368 energy corridor planning,[24] and various efforts related to fossil fuels.[25] It is critical that these regulatory, planning, and policy updates complement each other to form a cohesive and effective package that appropriately balances the rapid deployment of renewable energy with the protection of public lands and the interests of Tribes and local communities.

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[19] *See* BLM Instruction Memorandum 2023-015, Attachment 3 at 3-1, Step 1; 2012 Solar Plan ROD Appendix B.5.3 at 179.

[20] *See* Draft Solar PEIS ch. 2.1.1.6 at 2-21 (exclusion areas "will change over time as land use plans are revised or amended and new information on resource conditions is developed").

[21] 43 U.S.C. §§ 1711(a)(7), 1732(b); *see infra* Section II.a.

[22] 88 Fed. Reg. 39,726; Prepublication Renewable Energy Rule.

[23] 88 Fed. Reg. 19,583.

[24] *See* Notice of Intent to Amend Resource Management Plans for Section 368 Energy Corridor Revisions and Prepare an Associated Environmental Impact Statement, 88 Fed. Reg. 83,959 (Dec. 1, 2023); BLM et al., *Energy Policy Act of 2005 Section 368 Energy Corridor Review, Final Report: Regions 1-6* at 20-42 (Apr. 2022) ("2022 Energy Corridor Report Vol. 1"); BLM et al., *Energy Policy Act of 2005 Section 368 Energy Corridor Review, Final Report, Volume 2: Regions 1-6, Interagency Corridor Modification Summaries and Recommended Corridor Additions* (Apr. 2022) ("2022 Energy Corridor Report Vol. 2").

[25] *See, e.g.*, Waste Prevention, Production Subject to Royalties, and Resource Conservation, 89 Fed. Reg. 25,378 (Apr. 10, 2024) (codified at 43 C.F.R. pts. 3160 & 3170); Fluid Mineral Leases and Leasing Process, 88 Fed. Reg. 47,562 (July 24, 2023) (BLM announced the final rule and published the unofficial prepublication version on April 12, 2024).

Careful harmonization of BLM's concurrent initiatives is particularly important given the Phase 2 rulemaking by the White House Council on Environmental Quality (CEQ) to implement the National Environmental Policy Act (NEPA).[26] The proposed NEPA regulations, if finalized as proposed, could potentially hasten the permitting of solar projects,[27] expand the availability of categorical exclusions,[28] and authorize agencies to pursue "innovative approaches" for complying with NEPA to address "extreme" environmental challenges.[29] It is uncertain how BLM will apply these regulations to utility-scale solar projects, either now or under a future administration, so it is critical that a cohesive and effective conservation and climate plan for public lands is firmly in place.

i. Coordination with the Renewable Energy Rule.

Together, the final Western Solar Plan and Renewable Energy Rule must establish a coherent framework for siting and permitting solar energy development on public lands in a manner that prioritizes development in areas with the least environmental and social conflicts, and excludes or at least deprioritizes solar development on all other BLM lands. To accomplish this objective, the final solar plan should clarify and implement some key provisions of the rule, including the regulatory processes for designating new DLAs and prioritizing applications.

First, BLM must explain the relationship between the newly proposed solar application areas under the Draft Solar PEIS and the DLAs defined in the existing regulations,[30] which include SEZs, development focus areas, solar emphasis areas, and renewable energy development areas.[31] Like the prior regulations, the Renewable Energy Rule describes a process for designating new DLAs and lists the factors that BLM must consider when doing so.[32] And when prioritizing applications, the Renewable Energy Rule requires BLM to consider whether a project is within a DLA.[33]

Nonetheless, the Draft Solar PEIS fails to discuss how prioritization and development in the solar application areas will compare to or influence development in either the existing DLAs or

[26] *See* National Environmental Policy Act Implementing Regulations Revisions Phase 2, 88 Fed. Reg. 49,924 (July 31, 2023).
[27] 88 Fed. Reg. at 49,936 (requiring agencies to consider duration of effects in making significance determination, such as "short-term construction-related GHG emissions from a renewable energy project in light of long-term reductions in GHG emissions when determining the overall intensity of effects. In this situation, the agency could reasonably determine that the climate effects of the proposed action would not be significantly adverse, and therefore an EIS would not be required.").
[28] 88 Fed. Reg. at 49,937-39, 49,970 (agencies may create categorical exclusions through land use planning and apply other agencies' categorical exclusions) (to be codified at 40 C.F.R. § 1501.4(c), (e)); *see* 42 U.S.C. § 4336c (agencies may adopt other agencies' categorical exclusions).
[29] 88 Fed. Reg. at 49,957-58, 49,984 (to be codified at 40 C.F.R. § 1506.12).
[30] 43 C.F.R. § 2801.5(b).
[31] Draft Solar PEIS ch. 1.1.3 n.3 at 1-7.
[32] Prepublication Renewable Energy Rule at 176-77 (to be codified at 43 C.F.R. § 2802.11).
[33] Prepublication Renewable Energy Rule at 182 (to be codified at 43 C.F.R. § 2804.35(b)(1)).

any newly designated DLAs. The Draft Solar PEIS simply notes:

> Priority development areas have the same potential for development under the No Action Alternative and the Action Alternatives, because prioritization of ROW application processing and other incentives for development within these areas would remain unchanged from those included under the 2012 Western Solar Plan. These areas are included in the areas presented as available for utility scale solar ROW application under the Action Alternatives analyzed here. Over time, priority areas may be added, eliminated, or modified through land use plan amendments.[34]

The draft plan also notes that "none of the Action Alternatives include a process for identifying or analyzing new SEZs."[35] As shown, the draft plan treats priority areas like an afterthought, making no effort to improve or expand the existing SEZs, designate new ones, or lay out a plan and schedule for doing so, as anticipated by the Renewable Energy Rule.[36]

Also, the Draft Solar PEIS papers over prioritization by noting that areas that could become prioritized for development are captured in every action alternative analyzed. We urge BLM to do more of this work here. Under the Renewable Energy Rule, major screening factors relied upon in the draft PEIS are meant to inform BLM's application prioritization process, namely evidence that proposed projects are "likely to avoid adverse impacts to or conflicts with known resources or uses on or adjacent to public lands."[37] This phrase very clearly captures some of BLM's proposed exclusion criteria, but there is no discussion in the draft PEIS of the relationship between its application of exclusion criteria and its application prioritization process.

Similarly, BLM's statement that "priority areas may be added . . . through land use plan amendments"[38] appears to potentially conflict with the final rule, which envisions prioritizing applications that conform "with the governing BLM land use plans."[39] It is not clear, absent further discussion on these points, whether BLM would grant priority processing to a project located in the proposed solar application areas if that project is outside of already established priority areas absent land use plan amendments. If not, the draft PEIS appears to create a situation where virtually no applications could receive priority processing until the BLM undertakes land use plan amendments across the entire study area. If so, opportunities for processing efficiency are being ignored and should be revisited in the final PEIS.

Because of the disconnect created by the Draft Solar PEIS's landscape-level approach and the possibility for a more granular, directed development approach under the BLM's expanded DLA

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[34] Draft Solar PEIS ch. 5 at 5-2 to -3.
[35] Draft Solar PEIS ch. 2.3.2 at 2-35.
[36] Prepublication Renewable Energy Rule at 176-77 (to be codified at 43 C.F.R. § 2802.11).
[37] Prepublication Renewable Energy Rule at 183 (to be codified at 43 C.F.R. § 2804.35(b)(2)).
[38] Draft Solar PEIS ch. 5 at 5-2.
[39] Prepublication Renewable Energy Rule at 176-77 (to be codified at 43 C.F.R. § 2804.35(b)(3)).

regulation and application prioritization process in the Renewable Energy Rule, we urge BLM to carefully explain how the two siting systems can complement each other to improve and expedite solar development moving forward. The final solar plan must be clear that priority areas, including the associated development incentives and streamlining opportunities under both the existing ROW regulations and proposed new rule, will be carried forward and remain distinct from solar application areas. Failure to provide these clarifications risks creating confusion for all stakeholders and further complicating the process of siting, permitting, and building solar power facilities on BLM-managed lands.

Because the Renewable Energy Rule explicitly preserves the administrative process for designating new DLAs,[40] the solar plan should lay the groundwork for BLM to carve out new areas for priority siting in future programmatic and regional planning and emphasize that the agency will continue to give top priority to project permitting in those areas. The updated solar plan should also clarify how BLM will implement the application prioritization factors set forth in the Renewable Energy Rule to ensure that BLM dedicates its resources to proposed projects with the highest potential for approval.[41] Specifically, the programmatic design features should incorporate the prioritization factors as mitigation measures and require BLM to give higher or lower priorities to solar applications depending on their potential adverse impacts to sensitive areas and important resource values.[42]

In sum, the success of the Western Solar Plan depends on thoughtful coordination with the Renewable Energy Rule, and vice versa. The updated plan and Renewable Energy Rule must therefore complement one another to achieve the desired result of responsible, smart from the start solar development on public lands.

ii. Coordination with the proposed Public Lands Rule.

The final Western Solar Plan should complement and support the final Public Lands Rule to ensure the buildout of utility-scale solar projects on public lands does not unnecessarily impair or degrade intact landscapes and ecosystem resilience. To achieve this, the solar plan should incorporate and implement some key concepts from the proposed rule.

As proposed, the Public Lands Rule would define UUD and tie it to the concept of ecosystem resilience.[43] The proposed rule would also require BLM, during land use planning, to identify and give priority to areas that are potentially eligible to be designated as areas of critical environmental concern (ACECs),[44] and to identify intact landscapes and land health.[45] Further,

[40] Prepublication Renewable Energy Rule at 176-77 (to be codified at 43 C.F.R. § 2802.11).
[41] Prepublication Renewable Energy Rule at 176-77 (to be codified at 43 C.F.R. § 2804. 35(b)).
[42] *See infra* Section III.f.
[43] 88 Fed. Reg. at 19,590, 19,599-600 (to be codified at 43 C.F.R. §§ 6101.4, 6101.5(c)(5), and 6102.3-1(a)(5)).
[44] 88 Fed. Reg. at 19,593, 19,596 (to be codified at 43 C.F.R. §§ 1610.7-2(a)-(c)).
[45] 88 Fed. Reg. at 19,590, 19,599 (to be codified at 43 C.F.R. §§ 6102.1, 6102.2).

the proposed rule would establish a leasing tool for the mitigation or restoration of public lands that, among other things, can be used to offset impacts associated with solar energy development.[46] All these proposed regulatory provisions, if finalized, will work in concert with the final solar plan and help BLM fulfill its obligation under FLPMA.

This update to the Western Solar Plan presents a timely opportunity for BLM to clarify how it will implement these relevant provisions of the Public Lands Rule. BLM, for example, should consider ecosystem resilience, the relevant and important resource values of potential ACECs, and landscape intactness when designating solar application areas and making project siting decisions. BLM should also consider how to implement the restoration or mitigation leasing tool to help offset the unavoidable impacts of solar projects. Together, the solar plan and final Public Lands Rule should ensure that large-scale solar development on BLM-managed lands occurs in the right places, prevents UUD, and any unavoidable impacts are fully offset.

iii. Coordination with Section 368 energy corridor planning.

The Draft Solar PEIS properly recognizes that the designation of Section 368 energy corridors for electric transmission purposes will impact where solar energy development occurs on public lands.[47] Because Alternatives 3 and 5 would direct solar development to within ten miles of most Section 368 energy corridors,[48] it is critical that BLM coordinates the final solar plan with its ongoing energy corridor planning[49] and carefully considers the direct, indirect, and cumulative impacts of designating solar application areas near energy corridors located in sensitive places.

In 2009, The Wilderness Society and other conservation groups, including several of the undersigned organizations, brought a lawsuit challenging the initial designation of Section 368 energy corridors. The litigation concluded in 2012 when the plaintiffs, BLM, and other federal agencies reached a settlement agreement ensuring that energy corridors are located "in favorable landscapes," facilitate renewable energy projects, avoid sensitive areas "to the maximum extent possible," and reduce dispersed ROWs across the landscape.[50] The agreement also identified "corridors of concern" that raise potential environmental and cultural issues, and required the agencies to periodically reevaluate existing corridor designations and prepare a study assessing their overall usefulness and effectiveness.[51] The agencies subsequently conducted a multi-year review and released a two-volume report in 2022 with

[46] 88 Fed. Reg. at 19,591-92, 19,600-02 (to be codified at 43 C.F.R. §§ 6102..4); *see infra* Section III.e.
[47] Draft Solar PEIS ch. 1.3.1 at 1-15, ch. 3.3.1.2 at 3-23 to -24.
[48] Draft Solar PEIS ch. 2.1.1.3 at 2-12, ch. 2.1.1.5 at 2-18.
[49] *See, e.g.*, Notice of Intent to Amend Resource Management Plans for Section 368 Energy Corridor Revisions and Prepare an Associated Environmental Impact Statement, 88 Fed. Reg. 83,959 (Dec. 1, 2023).
[50] *Settlement Agreement* at 4 (July 3, 2012), *Wilderness Soc'y v. U.S. Dep't of Interior*, No. 3:09-cv-03048-JW (N.D. Cal.) ("Energy Corridor Settlement Agreement").
[51] Energy Corridor Settlement Agreement at 9-12 & Exhibit A.

recommendations to modify, add, and delete certain Section 368 energy corridors.[52]

BLM must consider both the terms of the settlement agreement and the recommendations in the 2022 final report while updating the Western Solar Plan. To that end, we applaud BLM's decision to exclude the corridors of concern identified in the settlement agreement when designating proposed solar application areas near transmission, as well its decision to exclude the Section 368 energy corridors designated for underground uses only.[53] To the extent BLM did not already do so, however, BLM should also consider excluding the energy corridors that the 2022 final report recommended for deletion due to potential resource conflicts.[54]

c. BLM must consult early and often with tribal nations on a government-to-government basis during all phases of solar planning and development.

We endorse the response to the Draft Solar PEIS from the Alliance for Tribal Clean Energy and incorporate its recommendations by reference.[55] Indigenous peoples are the longest serving stewards of the lands now managed by BLM. Since time immemorial, they have used these lands for cultural and spiritual purposes, including hunting, fishing, gathering, ceremonies, burials, and other uses. The belief systems of tribes are often tied to lands and waters encompassing large areas rather than discrete sites,[56] and in many cases tribes retain enforceable rights to continue accessing those lands to practice traditional activities or make use of resources.

BLM must honor these traditional and present ties to the public lands and, consistent with the federal government's unique trust relationship with tribes and related legal obligations, meaningfully consult on a government-to-government basis with tribes during all phases of

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[52] 2022 Energy Corridor Report Vol. 1 at 20-42; 2022 Energy Corridor Report Vol. 2.
[53] Draft Solar PEIS Appendix J.5.1 at J-8 & n.2.
[54] *See* 2022 Energy Corridor Report Vol. 1 at 39-40.
[55] Alliance for Tribal Clean Energy Response to Request for Comments on Amendments to Bureau of Land Management Solar Energy Planning ("ATCE Response to Draft Solar PEIS") [attached as Ex. 1 in Appendix 5, at 2].
[56] *See Memorandum of Understanding Regarding Interagency Coordination and Collaboration for the Protection of Indigenous Sacred Sites* at 2 (Nov 2021) ("Interagency MOU on Sacred Sites") (acknowledging that "sites sacred to Indian tribes . . . often occur within a larger landform or are connected through physical features or ceremonies to other sites or a larger sacred landscape. Agencies should consider these broader areas and connections to better understand the context and significance of sacred sites. Sacred sites may include, but are not limited, to geological features, bodies of water, archaeological sites, burial locations, traditional cultural properties, plant communities and stone and earth structures and may be present on tribal, public, and private lands."), https://www.doi.gov/sites/doi.gov/files/mou-interagency-coordination-and-collaboration-for-the-protection-of-indigenous-sacred-sites-11-16-2021.pdf; Nat'l Park Service, *National Register Bulletin 38, Guidelines for Evaluating and Documenting Traditional Cultural Properties* at 1, 9, 18-19 (rev. 1992) ("NPS Bulletin 38") (traditional cultural properties include culturally significant natural "landscapes"), https://www.nps.gov/subjects/nationalregister/upload/NRB38-Completeweb.pdf.

solar planning and development to address their concerns.[57] At its best, consultation creates true collaboration whereby tribes are treated as full partners in decision-making:

> Tribal consultation is a two-way, Nation-to-Nation exchange of information and dialogue between official representatives of the United States and of Tribal Nations regarding Federal policies that have Tribal implications. Consultation recognizes Tribal sovereignty and the Nation-to-Nation relationship between the United States and Tribal Nations, and acknowledges that the United States maintains certain treaty and trust responsibilities to Tribal Nations. Consultation requires that information obtained from Tribes be given meaningful consideration, and agencies should strive for consensus with tribes or a mutually desired outcome.[58]

In conducting tribal consultations, BLM must "respect Tribal self-government and sovereignty; identify and consider tribal treaty rights, reserved rights, and other rights; respect and elevate Indigenous Knowledge, including cultural norms and practices relevant to such consultations; and meet the responsibilities that arise from the unique legal relationship between the Federal Government and tribal governments."[59]

Here, BLM must provide clear information to all potentially interested tribes about the draft solar plan and explicitly direct attention to, and consult about, the proposed solar application areas, potential impacts, and how to address those impacts. BLM must seek tribal input on all these issues and others, including on the tribal Interest Areas to be excluded from solar development.[60] BLM should also explore opportunities for co-stewardship under the final solar plan that will advance tribal self-determination and help address any unavoidable impacts.[61]

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[57] *See* Exec. Order No. 13,175, *Consultation and Coordination With Indian Tribal Governments* (Nov. 6, 2000), 65 Fed. Reg. 67,249 (Nov. 9, 2000); *Presidential Memorandum on Uniform Standards for Tribal Consultation* (Nov. 30, 2022) ("Presidential Memorandum on Tribal Consultation"), 87 Fed. Reg. 74,479 (Dec. 5, 2022), https://www.govinfo.gov/content/pkg/DCPD-202201083/pdf/DCPD-202201083.pdf; *Presidential Memorandum on Tribal Consultation and Strengthening Nation-to-Nation Relationships* (Jan. 26, 2021), https://www.govinfo.gov/content/pkg/DCPD-202100091/pdf/DCPD-202100091.pdf; 512 Departmental Manual 4, *Department of the Interior Policy on Consultation with Indian Tribes* (Nov. 30, 2022); BLM Manual 1780, *Tribal Relations* (2016); *see also* National Historic Preservation Act, 54 U.S.C. §§ 300101-7108; Archeological Resources Protection Act, 16 U.S.C. §§ 470aa-mm; Native American Graves Protection and Repatriation Act, 25 U.S.C. §§ 3001-13; Exec. Order No. 13,007, *Indian Sacred Sites* (May 24, 1996), 61 Fed. Reg. 26,771 (May 29, 1996); Interagency MOU on Sacred Sites.

[58] Presidential Memorandum on Tribal Consultation § 2, 87 Fed. Reg. at 74,479.

[59] Presidential Memorandum on Tribal Consultation § 6, 87 Fed. Reg. at 74,481.

[60] *See infra* Section II.f.

[61] *See* Order No. 3403, *Joint Secretarial Order on Fulfilling the Trust Responsibility to Indian Tribes in the Stewardship of Federal Lands and Waters* (Nov. 15, 2021), https://www.doi.gov/sites/doi.gov/files/elips/documents/so-3403-joint-secretarial-order-on-fulfilling-the-trust-responsibility-to-indian-tribes-in-the-stewardship-of-federal-lands-and-waters.pdf; Permanent

Moreover, BLM must seek to resolve any tribal concerns and potential impacts through the final exclusion criteria, design features, areas of special concern, and other means.

d. BLM must engage with frontline communities during all phases of solar planning and development.

To avoid repeating the mistakes of the past associated with fossil fuel production on public lands, the clean energy transition must be centered around justice and equity for all Americans, particularly those that have historically been left behind and overburdened by energy development. The final solar plan must therefore prioritize environmental justice and implement incentives and mechanisms to create regenerative, sustainable benefits to local communities.[62]

Despite the climate urgency, local opposition in some places has become a major impediment and source of delay in the approval process for large-scale solar projects.[63] To address this, BLM should require early and meaningful engagement with local communities at pre-processing public meetings and other venues that are in addition to the NEPA process.[64] Maximum engagement means BLM and developers will involve communities in decision-making, address their concerns to the maximum extent possible, and share the benefits of solar development on public lands. This approach will minimize social conflicts and ultimately lead to a more efficient and equitable permitting process.

II. Preventing unnecessary and undue degradation of public lands and avoiding potential impacts to important resources and values at a landscape scale.

Consistent with FLPMA and the mitigation hierarchy, BLM must ensure that the updated Western Solar Plan prevents UUD and avoids impacting important resources and values on the public lands to the maximum extent possible. Doing so will not only protect BLM-administered lands, it will also lead to faster deployment of utility-scale solar development and fully align with BLM's "multiple use and sustained yield" mission.[65]

All the action alternatives in the Draft Solar PEIS use a set of 21 resource-based exclusion criteria to screen the public lands and identify places that are generally unsuitable for solar energy development, known as exclusion areas. This is a critical first step to ensure that utility-scale solar development on public lands avoids the most sensitive places. In addition,

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Instruction Memorandum 2022-011, *Co-Stewardship with Federally Recognized Indian and Alaska Native Tribes Pursuant to Secretary's Order 3403* (Sept. 13, 2022).

[62] *See infra* Section III.d.

[63] Robi Nilson et al., Berkeley Lab, *Survey of Utility-Scale Wind and Solar Developers Report* (Jan. 2024), https://live-etabiblio.pantheonsite.io/sites/default/files/w3s_developer_survey_report_-011824_version.pdf.

[64] Prepublication Renewable Energy Rule at 180 (to be codified at 43 C.F.R. § 2804.25(e)(2)(i)).

[65] *See* 43 U.S.C. §§ 1701(a)(7), 1732(a).

Alternatives 2 through 5 apply a 10% slope exclusion, Alternatives 3 and 5 limit solar applications to lands within ten miles of existing or planned transmission infrastructure, and Alternatives 4 and 5 limit solar applications to lands deemed to be "previously disturbed," as defined by BLM.

While we believe the designation of pre-screened, low-conflict SEZs is the best way to avoid adverse environmental and social conflicts on public lands and streamline development, BLM, unlike in 2012, is not performing the level of detailed analysis that is required to do so. The updated Western Solar Plan will only identify solar application areas, which are vast and varied and in many ways similar to the existing variance areas. It is therefore critical that BLM adopts comprehensive and scientifically sound exclusion criteria that prevent UUD and avoid adverse impacts to the maximum extent possible.

Unfortunately, there are glaring gaps in the exclusion criteria that the final Western Solar Plan must address to ensure that only the most appropriate lands are open to solar application.

a. The exclusion criteria must prevent unnecessary or undue degradation of public lands to the maximum extent possible.

FLPMA requires BLM, "by regulation or otherwise," to "take any action necessary to prevent unnecessary or undue degradation" when "managing the public lands."[66] This substantive duty to prevent UUD lies at "the heart of FLPMA,"[67] and extends to all actions undertaken on BLM-managed public lands.[68] In addition, the proposed Public Lands Rule would define UUD to apply broadly as part of managing public lands for ecosystem resilience.[69] Accordingly, BLM must look holistically at the updated Western Solar Plan and, more specifically, the exclusion criteria, to ensure they satisfy FLPMA's mandate to prevent UUD of all the explicitly enumerated resources

[66] 43 U.S.C. § 1732(b). FLPMA contains identical language at 43 U.S.C. § 1782(c), which requires BLM to prevent UUD while managing lands under review as potential WSAs.
[67] *Mineral Policy Ctr. v. Norton*, 292 F. Supp. 2d 30, 33 (D.D.C. 2003) (UUD lies at "the heart of FLPMA"); *see Gardner v. Bureau of Land Mgmt.*, 638 F.3d 1217, 1222 (9th Cir. 2011) (concluding that § 1732(b) of FLPMA is a congressional directive requiring BLM to "achieve the broad objectives of preventing unnecessary or undue degradation of public lands"); *Ctr. for Biological Diversity v. U.S. Dep't of Interior*, 623 F.3d 633, 644-45 (9th Cir. 2010) (the duty to prevent UUD "supplements requirements imposed by other federal laws"); *Utah Shared Access Alliance v. Carpenter*, 463 F.3d 1125, 1136 (10th Cir. 2006) (noting BLM has an independent duty to prevent UUD).
[68] *Mineral Policy Ctr.*, 292 F. Supp. 2d at 41-43 (noting BLM has discretion on a case-by-case basis to protect the environment and avoid UUD, even if to date it has only exercised it in the hardrock mining context); *Utah Shared Access Alliance*, 463 F.3d at 1136 (BLM may close land to OHV use to prevent UUD); *Gardner*, 638 F.3d at 1222 (while BLM neglected to adopt UUD restrictions against OHV use, it has authority to do so).
[69] 88 Fed. Reg. at 19,590, 19,599 (to be codified at 43 C.F.R. § 6101.4).

and values.[70] Doing so is consistent with BLM's statutory obligations under FLPMA, as well as the proposed Public Lands Rule, and will assist BLM in applying the mitigation hierarchy.[71]

b. The exclusion criteria must follow the mitigation hierarchy.

The exclusion criteria that BLM uses to determine the boundaries of its proposed solar application areas and exclusion areas must reflect the mitigation hierarchy, under which avoidance of adverse impacts to important environmental, cultural, and social values is "the first and preferred form of mitigation."[72] Specifically, the mitigation hierarchy favors avoidance over either minimization or compensation, as follows:

> First, the BLM will seek to require the public land user to avoid impacts, consistent with applicable law (e.g., by altering project design, location, or timing); then the BLM will seek to require the public land user to minimize impacts (e.g., through project modifications, permit conditions, interim and final reclamation, etc.); and, generally, only if those approaches are insufficient to fully mitigate the impacts from a proposed public land use, will the BLM seek to require the public land user to compensate for some or all of the remaining impacts from the proposed public land use (i.e., residual effects).[73]

The mitigation hierarchy applies "at all relevant scales" during land use planning, including at the programmatic or landscape-scale.[74] The 2012 solar plan, for example, sought to achieve avoidance through both "siting decisions and the identification of priority SEZs."[75] Because the Draft Solar PEIS does not propose new SEZs, it is even more critical that BLM seeks to avoid adverse impacts through the exclusion criteria used to screen the public lands and designate solar application areas.

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[70] *See* 43 U.S.C. § 1701(a)(8) (requiring BLM to manage public lands "in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use").

[71] *See infra* Section II.b.

[72] BLM Mitigation Handbook, H-1794-1, ch. 3.1.A at 3-1 (Sept. 22, 2021); *see* BLM Instruction Memorandum 2021-046, *Reinstating the Bureau of Land Management (BLM) Manual Section (MS-1794) and Handbook (H-1794-1) on Mitigation* (2021) (reinstating BLM's mitigation handbook and policies).

[73] BLM Mitigation Handbook, H-1794-1, ch 3 at 3-1; BLM Mitigation Manual, MS-1794, ch. 3 at 3-1 (Sept. 22, 2021). In addition, the proposed Public Lands Rule "reaffirms the BLM's adherence to the mitigation hierarchy for all resources," 88 Fed. Reg. at 19,586, and seeks to define "mitigation" to align with CEQ's mitigation hierarchy, 88 Fed. Reg. at 19,589, 19,598 (to be codified at 43 C.F.R. § 6101.4), which also prioritizes avoidance over minimization and compensation. 40 C.F.R. § 1508.1(s).

[74] BLM Mitigation Handbook, H-1794-1, ch. 2.1.B at 2-3 to -4; BLM Mitigation Manual, MS-1794, ch. 2.2 at 2-3 to -4.

