November 21, 2014

Champe Green
Supervisory Forest Planner, Cibola National Forest
2113 Osuna Rd NE
Albuquerque, NM 87113

Via Email (cibolamtnsplanrevision@fs.fed.us)

Re: Cibola National Forest Preliminary Wilderness Inventory

Dear Champe,

Thank you for the opportunity to provide feedback on the Cibola National Forest's preliminary wilderness inventory and initial recommendations for designated areas. We appreciate the forest's rigorous effort in conducting its preliminary inventory of lands potentially suitable for inclusion in the National Wilderness Preservation System pursuant to the draft directives found in Chapter 70 of the Forest Service Handbook (FSH) 1909.12 (FACA-revised version) and ensuring meaningful opportunities for public participation in that effort. Overall, the forest has done a tremendous job of interacting with the public, providing timely information, and responding to concerns. However, as outlined below, we do have some concerns with the agency's methodology both in general and as applied to specific roadless areas.

Wilderness Inventory Methodology

A. The Forest Service Should Remedy Discrepancies between the Methodology Described on its Website and in its PowerPoint Presentation.

Overall, the Forest Service has done an excellent job of ensuring that its inventory process is transparent and publicly accessible, consistent with the collaborative and participatory spirit of Chapter 70 of the draft directives. The description of the inventory methodology on the forest's Wilderness Inventory and Evaluation Process webpage (http://www.fs.usda.gov/detailfull/cibola/landmanagement/planning/?cid=stelprd3816114&width=full), however, is inconsistent in certain respects with the information in agency's PowerPoint Presentation addressing the inventory process (https://fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3817253.pdf). For example, the

webpage does not list as a criterion exclusion of "[a]reas with substantially noticeable timber harvest, veg treatments, mining activities, or range or vertical structures." *See* PPP Slide 23. Conversely, the PowerPoint does not reflect the exclusion of the Langmuir Research Site from the inventory. The descriptions of the agency's treatment of roads are also inconsistent: the webpage states that Maintenance Level (ML) 2-5 roads were excluded from the inventory, while the PowerPoint (Slide 23) states that "[r]oads mechanically maintained or identified for continued public use" were excluded.

These discrepancies make it difficult for the public to understand what criteria the agency has applied and identify any problems with the agency's methodology. Accordingly, the webpage should be updated to provide a complete and accurate description of the agency's methodology, including all of the criteria applied in the inventory process. That description should also address and remedy the other methodological issues identified below.

B. The Forest Service Should Clarify What Roads Layer is Being Used for the Inventory Map.

It is unclear what roads layer is being used for the Forest Service's preliminary inventory map. There appear to be many more roads depicted on the inventory map than on the forest's Motor Vehicle Use Map (MVUM). As explained below, this discrepancy raises concerns regarding the agency's treatment of ML2 roads in the inventory. But in any event, the agency should clarify what roads layer is being used, where that layer came from, and what types of roads (e.g., system, non-system, decommissioned, unauthorized, temporary, etc.) are and are not depicted in it. This clarification is necessary to ensure that the forest is accurately applying the roads criteria described in section 71.22a of the draft Chapter 70 directives, and it will provide additional transparency in terms of the agency's methodology. This clarification will also help the public understand why the MVUM – the transportation map that forest visitors recognize and are familiar with – does not match the road system displayed on the online wilderness inventory map.

C. The Forest Service Improperly Excluded ML2 Roads from the Inventory.

Section 71.22a of the draft Chapter 70 directives provides detailed guidance on treatment of roads in the wilderness inventory process. The guidance is clear that the existence of an ML2 road does *not* exclude an area from the inventory, provided the road satisfies certain criteria. For example, ML2 roads that have been identified for decommissioning or reclassified as ML1 in a travel management plan or travel analysis should not exclude an area from the inventory. FSH 1909.12, ch. 70, § 71.22a(1)(b)-(c). In addition, the agency must assess whether ML2 roads meet one or more of the following criteria:

(1) have been improved and are maintained by mechanical means to ensure relatively regular and continued use,
(2) have cumulatively degraded wilderness character or precluded future preservation of the area as wilderness,

(3) have been identified for continued public access and use in a project level or travel planning decision supported by NEPA, or
(4) otherwise preclude evaluation and consideration of the area during the public participation and intergovernmental outreach processes as potentially suitable for wilderness, based on Assessment information or on-the-ground knowledge.

Id. § 71.22a(2)(c). If an ML2 road does not satisfy any of those criteria, then it does not disqualify the area from the inventory. *Id.* § 71.22a(1)(g). Conversely, if the ML2 road satisfies one or more of the criteria, then the area should be excluded from the inventory. *Id.* § 71.22a(2)(c).

Despite the requirement to assess ML2 roads pursuant to the criteria enumerated in section 71.22a, the forest's Wilderness Inventory and Evaluation Process webpage states that "[l]evel 2-5 roads . . . shown on the inventory map have been buffered by 30m on either side of centerline and removed from the inventory." In other words, it appears that the Forest Service categorically excluded all ML2 roads from the preliminary inventory. The agency may not circumvent the Chapter 70 process in that way. Instead, it must apply the relevant criteria to each ML2 road to determine whether to exclude the area from the inventory.