[75] 2012 Solar Plan ROD at 19; *see* BLM Mitigation Handbook, H-1794, ch. 2.4.B at 2-14; BLM Mitigation Manual, MS-1794, ch. 5.B at 5-1.

Under a landscape-scale approach, BLM considers baseline conditions, reasonably foreseeable impacts, and conditions and trends of resources,[76] as well as the management responsibilities and interests of other federal agencies and tribal, state, and/or local governments.[77] The updated Western Solar Plan must therefore adopt landscape-scale mitigation measures to ensure that the designated solar application areas and future development avoid sensitive resources and values on the public lands to the maximum extent possible.

c. BLM must clarify its approach for applying certain exclusions and mandatory design features at the project level to improve certainty for all interested stakeholders.

While adherence to the mitigation hierarchy strongly favors avoidance—that is, no development or project relocation—the hierarchy nonetheless makes clear that BLM's approach to managing the impacts of development is inherently flexible. Currently missing in the Draft Solar PEIS is a thorough discussion of how BLM proposes to implement this flexibility. For example, BLM states throughout the Draft Solar PEIS that the "exclusion criteria would prohibit solar energy development" where a given exclusion applies,[78] but the proposed programmatic design features clearly anticipate situations where developers may compensate for impacts to resource values that the exclusion criteria purport to make off-limits to development.[79] This appears at odds with the broad exclusion-based approach, especially in situations where exclusions are not or cannot be mapped.

BLM must clarify the interplay of these programmatic elements so that stakeholders can better understand its approach to solar development siting and permitting moving forward. This situation also exemplifies, again, the importance of BLM reconsidering its approach to siting prioritization and reviving the DLA designation process advanced in the Renewable Energy Rule. Doing so may vastly improve the level of certainty both developers and conservation-focused interests are able to attain from BLM's landscape-level analysis and allow projects to be prioritized for permitting and completion as many of the essential data gaps identified in these comments and the Draft Solar PEIS are resolved.

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[76] BLM Mitigation Handbook, H-1794-1, ch. 2.1.B at 2-3.

[77] BLM Mitigation Handbook, H-1794-1, ch. 2.1.B.3 at 2-3.

[78] *See, e.g.*, Draft Solar PEIS tbl. 2.1-1 at 2-5.

[79] A key example of this in the Draft Solar PEIS is the "occupied habitat" exclusion that, as presented, appears to bar development when an undefined species occupation threshold is reached. Draft Solar PEIS tbl. 2.1-3 & n.b at 2-21, 2-24. However, the proposed programmatic design features appear to simultaneously allow developers the flexibility necessary to site projects that might, following site-specific analysis, turn up evidence of occupied habitat. *See, e.g.*, Draft Solar PEIS Appendix B.4.1.5 at B-20 ("ER-G-4sss Project developers shall develop and implement measures to ensure mitigation (i.e., avoidance, minimization), monitoring, and adaptive management of impacts on special status and priority species in coordination with appropriate federal and state agencies (e.g., BLM, USFWS, and state resource management agencies). Compensatory mitigation will be required when resource impacts cannot be avoided."); *see infra* Section III.c.

d. The exclusion criteria must be based on the best available science rather than outdated RMPs to protect important resource values on public lands.

Under the proposed exclusion criteria, many important resources and values are excluded from utility-scale solar development only to the extent they are identified and protected in existing RMPs, which often are years or even decades out of date.[80] ACECs and old growth forests, for example, are not excluded from solar development unless an applicable land use plan identifies such areas (Exclusion Nos. 1 and 18). Similarly, lands with wilderness characteristics (LWCs) and big game migratory corridors and winter ranges are not excluded unless an existing land use plan both identifies *and* protects such areas (Exclusion Nos. 3 and 9). As written, these exclusion criteria do not sufficiently prevent UUD and exclude important resources and values on BLM-administered lands.

FLPMA directs BLM to "prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values . . . , giving priority to [ACECs]," which "shall be kept current so as to reflect changes in conditions and to identify new and emerging resource and other values."[81] FLPMA's mandate to maintain an inventory of public lands resources is the foundation on which all further management decisions are built, from land use allocations to site-specific project planning, so timely updates are essential to preventing the UUD of public lands. Without an updated inventory of important resources and values on public lands, baseline information will not be sufficient to permit adequate impact analysis, as NEPA requires.[82] Relatedly, the proposed Public Lands Rule would require BLM to identify intact landscapes on public lands that warrant protection from activities that "significantly disrupt, impair, or degrade the structure or functionality of intact landscapes."[83]

In many places across the West, local communities and tribal nations have proposed or are developing proposals to conserve intact landscapes and natural and cultural resource values through administrative or legislative designations. Due in part to incomplete inventories and mapping, parcels with significant resource values proposed for conservation, such as within the proposed Great Bend of the Gila National Monument in Arizona,[84] or potential ACECs within the Northwest California Integrated RMP,[85] appear on the BLM's current maps as available to

[80] *See* Draft Solar PEIS Appendix A tbl. A-1 at A-2 to -11.
[81] 43 U.S.C. § 1711(a).
[82] *See* 40 C.F.R. § 1502.15 (requiring EIS to "describe the environment of the area(s) to be affected or created by the alternatives under consideration, including the reasonably foreseeable environmental trends and planned actions in the area(s)"); *Half Moon Bay Fisherman's Marketing Ass'n v. Carlucci*, 857 F.2d 505, 510 (9th Cir. 1988) ("without establishing . . . baseline conditions . . . there is simply no way to determine what effect [an action] will have on the environment, and consequently, no way to comply with NEPA").
[83] 88 Fed. Reg. at 19,599 (to be codified at 43 C.F.R. § 6102.2(a)).
[84] *See infra* Section III.i.iii.
[85] BLM, Northwest California Integrated Draft Resource Management Plan and Environmental Impact Statement tbl. 3-81 at 3-371 (Sept. 2023).

application.[86] To help provide certainty for ongoing conservation efforts as well as for solar developers, BLM should update its inventories and data for a parcel upon receipt of an application and immediately reject applications for parcels that are eligible for conservation designations encompassed by the exclusion criteria or that are found to contain resources identified in the exclusion criteria.

The final exclusion criteria must comply with BLM's statutory obligations under FLPMA and, rather than rely solely on outdated RMPs and inventories, use the best available data and science to exclude lands with important resource values. And after the updated solar plan is finalized and new science becomes available, BLM should analyze the data, update its inventories, and either exclude or open public lands to solar application on a continuing and transparent basis.[87] In other words, even if BLM is unable to adequately inventory and exclude all the important resources values on public lands before the final PEIS, the exclusion areas should evolve over time as new information on resource conditions is developed, and BLM should make the mapped exclusion areas available to the public to the maximum extent practicable.

i. Areas of Critical Environmental Concern.

Proposed Exclusion No. 1 excludes solar development within "[a]ll ACECs identified in applicable land use plans."[88] While this exclusion properly protects designated ACECs, it fails to protect potential ACECs nominated by the public or by the agency during RMP revisions that are ongoing, or that have been paused, terminated, or otherwise not completed. In some cases, BLM has evaluated these nominations and found them to meet the relevance and importance criteria, but without a completed plan, these ACECs would remain open to potential solar development. In other cases, BLM has not yet evaluated pending ACEC nominations for formal designation.

The final solar plan should exclude nominated ACECs from utility-scale solar development and require BLM to promptly evaluate their relevance and importance, then either provide interim management or, if the lands do not qualify as an ACEC and are not otherwise excluded, open them to solar application.[89] Because RMP revisions can take many years to commence, let alone complete, interim management is needed to prevent UUD that potentially disqualifies them from formal designation. Further, to prevent lingering uncertainty, the final solar plan

[86] *See* BLM Data Viewer, https://blm-egis.maps.arcgis.com/apps/webappviewer/index.html?id=22df2b327e0c49c3a9afb67de5ca658d.
[87] *See* Draft Solar PEIS ch. 2.1.1.6 at 2-21 (exclusion areas "will change over time as land use plans are revised or amended and new information on resource conditions is developed").
[88] Draft Solar PEIS tbl. 2.1-3 at 2-21.
[89] By their nature, many nominated ACECs may already be excluded under other proposed exclusion criteria. Thus, excluding nominated ACECs until they are evaluated will not significantly BLM's siting flexibility under any of the action alternatives. In addition, many nominated ACECs overlap with inventoried LWCs and community LWCs awaiting evaluation that are not recognized in an existing RMP. *See infra* Section II.ii.

should require timely evaluations of nominated ACECs outside the land use planning process.

ACECs are "areas within the public lands where special management attention is required . . . to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes."[90] FLPMA therefore directs BLM to give "priority" to the identification, designation, and protection of ACECs during land use planning.[91] Moreover, BLM's ACEC Manual requires the agency to provide temporary management of potential ACECs to prevent their degradation before land use planning begins, as follows:

> Provide Temporary Management of Potential ACEC, if Necessary. If an area is identified for consideration as an ACEC and a planning effort is not underway or imminent, the District Manager or Area Manager must make a preliminary evaluation on a timely basis to determine if the relevance and importance criteria are met. If so, the District Manager *must* initiate either a plan amendment to further evaluate the potential ACEC*, or provide temporary management until an evaluation is completed through resource management planning.* Temporary management includes those reasonable measures necessary to protect human life and safety or significant resources values from degradation *until the area is fully evaluated through the resource management planning process*.[92]

Similarly, BLM Instruction Memorandum 2023-013 and the proposed Public Lands Rule both provide for the interim management of nominated ACECs to protect relevant and important resources and values until the agency completes a planning process and makes a designation determination.[93]

Consistent with FLPMA's mandates to prevent UUD and prioritize the protection of ACECs, as well as the interim management requirements described above, the final solar plan should exclude all nominated ACECs from solar development until BLM evaluates their relevance and importance and promptly determines whether to provide interim management or open the lands to solar application. Excluding these lands at the outset, rather than at the time of a proposed project, is the most efficient use of BLM's limited resources because it will provide certainty to interested stakeholders, avoid areas that are likely to present significant resource conflicts, and result in less community opposition.

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[90] 43 U.S.C. § 1702(a).
[91] 43 U.S.C. §§ 1711(a), 1712(c)(3); *see* BLM Manual 1613, *Areas of Critical Environmental Concern* at 1613.06 (1988).
[92] BLM Manual 1613 at 1613.21.E (emphasis added).
[93] BLM Instruction Memorandum 2023-013, *Clarification and Interim Guidance for Consideration of Areas of Critical Environmental Concern Designations in Resource Management Plans and Amendments* (Nov. 30, 2022); 88 Fed. Reg. at 19,596-97 (to be codified at 43 C.F.R. § 1610.7-2(c)(3)).

ii. Lands with wilderness characteristics.

Proposed Exclusion No. 3 excludes solar development within "all areas for which an applicable land use plan establishes protection for lands with wilderness characteristics."[94] Land use plans are often badly outdated, however, and as a result many inventoried LWCs are not recognized in land use plans. Moreover, many LWCs identified in RMPs do not benefit from management prescriptions to protect their wilderness qualities. BLM should exclude all inventoried LWCs regardless of whether a land use plan specifically protects them. In addition, numerous LWCs that the public has identified and submitted to BLM await evaluation and are neither recognized nor protected by a land use plan. BLM should also exclude all community-identified LWCs until they can be evaluated.

Due to their natural and untrammeled state, LWCs provide valuable wildlife habitat, including important core habitat and migration corridors. Wilderness-quality lands also support biodiversity, watershed protection, and overall healthy ecosystems. The low route density and absence of development activities, which attract motorized vehicles, are integral components of wilderness character and essential to productive wildlife habitat, large-scale connectivity, and riparian areas. LWCs also represent an important component of identifying intact landscapes and managing them for ecosystem resilience, as proposed in BLM's Public Lands Rule.[95]

FLPMA therefore obligates BLM to inventory wilderness characteristics on public lands on a continuing basis.[96] The protection of wilderness resources is consistent with FLPMA's definition of multiple use, which identifies the importance of wilderness characteristics and requires BLM to consider the relative values of these resources and not just "the combination of uses that will give the greatest economic return."[97]

Instruction Memorandum 2011-154 and BLM Manuals 6310 and 6320 contain mandatory guidance on implementing FLPMA's requirements with respect to inventorying and considering LWCs during land use planning. BLM Manual 6310, for example, requires the agency to "maintain and update as necessary" its LWC inventories, including when the public submits wilderness quality information or when BLM is undertaking a land use planning process.[98] Further, BLM Manual 6320 requires BLM to consider LWCs during land use planning, both in

[94] Draft Solar PEIS tbl. 2.1-3 at 2-21.
[95] 88 Fed. Reg. at 19,590, 19,599 (to be codified at 43 C.F.R. §§ 6101.5, 6102.1, 6102.2).
[96] 43 U.S.C. § 1711(a); *Or. Natural Desert Ass'n v. Bureau of Land Mgmt.*, 625 F.3d 1092, 1122 (9th Cir. 2008) (holding that "wilderness characteristics are among the 'resource and other values' of the public lands to be inventoried under § 1711"); BLM Manual 6310, *Conducting Wilderness Characteristics Inventory on BLM Lands*, ch. 1.6.A (2021).
[97] 43 U.S.C. § 1702(c).
[98] BLM Manual 6310, *Conducting Wilderness Characteristics Inventory on BLM Lands*, ch. 1.6.A (2021); *see* BLM Instruction Memorandum 2011-154, *Requirement to Conduct and Maintain Inventory Information for Wilderness Characteristics and to Consider Lands with Wilderness Characteristics in Land Use Plans* (July 25, 2011).

evaluating the impacts of management alternatives on LWCs and in evaluating alternatives that would protect those values.[99] Manual 6320 also directs BLM to "[c]onsider the benefits that may accrue to other resource values and uses as a result of protecting wilderness characteristics."[100]

The table below illustrates how relying on existing RMPs to exclude LWCs will leave a significant amount of inventoried BLM LWCs and community-identified LWCs unprotected in many BLM field offices:

ACRES OF OVERLAP BETWEEN SOLAR APPLICATION AREAS AND LWCs IN BLM FIELD AND DISTRICT OFFICES[101]						
Office (RMP Date)	**State**	**BLM LWC Alt 3**	**BLM LWC Alt 5**	**Community LWC Alt 3**	**Community LWC Alt 5**	**BLM LWC Inventory Date**
Tonopah (1997)	NV	386,038	22,582	146,078	8,093	2017
Ely (2008)	NV	164,916	11,267	256	181	2017
Price (2008)	UT	58,858	9,052	10,253	5,759	2013
Kingman (1995)	AZ	23,133	543	14,973	3,236	2017
Twin Falls (1982)	ID	362	257	119,427	22,507	2011 to 2014

As shown, in the Tonopah Field Office alone, where BLM has not updated the RMP since 1997, solar application areas under Alternative 3 would overlap with over 530,000 acres of BLM LWCs (386,038 acres) and community LWCs (146,078 acres) combined. Significant amounts of overlap

[99] BLM Manual 6320, *Considering Lands with Wilderness Characteristics in the BLM Land Use Planning Process*, ch. 1.6 (2021).

[100] BLM Manual 6320 ch. 1.6(A)(1)(b) at 1-4.

[101] Information in this table is from The Wilderness Society (TWS), which merged BLM or community LWC data into nationwide datasets and then clipped the data to each action alternative in the Draft Solar PEIS and calculated the acreage of overlap. For the community LWC analysis, TWS only included additional community LWCs that were not present in BLM's LWC data. BLM LWC data came directly from BLM and was usually acquired in the form of field office inventories. Where we possessed the full inventory, we queried the data to show only lands where BLM found wilderness characteristics. In some instances (Utah), datasets were available from BLM's GIS data hub or were acquired from the state office (Colorado). We also collected RMP data from BLM's E-Planning portal during administrative processes, when such data was available. Community LWC data represents inventories where the public has found wilderness characteristics within a given field office or planning area. Local wilderness coalitions, friends of wilderness groups, and TWS have all contributed to this data.

would also exist under Alternative 3 in the Price and Kingman Field Offices, where BLM has not updated the applicable RMPs since 2008 and 1995, respectively. And while Alternative 5 would result in significantly less overlap in all these field offices, it would still leave many LWCs available to solar application, including over 30,000 acres of BLM and community LWCs combined in the Tonopah Field Office. These are just a few examples of many.

For this reason, the final solar plan should exclude all inventoried LWCs at the outset and prohibit solar development in these areas, and exclude all community LWCs until BLM conducts the necessary wilderness characteristic evaluation. This approach would be the most efficient use of BLM's limited resources because it will provide certainty to stakeholders, avoid likely resource conflicts, and result in less community opposition, all of which will speed up the permitting process. Moreover, it will help maintain landscape intactness, support ecosystem resilience, and prevent UUD.

Notably, as suggested above, BLM could make significant strides toward excluding BLM and community-identified LWCs simply by selecting Alternative 5 rather than its preferred Alternative 3. As shown in the table below, solar application areas under Alternative 3 would overlap with approximately 1.6 million acres of inventoried BLM LWCs and a little more than 765,000 acres of community LWCs, for a total overlap of over 2.3 million acres of LWCs that are not identified in existing RMPs, let alone protected. On the other hand, solar application areas under Alternative 5 would overlap with about 203,000 acres of BLM LWCs and 91,000 acres of community LWCs, for a total of nearly 295,000 acres of LWCs not identified in existing RMPs:

ACRES OF OVERLAP BETWEEN SOLAR APPLICATION AREAS AND LWCs			
Alternative	**BLM LWCs**	**Community LWCs (excludes BLM LWCs)**	**Total overlap**
3	1,601,315	765,257	2,366,572
5	202,981	91,499	294,480

While we urge BLM to exclude all BLM and community LWCs at the outset, we believe the dramatic difference in LWC overlap between Alternatives 3 and 5 is an important distinction that BLM must consider when selecting an alternative and finalizing the Western Solar Plan. But regardless of which alternative BLM selects, all inventoried BLM LWCs should be permanently excluded and all community LWCs should be excluded until BLM conducts the necessary wilderness evaluation.

iii. Big game migration corridors and winter ranges.

Proposed Exclusion No. 9 excludes solar development within all big game migration corridors and winter ranges "identified in applicable land use plans," but only "to the extent the land use

plan decision prohibits utility-scale solar energy development" within such areas.[102] This unmapped exclusion criterion is inadequate.[103] BLM must work closely with cooperating agencies, other federal and state agencies, Tribes, and conservation organizations to analyze the best available science and identify critical components of migration corridors and winter ranges—such as linkages between protected areas, pinch points, stopover sites, and high-use areas—that help facilitate wildlife movement, increase the likelihood of species survival by promoting population abundance, and mitigate threats to biodiversity.[104] The United States Geological Survey's (USGS) collaborative Corridor Mapping Team has, to date, identified the migratory routes and habitats for 182 big game herds across the United States,[105] and are

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[102] Draft Solar PEIS tbl. 2.1-3 at 2-22.

[103] Under BLM's preferred Alternative 3, for example, solar application areas would overlap with about 1.8 million acres of big game migration corridors and 4 million acres of big game winter habitat, and even the most restrictive action alternative, Alternative 5, would overlap with about 730,000 acres of migration corridors and 1.8 million acres of winter habitat. Draft Solar PEIS tbl. 2.4-1 at 2-41. Also, very few RMPs identify migration corridors, and those that do often do not provide adequate management protections. *See, e.g.*, BLM, Lower Sonoran Record of Decision & Approved Resource Management Plan at 2-65 to -66 (Sept. 2012) ("2012 Lower Sonoran ROD and RMP") (designating Wildlife Movement Corridors for Sonoran pronghorn and other species but allowing all usual mineral activities to proceed). Notably, the 2012 Lower Sonoran ROD and RMP also identified utility-scale renewable energy avoidance areas to, in some instances, "maintain wildlife habitat and movement connectivity." 2012 Lower Sonoran ROD and RMP at 2-55. BLM should give maximum consideration to these previously designated renewable energy avoidance areas, and any similar designations set forth in other RMPs, in determining which lands to exclude from solar development.

[104] Convention on the Conservation of Migratory Species of Wild Animals (CMS), *State of the World's Migratory Species* (2024) [attached as Ex. 1 in Appendix 1A, at 2], https://www.cms.int/sites/default/files/publication/State%20of%20the%20Worlds%20Migratory%20Species%20report_E.pdf; Ellen O. Aikens et al., *Industrial energy development decouples ungulate migration from the green wave*, Nature Ecology & Evolution (2022) [attached as Ex. 2 in Appendix 1B, at 91], https://doi.org/10.1038/s41559-022-01887-9; Kevin Barnett & R. Travis Belote, *Modeling an aspirational connected network of protected areas across North America*, Ecological Applications, 31(6): e02387 (Sept. 2021) [attached as Ex. 3 in Appendix 1B, at 101], https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/eap.2387; Matthew J. Kauffman et al., *Causes, Consequences, and Conservation of Ungulate Migration*, Annual Review of Ecology, Evolution, and Systematics, 52: 453-78 (2021) [attached as Ex. 4 in Appendix 1B, at 108], https://www.annualreviews.org/content/journals/10.1146/annurev-ecolsys-012021-011516; R. Travis Belote et al., *Wild, connected, and diverse: building a more resilient system of protected areas*, Ecological Applications, 27(4): 1050-56 (2017) [attached as Ex. 5 in Appendix 1B, at 143], https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/eap.1527; R. Travis Belote et al., *Identifying Corridors among Large Protected Areas in the United States*, PLoS ONE 11(4): e0154223 (2016) [attached as Ex. 6 in Appendix 1B, at 150], https://doi.org/10.1371/journal.pone.0154223; CMS, *Renewable Energy Technologies and Migratory Species: Guidelines for Sustainable Deployment* at 8 (2014) ("CMS Guidelines") [attached as Ex. 7 in Appendix 1B, at 166], https://www.cms.int/sites/default/files/document/Doc_10_2_2_Guidelines_Renewable_Energy_E.pdf.

[105] USGS, *Collaborations across State, Tribal, and Federal organizations help to enhance habitat quality for western ungulate herds* (May 19, 2023), https://www.usgs.gov/index.php/special-topics/year-of-

involved in ongoing studies to document many more migrations. To fully achieve BLM's mandate for using the best available science and having an updated inventory of wildlife habitats, BLM should use the data produced from this Corridor Mapping Team's studies and all other relevant research in its inventories. And following this inventory work, BLM should implement a tiered approach that protects the critical components of big game migration corridors and winter ranges by excluding them from solar development and limits surface disturbance densities in the other portions,[106] as described below.

Healthy big game populations are essential to sustaining the ecological, economic, and cultural values of Western landscapes and communities. Migratory ungulates provide substantial ecological, cultural, and economic benefits, such as transferring nutrients, promoting plant diversity and productivity through seed dispersal, providing a food base for large carnivores and scavengers, and supporting the subsistence lifestyles and recreational economies of local communities.[107] The long-term health of migratory wildlife populations depends on their ability to migrate between winter and summer ranges, and research has shown that migratory herds show greater population abundance over non-migratory herds.[108] Poorly sited solar projects can cause habitat loss and degradation, fragmentation, and an overall decline in landscape connectivity that significantly disrupts the seasonal movement of wildlife between important habitat and stopover sites and ultimately contributes to species population decline and extinction.[109] The displacement and altered use of habitat by mule deer due to energy

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open-science/news/mapping-ungulate-migrations-across-western-us; USGS, National News Release, *Mapped: 33 new big game migrations across American West* (Apr. 11, 2024), https://www.usgs.gov/news/national-news-release/mapped-33-new-big-game-migrations-across-american-west.

[106] *See* The Wilderness Society et al., Comment Letter on Rock Springs Field Office Draft Resource Management Plan and Draft Environmental Impact Statement (DOI-BLM-WY-D040-2011-0001-RMP-EIS) at 31-41 (Jan. 17, 2024) ("TWS Rock Springs RMP Comments"); The Wilderness Society et al., Comment Letter on Colorado Big Game Corridor Resource Management Plan Amendment (DOI-BLM-CO-0000-2022-0003-RMP-EIS) at 21-22 (Sept. 2, 2022) ("TWS Big Game Corridor Comments") (recommending increased protections for priority corridors and ranges); *see* BLM CO State Office, Final Scoping Report at A-43 to -57 (Dec. 2022), https://eplanning.blm.gov/public_projects/2018400/200525996/20071136/250077318/20221205_FinalScopingRpt_Formatted_508.pdf. These comments are incorporated here by reference.

[107] Aikens et al. (2022); Kauffman et al. (2021).

[108] John M. Fryxell et al., *Why are migratory ungulates so abundant?*, The American Naturalist, 131(6): 781-98 (1988) [attached as Ex. 8 in Appendix 1B, at 234], https://www.journals.uchicago.edu/doi/abs/10.1086/284822; John M. Fryxell & A.R.E. Sinclair, *Causes and consequences of migration by large herbivores*, Trends in Ecology & Evolution, 3(9): 237-41 (1988) [attached as Ex. 9 in Appendix 1B, at 253], https://www.sciencedirect.com/science/article/abs/pii/0169534788901668.

[109] Hall Sawyer et al., *Trade-offs between utility-scale solar development and ungulates on western rangelands*, Frontiers in Ecology and the Envt., 20(6): 345-51 (2022) [attached as Ex. 10 in Appendix 1B, at 259], https://esajournals.onlinelibrary.wiley.com/doi/10.1002/fee.2498; *see* CMS (2024); Michael O. Levin et al., *Solar Energy-Driven Land-cover Change Could Alter Landscapes Critical to Animal Movement*

development also results in greater fitness costs during the winter months, when individual animals already exhibit a negative energy balance.[110]

FLPMA declares a federal policy of managing public lands to protect ecological values and wildlife habitat,[111] and directs BLM to "use a systemic interdisciplinary approach to achieve integrated consideration" of multiple forms of science to carry out its mandate.[112] It is therefore BLM's policy to "[i]dentify, using best available inventory data, important big game/upland game habitats at the BLM State, District, and Area level,"[113] and "[e]nsure that big game/upland game species on the public lands are provided habitat of sufficient quantity and quality to sustain identifiable economic and/or social contributions to the American People."[114] Because habitat connectivity is essential for ecological quality and healthy wildlife habitats, BLM must create a systematic data-driven approach to inventorying, designating, and managing public lands to preserve connected lands that serve as key linkages between core habitats.

In 2018, in order to address the declining condition of big game migration corridors and winter ranges in the eleven western states, the Secretary of the Interior (Secretary) issued Secretarial Order 3362 directing BLM and other agencies to work in close partnership with the states to evaluate and apply measures that "conserve or restore habitat necessary to sustain local and regional big-game populations."[115] Such measures may include avoiding development in "crucial" migration corridors and winter ranges during sensitive seasons and minimizing developments that "fragment" migration corridors and winter ranges, as well as "other proven actions necessary to conserve and/or restore the vital big-game winter range and migration corridors across the West."[116] This policy directive was further reinforced in May 2021 in a report to the National Climate Task Force entitled "Conserving and Restoring America the Beautiful," which commits to expanding the collaborative conservation of wildlife habitats and

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in the Continental United States, Envtl. Science & Tech., 57: 11,499-509 (2023) [attached as Ex. 11 in Appendix 1C, at 266], https://pubs.acs.org/doi/10.1021/acs.est.3c00578?ref=pdf; Aikens et al. (2022); Kauffman et al. (2021); Colorado Parks & Wildlife (CPW), *2020 Status Report: Big Game Winter Range and Migration Corridors* at 25-33 (2020) [attached as Ex. 12 in Appendix 1C, at 277], https://cpw.state.co.us/Documents/Hunting/BigGame/2020BigGameWinterRangeandMigrationCorridorsReport.pdf; CMS Guidelines at 55.

[110] Joseph M. Northrup et al., *Quantifying spatial habitat loss from hydrocarbon development through assessing habitat selection patterns of mule deer*, Global Change Biology 21(11): 3961-70 (2015) [attached as Ex. 13 in Appendix 1C, at 296], https://onlinelibrary.wiley.com/doi/full/10.1111/gcb.13037.

[111] 43 U.S.C. § 1701(a)(8).

[112] 43 U.S.C. § 1712(c)(2).

[113] BLM Manual 6500, *Wildlife and Fisheries Management*, sec. 6500.12.B.2.a.

[114] BLM Manual 6500 sec. 6500.12.B.1.

[115] Secretarial Order No. 3362, *Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors*, § 4(b)(5) (Feb. 9, 2018).

[116] Secretarial Order No. 3362 §§ 4(b)(5)(iv)-(v), (vii).

migration corridors and continuing implementation of Secretarial Order 3362.[117]

BLM also issued guidance in November 2022 to "ensure habitat connectivity, permeability, and resilience is restored, maintained, improved, and/or conserved."[118] Consistent with BLM's obligations under FLPMA to inventory and protect important resources and values on the public lands, and to help BLM determine "where best to focus management of connectivity," the guidance required the agency, within one calendar year, to assess the public lands and inventory areas of habitat connectivity "that support or facilitate priority species movements and other ecological processes, such as seed dispersal, migrations, and stopover sites."[119] And upon completion of the habitat connectivity assessment and inventory, BLM must consider each area determined to be important to connectivity "as a habitat feature for the relevant species" and appropriately analyze and address potential impacts to such features in land use planning.[120]

Similarly, in March 2023, the CEQ issued guidance on ecological connectivity and wildlife corridors establishing a national policy that, "[t]o the maximum extent practicable," federal agencies must "conserve, enhance, protect, and restore corridors and connectivity."[121] CEQ's objective "is to build consideration of connectivity and corridors into the early steps of [land use planning] processes to facilitate easy implementation," and provide clear policy direction that will "help avoid conflicts between multiple uses in advance and drive development to areas with fewer conflicts."[122] To that end, agencies must elevate "the conservation, enhancement, protection, and restoration of connectivity and corridors as a programmatic goal" in landscape-scale planning and decision-making,[123] and consistent with FLPMA, assess and inventory connectivity and corridor values on public lands to "inform project siting decisions" and "protective designations."[124] This guidance underscores the importance of proactive and early integration of wildlife connectivity considerations during planning and decision-making, ideally at the landscape level. Accordingly, BLM must assess habitat connectivity on the public lands and inventory important wildlife migration corridors to inform its decisions in the Western Solar Plan.

The agency has access to a wealth of current research about big game migration corridors in the western United States. Though the science on ungulate migrations continues to evolve, we

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[117] U.S. Dep't of Interior et al., *Conserving and Restoring America the Beautiful* at 19-20 (2021) ("2021 America the Beautiful Report"), https://www.doi.gov/sites/default/files/report-conserving-and-restoring-america-the-beautiful-2021.pdf.
[118] BLM Instruction Memorandum 2023-005, Change 1, *Habitat Connectivity on Public Lands* (Nov. 18, 2022).
[119] BLM Instruction Memorandum 2023-005, Change 1.
[120] BLM Instruction Memorandum 2023-005, Change 1.
[121] CEQ, *Guidance for Federal Departments and Agencies on Ecological Connectivity and Wildlife Corridors* at 2 (Mar. 21, 2023) ("CEQ Connectivity Guidance").
[122] CEQ Connectivity Guidance at 5.
[123] CEQ Connectivity Guidance at 5.
[124] CEQ Connectivity Guidance at 6; *see* 43 U.S.C. §§ 1711(a), 1712(c)(4).

know how crucial corridors are to population abundance and how animals use different areas, or habitats, within corridors at different intensities. For instance, peer-reviewed research shows that mule deer spend 95% of the migratory period foraging and resting at stopover sites, where habitat quality is higher than in other areas, and that deer continue to use the same stopover areas from year to year.[125] These stopover sites are important resting areas along the long migration routes where valuable food resources are abundant. Research has also shown that mule deer have a strong fidelity to their learned migration corridors from generation to generation that overrides the animal's potential to learn new routes.[126] Further, mule deer mediate exposure to development by altering movements—both rates and timing/duration—rather than changing the routes they traverse.[127] For example, use of migratory habitat by mule deer, excluding stopover areas, has been shown to decline as surface disturbance from oil and gas development increases, with sharp declines observed when development crosses a 3% threshold.[128] Researchers caution against applying this threshold finding to stopover habitats, however, which are disproportionately important for tracking vegetation green-up and characterized by low human disturbance.

Clearly, it is reasonable to assume that the same animals will avoid utility-scale solar projects, which would reduce access to forage and disrupt movement through migration corridors. If, in response to solar development, animals moved through traditional stopover areas quickly without stopping, they would not consume valuable food resources at important times during their migration. The final solar plan should therefore prioritize, and exclude, stopover locations and high-use areas of connectivity between these important forage locations.[129] The final solar plan should also prioritize the exclusion of critical bottlenecks, or pinch points, where solar development could have especially far-reaching adverse impacts on wildlife movement and survival.

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[125] Hall Sawyer & Matthew J. Kauffman, *Stopover ecology of a migratory ungulate*, Journal of Animal Ecology, 80(5): 1078-87 (2011) [attached as Ex. 14 in Appendix 1C, at 306], https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/j.1365-2656.2011.01845.x.

[126] Jerod A. Merkle et al., *Spatial memory shapes migration and its benefits: evidence from a large herbivore*, Ecology Letters, 22(11): 1797-1805 (2019) [attached as Ex. 15 in Appendix 1C, at 316], https://onlinelibrary.wiley.com/doi/abs/10.1111/ele.13362; Hall Sawyer et al., *All routes are not created equal: An ungulate's choice of migration route can influence its survival*, Journal of Applied Ecology, 56(8): 1860-69 (2019) [attached as Ex. 16 in Appendix 1C, at 326], https://besjournals.onlinelibrary.wiley.com/doi/full/10.1111/1365-2664.13445.

[127] Teal B. Wyckoff et al., *Evaluating the influence of energy and residential development on the migratory behavior of mule deer*, Ecosphere, 9(2): e02113 (2018) [attached as Ex. 17 in Appendix 1C, at 336], https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/ecs2.2113.

[128] Hall Sawyer et al., *Migratory disturbance thresholds with mule deer and energy development*, Journal of Wildlife Mgmt., 84(5): 930-37 (2020), https://wildlife.onlinelibrary.wiley.com/doi/10.1002/jwmg.21847.

[129] David S. Jachowski et al., *Integrating physiological stress into the movement ecology of migratory ungulates: a spatial analysis with mule deer*, Conservation Physiology, 6(1) (2018) [attached as Ex. 19 in Appendix 1C, at 349], https://academic.oup.com/conphys/article/6/1/coy054/5110105?login=false.

To provide both clarity and durability, we urge BLM to implement a tiered approach to big game migration corridors and winter ranges in the final solar plan that appropriately targets crucial corridor by excluding critical stopover sites, connecting lands (including potential locations for wildlife crossings), high-use areas, and bottlenecks, while the medium- and low-use portions of migration corridors and winter ranges would be subject to solar development density limitations and permeability requirements.[130]

To that end, BLM should collaborate with federal and state agencies, tribes, and NGOs to analyze local and regional data and high-resolution national spatial datasets to identify the crucial components of migration corridors that will enable wildlife movement in response to climate change and protect a broader variety of ecosystem types and species.[131] We also recommend that BLM take full advantage of the immense dataset compiled by the USGS in Ungulate Migrations of the Western United States Volumes 1, 2, 3, and 4 (as well as any future volumes to be published).[132] This work should be an ongoing process that continues even after the update to the Western Solar Plan is finalized, such that BLM will update the exclusion areas as new science and research becomes available. Given the number of ongoing studies and research planned in the future, BLM must be responsive and adaptive to any new research on big game migration corridors. Relatedly, BLM should act quickly to complete its inventory of habitat connectivity and migration corridors required by Instruction Memorandum 2023-005 and incorporate those findings into the exclusion criteria and programmatic design features.

Keeping priority migration corridors and winter ranges intact and viable over the long term requires interagency collaboration and detailed data analysis and planning at a national, state, and landscape scale. Here, BLM should collaborate with other stakeholders to identify priority corridors and ranges for exclusion from utility-scale solar development, regardless of whether such areas are excluded under an existing land use plan.

iv. Mature and old growth forests.

Proposed Exclusion No. 18 excludes solar development in "Old Growth Forests identified in applicable land use plans."[133] This exclusion focuses solely on existing land use plans, which are often outdated, and therefore falls short of the Biden Administration's directive in Executive

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[130] *See infra* Section III.b.iii.

[131] R. Travis Belote et al., *Beyond priority pixels: Delineating and evaluating landscapes for conservation in the contiguous United States*, Landscape and Urban Planning 209 (2021) [attached as Ex. 20 in Appendix 1C, at 363], https://www.sciencedirect.com/science/article/pii/S0169204621000220; Barnett & Belote (2021); Kauffman et al. (2021); Belote et al. (2017); Belote et al. (2016); *see* TWS Big Game Corridor Comments at 7-11.

[132] USGS, *Mapping Ungulate Migrations Across the Western U.S.* (May 19, 2023), https://www.usgs.gov/index.php/special-topics/year-of-open-science/news/mapping-ungulate-migrations-across-western-us; USGS, National News Release, *Mapped: 33 new big game migrations across American West* (Apr. 11, 2024), https://www.usgs.gov/news/national-news-release/mapped-33-new-big-game-migrations-across-american-west.

[133] Draft Solar PEIS tbl. 2.1-3 at 2-23.

Order No. 14072, "Strengthening the Nation's Forests, Communities, and Local Economies," to inventory, conserve, and restore old growth and mature forests on federal lands.[134] The BLM and U.S. Forest Service (USFS) recently completed the required inventory of old growth and mature forests on federal lands,[135] and BLM should use this inventory and subsequent guidance to identify and exclude old growth emphasis areas, or priority old growth areas, consisting of all existing old growth forest and a strategic amount of mature forest to effectively meet scientifically-determined old growth targets and sustain these ecosystems on public lands.[136] This should be an ongoing process both before and after the solar plan is finalized, as BLM identifies old growth emphasis areas during future land use planning, project reviews,[137] and other processes and continues to update and refine the exclusion areas related to mature and old growth forests.[138]

Executive Order 14072 recognizes the widespread importance of mature and old growth forests. They provide clean air and water, sustain and increase biodiversity, enhance climate resilience, enable cultural and subsistence uses, and offer outdoor recreation opportunities,[139] so protecting priority old growth and mature forests will not only advance BLM's multiple use and sustained yield mission under FLPMA, it will also align with a principal aim of the Western Solar Plan to combat climate change through the protection of carbon sinks that "play an irreplaceable role in reaching net-zero greenhouse gas emissions."[140]

These essential ecological, climate, cultural, and recreational benefits are shared by all old growth and mature forests on BLM lands. BLM recently recognized that pinyon pine and juniper ("pinyon juniper") forests—which make up about 90% of the inventory of mature and old growth forests on BLM-managed lands—have "distinct characteristics that develop over centuries" to support a "multitude of species," including the imperiled pinyon jay, "have

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[134] Exec. Order No. 14,072, § 2 (Apr. 22, 2022), 87 Fed. Reg. 24,851, 24,852 (Apr. 27, 2022).
[135] USFS & BLM, *Mature and Old-Growth Forests: Definition, Identification, and Initial Inventory on Lands Managed by the Forest Service and Bureau of Land Management* (Apr. 2023), https://www.fs.usda.gov/sites/default/files/mature-and-old-growth-forests-tech.pdf.
[136] *See* The Wilderness Society et al., Comment Letter on Proposed Public Lands Rule at 58-59 (July 5, 2023) (recommending that BLM maintain an updated inventory of mature and old growth forests, identify old growth emphasis areas, and adopt related management prescriptions), https://www.regulations.gov/comment/BLM-2023-0001-153186. These comments are incorporated here by reference.
[137] *See infra* Section III.b.iv.
[138] *See* Draft Solar PEIS ch. 2.1.1.6 at 2-21 (exclusion areas "will change over time as land use plans are revised or amended and new information on resource conditions is developed").
[139] 87 Fed. Reg. at 24,852.
[140] 87 Fed. Reg. at 24,851 (highlighting that America's forests absorb more than 10 percent of the nation's annual greenhouse gas emissions); *see* Dominick A DellaSala et al., *Mature and old-growth forests contribute to large-scale conservation targets in the conterminous United States*, Frontiers in Forests and Global Change, 5:979528 (2022) [attached as Ex. 1 in Appendix 2, at 2], https://www.frontiersin.org/articles/10.3389/ffgc.2022.979528/full.

significant value to Tribes," and are a popular destination for recreation.[141] Old growth and mature pinyon-juniper ecosystems, which feature carbon rich biotic crusts, are important carbon sinks that account for a significant amount of carbon storage of federal lands.[142]

Pinyon juniper forests are often misunderstood due largely to their relatively un-studied nature compared to other forest cover types and because they often occur in areas that have experienced centuries of landscape manipulation through the removal of woody vegetation and introduction of forage grasses for grazing. Thus, pinyon juniper systems have been, and continue to be, disproportionately subject to thinning, clearing, and other mechanical vegetation removal treatments.[143]

Like all mature and old growth forests, the remaining mature and old growth pinyon-juniper woodlands on BLM-administered lands represent some of the least disturbed landscapes that provide myriad benefits for wildlife, clean water, and other important natural and cultural resource benefits, including:

- Mature and old growth pinyon-juniper woodlands store atmospheric carbon. Pinyon-juniper forests are the primary forest and woodland vegetative cover type in the arid Intermountain West and Southwest. In areas where large woody vegetation is scarce, these woodlands provide considerable carbon storage benefits, both in the trees themselves and in associated biological soil crusts and understory plants that are components of the unique native understory found in old and mature pinyon-juniper forests. While the density of carbon stored in pinyon-juniper forests may be low relative to other forest types, because pinyon-juniper woodlands cover such a large area, their contribution to carbon storage is significant. Aboveground carbon stocks in juniper woodlands are well over double those of other arid plants, and studies have shown that as juniper size increases, so does carbon storage. Old growth and mature pinyon-juniper forests often lack a history of ground disturbance, meaning that soils, including biological soil crusts, which are also a significant long-term dryland carbon sink, are better preserved in these mature and old growth stands.

- Mature and old growth pinyon-juniper woodlands sustain biodiversity. A multitude of species are found in pinyon-juniper woodlands, including some sensitive and at-risk

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[141] BLM & USFS, *Fact Sheet, Pinyon-Juniper Woodlands* ("BLM Pinyon Juniper Old Growth Fact Sheet"), https://www.fs.usda.gov/sites/default/files/pinyon-juniper-fact-sheet.pdfK; *see* Kevin Barnett et al., *Classifying, inventorying, and mapping mature and old-growth forests in the United States*, Frontiers in Forests and Global Change, 5:1070372 (2023) [attached as Ex. 2 in Appendix 2, at 22], https://www.frontiersin.org/articles/10.3389/ffgc.2022.1070372/full.

[142] BLM Pinyon Juniper Old Growth Fact Sheet; Emily J. Fusco et al., *Accounting for aboveground carbon storage in shrubland and woodland ecosystems in the Great Basin,* Ecosphere, 10(8): e02821 (2019) [attached as Ex. 3 in Appendix 2, at 47], https://doi.org/10.1002/ecs2.2821.

[143] Miranda D. Redmond & Nichole N. Barger, *Tree regeneration following drought- and insect-induced mortality in piñon-juniper woodlands*, New Phytologist, 200(2): 402-12 (2013) [attached as Ex. 4 in Appendix 2, at 64], https://nph.onlinelibrary.wiley.com/doi/full/10.1111/nph.12366.

species. Older stands with larger and more developed trees provide higher seed production and attract and support seed-dispersing birds such as the pinyon jay, scrub jay, and Clark's nutcracker. Pinyon pine only produce female cones at 80 years of age and older, and trees that are several hundred years old produce the best bursts of cones that can survive predation and sustain the above-mentioned dispersers. Pinyon jays, currently being considered for listing under the Endangered Species Act (ESA),[144] live in these forests year-round. Long-term drought, climate change, and habitat loss pose a significant threat to pinyon jay populations.

- Mature and old growth pinyon-juniper forests provide for subsistence and cultural uses. Pinyon-juniper woodlands are forests with exceptional cultural importance and a long history of interdependence with Indigenous people. Pinyon-juniper forests have provided for medicinal, artistic, ceremonial, construction, and food use throughout human history in these ecosystems. Pinyon pine nuts have been a staple keystone food for Indigenous peoples for thousands of years and only older trees produce pine nuts to a sustainable degree.

Old growth and mature forests are "quickly disappearing."[145] BLM and the USFS's analysis demonstrates over half of old growth forests, and two thirds of mature forests, have high exposure to a variety of threats of enduring loss or degradation, and that these threats will increase with climate change.[146] Consistent with BLM's obligation to prevent UUD under FLPMA and our national clean energy and 30 by 30 goals, and other laws and policy directives related to public lands, it is imperative that BLM preserves and restores the United States' old growth and mature forests to the maximum extent possible.

As required by Executive Order 14072, BLM and the USFS released their old growth inventory in April 2023, which documented 8 million acres of old growth forests and woodlands and over 12 million acres of mature forests on BLM-administered lands.[147] Now that the inventory is complete, the Executive Order directs BLM to institutionalize "climate-smart management and conservation strategies that address threats to mature and old-growth forests" on BLM lands.[148] BLM must take action through programmatic planning efforts, such as this update to the Western Solar Plan, to implement this directive. Although the USFS, acting in fulfillment of

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[144] Endangered and Threatened Wildlife and Plants; 90-Day Findings for Five Species, 88 Fed. Reg. 55,991 (Aug. 17, 2023).
[145] 87 Fed. Reg. at 24,851.
[146] USFS & BLM, *Introductory Report: Analysis of Threats to Mature and Old-Growth Forests on Lands Managed by the Forest Service and Bureau of Land Management, Fulfillment of Executive Order 14072, Section 2.c.ii*, FS-1242a (Jan. 2024), https://www.fs.usda.gov/sites/default/files/fs_media/fs_document/MOG-Threats-Intro.pdf.
[147] USFS & BLM, *Mature and Old-Growth Forests: Definition, Identification, and Initial Inventory on Lands Managed by the Forest Service and Bureau of Land Management, Fulfillment of Executive Order 14072, Section 2(b)*, FS-1215a (Apr. 2023) ("USFS/BLM MOG Definition, Identification, and Inventory"), https://www.fs.usda.gov/sites/default/files/mature-and-old-growth-forests-tech.pdf.
[148] 87 Fed. Reg. at 24,852.

the same directive, recently initiated an effort to amend forest land management plans nationwide,[149] BLM has not initiated a similar programmatic conservation effort. While the Draft Solar PEIS touches on old growth conservation in Exclusion No. 18, its protections fall short of Executive Order 14072 directive and meaningful forest conservation. This exclusion criterion only protects old growth forests, not mature forests, and only if they are identified in RMPs. This proposed approach is problematic for two reasons.

First, sole reliance on RMPs will not adequately protect old growth forests on BLM-managed lands, as many RMPs are badly outdated and, even if not, in nearly all cases they will pre-date the 2023 old growth inventory and the information learned during that process. BLM has recognized as much, acknowledging that many RMPs do not adequately address, let alone discuss, old growth and mature forests and will need to be amended or revised to comply with Executive Order 14072.[150] RMP amendments often take several years to complete after the process is commenced.

Second, Exclusion No. 18 leaves an essential ecological resource and carbon sink—mature forests—entirely unprotected. Mature forests are ecologically characterized as the stage of forest development immediately before old growth and they include many of the characteristics of, and provide many of the same benefits as, old growth forests.[151] Conserving mature forests is important both for the multitude of benefits they currently provide, and because preserving and allowing them to mature is essential for restoring and recovering the nation's dwindling old growth.[152]

The Western Solar Plan should exclude old growth emphasis areas that BLM identifies during this PEIS process, future project site surveys, or other land use planning efforts, and should do so regardless of whether such area is identified in a RMP. As discussed above, BLM recently completed an inventory of old growth and mature forests on BLM lands that Executive Order 14072 intended to facilitate subsequent protective actions. BLM should follow through and implement such protections in the Western Solar Plan amendment to the maximum extent possible. So in addition to our recommended design features to address potential project impacts to mature and old growth forests,[153] BLM must use its inventory and other available data and science on an ongoing basis to identify and exclude mature and old growth emphasis areas from solar development. BLM should also develop related guidance and management

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[149] Land Management Plan Direction for Old-Growth Forest Conditions Across the National Forest System, 88 Fed. Reg. 88,042 (Dec. 20, 2023); *see* The White House, *FACT SHEET: Biden-Harris Administration Advances Commitment to Protect Old Growth Forests on National Forest System Lands*, https://www.whitehouse.gov/briefing-room/statements-releases/2023/12/19/fact-sheet-biden-harris-administration-advances-commitment-to-protect-old-growth-forests-on-national-forest-system-lands/?utm_source=link.

[150] BLM Information Bulletin 2023-013, *Strengthening BLM Management Considerations in Old-Growth and Mature Forests* (Dec. 9, 2022).

[151] USFS/BLM MOG Definition, Identification, and Inventory.

[152] *See* 87 Fed. Reg. at 24,851.

[153] *See infra* Section III.b.iv.

prescriptions for old growth emphasis areas that address how to establish and, as necessary, revise the boundaries of such areas.

e. BLM should exclude priority desert tortoise connectivity habitat identified by the U.S. Fish and Wildlife Service.

Proposed Exclusion No. 2 excludes all designated and proposed critical habitat under the ESA, including for the threatened Mojave desert tortoise,[154] and all "[k]nown occupied habitat" identified "during project-specific evaluations."[155] Further, proposed Exclusion No. 8 would exclude desert tortoise translocation sites.[156] To protect important linkages between conservation areas, the final solar plan should also exclude Priority 1 and 2 desert tortoise connectivity habitat identified by the U.S. Fish and Wildlife Service (USFWS).[157]

The Mojave desert tortoise is extremely sensitive to changes in their environment. Heightened drought conditions, wildfires, and solar energy development, among other stressors, have all led to chronic declines in tortoise populations throughout its range, including in USFWS-designated recovery units.[158]

Accordingly, the 2012 Western Solar Plan includes an exclusion criterion to protect sensitive natural, visual, and cultural resources on lands identified after the October 2011 supplemental PEIS (Exclusion No. 32),[159] and BLM subsequently excluded approximately 515,000 acres of priority desert tortoise connectivity habitat under this criterion.[160] "[G]iven the anticipated high conflict, higher survey costs, and high mitigation requirements" associated with development in

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[154] Draft Solar PEIS tbl. 2.1-3 at 2-21.
[155] Draft Solar PEIS tbl. 2.1-3 n.b at 2-24. The Draft Solar PEIS does not define what constitutes occupied habitat for desert tortoise. *See supra* II.c; *infra* Section III.c.
[156] Draft Solar PEIS tbl. 2.1-3 at 2-22.
[157] *See* Map of Priority Desert Tortoise Connectivity Habitat Identified by the USFWS (July 2012), https://solareis.anl.gov/documents/fpeis/maps/FWS_Desert_Tortoise_Connectivity.pdf; Explanation of Map of FWS-Identified Priority Desert Tortoise Connectivity Areas, https://solareis.anl.gov/documents/fpeis/maps/FWS_Connectivity_Explanation.pdf. Rather than exclude priority tortoise connectivity habitat, the Draft Solar PEIS simply states that the avoidance of Priority 1 and 2 desert tortoise connectivity habitat "may be useful." Draft Solar PEIS ch. 5.4.4.3 at 5-78.
[158] M. Susanna Glass et al., *Survival and behavior of Mojave desert tortoises head-started with and without outdoor rearing*, The Journal of Wildlife Management (2024) [attached as Ex. 1 in Appendix 3, at 2]; K.H. Berry et al., *Gopherus agassizii, Mojave Desert Tortoise: The IUCN Red List of Threatened Species* (2021) [attached as Ex. 2 in Appendix 3, at 21], https://www.iucnredlist.org/species/97246272/3150871; Kristin H. Berry et al., *The Catastrophic Decline of Tortoises at a Fenced Natural Area*, Wildlife Monographs 205:1-53 (2020) [attached as Ex. 3 in Appendix 3, at 61], https://wildlife.onlinelibrary.wiley.com/doi/full/10.1002/wmon.1052#:~; Linda J. Allison & Ann M. McLuckie, *Population Trends in Mojave Desert Tortoises (Gopherus Agassizii)*, Herpetological Conservation and Biology 13(2):433-52 (2018) [attached as Ex. 4 in Appendix 3, at 114], https://www.herpconbio.org/Volume_13/Issue_2/Allison_McLuckie_2018.pdf.
[159] 2012 Solar Plan ROD Appendix A tbl. A at A-2.
[160] BLM Instruction Memorandum 2023-015, Attachment 3 at 3-2, Step 22.

priority desert tortoise connectivity habitat, the 2012 plan and associated variance process requires developers who propose solar projects in priority desert tortoise connectivity habitat that is not already excluded to work with the BLM and USFWS at the preliminary application meeting to avoid the highest priority areas.[161] The updated solar plan should impose similar protections.

Despite the existing exclusion and protections for desert tortoise connectivity habitat in the variance process, the draft solar plan does not exclude such habitat. Rather, the Draft Solar PEIS merely states "it may be useful" for developers to "avoid to the extent practicable all solar energy development activities in Priority 1 and 2 desert tortoise habitat."[162] This is inadequate. As shown in the table below, the solar application areas under all the action alternatives in the Draft Solar PEIS would significantly overlap with priority desert tortoise connectivity habitat identified by USFWS:

Acres of Overlap Between Solar Application Areas and USFWS Priority 1 and 2 Desert Tortoise Connectivity Habitat[163]					
Alternative	1	2	3	4	5
Total Acres	733,376	704,880	661,096	207,172	193,755

BLM's preferred Alternative 3 would intersect with over three times as many acres of priority tortoise connectivity habitat (661,096 acres) as Alternative 5 (193,755 acres), so simply selecting Alternative 5 as the preferred alternative would greatly reduce the potential conflicts with tortoise connectivity habitat and level of required mitigation.

Because solar development disproportionately impacts the desert tortoise, which are in steady decline, the final solar plan should exclude all Priority 1 and 2 connectivity habitat, regardless of which alternative BLM selects. Such an exclusion would increase certainty and efficiency with respect to project siting, permitting, and mitigation, and also be consistent with the recent guidance on habitat connectivity issued by CEQ and BLM.[164]

f. BLM must consult with tribes to identify the Tribal Interest Areas to be excluded.

Proposed Exclusion No. 17 prohibits solar development within "Tribal Interest Areas," described as traditional cultural properties (TCPs) and sacred sites identified through tribal consultation

[161] 2012 Solar Plan ROD Appendix A.4.1.11.1 at 75; BLM Instruction Memorandum 2023-015, Attachment 3 at 3-2, Step 23; BLM, Variance Protocol for Desert Tortoise, https://blmsolar.anl.gov/non-competitive/specific/variance/factors/desert-tortoise.
[162] Draft Solar PEIS ch. 5.4.4.3 at 5-78.
[163] As determined by TWS using USFWS GIS layers.
[164] CEQ Connectivity Guidance; BLM Instruction Memorandum 2023-005, Change 1.

"and recognized by the BLM" or through a Memorandum of Understanding (MOU).[165] Pursuant to its solemn trust obligations, BLM must meaningfully consult with interested tribes to identify the location and appropriate scope of the Tribal Interest Areas to be excluded.[166]

In 2021, the U.S. Department of the Interior entered into an inter-agency MOU to increase collaboration with tribes and ensure good stewardship and rightful access to sacred sites. The MOU acknowledged that while a sacred site is defined as a "specific, discrete, narrowly delineated location," these sites "often occur within a larger landform or are connected through physical features or ceremonies to other sites or a larger sacred landscape."[167] Therefore, federal agencies were instructed to "consider these broader areas and connections."[168]

Consistent with this direction, BLM should expand its exclusion description of Tribal Interest Areas beyond TCPs and sacred sites, based on tribal consultation within the current planning process. This may include adding interests such as sacred lands and viewsheds to the description.

g. BLM should exclude all areas where solar applications previously received a low priority due to known resource conflicts.

Although the Renewable Energy Rule will change the application prioritization process, BLM previously prioritized solar applications by using the list of screening criteria and factors at 43 C.F.R. § 2804.35 and assigning them a high, medium, or low priority. Because applications receiving a low priority typically do not enter the variance process and are typically rejected, the exclusion criteria should exclude all lands where a solar application previously received a low priority.

Among other factors, low priority applications included lands that are "near or adjacent to" sensitive areas such as units of the National Park Service (NPS), USFWS Refuge System, and National Landscape Conservation System (NLCS), among other protected areas.[169] Late last year, for example, BLM assigned a low priority to several solar applications in the Amargosa Valley in Nevada due to potential hydrological impacts to the Ash Meadows National Wildlife Refuge, Ash Meadows ACEC, Death Valley National Park (i.e., Devil's Hole), and the numerous threatened and endangered species and critical habitats present within these areas.[170] Despite the low priority designations and well-known conflicts, all the action alternatives in the Draft

[165] Draft Solar PEIS tbl. 2.1-3 at 2-23.
[166] *See supra* Section I.c.
[167] Interagency MOU on Sacred Sites.
[168] Interagency MOU on Sacred Sites; NPS Bulletin 38 at 1, 9, 18-19 (TCPs include culturally significant natural "landscapes").
[169] 43 C.F.R. § 2804.35(c)(1)-(2).
[170] *See, e.g.*, BLM, N-100386 Solar 373 Priority Determination (Oct. 12, 2023); BLM, N-100448 Amargosa East Priority Determination (Oct. 12, 2023); BLM, N-100732 Busted Butte Priority Determination (Oct. 12, 2023).

Solar PEIS would continue to make substantial portions of the same lands available to solar application.[171]

Common sense dictates that these lands be excluded from the solar application areas going forward. BLM should therefore expand Exclusion No. 19 (Lands Previously Found to Be Inappropriate for Solar Energy Development) to exclude lands where a solar application previously received a low priority.[172]

III. Preventing unnecessary and undue degradation of public lands and mitigating environmental and social impacts at the project level.

Appendix B in the Draft Solar PEIS identifies mandatory programmatic design features to be implemented at the project level. The design features are mitigation measures, or best management practices, that apply to all the action alternatives and all proposed projects under each alternative, as applicable. Like the resource-based exclusion criteria, BLM must carefully craft the design features to ensure they prevent the UUD of public lands and follow the mitigation hierarchy (i.e., avoidance, minimization, and compensation) to the maximum extent possible.[173] Requiring avoidance—including maximum consideration of project relocation where impacts to important resource values cannot be avoided—will ensure that BLM utilizes its substantial siting flexibility within the proposed solar application areas, which is critical because BLM is not performing the detailed analysis needed to designate pre-screened, low-conflict priority areas.

BLM must also ensure that all applicable design features are fully implemented, monitored for effectiveness, and adapted accordingly.[174] To that end, developers should be required to periodically report to BLM on the implementation and effectiveness of the design features, and BLM should use this information to guide and improve future mitigation.

a. The final solar plan must ensure BLM conducts rigorous site-specific NEPA reviews and fully analyzes all potential impacts of proposed projects that the final PEIS will not address.

Preparation of a PEIS does not preclude the need for BLM to conduct robust site-specific NEPA reviews at the project level, particularly one as geographically broad and sweeping as the solar PEIS where it is impossible to analyze the impacts of any individual project within the 11-state

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[171] *See* BLM Data Viewer, https://blm-egis.maps.arcgis.com/apps/webappviewer/index.html?id=22df2b327e0c49c3a9afb67de5ca658d.

[172] If BLM declines to do so, then at a minimum it should designate additional areas of special concern consistent with the regulatory factors applicable to low priority applications. *See infra* Section X.

[173] *See supra* Sections II.a-b.

[174] BLM Mitigation Handbook, H-1794, chs. 2.1.F-H at 2-7 to -10; CEQ Memorandum, *Effective Use of Programmatic NEPA Reviews* at 34-37 (Dec. 18, 2014) ("CEQ PEIS Guidance"), https://obamawhitehouse.archives.gov/sites/default/files/docs/effective_use_of_programmatic_nepa_reviews_final_dec2014_searchable.pdf.

planning area. BLM is clear that the designation of solar application areas "does not mean that such lands have affirmatively been determined . . . to be suitable for solar energy development," and as a result all proposed projects in solar application areas will require "a detailed project-specific environmental review" pursuant to NEPA.[175] BLM also states that it "may tier to relevant analysis" in the final Solar PEIS,[176] but does not expand on this statement or clarify the level of NEPA review and tiering it expects to occur in solar application areas. Because such areas are largely the same as variance areas in terms of both geographic scope and the level of analysis that went into identifying them, we presume BLM will generally require an environmental impact statement (EIS) as opposed to an environmental assessment (EA) to analyze the impacts of utility-scale solar projects proposed outside of SEZs or other DLAs, and that BLM's ability to tier to the final PEIS on project- and site-specific issues will be limited. This is consistent with BLM's current practice in variance areas.

BLM must not resort to playing a shell game in which it defers detailed analysis to the project level and then, when reviewing a proposed project, it "tiers" to the final PEIS on issues that were not adequately addressed in order to avoid conducting the required analysis.[177] BLM can only tier to the final solar PEIS on site-specific issues if they were "fully analyzed" at the programmatic level,[178] but the PEIS will rarely do so. The final solar plan will consist mostly of high-level comparisons between various action alternatives across eleven western states, and "[t]he resulting hierarchy amongst the alternatives does not (and cannot) reflect the sort of effective *site-specific* impacts analysis contemplated by NEPA."[179] "Tiering aims to prevent undue duplication so the agency can 'concentrate on the issues specific to the subsequent action.'"[180] However, "tiering has no teeth when the prior review did not evaluate an issue at hand because, in such cases, there's no work to duplicate."[181]

The 2012 solar plan, unlike the Draft Solar PEIS, contained in-depth data and detailed environmental analyses that allowed BLM to designate discrete, low-conflict SEZs. BLM also developed SEZ-specific design features,[182] and implemented a framework for developing

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[175] Draft Solar PEIS ch.1.1.5 at 1-11.
[176] Draft Solar PEIS ch.1.1.5 at 1-11.
[177] *See N.M. ex rel. Richardson v. Bureau of Land Mgmt.*, 565 F.3d 683 (10th Cir. 2009). In addition, the recent amendments to NEPA will restrict BLM's ability to tier the final solar PEIS and rely on the analyses in the PEIS after five years. 42 U.S.C. § 4336b.
[178] 43 C.F.R. § 46.140(c).
[179] *W. Watersheds Project v. Bernhardt*, 543 F. Supp. 3d 958, 991-92 (D. Idaho 2021) (emphasis in original); *see Wilderness Soc'y v. U.S. Dep't of Interior*, No. 22-cv-1871(CRC), 2024 U.S. Dist. Lexis 51011, at *58 (D. Wyo. Mar. 22, 2024).
[180] *Wilderness Soc'y*, 2024 U.S. Dist. Lexis 51011, at *56 (quoting 40 C.F.R. § 1501.11(b)); *see* CEQ PEIS Guidance at 10 ("An agency relying on a programmatic NEPA review must consider whether the depth of analysis needed for a tiered decision requires adding to, or building on, the analysis provided in the programmatic NEPA review.").
[181] *Wilderness Soc'y*, 2024 U.S. Dist. Lexis 51011, at *56-57 (citing *Theodore Roosevelt Conservation P'ship v. Salazar*, 616 F.3d 497, 511-12 (D.C. Cir. 2010)).
[182] 2012 Solar Plan ROD Appendix A, tbl. A-5 at 129-45.

regional mitigation strategies associated with SEZs.[183] "The primary purpose of this more rigorous analysis [wa]s to provide documentation from which the BLM can tier future project authorizations, thereby limiting the required scope and effort of project-specific NEPA analyses."[184] Accordingly, BLM "expected that the ability to tier will be greatest in the SEZs,"[185] as opposed to variance areas where the level of environmental analyses was far less rigorous. BLM was correct; since 2012 proposed projects in SEZs are normally subject to EAs and proposed projects in variance areas are subject to EISs. Since the final solar PEIS will lack the in-depth, site-specific analysis needed to identify priority areas, the degree of tiering to the final PEIS for proposed projects in solar application areas should be somewhat limited and BLM should generally require an EIS when reviewing the potential impacts of utility-scale solar projects on such lands.

We recognize that appropriate tiering to programmatic analysis improves efficiency—which is key to achieving a rapid clean energy transition—and fully agree that tiering to detailed, relevant, and scientifically sound programmatic analysis is appropriate. We do not agree, however, that the Draft Solar PEIS contains a sufficiently in-depth review of potential direct, indirect, and cumulative impacts in solar application areas—which span across millions of acres in 11 western states and a variety of ecosystems—to allow significant tiering during project-specific reviews.

b. The programmatic design features should require that all resource inventories be current before BLM approves any ground disturbances.

The exclusion criteria preclude solar development on certain lands, such as ACECs, big game migration corridors, and old growth forests, but only to the extent an existing RMP identifies and, in some cases, specifically protects those areas.[186] Many RMPs are decades out of date, however, and may not be updated for years or even decades to come. Accordingly, if BLM receives a solar application in an area with old or nonexistent inventories, the programmatic design features should require BLM to update the inventories and determine how to manage the relevant resources and values prior to approving any ground disturbances. This requirement will help prevent UUD and ensure proper application of BLM's mitigation hierarchy.

FLPMA is clear that BLM "shall prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values . . . , giving priority to [ACECs]," and "[t]his inventory shall be kept current so as to reflect changes in conditions and to identify new and emerging resource and other values."[187] Relatedly, the proposed Public Lands Rule would

[183] 2012 Solar Plan ROD Appendix B.4.4 at 167-68; *see, e.g.*, BLM, *Regional Mitigation Strategy for the Dry Lake Solar Energy Zone*, Technical Note 444 (Mar. 2014).
[184] 2012 Solar Plan ROD ch. 1.3.5.1 at 1-18.
[185] 2012 Solar Plan ROD at 4.
[186] *See supra* Section II.d.
[187] 43 U.S.C. § 1711(a).

require BLM to identify intact landscapes on public lands that warrant protection from activities that would significantly disrupt, impair, or degrade the structure, functionality, or ecosystem resilience of such landscapes.[188] BLM should incorporate its statutory and regulatory obligations under FLPMA and the proposed Public Lands Rule into the programmatic design features, as described below.

i. Areas of Critical Environmental Concern.

As previously stated, the Draft Solar PEIS properly excludes designated ACECs identified in existing land use plans, but should also exclude nominated ACECs until they can be evaluated and BLM determines whether to provide interim management protections.[189]

If nominated ACECs are not excluded, however, then at the time of a solar application that overlaps with such lands, the design features should require BLM to promptly evaluate the proposed ACEC's relevance and importance. And if BLM determines a proposed ACEC warrants interim management, it must exclude those lands from solar development, prohibit any ground disturbances, and require project relocation. This approach will comply with FLPMA, which requires BLM to "give priority to the designation and protection of [ACECs],"[190] and is also consistent with BLM's ACEC Manual,[191] Instruction Memorandum 2023-013, and the proposed Public Lands Rule.[192]

ii. Lands with Wilderness Characteristics.

As previously stated, BLM should exclude all inventoried BLM LWCs regardless of whether a land use plan protects them and exclude all community-identified LWCs until they can be evaluated.[193] If not, then BLM must ensure, to the maximum extent practicable, that project relocation is considered at the time of any solar application that overlaps with such LWCs. Minimization or compensation should only be considered as a last resort, as described below.

Again, wilderness characteristics are among the resources and other values on public lands that BLM must inventory and manage under FLPMA.[194] BLM guidance therefore requires the agency to maintain and update its LWC inventories during land use planning, including when the public submits wilderness quality information or when BLM is undertaking a land use planning process.[195] LWCs are also an important component of identifying intact landscapes and managing them for ecosystem resilience, as proposed in BLM's Public Lands Rule.[196]

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[188] 88 Fed. Reg. at 19,599 (to be codified at 43 C.F.R. § 6102.2).
[189] *See supra* Section II.d.i.
[190] 43 U.S.C. § 1712(c)(3).
[191] BLM Manual 1613 at 1613.21.E.
[192] 88 Fed. Reg. at 19,596-97 (to be codified at 43 C.F.R. § 1610.7-2(c)(3)).
[193] *See supra* Section II.d.ii.
[194] 43 U.S.C. § 1711(a); *Or. Natural Desert Ass'n*, 625 F.3d at 1122; *see supra* Section II.d.
[195] BLM Manual 6310 ch. 1.6.A.
[196] *See supra* Section II.d.ii.

Appendix B of the Draft Solar PEIS describes proposed programmatic design features for specially designated areas and LWCs. The introduction to these design features states that "[b]ecause specially designated areas and LWCs will be excluded from solar development, no design features are required for direct impacts to these areas for solar facilities."[197] This statement ignores that direct impacts to LWCs are likely to occur in areas where LWC inventories are either badly outdated or non-existent.

The introduction also states that, "[t]o the maximum extent practicable, project relocation shall be considered in cases where the impacts on values of specially designated areas or LWCs cannot be minimized or mitigated."[198] We support this statement, but the final solar plan should include it as an enumerated design feature that specifically requires early consultation with BLM, either at the preliminary application review meetings required by 43 C.F.R. § 2804.12(b)(4) or earlier, to determine the likelihood of potential unavoidable impacts and need to consider project relocation. Relatedly, the design features must ensure that LWC inventories are updated before BLM approves any ground disturbances that may have direct, indirect, or cumulative impacts on LWCs.

To that end, we commend BLM for proposing several design features attempting to address the issue of outdated inventories, but as written they will not accomplish the intended purpose. Although design feature SDLW-G-1 properly recognizes that, "[i]n some cases, an updated inventory may be needed," the design features that follow rely exclusively on developers to "consider" conducting an inventory (SLDW-G-2) and to evaluate their own projects' impacts on specially designated areas and LWCs (SLDW-G-3). This overreliance on developers is a clear conflict of interest and will not adequately protect wilderness qualities or prevent UUD on public lands.

To ensure LWC inventories are current and accurate before BLM approves any ground-disturbance activities, we urge BLM to revise the design features as follows:

- **SDLW-G-1** Both BLM and~~Project~~ developers shall identify specially designated areas and LWCs in proximity to the proposed projects. In coordination with the BLM, developers shall consult current land use plans and inventories. BLM shall independently verify the accuracy of all information it receives from developers regarding a proposed project's proximity to specially designated areas and LWCs. In some cases, an updated inventory or first-time inventory may be needed. BLM shall update an inventory that is more than 10 years old. If no inventory exists or the last update was more than 10 years ago, BLM shall not approve any project until the inventory is completed or updated and appropriate management prescriptions are in place.

- **SDLW-G-2** ~~Project developers~~BLM shall identify lands within the geographic scope of the

[197] Draft Solar PEIS Appendix B.16.1 at B-72.
[198] Draft Solar PEIS Appendix B.16.1 at B-72.

proposed solar energy project to determine if they have been inventoried for wilderness characteristics or any lands that have been identified in a citizen's wilderness proposal. If wilderness characteristics inventory findings are not current or not inventoried, ~~project developers~~BLM shall, prior to approving any ground-disturbance activities, ~~consider~~conduct~~ing~~ the wilderness characteristics evaluations to determine whether lands within the geographic scope of the proposed solar energy project possess wilderness characteristics. If there are existing BLM wilderness characteristics inventory findings on file regarding the presence or absence of individual wilderness characteristics, ~~developers~~BLM shall consider the information of the evaluations to identify LWCs in proximity to the proposed projects. ~~Developers shall consider including t~~The wilderness characteristics evaluation shall be included as part of the processing of a solar energy ROW application for those lands without a recent wilderness characteristics inventory. All work must be completed in accordance with current BLM policies and procedures.

- **SDLW-G-3** ~~Project developers~~BLM shall evaluate impacts on specially designated areas and LWCs as part of the environmental impact analysis for the project and develop measures~~consider options~~ to avoid, minimize, and/or mitigate adverse impacts, in that order~~coordination with the BLM~~.

Although it will take many years for BLM to adequately inventory LWCs and update its RMPs, as revised the design features above would help to address this issue and provide interim protections going forward.

iii. Big game migration corridors and winter ranges.

As previously discussed, the proposed exclusion criteria do not adequately protect wildlife migration corridors and winter ranges, either for big game or for special status species or species of concern other than big game.[199] BLM should use the best available science and datasets and work closely with cooperating agencies, other federal and state agencies, tribes, and conservation organizations to implement a science-driven, tiered approach to protecting corridors and ranges that excludes crucial corridor segments and ranges for maintaining connectivity and biodiversity—including bottlenecks, stopover sites, other high-use areas, and linkages between protected areas—and imposes density disturbance caps and other management prescriptions in medium- and low-use portions of corridors and ranges.[200] Also, to the extent migration corridors and winter ranges are left open to solar application, the programmatic design features must require avoidance to the maximum extent possible and seek to minimize or compensate for unavoidable impacts only as a last resort, as described below.

[199] *See supra* Section II.d.iii.

[200] *See supra* Section II.d.iii; TWS Rock Springs RMP Comments at 31-41; TWS Big Game Corridor Comments at 21-22.

Although BLM proposes several design features related to habitat connectivity, migration corridors, and winter ranges, they are interspersed among other design features for ecological resources and do not form a cohesive or effective strategy for addressing direct, indirect, and cumulative impacts to these critical areas. Specifically, the proposed design features for wildlife and special status species in Appendix B would require BLM to consider habitat connectivity in NEPA documents (ER-G-18w), and require project developers to do the following during site characterization, siting and design, and construction:

- **ER-C-4g** Project developers shall site and design project activities away from crucial winter ranges and habitats occupied by priority species.

- **ER-C-2w** Project developers shall maximize the preservation of wildlife and SSS connectivity corridors using novel construction methods, site designs, corridor avoidance, wildlife crossings, and fencing designs. Each will be evaluated and studied as needed to improve connectivity. This includes maintaining wildlife and SSS corridors of sufficient width, as determined by site-specific analysis, and field verification of permeability for wildlife. Project developers shall design and install fences that reduce impacts to wildlife and allow for wildlife passage when appropriate. Allow for wildlife movement through fencing via lifted fencing or by creating wildlife access gates. Fencing design shall incorporate best available science and technology advances and be approved by federal and state wildlife agency biologists to ensure local species needs are considered. See also ER-G-18w.

- **ER-C-10w** Project developers shall ensure that all relevant information from DOI Secretarial Order 3362: Improving Habitat Quality in Western Big Game Winter Range and Migration Corridors has been incorporated as necessary.

- **ER-C-1sss** Project developers shall develop, in coordination with state wildlife agencies and the USFWS and/or National Marine Fisheries Service (NMFS), the level and extent of surveys required to determine effects and avoid occupied habitats and connectivity corridors for special status species, and other plant and wildlife species of concern, in all solar development project areas.

- **ER-C-8sss** Project developers shall, to the maximum extent practicable, site project facilities and activities, including associated roads and utility corridors, out of occupied habitats, and corridors (e.g., migratory, habitat connectivity) of special status species.

While these design features sometimes encourage avoidance of migration corridors and winter ranges, as written they lack sufficient detail and do not ensure that project relocation will be

considered, let alone enforced.[201] Nor do they impose adequate protections for solar development that ultimately occurs in such areas.

Again, recent guidance issued by CEQ and BLM establish a national policy of protecting and restoring habitat connectivity and wildlife migration corridors on public lands and, to that end, BLM must inventory connectivity and corridor values to inform its project siting decisions.[202] The Western Solar Plan should therefore include a design feature requiring developers to confer with BLM and other stakeholders, either at the preliminary application review meetings required by 43 C.F.R. § 2804.12(b)(4) or earlier, to determine whether a proposed project site is adequately inventoried and, if so, whether it intersects with a known migration corridor or winter range of big game or a connectivity corridor for a special status species or species of concern other than big game. If the applicable inventory is up to date and a proposed project will potentially obstruct a high-use migration corridor or winter range, to the extent not already excluded the design features should require maximum consideration of project relocation—particularly in critical areas of connectivity between protected areas, pinch points, and stopover sites for wildlife foraging and resting.

To the extent BLM allows some solar development within big game migration corridors and winter ranges, or a connectivity corridor for a special status species or species of concern other than big game, the design features should establish surface density development limitations to ensure that solar projects, either individually or cumulatively with other development, do not unnecessarily impede wildlife movement.[203] These density limitations should also be tailored to the level of use by wildlife and the specific species.

In addition, the design features should require project developers and operators to monitor, or fund agency monitoring, and publicly report wildlife migration patterns in a standardized and repeatable manner that includes pre- and post-construction assessments and surveys and will enable adaptive management measures to be implemented accordingly. This not only will help BLM determine an existing project's impacts and the effectiveness of mitigation, but also help to predict the direct, indirect, and cumulative impacts of future solar developments and improve mitigation measures going forward.[204]

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[201] The Draft Solar PEIS also identifies big game migration corridors and winter ranges as areas of special concern where additional review will be required at the time of a project proposal, but more clarity is needed about the application review process in such areas. *See infra* Section III.i.i.

[202] CEQ Connectivity Guidance at 5-6; BLM Instruction Memorandum 2023-005, Change 1; *see supra* Section II.d.iii.

[203] *See* BLM Instruction Memorandum CO-2022-029, *Conservation of Important Big Game Habitats, Movement Routes, and Migration Corridors* (June 30, 2022); CPW, *Colorado Parks and Wildlife's (CPW) Recommendations to Avoid and Minimize Impacts to Wildlife from Land Use Development in Colorado* (2023) (recommending species-specific surface density limitations in migration corridors and winter ranges related to oil and gas development in Colorado) [attached as Ex. 21 in Appendix 1, at 376], https://cpw.state.co.us/Documents/Conservation-Resources/Energy-Mining/CPW_HPH-Map-Layers.pdf.

[204] CMS Guidelines at 18-19.

iv. Mature and old growth forests.

As previously discussed, the proposed Exclusion No. 18 does not provide adequate protection for old growth and mature forests.[205] BLM should identify priority old growth areas, or old growth emphasis areas, and expand Exclusion No. 18 to permanently exclude solar development from such areas. To the extent BLM leaves old growth and mature forests open to solar application, then the programmatic design features should require strict adherence to the mitigation hierarchy: impacts must be avoided to the maximum extent possible, then minimized, with compensation for unavoidable impacts as a last resort. Unfortunately, BLM's proposed programmatic design features do not provide *any* protections for old growth and mature forests—a significant omission in light of Executive Order 14072.[206]

Again, Executive Order 14072 highlights the myriad benefits and importance of conserving old growth and mature forests and directs BLM to institutionalize and implement conservation strategies for these forests.[207] To comply with Executive Order 14072's directive to conserve and restore old growth and mature forests, the final programmatic design features should require project developers to confer with BLM and other stakeholders as early as feasible in the project application process, but no later than the preliminary application review meetings required by 43 C.F.R. § 2804.12(b)(4), to discuss the potential for old growth and mature forests at the proposed project site.

The design features should also require a site survey, conducted by a certified biologist, to determine if old growth or mature forests are present and, if so, BLM should give maximum consideration to project relocation to prevent disruption of the overall old growth and mature forest ecosystem characteristics within the affected area. BLM should also adopt appropriate management direction for the old growth and mature forests that are present onsite, including a determination of whether to identify it as an old growth emphasis area that should be excluded from solar applications in the future. Minimization or compensatory mitigation for unavoidable impacts should only be considered as a last resort.

c. BLM should clarify the relationship between the exclusion for desert tortoise occupied habitat and the tortoise density thresholds in the programmatic design features.

The draft PEIS excludes from development areas that are determined to be "known occupied habitat" of ESA-listed species, either based on "current available information" or during surveys

[205] *See supra* Section II.d.iv.
[206] The extent of these lands, and potential impacts on old growth and mature forests, is unknown, as the Draft Solar PEIS does not include any analysis of potential impacts on old growth and mature forests. In fact, as noted, the only time old growth is mentioned is in the exclusion criteria.
[207] 87 Fed. Reg. at 24,851.

conducted on a project-specific basis.[208] Although the draft PEIS does not define "occupied habitat,"[209] for desert tortoise, USFWS reporting forms for desert tortoise monitoring have defined areas as "occupied habitat" where a "[d]esert tortoise or desert tortoise sign have been identified within . . . 600 meters."[210] Habitat "occupancy" is generally defined by "presence," which is indicated by "all instances where abundance is greater than zero."[211] Thus, ostensibly, where project-specific surveys indicate the presence of desert tortoises, all areas where desert tortoises are determined to be present based on proximity to tortoises and tortoise signs would constitute "occupied habitat" and be excluded from development, independent of the overall density of desert tortoises estimated for those areas based on the total abundance.

The Draft Solar PEIS describes "design features" and "additional mitigation" for desert tortoise that would apply to sites where the density as determined by surveys is 5 or more tortoises per square mile.[212] This may create confusion because if an area is determined to be within "known

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[208] Draft Solar PEIS ch. 5.4.4.1 at 5-74 ("All known occupied habitat for ESA-listed species, based on current available information or surveys of project areas, is also excluded from solar energy development. GIS data for known occupied habitat is not available for all listed species, but these areas are still excluded."); 2-24 n. b ("Occupied habitat for ESA-listed species . . . is excluded but is unmapped for this Solar Programmatic EIS. Where solar applications are proposed within the range of ESA-listed species, occupied habitat would be required to be mapped and excluded during project-specific evaluations, in coordination with the USFWS."); 5-82 ("In addition to critical habitat, known occupied habitat for ESA-listed species, based on current available information or surveys of project areas, is excluded from solar energy development. Suitable habitat for ESA listed species, where ESA listed species occupancy is unknown, would be evaluated on a project specific basis and any occupied habitat would be subject to the exclusion.").

[209] *See supra* Sections II.c, II.e.

[210] USFWS, Daily Desert Tortoise Report Form, https://www.fws.gov/sites/default/files/documents/Daily%20Desert%20Tortoise%20Report%20Blank%20form.pdf; *see* USFWS, Utah 2018 Desert Tortoise Section 7 Conservation Guidelines at 3, https://www.fws.gov/sites/default/files/documents/USFWS%20Utah%20Desert%20Tortoise%20Conservation%20Guidelines%20Final%202018.pdf (referring to "Daily Desert Tortoise Report Form" for definition of "occupied habitat" to be delineated via surveys for Mojave desert tortoise).

[211] *See, e.g.*, Erin R. Zylstra et al., *A Spatially Explicit Model for Density that Accounts for Availability: A Case Study with Mojave Desert Tortoises*, Ecosphere 14(3): e4448 at 13 (2023), https://doi.org/10.1002/ecs2.4448 ("These patterns highlight the inherent relationship between abundance (or density) and occupancy (or presence), with the latter representing all instances where abundance is greater than zero[.]").

[212] *See* Draft Solar PEIS Appendix B.4.2.5.1 at B-38 (Design features specifically for the Mojave desert tortoise "apply to any solar development applications within modeled desert tortoise habitat with a suitability index equal to or greater than 0.5 (Nussear et al. 2009 or most recent as approved by permitting agencies) or habitat supporting 5 or more tortoises per square mile (number of tortoises is based on estimates derived from the [USFWS] pre-project survey protocol (USFWS 2019 or most recent))."); Draft Solar PEIS Appendix ch. 5.4.4.3 at 5-78 ("Project developers should avoid to the extent practicable all solar energy development activities in Priority 1 and 2 desert tortoise habitat (BLM 2012) and identified desert tortoise project areas that will result in removal of habitat supporting more than 5 adult tortoises. The number of desert tortoises on-site is based on estimates derived from the protocol

occupied habitat" based on proximity to tortoises and tortoise signs identified during surveys, presumably it would be excluded from development per Exclusion No. 2 and there would be no reason to apply design features within those areas at all. Specifically, there may be confusion about whether the density thresholds described in the design features criteria mean that such areas are not excluded from solar development even if tortoises are present at a density of 5 or more per square mile, but less than some higher, unspecified, density required to define habitat as "occupied."

Notably, the FWS 2019 pre-project survey protocol referred to in the design features for desert tortoise does not address or define what constitutes "occupied habitat."[213] Rather, the 2019 survey protocol describes the procedures for conducting surveys and for estimating total abundance based on detections of large individuals, taking into account the likelihood of additional adult tortoises being present but not visible due to their smaller size or being hidden deep in burrows. However, the protocols do make plain that in addition to calculating total abundance, other survey information—including the locations of all tortoise signs, not just live tortoises—is relevant to evaluating presence.[214] This suggests that USFWS would determine presence, and therefore whether areas are occupied, by considering this additional information about the distribution and location of all tortoises and signs of tortoises.

As shown, there is potential for confusion about the interplay between Exclusion No. 2 and the programmatic design features related to desert tortoise. To provide certainty and predictability and ultimately enhance permitting efficiency, the final solar PEIS should clarify BLM's intended approach for applying the exclusion criterion for occupied habitat (including any applicable density thresholds) and additional mitigation for desert tortoise in the design features. One option for BLM's consideration is to adopt or endorse a framework at the project level that embraces the Section 7 consultation process,[215] as that process has not generally added

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surveys described previously using the USFWS's pre-project survey protocol (USFWS 2019, or most recent). These design features apply to any solar energy development applications within modeled desert tortoise habitat with a suitability index $\geq$ 0.5 (Nussear et al. 2009 or most recent as approved by permitting agencies) or habitat supporting $\geq$ 5 tortoises per square-mile (number of tortoises is based on estimates derived from the USFWS pre-project survey protocol (USFWS 2019 or most recent).").

[213] *See* USFWS, Preparing for Any Action that May Occur Within the Range of the Mojave Desert Tortoise (*Gopherus Agassizii*) (2018) ("USFWS Desert Tortoise Guidance"), https://www.fws.gov/sites/default/files/documents/Mojave%20Desert%20Tortoise_Pre-project%20Survey%20Protocol_2019.pdf.

[214] USFWS Desert Tortoise Guidance at 6 ("On the datasheet included in this guidance, record all evidence that indicates desert tortoises may be present (e.g., scat, burrows, carcasses, courtship rings, drinking depressions, etc. in addition to live tortoises)."), 9 ("In addition to abundance estimates, also provide the completed spreadsheets, the data sheets, *a map of the action area that includes the locations of desert tortoises and sign*, and a description of the habitat conditions onsite (features to note are described below) to the USFWS as soon after completion of the surveys as possible." (emphasis added)), 10 ("Determining whether desert tortoises are present based primarily on sign (rather than live animals) requires that biologists be diligent in observing and describing sign.").

[215] 16 U.S.C. § 1536.

substantial time to the permitting process.

d. The programmatic design features should better utilize community benefits agreements to address community impacts.

We appreciate that the Draft Solar PEIS reflects significant thought as to how best to identify and minimize impacts on communities. In particular, the design features for cultural resources[216] and environmental justice (EJ)[217] reflect many of the issues that will need to be considered by developers in their outreach to communities and deployment of minimization and mitigation measures.

However, the Draft Solar PEIS makes only passing reference to community benefits agreements (CBAs) as a means of ensuring that outreach happens appropriately and the resulting measures are implemented in an efficient and enforceable manner. The role of CBAs should be further emphasized, expanded, and integrated.

i. <u>CBAs and similar agreements are increasingly being deployed as a tool to address impacts to communities and negotiate community benefits that may lead to broader community support</u>.

A CBA is an enforceable agreement between project developers and community groups or coalitions—addressing matters such as developer monetary or in-kind contributions for community services, agreed-upon mitigation measures, or local workforce training and deployment—that often lead to broader community support.[218] CBAs, being negotiated directly

[216] Draft Solar PEIS Appendix B.3 at B-9 to -13.

[217] Draft Solar PEIS Appendix B.5 at B-47 to -49.

[218] U.S. Dep't of Energy (DOE), *About Community Benefits Plans* ("DOE CBPs") ("A 'Community Benefits Agreement' is an agreement signed by community groups or coalitions and a project developer, identifying the community or labor benefits a developer agrees to deliver in return for community support or workforce availability for a project. Community coalitions can comprise stakeholder groups that would be impacted by a project, including neighborhood associations, faith-based organizations, worker-serving organizations, environmental groups, labor unions, child care providers, and others. Community Benefit Agreements help ensure that measurable local benefits will be given to a community. They are enforceable, legally binding contracts for all parties. They typically specify responsibilities, reporting, and remedies."), https://www.energy.gov/infrastructure/about-community-benefits-plans; *see* Katherine Hoff & Katie Segal, Berkeley Law Center for Law, Energy, & the Environment, *Offshore Wind and Community Benefits Agreements in California* (June 2023) [attached as Ex. 1 in Appendix 4, at 2], https://www.law.berkeley.edu/wp-content/uploads/2023/06/CBA-Policy-Paper.pdf; DOE, *Guide to Advancing Opportunities for Community Benefits through Energy Project Development* (Aug. 1, 2017) ("DOE Guide"), https://www.energy.gov/diversity/articles/community-benefit-agreement-cba-resource-guide; Julian Gross et al., *Community Benefits Agreements: Making Development Projects Accountable* (2005) [attached as Ex. 2 in Appendix 4, at 17], https://juliangross.net/docs/CBA_Handbook.pdf; Trace Allen et al., *Community Benefits Agreement Guidelines for Renewable Energy Projects on Tribal Lands in the U.S. Applied to Solar Development on*

with affected community based organizations (CBOs) and embodied in a signed contract, have been lauded as supporting the key values of inclusiveness, enforceability, justice, and transparency.[219] CBAs are distinct from "host agreements," which are negotiated between a developer and the local government entity; and from community benefits plans (CBPs), which do not require prior CBO engagement, but rather are crafted by developers to guide their public engagement strategy and generally are not legally binding.[220] While both CBAs and CBPs have value, CBAs are the gold standard for community involvement, ensuring that problems affecting residents are identified and solutions will be carried out.

Agencies are increasingly incentivizing use of CBAs and CBPs in recognition of their obligation and authority to ensure that community concerns are addressed. The Bureau of Ocean Energy Management (BOEM) provides 5% bid credits for offshore wind development in California where developers commit to enter into a CBA with benefits commensurate to the credit received—with the value of the credit retained by the developer and invested into a CBA.[221] The Department of Energy (DOE) requires CBPs as part of all Bipartisan Infrastructure Law and Inflation Reduction Act grant programs, and makes an applicant's CBP part of its contractual application if its application is selected.[222] Further, DOE's Domestic Engagement Framework for meaningful two-way engagement involves "Empowered Communities [where] Community members, stakeholders, and local officials have the information and tools they need to evaluate potential projects, represent themselves in the project development process, and negotiate community benefits agreements and other agreements with project developers."[223]

DOE described the objectives and expectations around CBPs in a recent funding opportunity announcement for carbon capture and storage projects:

Red Lake Nation (May 2023), Community Benefits Agreement Guidelines for Renewable Energy Projects on Tribal Lands in the U.S. by MIT DUSP - Issuu.

[219] DOE Guide at 5.

[220] DOE CBPs; DOE, *Community Benefits Plan Template*, https://www.energy.gov/sites/default/files/2023-05/CommunityBenefitsPlanTemplate.docx.

[221] Hoff & Segal (2023) at 5-6. While the credit proved to be an effective incentive, as a more general matter Commenters support the cost of CBAs being funded by developers rather than the public. Also, it is essential that CBOs receive funding from developers to have the capacity necessary to negotiate and administer CBAs.

[222] DOE CBPs, https://www.energy.gov/infrastructure/about-community-benefits-plans. The Biden Administration has also issued executive orders that require the use of Project Labor Agreements for federal construction projects, and support increasing investments to underrepresented communities. Exec. Order No. 14,063, *Use of Project Labor Agreements for Federal Construction Projects* (Feb. 4, 2022), 87 Fed. Reg. 7,363 (Feb. 9, 2022); The White House, *FACT SHEET: President Biden Signs EO to Boost Quality of Federal Construction Projects* (Feb. 3, 2022), https://www.whitehouse.gov/briefing-room/statements-releases/2022/02/03/fact-sheet-president-biden-signs-executive-order-to-boost-quality-of-federal-construction-projects/.

[223] DOE, Office of Fossil Energy and Carbon Management, *Fossil Energy and Carbon Management Domestic Engagement Framework: Engaging Communities, Stakeholders, and Tribes in Clean Energy Technologies*, https://www.energy.gov/sites/default/files/2022-12/FECM%20Engagement%20Framework_12.1.22.pdf.

> [Grant r]ecipients are expected to engage with community and labor organizations and develop, update, and implement [a CBP] through the life of the project. This involves understanding and addressing potential energy and environmental justice issues during the planning and design of their storage project . . . . Communities that could be affected negatively or positively should be identified and engaged in the process such that they have meaningful input throughout the project's lifecycle.[224]

A recent report by the Center for American Progress similarly highlighted the importance of engaging with communities to agree on benefits, and observed, "The DOE . . . requires a CBP because early and effective community engagement indicates a project is more likely to be successfully permitted and built in a timely manner."[225]

ii. <u>BLM should promote and incentivize CBAs to address environmental justice and cultural resource impacts</u>.

It is a positive first step that the Draft Solar PEIS includes extensive and largely mandatory project design features aimed at avoiding and minimizing impacts to both EJ communities[226] and cultural resources.[227] These design features reflect recognition, at a fundamental level, that solar projects should not move forward without early and consistent engagement with communities being asked to host them; and that failure to pursue such engagement will inevitably lead to delays and frustration.

The steps that developers are asked to take in these design feature requirements are straightforward and commonsensical and should not be understood as adding to developer burdens; they are actions that are in the developer's interest and should already be part of any responsible development effort. The design features for EJ communities and cultural resources are simply a partial summary of some aspects of accumulated experience and understanding

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[224] DOE, Office of Fossil Energy and Carbon Management, Funding Notice: Bipartisan Infrastructure Law: Carbon Storage Validation and Testing, *Bipartisan Infrastructure Law (BIL): Storage Validation and Testing (Section 40305): Carbon Storage Assurance Facility Enterprise (CarbonSAFE): Phases III, III.5, and IV*, DE-FOA-0002711, https://www.energy.gov/fecm/funding-notice-bipartisan-infrastructure-law-carbon-storage-validation-and-testing.

[225] Market Haggerty & Anastasios Chryssikopoulos, Center for American Progress, *Leveraging Renewable Energy Investments for Rural Development* (Nov. 6, 2023) [attached as Ex. 3 in Appendix 4, at 148], https://www.americanprogress.org/article/leveraging-renewable-energy-investments-for-rural-development/.

[226] Draft Solar PEIS Appendix B.5 at B-47 to -49. Mapping and other tools are available to enable BLM and developers to identify affected EJ communities. In addition, refer to the Draft Solar PEIS ch. 4.15 and Appendix F.5.3 for data identifying low-income and minority populations at the Census block group level within proximity to lands available for utility scale solar development.

[227] Draft Solar PEIS Appendix B.3 at B-9 to -13.

about what is needed to maintain a productive relationship with an affected community.[228]

However, a flaw in the design features is that they fail to center around the vehicle of negotiated agreements such as CBAs, and hence unwittingly fall back on the type of one-sided and non-collaborative structures that have created injustices and delays in the past. While design feature EJ-G-8 does reference CBAs, the mention is in passing and neither fully integrated into the rest of the design features nor incentivized or made mandatory in the manner of DOE CBAs.[229] The remaining design features, rather than requiring level playing field dialogue between communities and developers, fall back on the more traditional model of simply requiring developers to keep community members apprised of decisions already made. For instance:

- Design Features EJ-G-1, EJ-G-2, and EJ-G-3 state that BLM and developers shall "provide information" on the scale, timeline, and impact of projects.[230] However, it is necessary but not sufficient to simply provide information to communities about development plans and decisions. Such matters should be discussed with communities in tandem with planning and in advance of any decisions, with the conclusions reflecting community input and embodied in a CBA.

- Design Feature EJ-G-6 similarly calls for "multiple, accessible avenues to provide public comment."[231] Public comment opportunities are, of course, critical to both justice and project success. However, they are not a substitute for the collaborative decision-making made possible by a CBA.

- Design Feature EJ-G-9 states that BLM and developers shall avoid siting projects where community impacts are reasonably foreseeable.[232] Once again, while this requirement is clearly essential, carrying it out effectively requires that developers engage affected CBOs early on to gain their perspectives, before any siting decisions have been made, in order to obtain factual information and priorities from the community regarding siting sensitivities and how to potentially avoid them. That type of engagement is inherent in a CBA negotiation process.

- Design Feature CR-G-3 appropriately requires developers to minimize impacts on "sites

[228] In this regard, the design features pertaining to EJ communities and cultural resources are qualitatively different from the design features pertaining to technical project specifications. *See,* e.g., Appendix B.1 (acoustic environment), B.4 (ecological resources), or B.7 (hazardous materials and waste). While the substance of the technical design features is ultimately critical to include as part of any project, there may be more than one procedural way to ensure that happens.
[229] EJ-G-8 mere.ly requires CBAs "if appropriate," leaving the developer with complete discretion on defining appropriateness. Draft Solar PEIS Appendix B.5.1 at B-48.
[230] Draft Solar PEIS Appendix B.5.1 at B-47 to -48.
[231] Draft Solar PEIS Appendix B.5.1 at B-48.
[232] Draft Solar PEIS Appendix B.5.1 at B-48.

> with Tribal interests."[233] However, absent a robust CBA process,[234] the nature of those interests may not be identified until key project decisions have already been made – resulting both in complicated design backtracking and justifiable community resentment. A CBA process would empower tribal nations and Indigenous CBOs to identify tribal interests early in the process and enter into appropriate agreements to protect them. In this regard, it is important to note that many times tribal and Indigenous[235] interests in a site may not be evident at all from a desktop review of maps, and/or are not publicly available in any form due to the need for confidentiality around tribal resources, and often requires dialogue with community members to identify.

We appreciate that the intent of these design features is to foster dialogue and protect community interests. However, as DOE, BOEM, and other agencies have already recognized, this end is best achieved by requiring and/or incentivizing negotiated and enforceable agreements between developers and communities that ensure community concerns are identified as early as possible, and that resolution of those concerns be embodied in a legally enforceable document. For this reason, we encourage BLM to re-focus the design features to center them around a requirement to develop a CBA and/or establish an express incentive for CBA development.

We previously recognized that a CBA requirement could have been addressed in BLM's Renewable Energy Rule, but BLM declined to take that approach. For example, in comments concerning the proposed Renewable Energy Rule, Natural Resources Defense Council (NRDC) made the case for a CBA incentive as part of the renewable energy permitting process, stating:

> We recommend that additional consideration should be given to projects where the proponent has made a binding commitment to enter into [CBAs] that meet the needs of Tribes and local communities who are impacted by projects on public lands. BLM should commit to developing principles for CBAs associated with renewable energy projects on public lands to ensure that these agreements truly serve impacted communities and not solely stakeholders with the means to engage in negotiations with project developers.[236]

Similarly, comments on the proposed Renewable Energy Rule submitted by The Wilderness

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[233] Draft Solar PEIS Appendix B.3 at B-10.

[234] Since tribal governments have their own processes and requirements for assessing prospective developments, it is important to recognize that a CBA may be helpful but not sufficient. All consultation requirements that attend tribal sovereignty must be adhered to regardless of the presence of a CBA. *See supra* Section I.c.

[235] We note as well that a reference to "tribal" interests is narrower than the full set of Indigenous interests that may be affected by a development. The referenced design feature, and any other similar references to "tribal" interests, should be expanded to include interests of communities populated by Indigenous people, whether or not such people are directly represented by a tribal government.

[236] NRDC Comments on Proposed Renewable Energy Rule, https://www.regulations.gov/comment/BLM-2023-0004-0618. These comments are incorporated here by reference.

Society and Conservation Lands Foundation urged BLM to give a higher priority under 43 C.F.R. § 2804.35 to applicants who commit to negotiating CBAs with impacted communities, and to consider other incentives for developers to enter into CBAs such as rent and fee reductions and variable offsets.[237]

Since BLM did not adopt this approach in its Renewable Energy Rule, we urge BLM to create incentives in the final solar plan for developers to enter into CBAs by prioritizing projects with CBAs in place, such that an executed CBA between a developer and a community should contribute to a higher prioritization outcome for a project.[238] BLM should provide a clear definition of "community/community based organization" and ensure that the agency's prioritization decision accounts for the extent to which the potential impacts on a community are mitigated through the CBA. To the extent this incentive is embodied in a revised Leasing Rule, it should be referenced and reiterated in the final solar plan.

e. The programmatic design features should incorporate the leasing tool from the proposed Public Lands Rule to provide for restoration and mitigation associated with project impacts.

The proposed Public Lands Rule would establish a leasing tool intended to directly support ecological resilience through restoration and mitigation.[239] We welcome this tool and urge BLM to provide for mitigation leasing in the programmatic design features to help offset the impacts of utility-scale solar development. As part of authorizing a solar project on public lands that will result in an unavoidable loss of wildlife habitat, for example, BLM and the project developer could agree to compensate for this loss by restoring other habitat pursuant to such a lease.[240]

The design features should set strict sideboards on the use of leases for mitigation, however. First, BLM should follow the mitigation hierarchy and only issue conservation leases to offset unavoidable impacts, not to mitigate impacts that can be avoided or minimized.[241] Second, such leases should ensure no net loss and, to that end, require the restoration of degraded, damaged, or destroyed ecosystems as opposed to the mere protection of intact landscapes. Third, ideally leases for restoration purposes will be carried out in accordance with an approved restoration plan that identifies target lands and restoration activities in priority restoration areas. Fourth, any lease for restoration or mitigation must be fully considered during project-specific NEPA reviews. Fifth, such leases must be subject to robust monitoring, evaluation, and reporting requirements to ensure their purposes are being fulfilled.

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[237] TWS Comments on Proposed Renewable Energy Rule at 12-13, 21-22.
[238] *See infra* Section III.f.
[239] 88 Fed. Reg. at 19,591, 19,600 (to be codified at 43 C.F.R. § 6102.4).
[240] *See* 88 Fed. Reg. at 19,591 (using a similar example for a conservation lease); Drew McConville, Center for American Progress, *Why Conservation Leasing on Public Lands Is a Win-Win for Renewables and Wildlife* (June 1, 2023) [attached as Ex. 2 in Appendix 5, at 5], https://www.americanprogress.org/article/why-conservation-leasing-on-public-lands-is-a-win-win-for-renewables-and-wildlife/.
[241] *See supra* Section II.b.

In addition, BLM should explore the potential for project developers to assign or transfer restoration or mitigation leases to impacted communities and any tribes who are interested in carrying out restoration activities.[242] In this scenario, as a condition for project approval, one option is for a project developer to negotiate a CBA (or good neighbor agreement) with an interested community or tribe providing, among other things, for the transfer or assignment of a restoration or mitigation lease to an impacted community or tribe, and the developer would provide the necessary funding, including bonding, to carry out the terms of the lease.[243] Such an assignment or transfer could also occur through a negotiated agreement other than a CBA. And because tribes are sovereign nations with treaty rights and other interests on BLM-managed lands that must be fully addressed, both BLM and developers must provide tribes with full consideration under the law as part of any process involving a lease for the purpose of restoration or mitigation.[244]

f. The programmatic design features should incorporate the application prioritization factors in the existing regulations to avoid and minimize adverse impacts.

Until BLM officially finalizes the Renewable Energy Rule in the coming days, BLM's ROW regulations and related guidance currently prescribe a variety of detailed screening criteria and factors that the agency uses to evaluate solar applications outside of DLAs and assign them either a high, medium, or low priority based on proximity and potential impacts to protected areas and important resource values, among other considerations.[245] Because BLM moves high-priority applications to the front of the line and processes them before medium- or low-priority applications—and generally does not process low-priority applications at all—this system inherently helps prevent UUD and complements the mitigation hierarchy. The final Renewable Energy Rule will substantially overhaul the prioritization process, however, and give BLM significant discretion to apply a much more general list of criteria without assigning specific priority levels to solar applications. This new process is ripe for abuse and needs safeguards to ensure BLM prioritizes applications in a transparent manner that facilitates environmentally responsible development, as intended. BLM should therefore incorporate elements of the existing prioritization process into the programmatic design features.

Under the existing prioritization process, low-priority applications often involve proposed projects "near or adjacent to lands designated by Congress, the President, or the Secretary for the protection of sensitive viewsheds, resources, and values."[246] Such lands include NPS and

[242] *See* 88 Fed. Reg. at 19,600-01 (such leases may be issued "to any qualified individual, business, non-governmental organization, or Tribal government" and may be "assigned or transferred") (to be codified at 43 C.F.R. §§ 6102.4(a)(3), 6102.4(e)).
[243] *See supra* Section III.d.
[244] *See supra* Section 1.c.
[245] 43 C.F.R. § 2804.35; BLM Instruction Memorandum 2022-027. BLM currently gives top priority to the processing of leases inside DLAs, even over high-priority applications for ROW grants outside DLAs. 43 C.F.R. § 2809.10(d); BLM Instruction Memorandum 2022-027, Attachment 2.
[246] 43 C.F.R. § 2804.35(c)(1); *see supra* Section II.g.

NLCS lands and USFWS Wildlife Refuges, among others.[247] Medium-priority applications often involve proposed projects that might adversely impact other sensitive resources and values, such as LWCs, historic properties, and important habitats and other species use areas.[248] And high-priority applications involve "previously disturbed or developed sites," Visual Resource Management Class IV lands, and other areas that tend to present less conflicts.[249]

The Renewable Energy Rule will truncate the prioritization factors and no longer ties them to a specific priority level. Instead, BLM will consider a new list of sometimes vague factors and no longer follow a standardized process, and nothing explains how individual applications will be prioritized relative to other pending applications.[250] While BLM stated it will apply these factors "holistically to prioritize applications in a manner that would facilitate environmentally responsible developments and ensure that agency workloads are allocated appropriately,"[251] the proposed prioritization process lacks assurances that BLM will implement the new process consistently and as intended. The Western Solar Plan provides BLM with an ideal opportunity to clarify and refine the prioritization factors and establish clear parameters for implementation, as contemplated in the new rule.[252]

Specifically, to provide more predictability to interested stakeholders, including solar developers, the programmatic design features in Appendix B should provide for the prioritization of applications in relation to specific resources and values and require BLM to give a lower priority to applications within or proximate to big game migration corridors and winter habitats, aquatic habitats, old growth forests, ACECs, LWCs, and NLCS lands, among other important resource values and protected areas that may be directly, indirectly, or cumulatively impacted. Conversely, Appendix B should also include general design features requiring BLM to give a higher priority to applications within degraded sites, such as co-location with oil and gas infrastructure and abandoned mine lands, lands with direct access to existing roads, and other factors. Higher priorities should also be awarded to applicants who publicly commit to negotiating community benefits agreements or good neighbor agreements with impacted tribes and other local communities.[253]

By prioritizing applications that approach solar energy development through a smart from the

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[247] 43 C.F.R. § 2804.35(c); BLM Instruction Memorandum 2022-027, Attachment 2.
[248] 43 C.F.R. § 2804.35(b); BLM Instruction Memorandum 2022-027, Attachment 2.
[249] 43 C.F.R. § 2804.35(a); BLM Instruction Memorandum 2022-027, Attachment 2.
[250] Prepublication Renewable Energy Rule at 182-83 (to be codified at 43 C.F.R. § 2804.35(b)). To highlight this concern, the final Renewable Energy Rule will add a new provision after the list of prioritization criteria simply stating that "BLM may re-prioritize your application at any time." *Id.* at 183 (to be codified at 43 C.F.R. § 2804.35(d)).
[251] Prepublication Renewable Energy Rule at 59.
[252] Prepublication Renewable Energy Rule at 183 (BLM will consider "[a]ny other circumstances or prioritization criteria identified by the BLM in subsequent policy guidance or management direction through land use planning") (to be codified at 43 C.F.R. § 2804.35(b)(6)).
[253] *See infra* Section III.d. BLM, of course, should continue to give top priority to proposed projects within existing or newly designated DLAs, such as SEZs.

start lens, BLM will incentivize project proposals in the lowest-impact areas.

g. BLM should consistently require compensatory mitigation for unavoidable project impacts and such requirements must support regional conservation goals.

The 2012 Western Solar Plan established Regional Mitigation Strategies (RMS) to deliver more effective and strategic mitigation than can be secured through disparate, un-coordinated project-by-project mitigation requirements. These RMS were attached to designated SEZs, and while the Draft Solar PEIS does not establish new or expanded SEZs, BLM can and should continue to assess mitigation requirements within a regional conservation framework. Such a regional approach would encompass relevant BLM land use plans, restoration efforts, and state agency wildlife plans and supports the foundational goals of BLM's proposed Public Lands Rule to protect intact landscapes and ecosystem resilience. More detail on how these plans and principles should intersect with mitigation requirements is provided below.

As a first step in strengthening mitigation in the context of the Solar PEIS update, BLM must clarify the obligations of developers and BLM with regard to mitigation through a regional approach. The Draft Solar PEIS currently contains inconsistent language around mitigation: "Design Feature for All Action Alternatives: (the) regional mitigation strategy framework *could* be used, as appropriate, for the compensation of unavoidable residual impacts from solar energy development under any of the Action Alternatives in this Programmatic EIS."[254] This clearly states that a RMS framework is available to BLM, on an optional basis, under any of the proposed action alternatives. Although BLM does not provide detail as to when this framework would be "appropriate," we strongly encourage BLM to make RMS frameworks the standard for developing meaningful mitigation that contributes to identified conservation goals in a given region.

Mitigation requirements must be shown to have value for advancing conservation goals set by BLM and/or sister agencies at the federal and state levels. Below are examples, although not an exhaustive list, of policy and planning documents that could drive regional mitigation:

- BLM Resource Management Plans
- BLM Lands with Wilderness Characteristics Inventories
- BLM Visual Resources Management Inventories
- BLM Restoration Landscapes
- BLM Regional Ecological Assessments
- BLM Public Lands Rule inventories for landscape intactness
- State Wildlife Action Plans
- USFWS and state wildlife agency species-specific recovery plans

Elsewhere in the Draft Solar PEIS, compensatory mitigation is referred to as an optional activity to be implemented on a case-by-case basis, which is in stark contrast to a regional mitigation

[254] Draft Solar PEIS ch. 2.1.1.7 at 2-25 (emphasis added).

approach: "Existing BLM Mitigation Requirements for Solar Energy Development: Compensatory mitigation *may be considered and implemented on a case-by-case basis,* in consultation with BLM state office and national office program specialists and the Office of the Solicitor as needed."[255]

BLM should clarify that compensatory mitigation is required for all unavoidable impacts, not that it may be considered. Furthermore, BLM should require a regional approach to compensatory mitigation requirements so that on-the-ground results support and advance existing conservation goals of federal agencies, state agencies, and tribal natural resource and wildlife agencies.

h. BLM should process pending applications in a transparent and environmentally responsible manner that does not interfere with the purpose and need for the updated solar plan.

BLM must carefully consider how to address pending solar applications while it works to finalize the Draft Solar PEIS.[256] BLM states that it will "consider a variety of factors" to determine whether "to exempt some or all" pending applications from the new plan,[257] but any exemptions must be transparent and consistent with CEQ's NEPA regulations and smart from the start principles.

CEQ's regulation at 40 C.F.R. § 1506.1 prohibits BLM from taking interim actions during programmatic planning "that may significantly affect the quality of the human environment," except if three criteria are met: (1) the interim action is independently justified; (2) the action undergoes an adequate environmental review; and (3) the action will not prejudice ultimate decisions in the PEIS by determining subsequent development or limiting the alternatives.[258] Under the first criterion regarding independent justification, BLM may take an interim action if it determines the action "could be undertaken irrespective of whether or how the program goes forward, assuming the other two criteria are met."[259] The second criterion clearly requires compliance with NEPA, and the third criterion allows interim actions only if BLM determines that the action will "not jeopardize the objective consideration of reasonable alternatives" in the PEIS.[260]

To ensure that BLM does not unknowingly approve proposed solar developments sited in areas where development would be precluded under the new plan—and thus potentially undermine

[255] Draft Solar PEIS ch. 3.3.2.2 at 3-27 (emphasis added).
[256] For reference, BLM's website indicates that as of April 1, 2024 there were 23 proposed solar projects on BLM-administered lands that are undergoing either preliminary review (10 projects) or NEPA review (13 projects). BLM, Active Renewable Energy Projects, https://www.blm.gov/programs/energy-and-minerals/renewable-energy/active-renewable-projects.
[257] Draft Solar PEIS ch. 2.11 at 2-1 to -2 & n.3.
[258] 40 C.F.R. § 1506.1.
[259] CEQ PEIS Guidance at 38.
[260] CEQ PEIS Guidance at 38.

the consideration of reasonable alternatives in the Draft Solar PEIS—for each site-specific proposal reviewed during this planning process, BLM should identify whether its approval would be consistent with the proposed alternatives in the new plan. Moreover, as the goal is to ensure that BLM does not undermine the alternatives considered in the Draft Solar PEIS, BLM should disclose this information on a project-specific and cumulative basis. While approving one project in a small area that would be excluded under the new plan may not prejudice an alternative, locating multiple projects in the same region may do so. BLM can readily avoid this outcome by disclosing whether the proposed projects it is reviewing would be inconsistent with the landscape-level planning alternatives BLM is currently considering.[261]

Accordingly, we make several recommendations to ensure BLM handles pending solar applications in a fair, environmentally responsible manner that does not undercut BLM's efforts to update the Western Solar Plan. First, in reviewing applications submitted after December 8, 2022, the date BLM published its notice of intent for this action in the Federal Register,[262] BLM should disclose whether the projects it is reviewing would be allowed to proceed under any of the action alternatives in the Draft Solar PEIS. Specifically, BLM should analyze and disclose, among other things, whether the proposed project would be in a solar application area, exclusion area, or area of special concern, and if a project that BLM is reviewing would be in an exclusion area or area of special concern, BLM should make an independent finding on whether the project—either individually or cumulatively—would prejudice the ultimate decisions to be made in the final PEIS. For pending applications that have already received a high priority, this should be an easy task that would not appreciably slow down solar development in areas with a low likelihood of resource conflicts.

We believe the process described above is fair to developers, environmentally sound, and will not interfere with BLM's ongoing update to the Western Solar Plan.

i. BLM should expand the areas of special concern and clarify the associated application review process.

Based on input from the NPS, USFWS, cooperating agencies, and BLM staff, the Draft Solar PEIS identifies areas of special concern that are open to project proposals but "warrant additional review at the time of a solar project application."[263] The four categories of areas of special concern are (1) BLM Restoration Landscapes; (2) oil and gas leases; (3) big game migration corridors and winter ranges; and (4) areas surrounding NPS units. While we support the concept of giving extra attention to sensitive lands and resource values,[264] the final solar plan must provide more clarity on how BLM will process applications in these areas. The final plan

[261] *See* Draft Solar PEIS ch. 1.1.1 at 1-3.
[262] *See* 87 Fed. Reg. at 75,285.
[263] Draft Solar PEIS Appendix H at H-1.
[264] In this regard, we note the disconnect between the conservation-focused areas of special concern and the areas of concern for oil and gas leases. BLM should consider addressing potential conflicts with oil and gas leases solely through the programmatic design features.

should also consider expanding and refining the categories of areas of special concern, as recommended below.

i. Clarifying the required level of additional review in areas of special concern.

To provide more certainty to all stakeholders, the final solar plan must better explain the application review process in areas of special concern and what it means by "additional review." The Draft Solar PEIS simply compares this review to the existing variance process and states that BLM will screen solar applications to identify potential intersections with areas of special concern and, where intersections exist, project developers may propose avoidance or other mitigation measures to address resource concerns.[265] Because BLM is also proposing to eliminate the variance process, more clarity is needed about the application .

With respect to big game migration corridors and winter ranges, for example, the Draft Solar PEIS is silent on how BLM will process a solar application other than saying "[a]dditional big game datasets may be available and should be considered at the project level in collaboration with state agencies."[266] We believe crucial migration corridors and winter ranges, including linkages between protected areas, bottlenecks, and stopover sites, should be excluded at the outset rather than considered and hopefully addressed at the time of a solar application.[267] But if not, then any time BLM receives a solar application it should seek input and site-specific datasets from relevant federal and state agencies, tribes, and other stakeholders—either before or during the preliminary application review meetings required by 43 C.F.R. § 2804.12(b)(4)—and use that input and information to identify intersections with migration corridors and winter ranges and prioritize the application accordingly pursuant to 43 C.F.R. § 2804.35. If significant unavoidable impacts are likely, BLM should seek project relocation to the maximum extent possible.[268]

The final solar plan should adopt a similar process for reviewing applications in any additional areas of special concern it identifies pursuant to our recommendation below.

ii. Designating additional areas of special concern.

BLM should consult with the USFWS and tribes to determine whether to establish buffers around key units of the National Wildlife Refuge (NWR) System and areas of cultural and spiritual significance, similar to the proposed buffers around NPS lands. Also in consultation with tribes, BLM should consider buffers adjacent to certain BLM-managed properties, such as national monuments, national conservation areas (NCAs), wilderness areas, wilderness study areas, and ACECs, among others.

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[265] Draft Solar PEIS at 2-2 to -3, 2-36, Appendix H at H-1.
[266] Draft Solar PEIS Appendix H at H-5.
[267] *See supra* Section II.d.iii.
[268] This process is akin to BLM's proposal for NPS areas of special concern where it will seek the input of NPS at the preliminary application review meetings. *See* Draft Solar PEIS Appendix H at H-5 to -6.

To highlight just one example, all the proposed alternatives would open public lands near Searchlight, Nevada that are entirely surrounded by Avi Kwa Ame National Monument.[269] President Biden established Avi Kwa Ame National Monument because it is "among the most sacred places for the Mojave, Chemehuevi, and some Southern Paiute people," as well as other tribal nations.[270] Proclamation 10533 therefore declared that "the entire monument landscape . . . is an object in need of protection."[271] The Secretary is also directed to "meaningfully engage the Tribal Nations with historical and spiritual connections to the monument lands" and "enter into a memorandum of understanding with interested Tribal Nations . . . for co-stewardship of the monument."[272] In this circumstance, BLM must consult with the interested Tribes not only about the proposed solar application areas near Avi Kwa Ame National Monument, but also to explicitly direct attention to the relevant issues so tribes can offer informed input.[273]

Further, Congress established the NLCS "[i]n order to conserve, protect, and restore nationally significant landscapes that have outstanding cultural, ecological, and scientific values for the benefit of current and future generations,"[274] and such landscapes explicitly include national monuments.[275] For these reasons, The Wilderness Society and several of the undersigned organizations recently opposed BLM's proposal to extend an existing Section 368 energy corridor in California through Avi Kwa Ame National Monument.[276] BLM should therefore reconsider its proposed solar application in the same area.

iii. Avoiding public lands that are the subject of community-driven conservation campaigns.

BLM should screen solar applications to identify potential overlap with public lands that are the subject of community-driven campaigns and legislative efforts to designate new or expanded national monuments, NCAs, and NWRs, among other protective designations. Numerous

[269] *See* BLM Data Viewer, https://blm-egis.maps.arcgis.com/apps/webappviewer/index.html?id=22df2b327e0c49c3a9afb67de5ca658d.
[270] Proclamation 10533, *Establishment of Avi Kwa Ame National Monument*, 88 Fed. Reg. 17,987 (Mar. 27, 2023).
[271] Proclamation 10533, 88 Fed. Reg. at 17,994.
[272] Proclamation 10533, 88 Fed. Reg. at 17,995.
[273] *See supra* Sections I.c, II.f. Avi Kwa Ame National Monument is only one example among many others, including but not limited to proposed solar application areas that are near or adjacent to Baaj Nwaavjo I'tah Kukveni – Ancestral Footprints of the Grand Canyon National Monument, Basin and Range National Monument, Cabeza Prieta NWR, Ash Meadows NWR, Cabeza Prieta NWR, and Dominguez-Escalante NCA. *See* BLM Data Viewer, https://blm-egis.maps.arcgis.com/apps/webappviewer/index.html?id=22df2b327e0c49c3a9afb67de5ca658d.
[274] Omnibus Public Land Management Act of 2009, 16 U.S.C. § 7202(a).
[275] Omnibus Public Land Management Act of 2009, 16 U.S.C. § 7202(b)(1)(a).
[276] The Wilderness Society et al., Comment Letter on Notice of Intent to Amend RMPs for Section 368 Corridor Revisions and Prepare an Associated EIS (NEPA # DOI-BLM-HQ-3500-2023-0001-RMP-EIS) at 10-13 (Feb. 2, 2024). These comments are incorporated here by reference.

campaigns are currently underway across the eleven western states to protect areas of environmental and cultural importance to local communities and tribes, and to varying degrees all the action alternatives in the Draft Solar PEIS would impede these efforts.[277]

Places like the Great Bend of the Gila in Arizona,[278] Mimbres Peaks in New Mexico,[279] Dolores Canyon in Colorado,[280] Owyhee Canyonlands in Oregon,[281] for example, are all the subject of diverse grassroots and/or congressional campaigns to designate national monuments and protect ecologically and culturally significant resources and values on the public lands. Local communities and tribes have deep physical and cultural connections to these mostly intact landscapes. These places also contain important wildlife habitat and areas of connectivity that are key to addressing the climate and biodiversity crises, improving equitable access to nature,

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[277] We note, however, that there is overlap with these place under Alternative 5 than with BLM's preferred Alternative 3 and the other action alternatives being considered.

[278] *See* Respect Great Bend of the Gila, https://www.respectgreatbend.org; The Wilderness Society, Press Release, *Diverse community coalition praises introduction of bill to protect the Great Bend of the Gila* (Aug. 16, 2022) [attached as Ex. 3 in Appendix 5, at 16]; https://www.wilderness.org/articles/press-release/diverse-community-coalition-praises-introduction-bill-protect-great-bend-gila. The BLM Lower Sonoran Field Office previously identified utility-scale renewable energy exclusion and avoidance areas within this proposed monument. BLM, *Lower Sonoran Record of Decision & Approved Resource Management Plan*, Map 8 - Utility-scale Renewable Energy Exclusion & Avoidance Areas (Sept. 2012), https://eplanning.blm.gov/public_projects/lup/11856/39910/42110/LSDA-Map-08_Renewable_Energy.pdf. BLM should give maximum consideration to these previously designated renewable energy avoidance areas, and any similar designations set forth in other RMPs, when reviewing solar applications.

[279] *See* Mimbres Peaks National Monument, https://protectmimbrespeaks.org; The Wilderness Society, Press Release, *Community-driven campaign calls for new Mimbres Peaks National Monument* (Dec. 6, 2023) [attached as Ex. 4 in Appendix 5, at 22], https://www.wilderness.org/articles/press-release/community-driven-campaign-calls-new-mimbres-peaks-national-monument.

[280] *See* Conservation Science Partners, *Final Report, Assessment of the biodiversity values provided by unprotected public lands in Colorado including the Dolores River Canyon region* (July 21, 2023) [attached as Ex. 5 in Appendix 5, at 25]; Colorado Wildlands Project, *Colorado's Most Important Unprotected Biodiversity Hotspot, The Dolores River Canyon Country* (2023) [attached as Ex. 6 in Appendix 5, at 43]; Protect the Dolores, https://www.protectthedolores.org; *see also* Dolores River National Conservation Area and Special Management Area Act, S. 636, 118th Cong. (2023), https://www.congress.gov/bill/118th-congress/senate-bill/636**;** Dolores River National Conservation Area and Special Management Area Act, H.R. 1534, 118th Cong. (2023), https://www.congress.gov/bill/118th-congress/house-bill/1534?s=1&r=1&q=%7B%22search%22%3A%22dolores%22%7D; Michael Bennet, U.S. Senator, *Dolores River National Conservation Area and Special Management Area Act*, https://www.bennet.senate.gov/public/index.cfm/dolores-river-national-conservation-area-proposal#:~:text=The%20Dolores%20River%20is%20currently,and%20requires%20managers%20to%20protect (see links under "Resources" for letters in support of Dolores River NCA from counties, municipalities, conservation groups, the Ute Mountain Ute Tribe, a rancher, water district, and others).

[281] Malheur Community Empowerment for the Owyhee Act, S. 1890, 118th Cong. (2023), https://www.congress.gov/bill/118th-congress/senate-bill/1890?s=1&r=3; Protect the Owyhee Canyonlands, https://www.protecttheowyhee.org.

and achieving the national goal of conserving 30 percent of our lands and waters by 2030.[282]

For these reasons, the Western Solar Plan should treat these areas as areas of special concern that warrant additional review and require maximum public participation.

IV. BLM's assessment of development acreage needs based on the RFDS reflects a reasonable upper-end estimate of potential solar development within the 11-state planning area but further analysis should be performed to refine the results.

In Appendix C, BLM indicates that its RFDS analysis may be in flux, with BLM expecting to revisit and potentially revise estimated solar development acreage. As such, BLM anticipates making possible refinements to the RFDS in the final PEIS based on public comments or other factors.[283] Accordingly, we have conducted an evaluation of the RFDS to assess its usefulness and accuracy as a predictive tool. Although there are some issues worth BLM's further consideration while finalizing this PEIS, we conclude that BLM's RFDS and acreage estimates are reasonable upper-end estimates of potential solar development needs in the 11-state planning area, even under an aggressive end-use electrification and 100% fossil fuel-free scenario by 2050 (i.e., the E+RE+ scenario in Princeton's Net Zero America (NZA) report[284]).

To summarize BLM's current conclusions regarding land use needs, the Draft Solar PEIS reports that approximately 700,000 acres of BLM-managed public land will be required to support foreseeable solar energy deployment across the 11-state planning area by 2045. This is in addition to the projected use of 283,000 acres within the Desert Renewable Energy Conservation Plan (DRECP), excluded from the planning area in the Draft Solar PEIS, and over 325,000 acres of non-BLM-managed land within the planning area states. Altogether, BLM's RFDS projects the need for a total of 1.3 million acres by 2045 in the 11-state planning area, as laid out in Table 2.2-1 of Appendix C,[285] reproduced below (Table 1). BLM describes this scenario as "an upper-end estimate of potential solar energy development in the next 20 years."[286]

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[282] *See* Exec. Order No. 14,008, § 216, 86 Fed. Reg. at 7,627; 2021 America the Beautiful Report at 14 (establishing principles for locally led efforts to conserve and restore lands and waters and stating that "[e]very community in the United States has its own relationship with nearby lands and waters, and every community is working in some way to conserve the places that matter the most to it. The Federal Government should do all it can to help local communities achieve their own conservation priorities and vision. Locally and regionally designed approaches can play a key role in conserving resources and be tailored to meet the priorities and needs of local communities and the nation."), https://www.doi.gov/sites/default/files/report-conserving-and-restoring-america-the-beautiful-2021.pdf.

[283] Draft Solar PEIS Appendix C.4 at C-4.

[284] Eric Larson et al., Princeton University, Net Zero America, *Potential Pathways, Infrastructure, and Impacts, Final Report* (Oct. 29, 2021) ("NZA Final Report"), https://netzeroamerica.princeton.edu/the-report.

[285] Draft Solar PEIS Appendix C.4 tbl. 2.2-1 at C-5.

[286] Draft Solar PEIS Appendix C.1 at C-2.

Table 1. BLM's results for the planning area, reproduced from Table 2.2-1.

Table 2.2-1. Reasonably Foreseeable Development Scenario[a]

State	Estimated Area Developed by 2045 Under RFDS (acres), by Landholding		Total State Land Area (acres)	BLM-Administered Land Area (% state total acres)
	BLM	Non-BLM		
Arizona	198,210	66,071	72,958,449	12,109,337 (17%)
California (non-DRECP)[b]	109,972	130,920	47,484,043	4,150,345 (06%)
Colorado	45,207	15,070	66,620,001	8,354,303 (13%)
Idaho	89,574	29,859	53,484,044	11,774,830 (22%)
Montana	5,387	1,797	94,105,196	8,043,026 (09%)
Nevada	48,119	16,040	70,757,520	47,272,125 (67%)
New Mexico	11,123	3,708	77,817,452	13,493,392 (17%)
Oregon	51,387	17,129	62,128,249	15,718,196 (25%)
Utah	39,793	13,264	54,334,651	22,767,896 (42%)
Washington	71,781	23,927	43,276,212	437,237 (01%)
Wyoming	27,277	9,092	62,600,125	18,047,487 (29%)
Total RFDS Acres	697,809	326,877	—	—

Sources: DOE (2021), NREL (2022).

a NREL (2022) estimates that a total of 1,307,493 acres of land in the 11-state planning area will be utilized for utility-scale solar energy development by 2045.

b The DRECP area, which accounts for 72% of BLM-administered land in California, is excluded from the scope of this Programmatic EIS. The RFDS assumes that 72% of future solar development will occur in the DRECP area, and the remaining 28% will occur on BLM-administered lands outside of the DRECP area. Thus, the RFDS estimate for non-DRECP BLM-administered lands in California is 28% of the overall projected development on BLM-administered lands in California. It is estimated that 282,786 acres of BLM-administered land within the DRECP planning area would be developed by 2045 under the RFDS, thus accounting for the total of 1,307,493 acres in the 11-state planning area.

We present below four conclusions and recommendations based on our evaluation of the RFDS analysis. First, while our analysis supports characterizing the projected acreage as an upper end estimate of potential land use needs for solar development, it may not represent an upper end *limit* to such needs based on consideration of comparable net-zero emission pathway studies, like Princeton's NZA analysis. Second, our review turned up significant differences on a state-by-state level in projected land use needs, with a number of states identified in the RFDS as solar development locations reporting no development in the NZA modeling and, conversely, some states identified in the NZA with much higher solar development than reflected in the RFDS.[287] We recommend that BLM evaluate the reason behind those differences to determine whether the RFDS estimates need adjustment, either by conforming the RFDS analysis more closely to the Princeton analysis or merging the state estimates from the two analyses to represent the most comprehensive combination. Third, BLM has not fully explained or quantified the basis for its assumption that 75% of projected solar development should be on

[287] We focus this comparison on Princeton's land use results under their "constrained" scenario. However the same trends hold true in the "base" land use scenario they also present. More detail on the differences in assumptions between these scenarios can be found in NZA Final Report Annex D: Solar and Wind Generation Transitions (Sept 7, 2021), https://netzeroamerica.princeton.edu/img/NZA%20Annex%20D%20-%20Solar%20and%20wind%20generation.pdf.

BLM-managed land. We recommend that BLM revisit and deepen that analysis using available spatial and mapping tools. And fourth, we conclude that aside from these three issues, the RFDS-based estimate of solar land use needs is otherwise largely consistent with the necessary level of ambition needed for nation-wide net-zero climate goals.

a. The RFDS accurately states an "upper end estimate" but may not reflect an upper limit for solar development needs nationwide.

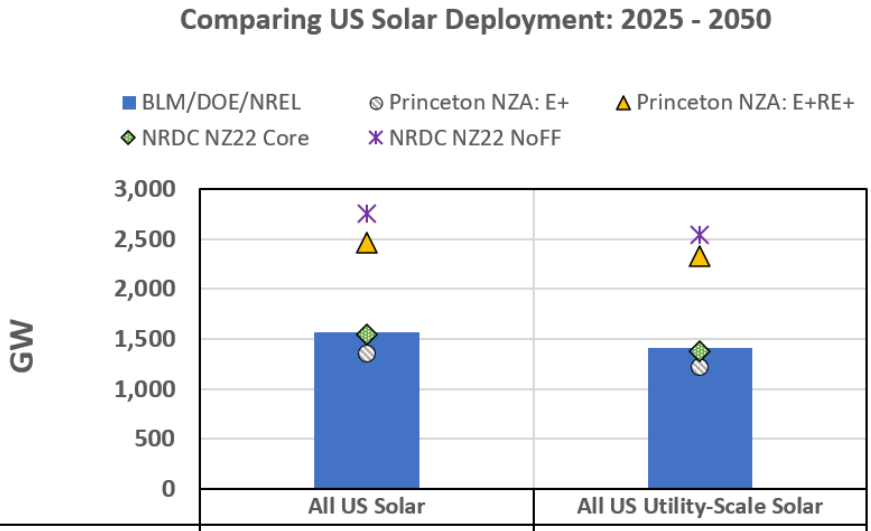
In the PEIS's Appendix C, when explaining the RFDS, BLM states: "the BLM considers the RFDS to represent an upper-end estimate of potential solar energy development in the next 20 years."[288] It uses the Department of Energy (DOE)'s *Solar Futures Study* and National Renewable Energy Laboratory's (NREL) companion study on environmental impacts, including land use, which model "an aggressive high-electrification development scenario that assumes enhanced electrification of end uses such as motor vehicles and building spaces and water heating" and "scenarios that achieve a carbon-free power sector by 2050, reflect national renewable energy goals, and account for increased deployment of both wind and solar energy."[289] BLM cites comparisons of their results to the Energy Information Agency's (EIA) Annual Energy Outlook (AEO) scenarios to support this, claiming that "The highest projections estimated by the EIA are 442 GW less than those estimated in the *Solar Futures Study* scenario used as the basis for the RFDS, providing further evidence that the *Solar Futures Study* scenario represents an upper-end solar energy development estimate for 2045."[290] However, AEO scenarios aren't yet available for targets like those of net-zero emissions by 2050.

Using two comparable studies of ambitious solar deployment: Princeton's NZA[291] and NRDC's *Pathways to Net Zero* reports.[292] We present a further consideration of the possible range of acreage needed by first comparing net-zero levels of solar energy capacity deployment, and looking beyond the planning area to national totals over the same time period. [293] Accomplishing something like net-zero emissions nationwide cannot be done with action in

[288] Draft Solar PEIS Appendix C.1 at C-2.
[289] Draft Solar PEIS Appendix C.1 at C-1 to -2.
[290] Draft Solar PEIS Appendix C at C-2.
[291] Throughout this comment, we reference data pulled from their "Constrained Land Use Assumptions (CLUA)" results.
[292] Jackie Ennis & Amanda Levin, NRDC, *Clean Energy Now for a Safer Climate Future: Pathways to net zero in the United States by 2050* (Apr. 2023), https://www.nrdc.org/sites/default/files/2023-04/clean-energy-pathways-net-zero-2050-report.pdf.
[293] The Princeton source provides data at 5-year increments between 2020 and 2050, with data on utility-scale solar deployment available only at the national level, and data on total solar deployment, inclusive of utility-scale, available at the state level. The NRDC source provides data on both utility-scale (referred to as "transmission-sited" in the report) and in total for the model start year of 2022 and then decadal intervals between 2030 and 2050, but is only available in regional or national level rather than state. Where datapoints were missing (i.e. for utility-scale solar at the state level or for years not reported by the source), estimations were made based on related data (i.e. share of utility-scale solar at the national level and using linear interpolation for unavailable years).

only a few states, so this level of comparison sets the bar on whether the smaller geography represents a degree of ambition aligned with the bigger picture needs. For each study, we looked at two relevant sets of scenarios: (1) one representing a central case net-zero scenario (E+ from Princeton and Core from NRDC); and (2) a high ambition estimate where fossil fuel use is eliminated by 2050 (E+RE+ and No Fossil Fuels from Princeton and NRDC, respectively). We compare both studies at the national level for deployment, as in this section, however, the NRDC study does not report land use estimates, so only Princeton will be compared when looking at acreage results later on.

At the national scale, we observe that BLM's level of solar deployment (GW) is in strong alignment with both Princeton's and NRDC's central case net zero scenarios: falling within 15% and 3% of their E+ and Core scenarios, respectively. However, looking to the more aggressive renewable deployment scenarios from these net-zero models calls into question whether BLM's estimate should be considered an upper end estimate. Princeton's E+RE+ scenario shows ~60% more solar being deployed nationwide through 2050 and NRDC's NoFF scenario shows ~80% more through 2050. This suggests that BLM could be underestimating total deployment overall.



	All US Solar		All US Utility-Scale Solar	
BLM/DOE/NREL	1,570		1,413	
Princeton NZA: E+	1,354	(-14%)	1,216	(-14%)
Princeton NZA: E+RE+	2,464	(+57%)	2,327	(+65%)
NRDC NZ22 Core	1,541	(- 2%)	1,374	(- 3%)
NRDC NZ22 NoFF	2,756	(+76%)	2,543	(+80%)

Figure 1. *Comparing utility-scale solar deployment at the national scale to net-zero modeling. Although the PEIS runs through 2045 and not 2050, this national level comparison is provided for 2025-2050 to offer best comparison between BLM's reported datapoint from the Solar Futures Study and Princeton and NRDC's net zero studies. E+ and Core represent the central case net-zero scenarios for Princeton and NRDC studies, respectively, and E+RE+ and NoFF represent the most ambitious renewable deployment scenarios.*

The same observation holds true when comparing BLM's total acreage needs from the DOE *Solar Futures Study* to net-zero studies at the national level. We observe a significant difference, with Princeton NZA predicting 45% higher acreage need for solar nationwide in its ambitious renewable-driven E+RE+ scenario through 2050, but also note this deviation is

markedly lower in magnitude than the divergence shown by the data on solar deployment levels nationwide, discussed in the prior paragraph. The narrowing of results between the deployment estimate step and the acreage estimate step is indicative of an important underlying assumption that differs between the BLM and Princeton studies, which we refer to as solar footprint in these comments. This metric, sometimes also referred to as land use intensity or power density, tells us how many acres of land the study believes are needed on average for a unit of solar power capacity to be installed and operated.

Detailed comparison of these solar footprint assumptions between studies is reserved for Section D, but because acreage estimates are nothing more than the product of deployment (MW) and footprint (acres/MW) for a given area and time period, then a shrinking difference between the studies' acreage estimates clearly indicates that BLM's relatively conservative footprint assumption of ~7.5 acres/MW is higher than Princeton's, and therefore BLM's results about acreage are masking the degree to which national solar deployment ambition is lower in the Solar Futures Study versus Princeton's net-zero modeling. This information confirms that BLM's source, the *Solar Futures Study*, is still relatively conservative overall, at least at a national level, but nonetheless is not necessarily a foreseeable upper end limit given the less conservative land needs assumptions in comparable studies.

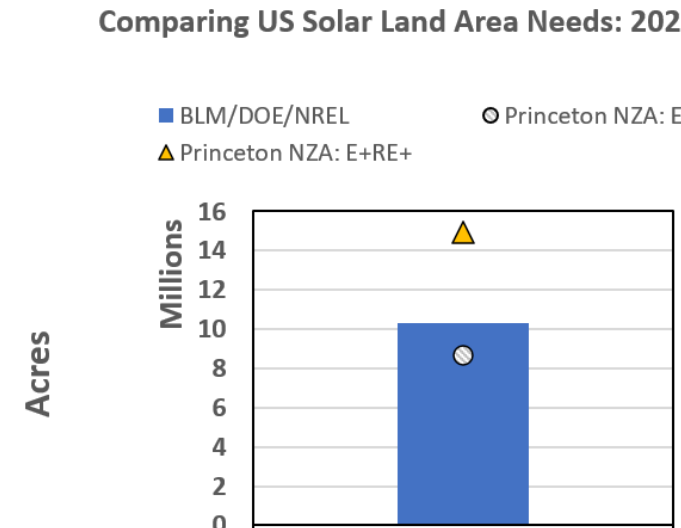


Figure 2. *Comparing utility-scale solar land use estimates at the national scale to net-zero modeling. Although the PEIS runs through 2045 and not 2050, this national level comparison is provided for 2025-2050 to offer best comparison between BLM's reported datapoint from the Solar Futures Study and Princeton and NRDC's net zero studies. E+ and Core represent the central case net-zero scenarios for Princeton and NRDC studies, respectively, and E+RE+ and NoFF represent the most ambitious renewable deployment scenarios.*

b. BLM's RFDS total acreage needs estimate for the 11-state planning area is largely accurate even under an aggressive electrification scenario but BLM should resolve

discrepancies between its state-level needs conclusions and those in Princeton's NZA modeling.

Our analysis suggests that, while useful for direct comparison with BLM's RFDS, regional level analysis may also not be enough to ensure BLM is allocating its land appropriately among states it is considering opening to solar development. In contrast to the national scale comparison, we find that BLM's RFDS acreage estimate for the planning area appears to be accurate for even ambitious net-zero-aligned levels of utility-scale solar deployment, at least through 2045. However, there are discrepancies between BLM's state-level needs estimates and those in other studies. For these reasons, we urge BLM to do more to assess divergence from other studies, like the Princeton NZA report, at this state-level scale to ensure sufficient land is available while still also carefully balancing the competing uses and impacts on federal public lands in different states. Additionally, state level analysis reveals that there may be value in considering what happens in these net-zero scenarios in the years just after the end of the identified 20-year planning horizon—between 2045 and 2050—when pathway alignment for more environmentally friendly scenarios will diverge most rapidly from the central case, expanding to include more growth in more states in order to squeeze out the last and hardest-to-abate chunk of fossil-dependent sectors. Failure to do so can result in myopic underestimating.

In this section we report two different sets of results, each representing different scopes of geography: planning area, which excludes the DRECP, and planning area + DRECP, which eponymously includes it. This is because the direct results reported by BLM and Princeton do not match in scope for a major contributor—California—requiring further analysis to estimate Princeton's planning area total without the DRECP,[294] as this is what BLM represents (column 1). Additionally, to minimize the influence of this additional layer of assumption, which is necessary to match scope with BLM, we also present comparison of Princeton's results at its own natural level of reporting—i.e., full state totals—to the relevant expanded version of BLM's planning area that includes foreseeable development in the DRECP as well, as in the PEIS at Table C-1.

[294] Princeton's state-level data are generated from regional deployment models which are then downscaled to state-level deployment and land use results based on geospatial constraints for acceptable siting and assumptions about solar projects' footprints. Sub-state level areas like the DRECP are not modeled explicitly, therefore Princeton's results for California represent the entire state and do not reflect the same geographic scope as this PEIS, forcing an assumption to estimate the share of California total from this region to exclude from the modeled data. Here, we assume the same proportional split of California solar deployment as BLM assumed in its own methods with respect to land use—54% in DRECP versus 46% outside DRECP as in Table C-2—and find that California would deploy 38.5 to 60.4 GW of solar outside the DRECP, reducing the total for the planning area by 45.3 to 70.9 GW (or around 40%) as compared to the simple total of all 11 states. This puts Princeton's deployment level estimates for the PEIS planning area decidedly below BLM's RFDS value regardless of scenario: totaling 65.1 to 117.5 GW through 2045 as compared to BLM's 136.5 GW.

Because California represents over 70%[295] of the total solar deployment modeled by Princeton across this eleven-state planning area region, any assumed split of California solar to accommodate separate treatment of DRECP in Princeton data will affect the planning area total results significantly. For this reason, the second analysis at full state level is critical to allow us to understand how robust any planning area comparisons are to the assumed share of California solar within and outside of the DRECP (column 2), made absent of explicit modeling in Princeton's analysis.

Figure 3 shows the total solar deployment in planning area states. If we assume the same share of California solar is deployed in the DRECP under Princeton's modeling as in BLM's own assessment, we find that, despite the potential higher-level underestimation suggested by nation-wide data, the planning area match is fairly good with even the most ambitious net-zero modeling scenario. This alignment also appears fairly robust to the default assumption on share of California solar, landing within +/-15% of BLM's deployment totals for the E+RE+ scenario in either view: 65 to 118 GW in the planning area and 110 to 188 GW in all 11 states. Notably, however, if the DRECP is included, the ambitious net-zero scenario deploys 8% more solar than BLM predicts, which again, technically calls into question the idea of this as an upper-end limit, but certainly supports the idea of it representing an upper-end estimate.

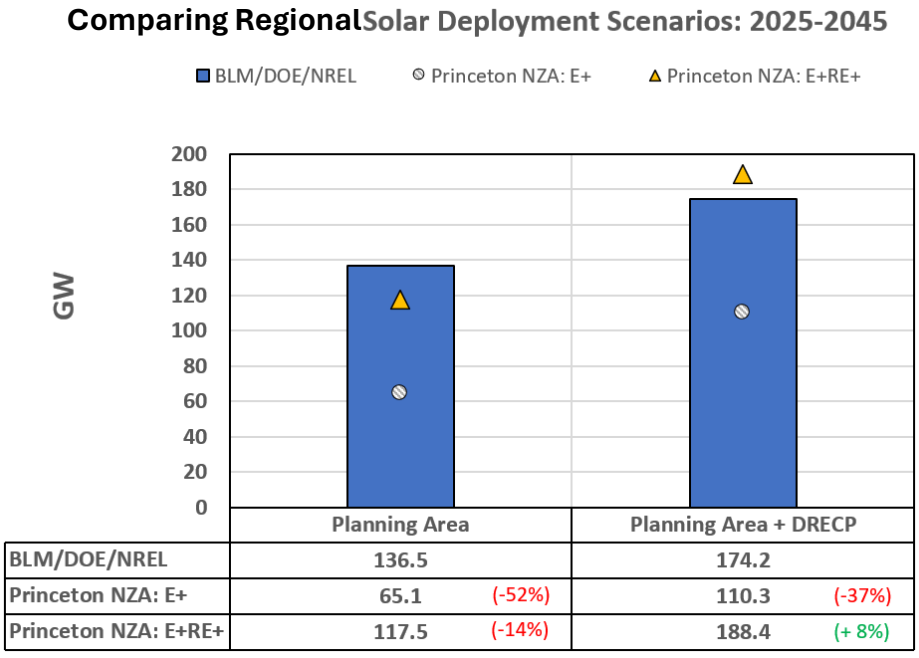
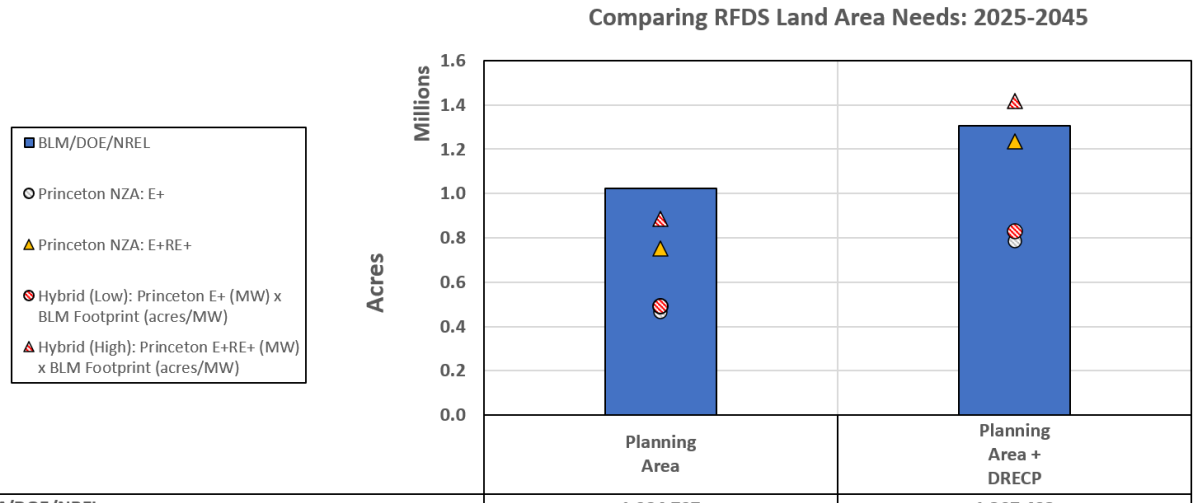


Figure 3. *Comparing regional utility-scale solar deployment from BLM's underlying model (DOE Solar Futures Study) results to Princeton's modeling of net-zero emissions by 2050 to assess likelihood that BLM RFDS represents as it states "an upper-end estimate" at the planning area scale. Princeton's E+ and NRDC's Core scenario represent more central cases with high electrification and certain other constraints. Princeton's E+RE+ and NRDC's No Fossil Fuels (NZ22 NoFF) scenarios represent highly ambitious scenarios without fossil fuels by 2050.*

[295] Princton's modeling estimates 38.5 to 60.4 GW of solar deployed in California through 2045, and 110.3 to 188.4 GW of solar deployed across all eleven planning area states, yielding a share of 76% and 70% from California in the central estimate E+ and ambitious E+RE+ scenarios, respectively.

Similarly, Figure 4 shows the total acreage estimates for utility-scale solar in the planning area region covered by this PEIS. Again, despite potential for national-scale underestimation, we find the planning area acreage estimates are fairly consistent with BLM's totals whether California's DRECP is included or not, implying differing degrees of reliance on western states between *Solar Futures* and *NZA*. BLM's data totals 1.02 million acres through 2045 for the planning area proper (inclusive of BLM-managed lands and lands outside of BLM's jurisdiction)—excluding DRECP—whereas estimates from downscaling of Princeton state-level data suggests 27-55% less, at 464 to 752 thousand acres, depending on the specific net-zero scenario and its reliance on solar. In contrast to the deployment level comparison in Figure 3, acreage estimates from the net-zero study are all beneath BLM's predictions for the planning area, whether or not it includes the DRECP. This is because, for the same reason noted in the national scale data in section A, the underlying solar footprint used by Princeton is lower than BLM's source and results in systematically lower land use predictions for the same level of solar deployment. For this reason, it is also important to consider how this known difference in underlying drivers of acreage estimates—namely, the solar footprint (acres/MW) assumed by each study and levels of solar deployed (MW) it gets applied to—are biasing results in ways the prevent apples-to-apples comparison, and we include two additional "hybrid" scenario datapoints in Figure 4 to demonstrate that.



	Planning Area		Planning Area + DRECP	
BLM/DOE/NREL	1,024,707		1,307,493	
Princeton NZA: E+	464,094	(-55%)	786,854	(-40%)
Princeton NZA: E+RE+	751,685	(-27%)	1,234,141	(- 6%)
Hybrid (Low): Princeton E+ (MW) x BLM Footprint (acres/MW)	488,978	(-52%)	828,506	(-37%)
Hybrid (High): Princeton E+RE+ (MW) x BLM Footprint (acres/MW)	884,049.7	(-14%)	1,416,037.0	(+ 8%)

Figure 4. *Planning area land needs for solar deployment, comparing estimates of acreage for BLM's scope ("Planning Area") and the full eleven states, including BLM's scoped-out DRECP within California ("Planning Area + DRECP).*

The results of harmonizing assumptions between the studies[296] are labeled "Hybrid (low)" and "Hybrid (high)" in Figure 4, and they represent using deployment data from Princeton's E+ and

[296] By taking Princeton's alternate deployment data by state and multiplying it by BLM's higher solar footprint assumption.

E+RE+ scenarios, respectively, but applying BLM's more conservative solar footprint assumptions. When including DRECP, at most, Princeton's *directly reported* estimates of solar land use for these eleven states tops out at 1.23 million acres in the ambitious renewable net-zero scenario (E+RE+) through 2045, which is still 6% lower than BLM's RFDS total if the area estimates for DRECP development are added back in. Even when using conservative harmonized estimates, these models suggest that the planning area states would require no more than 1.42 million acres, or just 8% more than BLM's RFDS total when including DRECP, suggesting good upper end match at planning area level, with potential to overestimate need for the region collectively by as much as 55%. Again, we do see the ordinal relationship between the Princeton ambitious E+RE+ scenario data and BLM's estimate flip notably when adding in the DRECP, where Princeton's modeling suggests slightly more land area is needed than what BLM's RFDS estimates, which speaks to the power of this single assumption.

The results tell us that, even if Princeton's modeling is more accurate than BLM's about the level of deployment in these states collectively, and if BLM is more correct about its higher land area need assumptions per unit of solar capacity installed, BLM still reasonably well approximates the land needs for aggressive western state solar deployment: within 15% of the upper estimate of land use ("Hybrid (high)") regardless of how DRECP should be broken out from California totals.

The real discrepancies reemerge when zooming into the state level. Results from Princeton's *NZA* report for the eleven states highlights significant departures between BLM's RFDS estimates and the net-zero pathways Princeton modeled, suggesting further need for scrutiny from BLM at this level beyond the planning area total. BLM would be wise to consider this additional data from Princeton's E+RE+ scenario to see where the DOE study may be leading to state-level estimates that could be inappropriately limiting area needs within certain states.

Table 2 displays state level deployment results, comparing BLM and Princeton findings for 2025 to 2045, including totals for the planning area (with and without DCREP included in California).[297] Here we see Princeton modeling suggest solar deployment to be more targeted in fewer states than BLM: only six of the eleven states included in the planning area report capacity expansions through 2045 in NZA. By contrast, Idaho, Montana, Oregon, Washington, and Wyoming show no deployment in either scenario from Princeton during this period.[298] As a

[297] The ranges presented in each state entry for the Princeton data reflect the inherent uncertainty within our state level estimates because utility-scale data were not directly reported at the state level. Because we estimated the state level utility-scale solar deployment values, we present a range starting with the core simplifying assumption that each state will follow the same breakdown as the national level data suggests from NZA, and could be as high as 100% of the solar deployment for the state. Table 2 includes the values used to attribute utility-scale share by state in the final row.

[298] Notably, this aligns with the states excluded from BLM's 2012 Western Solar Plan. While the Princeton study's methodology does not affirmatively state it screens out these states on this basis, it does reference "BLM – SEP, WSP" in a table describing it's exclusions in Appendix D cited in prior footnote. There is a small amount of deployment in some of these states after 2045, as indicated by non-zero 2050

result, we see significantly larger predictions of solar deployment in a few states under Princeton's NZA study: New Mexico (increasing more than 4X), California (potentially doubling), and Colorado (increasing by over 70%). Other states, like Arizona, see significantly less deployment (less than half). Changes are more moderate in the remaining states – <20 – 30% more deployment for Nevada and Utah in the most ambitious scenario – which is what leads to the previously discussed conclusions of overall planning area totals matching fairly well to NZA's high-ambition E+RE+ scenario.

data, undercutting the potential that solar is not deployed in these states by rule in the model, but further clarity should be sought with the authors.

Table 2. *State-level utility-scale solar deployment between 2025 – 2045 in gigawatts (GW) of capacity: Net-zero study (Princeton NZA) as compared to BLM's RFDS for planning area. Red text = less solar deployment, green text = more solar deployment.*

		Total Utility-Scale PV Solar Development (GW): 2025 - 2045		
			Princeton NZA: Constrained Land Use *(Percent difference from BLM's solar deployment by state)*[299]	
State		**BLM**	**E+**	**E+RE+**
Arizona		35.2	4.1 – 4.6 *(-87% to -88%)*	15.6 – 16.6 *(-53% to -56%)*
California	non-DRECP	32.1*	38.6 – 42.8** *(+20% to +33%)*	60.4 – 64.3** *(+88% to +100%)*
	DRECP	*37.7**	*45.3 – 50.3*** *(+20% to +33%)*	*70.9 – 75.4*** *(+88% to +100%)*
Colorado		8.0	8.3 – 9.2 *(+4% to +16%)*	12.8 – 13.6 *(+60% to +71%)*
Idaho		15.9	0 *(-100%)*	0 *(-100%)*
Montana		1.0	0 *(-100%)*	0 *(-100%)*
Nevada		8.6	4.4 – 4.9 *(-43% to -49%)*	10.1 – 10.8 *(+18% to +25%)*
New Mexico		1.9	2.5 – 2.8 *(+33% to +48%)*	10.0 – 10.7 *(+428% to +462%)*
Oregon		9.1	0 *(-100%)*	0 *(-100%)*
Utah		7.1	7.2 – 8.0 *(+1% to +12%)*	8.5 – 9.0 *(+19% to +27%)*
Washington		12.8	0 *(-100%)*	0 *(-100%)*
Wyoming		4.8	0 *(-100%)*	0 *(-100%)*
Planning Area Total (without DRECP)		**136.5**	**65.1 – 72.3** ***(-47% to -52%)***	**117.5 – 124.9** ***(-8% to -14%)***
Planning Area + DRECP California		174.2	110.3 – 122.6 *(-30% to -37%)*	188.4 – 200.4 *(+8% to +15%)*
Utility-scale share of total solar		80-90% [300]	90%	94%

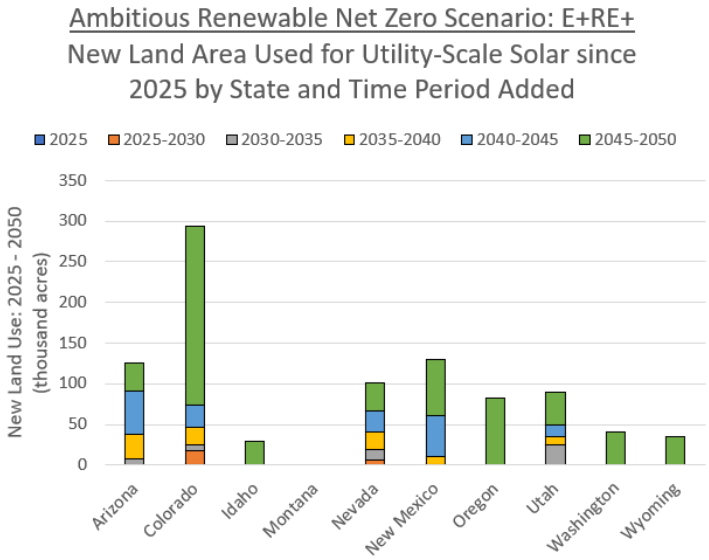
** Total deployment in California, inclusive of the DRECP, which BLM otherwise chooses to exclude from this planning area, is reported in the PEIS Appendix C at Table C-1 as 69.8 GW and needing 523,679 acres. Table C-2 of the PEIS also reports the area of land assumed to be deployed in California in the RFDS for non-DRECP land, which corresponds to 240,892 acres across BLM and non-BLM lands outside the DRECP, or the equivalent of 46% of the total California land use for solar. Given the fixed relationship in BLM's modeling between land use and solar deployment, reported as 7.5 acres/MW in footnote of Table C-1, the same ratio should hold for share of solar capacity deployed in MW or GW in California DCREP (46%) vs non-DCREP (54%).*

*** Absent specific results for the DRECP from Princeton's modeling, we applied the same assumption described in the prior note (*) to estimate Princeton's results for California outside (46%) and within (54%) the DRECP.*

[299] Results for utility-scale solar not provided at state level from Princeton NZA directly; instead, they are estimated from national level's utility-scale share of total solar, presented in the final row of the table. Because applying this to state-level data of all solar assumes each state has the same breakdown, we also include the raw results as the upper end of a range (all utility).

[300] Draft Solar PEIS Appendix C.1 at C-1 ("The Solar Futures Study estimates that up to about 1,570 GW of solar energy development across the entire U.S. would be required for the nation to produce about 45% of its total electricity requirements from solar by 2050, and that 80–90% of that will be utility-scale solar, with the remainder coming from smaller-scale distributed solar (DOE 2021).").

Notably, states that did not show any solar deployment over the planning period in Princeton's modeling—Idaho, Oregon, Washington, and Wyoming—do eventually show deployment in the period between 2045 and 2050 under their aggressive E+RE+ scenario (Figure 5). This happens because the scenario's goal is to reach net-zero by phasing out fossil fuels completely by 2050, and the last five years feature a big push with broader deployment everywhere, including areas not previously economically optimal. The only state in the planning area that never sees utility-scale solar deployment is Montana due to a variety of factors not comprehensively analyzed here. However, it is important to note that this result is not a signal that solar, or even specifically utility-scale solar, is wholly inappropriate to site in Montana or any other state, only that it may not be the most cost-optimal solution compared to other alternatives based on, among other things, resource potential, landscape, cultural, or ecosystem limitations, according to this study.



ACRES x 1000 ADDED

Scenario	State	2025	2025-2030	2030-2035	2035-2040	2040-2045	2045-2050	TOTAL: 2025-2050
E+RE+	Arizona	0	0	7.17	30.07	53.96	34.91	**126.10**
E+RE+	California	7.84	77.21	158.05	341.22	309.13	352.31	**1,245.75**
E+RE+	Colorado	1.03	16.31	7.17	21.94	27.21	220.41	**294.06**
E+RE+	Idaho	0	0	0	0	0	29.47	**29.47**
E+RE+	Montana	0	0	0	0	0	0	**0.00**
E+RE+	Nevada	0	6.36	13.28	20.39	26.64	34.97	**101.65**
E+RE+	New Mexico	0.15	0	0	9.76	50.45	69.13	**129.50**
E+RE+	Oregon	0	0	0	0	0	81.72	**81.72**
E+RE+	Utah	0	0	24.34	10.44	14.03	40.16	**88.97**
E+RE+	Washington	0	0	0	0	0	40.30	**40.30**
E+RE+	Wyoming	0	0	0	0	0	34.23	**34.23**
E+RE+	Total	9.01	99.89	210.01	433.82	481.41	937.62	**2,171.77**

Figure 5. *Princeton NZA ambitious renewable scenario, E+RE+, showing delayed deployment in states lacking deployment through planning period (2025-2045). Color bars segments correspond to the amount of solar acreage used during a given 5 year period. Numbers highlighted in yellow in data table show states where first new deployment since 2025 is seen between 2045 and 2050: Idaho, Oregon, Washington, Wyoming.*

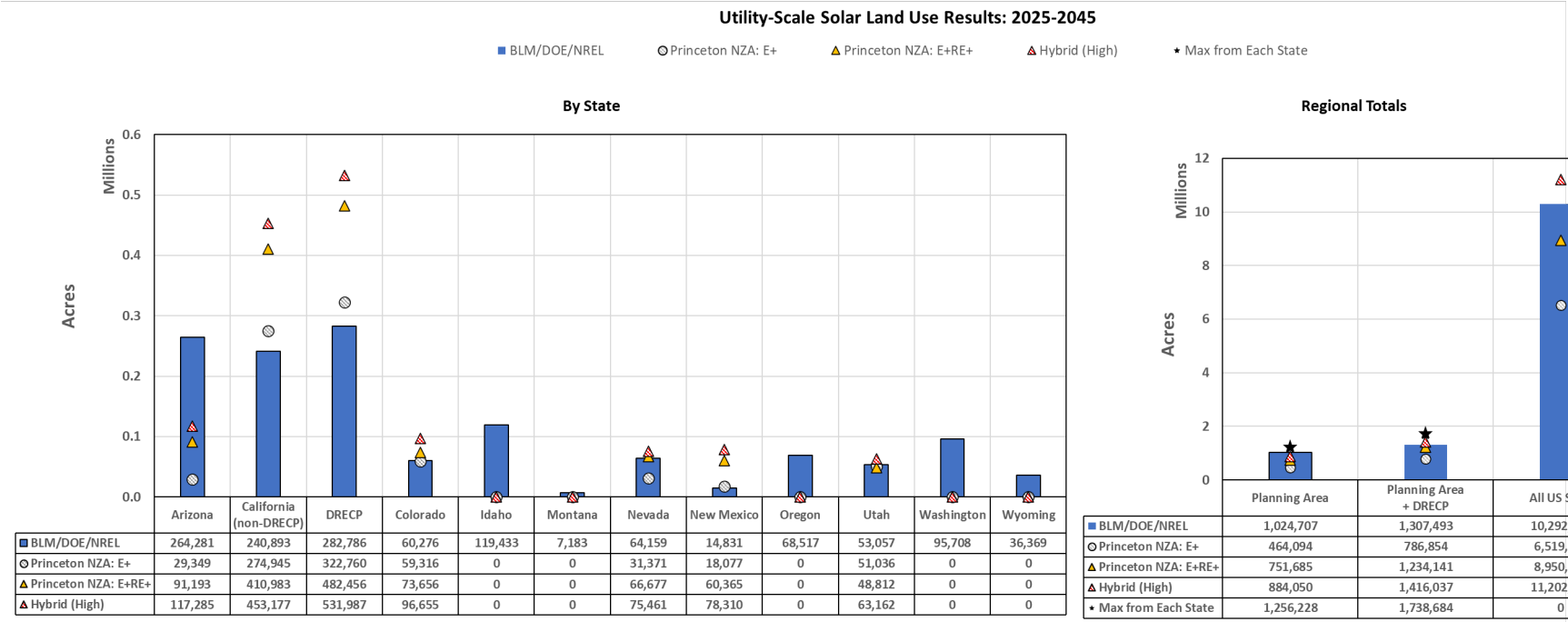
Table 3 and Figure 6 show the corresponding land area expected to be needed to meet the deployment through 2045 in planning area states, for the most direct final comparisons to the RFDS. Given the direct relationship between deployment and land use, the directional changes by state are consistent with those described in the prior paragraph; however, the magnitudes vary for the six states NZA predicts to see development in. New Mexico, California, and Colorado see the largest discrepancies, suggesting BLM is potentially underestimating acreage requirements in these states by as much as 3x, 1.8x, and 22%, respectively, if NZA modeling assumptions of solar footprint are taken to be representative. If expanded to combine BLM solar footprint assumption with Princeton's deployment levels, this discrepancy grows to 4.3x, 2x, and 60% for New Mexico, California, and Colorado, respectively.

Identification of this discrepancy in the state-by-state numbers does not by itself inform a determination whether the RFDS versus the NZA numbers for individual state solar development are more accurate, or how the discrepancy should be handled. We recommend that BLM evaluate the reason for the differing state by state estimates, make a determination as to their relative accuracy, and explain in the FEIS the reasons for that determination. Depending on the results of that analysis, BLM could either keep the RFDS numbers as they are (see "ORIGINAL RESULT" columns in Table 3) or adjust some or all of them to conform to the NZA numbers. Table 3 columns labeled "OPTION 1: SUBSTITUTE" represent the results if BLM adjusted all numbers to conform to either Princeton NZA's E+ or E+RE+ scenario data, and the columns labeled "OPTION 2: HYBRIDIZE" represent the results if BLM used a combination of data from each study. The first way this could be done was described above as harmonizing the studies to use the maximum of each acreage driver: deployment levels from Princeton E+RE+ and footprint assumptions from BLM, as previously discussed. Another way could be to create a total from combining either BLM's or Princeton's acreage at the state level, using whichever study reports the larger result, representing a true conservative maximum area regardless of which study is closest to reality's potential.

If adopting Princeton's ambitious E+RE+ scenario modeling outright, and accepting the assumptions made here about the share excluded in DRECP, BLM might only need 81%, or 563 thousand acres, of the federal land it predicted in the RFDS. However, if the share of California solar outside DRECP is higher, approaching 100%, we might need 1.05 million acres. BLM would be well advised to consider this question in more detail, including, but not limited to, by looking through the state level data presented here, and more importantly, taking advantage of the next step recommended in section C to compare geospatial data on Princeton's NZA scenario with regions of interest like DRECP and public vs. private lands. If expanded to harmonize underlying assumptions, as previously discussed, and excluding DRECP at default share, this narrows RFDS counterfactual results to within 5% of BLM's total, or 663 thousand acres of federal land. But again, if DRECP share of solar is lower, approaching zero, then this method predicts we may need 1.06 million acres of BLM land. Finally, if expanded to include the area where Princeton predicts more in any state than BLM—a true conservative upper estimate—the RFDS total acreage would be increased by 35% to 942 thousand acres on BLM-managed lands. All these results adopt the same assumption of 75% public to 25% private that BLM applied, but we recommend additional analysis to supplement this in the next section.

Table 3. *Utility-Scale solar development needed in acres of land needed between 2025 – 2045. Includes estimate of BLM-managed share if same split of 75% used in the RFDS is applied to net-zero study data for comparison. Additionally presents results in terms of alternative options for quantifying the RFDS for this PEIS: Option 1, which is to substitute directly for the state level data from one of Princeton's scenarios (E+RE+ matches most closely), or Option 2, which is to hybridize the estimate by combining some data from BLM and others from Princeton. Values in parenthetical represent percent difference from BLM value by land type. Red text = less solar deployment, green text = more solar deployment.*

	Utility-Scale Solar Development Land Used (acres): 2025-2045									
	ORIGINAL RESULT: BLM's current RFDS using DOE Solar Futures Study		**OPTION 1: SUBSTITUTE COMPLETELY e.g. for Princeton NZA - Constrained Land Use Scenario Data**				**OPTION 2: HYBRIDIZE e.g. Select source based on MAXIMUM…**			
			E+		**E+RE+**		**…Drivers by study, i.e. Max. national deployment (Princeton E+RE+) × max. solar footprint (BLM) by state**		**…Land area result by state across studies (BLM or Princeton E+RE+)**	
STATE	**All Lands**	**BLM-managed (@75%)**	**All Lands**	**BLM-managed (@75%)**	**All Lands**	**BLM-managed (@75%)**	**All Lands**	**BLM-managed (@75%)**	**All Lands**	**BLM-managed (@75%)**
Arizona	264,281	198,210	29,349 *(-89%)*	22,012 *(-89%)*	91,193 *(-65%)*	68,395 *(-65%)*	117,285 *(-56%)*	87,964 *(-56%)*	264,281 *(0%)*	198,211 *(+0%)*
California (non-DRECP)	240,893	109,972	274,945 *(+14%)*	206,209 *(+88%)*	410,983 *(+71%)*	308,237 *(+180%)*	453,177 *(+88%)*	339,883 *(+209%)*	410,983 *(+71%)*	308,237 *(+180%)*
California DRECP (100% BLM)	282,786	282,786	322,760 *(+14%)*	322,760 *(+14%)*	482,456 *(+71%)*	482,456 *(+71%)*	531,987 *(+88%)*	398,990 *(+41%)*	482,456 *(+71%)*	482,456 *(+71%)*
Colorado	60,276	45,207	59,316 *(-2%)*	44,487 *(-2%)*	73,656 *(+22%)*	55,242 *(+22%)*	96,655 *(+60%)*	72,491 *(+60%)*	73,656 *(+22%)*	55,242 *(+22%)*
Idaho	119,433	89,574	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	119,433 *(0%)*	89,575 *(+0%)*
Montana	7,183	5,387	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	7,183 *(0%)*	5,387 *(0%)*
Nevada	64,159	48,119	31,371 *(-51%)*	23,528 *(-51%)*	66,677 *(+4%)*	50,007 *(+4%)*	75,461 *(+18%)*	56,596 *(+18%)*	66,677 *(+4%)*	50,007 *(+4%)*
New Mexico	14,831	11,123	18,077 *(+22%)*	13,558 *(+22%)*	60,365 *(+307%)*	45,273 *(+307%)*	78,310 *(+428%)*	58,732 *(+428%)*	60,365 *(+307%)*	45,273 *(+307%)*
Oregon	68,517	51,387	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	68,517 *(0%)*	51,388 *(+0%)*
Utah	53,057	39,793	51,036 *(-4%)*	38,277 *(-4%)*	48,812 *(-8%)*	36,609 *(-8%)*	63,162 *(+19%)*	47,372 *(+19%)*	53,057 *(0%)*	39,793 *(0%)*
Washington	95,708	71,781	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	95,708 *(0%)*	71,781 *(0%)*
Wyoming	36,369	27,277	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	0 *(-100%)*	36,369 *(0%)*	27,277 *(0%)*
Planning Area	**1,024,707**	**697,830**	**464,094 *(-55%)***	**348,071 *(-50%)***	**751,685 *(-27%)***	**563,764 *(-19%)***	**884,050 *(-14%)***	**663,037 *(-5%)***	**1,256,228 *(+23%)***	**942,171 *(+35%)***
Planning Area + DRECP	**1,307,493**	**980,616**	**786,854 *(-40%)***	**670,830 *(-32%)***	**1,234,141 *(-6%)***	**1,046,220 *(+7%)***	**1,416,037 *(+8%)***	**1,062,028 *(+8%)***	**1,738,684 *(+33%)***	**1,424,627 *(+45%)***
Total US (to 2050)	**10,292,000**	**N/A**	8,661,770 *(-16%)*	N/A	14,948,586 *(+45.2%)*	N/A	16,950,627 *(+64.7%)*	N/A	N/A	N/A



	Arizona	California (non-DRECP)	DRECP	Colorado	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming
BLM/DOE/NREL	264,281	240,893	282,786	60,276	119,433	7,183	64,159	14,831	68,517	53,057	95,708	36,369
Princeton NZA: E+	29,349	274,945	322,760	59,316	0	0	31,371	18,077	0	51,036	0	0
Princeton NZA: E+RE+	91,193	410,983	482,456	73,656	0	0	66,677	60,365	0	48,812	0	0
Hybrid (High)	117,285	453,177	531,987	96,655	0	0	75,461	78,310	0	63,162	0	0

	Planning Area	Planning Area + DRECP	All US Solar
BLM/DOE/NREL	1,024,707	1,307,493	10,292,000
Princeton NZA: E+	464,094	786,854	6,519,524
Princeton NZA: E+RE+	751,685	1,234,141	8,950,778
Hybrid (High)	884,050	1,416,037	11,202,634
Max from Each State	1,256,228	1,738,684	0

Figure 6. *State, regional and national level comparison of BLM's RFDS area needed for utility-scale solar between 2025 and 2045 to Princeton NZA data. Note: Princeton NZA data at state level has been estimated for utility-scale share using the national level ratio between utility-scale deployment and total solar deployment. Additionally, solar land use at the national level is for 2050, not 2045.*

c. BLM should further analyze and explain its assumed split between development on BLM versus non-BLM land.

BLM's method for determining the split of solar deployment on public versus private land in the planning area states is worthy of further consideration. The NREL study they cite does not offer any such distinction in its modeling results, so BLM "assumes that as much as 75% of solar development would be sited on BLM-administered lands, with the remaining 25% on non-BLM-administered lands." This reasoning is attributed to "legislative and executive direction to prioritize renewable energy development on public lands," and the 75% level chosen is characterized as "a conservative assumption that will likely overestimate solar energy development on BLM-administered lands."[301]

We urge BLM to further evaluate the assumed split between BLM and non-BLM lands using relevant data and analysis, and explain the basis for any numeric assumption based on more than a mere general reference to policy priorities. This BLM/non-BLM split is fundamentally important to the accuracy of the agency's RFDS and its usefulness as a measure of the full scale of impact that solar development on BLM-managed lands could have. As a threshold matter, we urge BLM to discuss in greater detail the legislative direction that it believes is leading to a prioritization of "renewable energy development on public lands." For example, though the Energy Act of 2020 included a renewable energy siting target of 25 GW sited on federal public lands by 2025,[302] that goal encapsulates solar, wind, and geothermal energy and is equivalent to just 1/7th of the *solar* deployment capacity BLM predicts in its current RFDS. Similarly, Executive Order 14057 expresses the prioritization of a nationwide effort to reach net zero energy generation by 2035 and a net zero economy by 2050.[303] That order is silent on the role of federal lands in achieving these goals.

We further urge BLM to quantitatively support the forecast land use split using available spatial tools and data. One approach would be to look to other spatially resolved studies of high electrification and deep decarbonization scenarios, such as those presented in the Princeton NZA, and layer them on top of maps of BLM land (see Table 4 for data sources). The authors of the NZA study make geospatial datasets available for the most relevant scenarios of interest: high electrification (E+) and 100% renewable (E+RE+), which is most comparable to the current RFDS as demonstrated in section B.

[301] Draft Solar PEIS Appendix C.3 at C-3.
[302] 48 U.S.C. § 3004(b).
[303] 86 Fed. Reg. 70,935.

Table 4. Suggested dataset for comparison with a basemap of BLM managed public lands

Scenario ID	Scenario description	Available geospatial dataset
E+	High electrification	This dataset shows the wind and solar development in the contiguous United States that will be required by 2050 under a net-zero-emissions scenario with high electrification and more permissive land-use assumptions. Citation Emily Leslie, Energy Reflections, LLC, Principal. Andrew Pascale, Andlinger Center, Princeton University, Post-Doctoral Research Associate. Net-Zero America selected renewable resource projects for high-electrification scenario (base land use), 2050. [Shapefile]. Available at: https://maps.princeton.edu/catalog/princeton-pz50h4506
E+RE+	100% renewable	This dataset shows the wind and solar development in the contiguous United States that will be required by 2050 under a net-zero-emissions scenario with high electrification and more permissive land-use assumptions. Citation Emily Leslie, Energy Reflections, LLC, Principal. Andrew Pascale, Andlinger Center, Princeton University, Post-Doctoral Research Associate. Net-Zero America selected renewable resource projects for 100% renewable scenario (base land use), 2050. [Shapefile]. Available at: https://maps.princeton.edu/catalog/princeton-ww72bm95h

According to the metadata, each of these datasets contain relevant years of geospatially resolved results for comparison in GIS mapping tools. Thus, we suggest that BLM can estimate the comparable area in 2045 by filtering the data in GIS according to the following parameters:

- Year = 2025 and 2045
- Technology = Solar

For all areas where solar project areas ("shapes" in GIS files) overlap with areas of BLM-managed public land in the year 2025, first record the sum of the installed capacity (parameter *IncCapMW*) and shape area (parameter *Shape Area*) to establish the base year conditions for deployment and area used. Then, do the same for the year 2045 to establish the end point over BLM's 20-year time horizon. Finally, subtract the difference between these two snapshots in time to reveal the result of interest: cumulative deployment and land used by location across

the planning area.[304, 305]

Similar work to check present-day solar deployment trends is also possible with data compiled by the U.S. Geological Survey (USGS). In its *The U.S. Large-Scale Solar Photovoltaic Database*, USGS has mapped the location and footprint of large-scale solar installations across the U.S. through the end of 2021.[306] It would be useful to stakeholders across the spectrum for BLM to compare past solar development trends within the study area (based on this or similar data) and explain how it views those trends either persisting or changing over time. This discussion would add another important means to evaluate the assumptions and conclusions upon which the BLM's RFDS is based.

No model is a crystal ball, but comparisons, when available and aligned with key large-scale complex climate goals, like achieving net-zero emissions by 2050, can be very informative. Having a better sense of where public lands, which offer significant value and importance outside available space for even clean energy deployment, might be well positioned to play a role versus where it may not be needed is important part of BLM's job with this programmatic EIS. Doing such a comparison with geospatial data would be suitable.

d. The Acreage Assessment Based on the RFDS is Otherwise Largely Aligned With Climate Ambition on the National Scale

While the three issues raised in the sections above describe potential accuracy issues in BLM's assessment of development acreage needs based on the RFDS, our analysis supports a conclusion that the assessment is largely consistent with other ambitious modeling, especially when considered on a national scale. That is, although as described in subsection C there may be adjustments needed in individual state acreage needs assessments, when considered cumulatively the assessed needs are consistent with the results of comparable modeling. Our analysis supporting this national-scale conclusion is set forth below.

i. <u>BLM faithfully represented the DOE & NREL Solar Futures study projections for the 11-state planning area</u>.

Table 2.2-1 in the PEIS draft (Table 1 here) cites the National Renewable Energy Laboratory (NREL) to source its total estimate of 1.3 million acres by 2045 across the 11-state planning area

[304] BLM's results are presented over a 20-year outlook from 2025 to 2045. Princeton NZA's data reports installed stock in the year of interest, here 2025 and 2045. Failure to subtract out the deployment until 2025 and just using the 2045 data from Princeton's data directly would imply that all solar arises during BLM's period of interest, and result in an unrealistically large deployment interpretation.

[305] Note that the value is close to, but not exactly the same as, BLM's reported data. As it excludes deployment in the year 2025, there may be a small underestimate, but it is well within reason and fit for purposes here.

[306] K. Sydny Fujita et al., USGS & Lawrence Berkeley National Laboratory, *United States Large-Scale Solar Photovoltaic Database*, v1.0 (Nov. 2023), https://www.sciencebase.gov/catalog/item/6442d8a2d34ee8d4ade8e6db.

at interest. The specific source—*Environmental and Circular Economy Implications of Solar Energy in a Decarbonized U.S. Grid*[307]—is a companion study to the Department of Energy's *Solar Futures* study from 2021, produced to explore questions around "environmental and resource concerns related to issues including material requirements, land use, water use,… and plans for managing system components that reach end of life (EOL)," which were either absent or incompletely examined in the more focused DOE report.

The NREL report does not directly report data for the end year of interest in BLM's 20-year outlook from 2025, *i.e.*, 2045, nor does BLM's documentation offer the method they used. The most likely option is that the data were estimated from the years 2040 and 2050, which were provided by NREL's study, and interpolating between. Results from taking the average of 2040 and 2050 data on estimated land need for solar from NREL for each state in the planning area are compared, below in Table 5, to the data reported by in BLM's RFDS, as reported in Table C-1, and the discrepancies are small. Only two states do not match exactly (or within 0.01%): Wyoming, which BLM reports at 30 acres more than NREL (<0.1% difference), and, more significantly, New Mexico, which BLM reports at 900 fewer acres than NREL (-5.72%). Overall, the differences are marginal for the total 11-state planning area matching within 0.1%, suggesting a good likelihood that this approach is what BLM used.[308]

[307] Garvin Heath et al., NREL, *Environmental and Circular Economy Implications of Solar Energy in a Decarbonized U.S. Grid*, NREL/TP-6A20-80818 (2022), https://www.nrel.gov/docs/fy22osti/80818.pdf.

[308] Like all models, the NREL report and its underlying companion DOE Solar Futures studies have limitations with respect to uncertainty. The model itself has uncertainties with respect to the amount of solar deployment needed, which are best interrogated by comparison to other studies with similar goals because there are too many details to check individually and span everything from assumptions about macroeconomic trends, costs, performance, and constraints applied to dozens of sectors and individual technologies.

Instead, it is useful to focus on the assumptions most relevant for translating between a given deployment of utility-scale solar and the land use estimates – what we refer to as the land-use intensity, solar footprint, or power density. NREL identified several systemic uncertainties in relation to this parameter and concluded the following: "it is not clear whether our land-use results for the Solar Futures Study scenarios are overestimates or underestimates." It is not difficult to imagine that a model of this complexity could come to such a conclusion about the future; however, it would be helpful to understand the probabilities of erring in either direction.

Major factors that NREL identified, specifically, were increased solar technology efficiency, which would require less land per unit of installed capacity in direct proportion to the change in efficiency; increased use of non-land-based emerging PV technologies, such as floating systems deployed on water and building integrated PV; energy storage impacts, which weren't expressly modeled within the Solar Futures model; and system longevity, which affects the amount of new development needed to provide a given amount of solar power by reducing need for replacement.

Table 5. *Estimate of Land Need for Solar PV (acres)*

State	BLM Table C-1	NREL Table 3	Difference: BLM vs. NREL source
Arizona	264,281	264,281	0.00%
California	523,679	523,683	0.00%
Colorado	60,276	60,276	0.00%
Idaho	119,433	119,433	0.00%
Montana	7,183	7,183	0.00%
Nevada	64,159	64,159	0.00%
New Mexico	14,831	15,732	-5.72%
Oregon	68,517	68,517	0.00%
Utah	53,057	53,057	0.00%
Washington	95,708	95,708	0.00%
Wyoming	36,369	36,339	0.08%
Planning Area Total	**1,307,493**	**1,308,367**	**-0.07%**

ii. BLM's assumptions about land-use intensity per MW of energy generated match those of other contemporary studies, but comparison to several other models suggest that BLM's is slightly to moderately high (<9-24% overestimate).

Table 6 below compares the Solar Futures study's underlying assumptions about solar footprint to two other studies of similarly ambitious energy system decarbonization: Princeton's Net-Zero America study from 2021, and the International Energy Agency (IEA)'s Net-Zero by 2050 Update report from 2023. BLM's source is within the bounds of commonly cited footprints, but is on the conservative end of the spectrum (i.e. less solar capacity deployed per unit area) at between 7 and 8 acres needed per megawatt, versus estimates from other sources that go as low as 5.5 according to Princeton (underlying density assumption reported at 45 MW/km^2) or 2.5 acres per MW deployed according to IEA (upper bound from recent projects quoted at between 33.3 MW/km^2 and 100 MW/km^2). This range in per acre generating potential may have profound impacts on the total acreage needed to reach modeled solar generation levels discussed in previous sections.

Table 6. *Summary of cross-study comparisons of key area-related model assumptions for climate scenarios*

<table>
<tr><th></th><th></th><th>BLM Solar PEIS 2023</th><th colspan="4">Princeton NZA 2021[309]</th><th colspan="2">NRDC Net-Zero report 2023[310]</th><th>IEA in NZE 2023[311]</th></tr>
<tr><td>Scenario modeled</td><td></td><td>High electrification</td><td colspan="4">High electrification (E+) and highest renewable deployment (E+RE+), targeting net-zero CO2 by 2050 for the US</td><td colspan="2">Net-Zero CO2 by 2050: Core and No Fossil Fuels</td><td>Net-zero CO2 by 2050 worldwide</td></tr>
<tr><td>Footprint (LOW = MORE EFFICIENT)</td><td></td><td>7 – 8 acres/MW</td><td>5.5 acres/MW (reported solar density[312])</td><td colspan="3">6.8 – 7.9 acres/MW (derived from ratio of results for national scale deployment as MW and area used for utility solar as km^2)</td><td colspan="2">Not reported</td><td>2.5 – 7.4 acres/MW</td></tr>
<tr><td rowspan="3">Quote</td><td rowspan="3"></td><td rowspan="3">“To express the RFDS in megawatts, the projected land areas given in Table 2.2-1 were assumed to correspond to land use in the range of 7–8 acres/MW (NREL 2022),” (pg 2-34).</td><td rowspan="3">45 MW/km^2 (Power density reported from Annex D, Table 2)</td><td colspan="3">Additionally, back calculated from results database[313]</td><td colspan="2" rowspan="3">N/A</td><td rowspan="3">“Based on a review of over 100 completed projects worldwide… [w]e found that a utility-scale solar PV project of 100 MW generally occupies from 1 km^2 to 3 km^2. This is in line with other published estimates (NREL, 2021; A. Arvesen, 2018; Smil, 2010; UNECE, 2022),” (pg 115).</td></tr>
<tr><td rowspan="2">At national scale</td><td rowspan="2">Across planning area states</td></tr>
<tr><td>6.81 – 7.93 acres/MW (raw data)</td><td>5.6 – 6.43 acres/MW (raw data)</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>6.2 – 9.2 acres/MW (assuming utility-scale portion at state level = national level)</td><td></td><td></td></tr>
<tr><td rowspan="4">Total US Solar Deployment (2025-2050)</td><td>All</td><td rowspan="2">1,570 GW</td><td colspan="2">E+</td><td colspan="2">E+RE+</td><td>Core</td><td>No Fossil</td><td rowspan="4">Data not reported at country level</td></tr>
<tr><td></td><td colspan="2">1,354 GW</td><td colspan="2">2,464 GW</td><td>1,541 GW</td><td>2,756 GW</td></tr>
<tr><td>Utility</td><td rowspan="2">1,413 GW</td><td colspan="2">E+</td><td colspan="2">E+RE+</td><td>Core</td><td>No Fossil</td></tr>
<tr><td></td><td colspan="2">1,216 GW</td><td colspan="2">2,327 GW</td><td>1,374 GW</td><td>2,543 GW</td></tr>
<tr><td colspan="2">Total Area for Solar Deployment (2025-2050)</td><td rowspan="2">10.3 million acres</td><td colspan="2">E+</td><td colspan="2">E+RE+</td><td colspan="2" rowspan="2">Not reported</td><td rowspan="2">Not reported</td></tr>
<tr><td colspan="2">8.66 million acres</td><td colspan="2">14.9 million acres</td></tr>
</table>

[309] Eric Larson et al., *Net-Zero America: Potential Pathways, Infrastructure, and Impacts, Final report* (2021), https://netzeroamerica.princeton.edu/the-report.

[310] Averaging 2040 and 2050 data from Figure 6 of Jackie Ennis & Amanda Levin, NRDC, *Clean Energy Now for a Safer Climate Future: Pathways to net zero in the United States by 2050*, at 9 (2023), https://www.nrdc.org/sites/default/files/2023-04/clean-energy-pathways-net-zero-2050-report.pdf.

[311] IEA, *Net Zero Roadmap: A Global Pathway to Keep the 1.5 °C Goal in Reach* (2023), https://www.iea.org/reports/net-zero-roadmap-a-global-pathway-to-keep-the-15-0c-goal-in-reach.

[312] Described as “on the high end of the range, but considered reasonable due to recent industry trends such as increasing nameplate power rating for photovoltaic panels.”

[313] Data used: Total MW of solar deployment by US state, corresponding area used for solar by US state in km2 in base case, total MW of utility-scale solar deployed at national level, and corresponding area used for solar at national level in km^2. Ratio of solar deployment to land use for solar deployment from for E+ and E+RE+, 2025 to 2045.

If these alternate sources are indicative of future improvement, BLM could be significantly overestimating the amount of area needed. If, for example, IEA's lower bound footprint of 2.5 acres/MW was theoretically more accurate for the bulk of future utility-scale solar projects deployed through 2045 than the upper range of 8 acres/MW cited by BLM, then BLM's RFDS could hypothetically be overestimating area by as much as 70%, all else held equal. However, while future efficiency improvements should be anticipated pushing new systems in the direction of less area per unit of installed solar power being needed, existing evidence about today's systems can illustrate how extreme a departure IEA's 100 MW/km^2 upper bound would be. To that end, the most transparent data source—Princeton's NZA report—offers a more comprehensive look at frequency of different levels of power density for solar projects in their Annex D. There, authors document the process of coming to their central estimate of 45 MW/km^2, or the 5.5 MW/acre noted above, for solar projects, key data points of which are shown in
Figure 7. They reviewed data on over 350 projects from USGS and EIA databases of existing solar projects and found that <7% (27 of 380) had power densities at or above IEA's upper bound of 100 MW/km^2 (below 2.5 acres/MW). They instead opted for the weighted average value of the remaining dataset, finding that to be 45 MW/km2 (5.5 acres/MW), which they characterized as "on the high end of the range [of comparable outside estimates], but considered reasonable due to recent industry trends such as increasing nameplate power rating for photovoltaic panels." This would suggest that BLM's estimate is not likely to be more than 26-47% off, in the direction of overestimate, for land area estimates if modeling the same amount of solar deployment in its relevant net-zero scenarios.

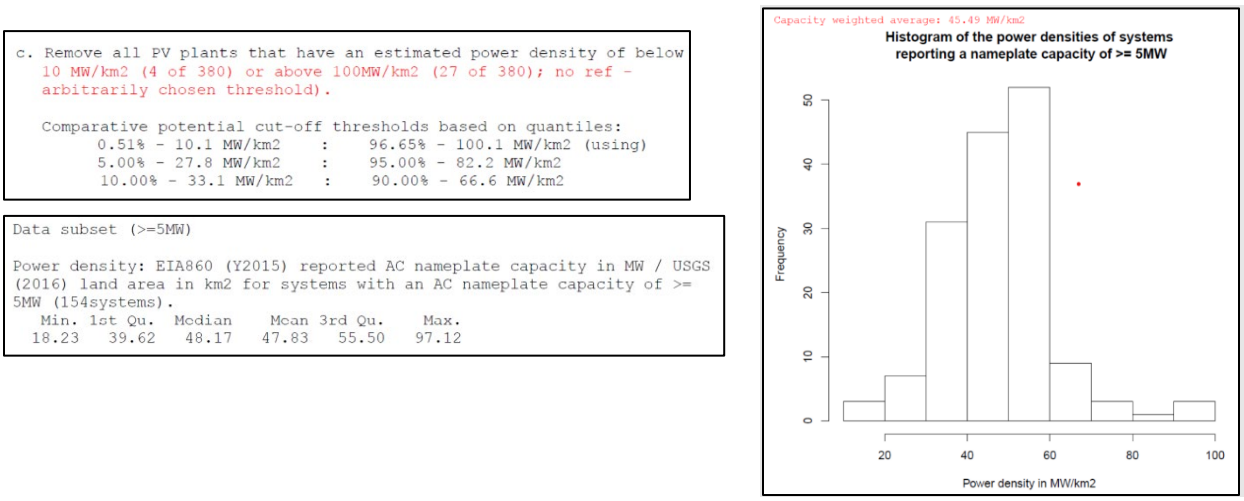


Figure 7. *Illustrative excerpts from Princeton NZA's Appendix on deriving PV footprint or power density*

One further note of refinement, when implemented, the results of actual solar deployed by state and nationally, for utility-scale solar and the corresponding area needed under base land use assumptions (note: there is a constrained land use scenario that we did not have time to assess), suggest ratios higher than the power density Princeton reports directly and more in line with BLM's/DOE's assumption. Table 6 shows the national level results of this parameter, which ranges from 6.8 to 7.9 acres/MW. At the state level, there isn't utility-scale solar data reported

directly as it is at the national level, so we needed to estimate it by making the simplifying assumption that all states exhibit the same split between utility and distributed solar as found at the national level. Using this approach, state level data exhibits more variable footprint estimates—6.2 to 9.2 acres/MW—but still centered around the same 7-8 acre/MW range used by BLM. Removing the assumption around share of total solar deployment from utility makes for a less apples-to-apples comparison, but utilizes more direct result data from the model and can be instructive; it reveals a range of 5.6 to 6.43 acres/MW, which is predictably lower because it includes extra MW of solar from an unknown mix of distributed PV (requiring no new land-use) and utility-scale PV, which is what drives the land-use results. Although it is closer to the power density reported by Princeton as what they used to generate these results, it is less conceptually relevant for comparison to the BLM land-use need in the RFDS. Splitting the difference to look at data points that overlap both estimate approaches—6.43 acres/MW—suggests that it is reasonable to consider that BLM could in fact be overestimating, but likely not by more than 9 to 24%, all else held equal.

V. Conclusion.

This update to the Western Solar Plan provides a remarkable opportunity for BLM to implement a smart from the start, west-wide plan for solar development on public lands that provides for a rapid expansion of solar energy while protecting public lands and centering community and tribal interests. We therefore encourage BLM to select an improved version of Alternative 5 that includes better exclusion criteria and durable programmatic design features. We also urge BLM to maintain and implement a process for designating new and expanded SEZs or other DLAs at the pace and scale needed to meet our national clean energy goals and acreage needs under BLM estimated RFDS for the 11-state planning area.

Thank you for undertaking this much-needed update to the Western Solar Plan and for carefully considering our comments. If you have questions or would like to discuss these comments, please contact Gregg DeBie, Senior Staff Attorney at The Wilderness Society, at gregg_debie@tws.org or (720) 647-9668.

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