When we brought up this issue, you informed us that the exclusion of all ML2 roads was based on a determination that they are either mechanically maintained to ensure relatively regular and continuous use or have been identified for continued public use in a prior decision. *See also* PPP Slide 23 (list of "what not to consider" includes "[r]oads mechanically maintained or identified for continued public use"). This approach is problematic for a number of reasons. First, the draft directives do not permit the agency to make a blanket determination that all ML2 roads are mechanically maintained or have been identified for continued public use. Rather, the agency must assess *each* ML2 road to determine whether it satisfies the criteria enumerated in section 71.22a.

Second, that blanket determination is unsupported by the existing publicly available information. As explained above, the roads layer of the preliminary inventory map appears to include many ML2 roads that are not depicted on the MVUM and therefore were not identified for continued public use in the forest's travel management planning process. Moreover, given the forest's staggering road maintenance backlog, it currently lacks the budget to mechanically maintain the ML2 roads that *have* been identified for continued public use – much less the numerous additional ML2 roads depicted on the inventory map.[1] In any event, the agency must document and explain its application of the relevant criteria for each ML2 road, and may not circumvent that process by categorically excluding all ML2 roads.

[1] *See* USDA, Cibola National Forest Mountain Ranger Districts Assessment Report, Vol. II, at 210 (May 21, 2014), *available at* http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprd3801467.pdf (average road maintenance budget approximately 19% of the $3.9 million necessary to adequately maintain over 3,000 miles of system roads, including over 2,500 miles of ML2 roads).

D. The Forest Service Should Clarify its Methodology and Findings Regarding Substantially Noticeable Improvements.

Pursuant to section 71.22b of the draft Chapter 70 directives, the presence of certain improvements – such as vegetation treatments, timber harvest areas, mining activity, and grazing infrastructure – do not disqualify an area from the inventory, provided that they are "not substantially noticeable." FSH 1909.12, ch. 70, § 71.22b. The "substantially noticeable" criterion comes directly from section 2(c) of the Wilderness Act, which defines wilderness as an area that, among other things, "generally *appears* to have been affected primarily by the forces of nature, with the imprint of man's work *substantially unnoticeable*." 16 U.S.C. § 1131(c)(1) (emphasis added). Based on the plain meaning of that language, it has long been understood that the proper inquiry is whether the area generally appears natural to the average, reasonable visitor who is unfamiliar with the its historical or ecological conditions. Thus, for inventory purposes under section 71.22b of the draft Chapter 70 directives, the Forest Service must assess whether an average, reasonable visitor who is unaware of existing vegetative treatments, timber harvest areas, historic mining activity, or other improvements would nevertheless notice those improvements because they make the area appear unnatural.

The forest's PowerPoint (slide 23) (but not its Wilderness Inventory and Evaluation Process webpage) lists "[a]reas with substantially noticeable timber harvest, veg treatments, mining activities, or range or vertical structures" under "what <u>not</u> to consider" in the inventory. The forest has not, however, provided any additional information about its methodology for determining what improvements are substantially noticeable. To ensure that it is applying the correct, reasonable visitor standard, the agency should clarify its methodology and make publicly available any findings that particular improvements are substantially noticeable and therefore disqualify the area from the inventory.

E. The Forest Service Improperly Omitted Areas of Less than 5,000 Acres that Are Adjacent to Roadless Areas under Another Agency's Jurisdiction.

Pursuant to the Wilderness Act, a wilderness area "has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition." 16 U.S.C. § 1131(c)(4). To fulfill that size criteria, the draft Chapter 70 directives require the Forest Service to include in its inventory "[a]reas contiguous to existing wilderness, primitive areas, administratively recommended wilderness, or wilderness inventories of other Federal ownership, regardless of their size." FSH 1909.12, ch. 70, § 71.21. In other words, areas adjacent to other wilderness-quality lands – regardless of the size, agency jurisdiction, or designation status of those adjacent lands – should be included in the inventory.

According to its Wilderness Inventory and Evaluation Process webpage, however, the Cibola improperly narrowed this criterion to include only "[a]rea[s] adjacent to existing Wilderness regardless of size." *See also* PPP Slides 22 & 25 (stating that adjacent areas of less than 5,000

acres must be "contiguous to existing wilderness").[2] The forest apparently failed to include in its inventory areas adjacent to wilderness-quality lands recognized by other federal agencies, but not designated by Congress. That approach conflicts with the clear direction provided in the draft directives. And in at least one situation, it meant that the agency excluded an area adjacent to a Bureau of Land Management Wilderness Study Area (WSA) from the preliminary inventory. *See* comment #24217 in Appendix II regarding a small area adjacent to the Sierra Ladrones WSA. To comply with the requirements of the Wilderness Act and the draft Chapter 70 directives, the Forest Service must correct its size criteria and re-inventory the area adjacent to the Sierra Ladrones WSA and any other areas adjacent to the categories of wilderness-quality land enumerated in section 71.21.

F. The Langmuir Research Site Should Not Have Been Excluded From the Inventory.

The Forest Service should not have excluded the entire 31,000-acre Langmuir Research Site from its inventory. The Wilderness Inventory and Evaluation Process webpage states that the site was excluded, but does not explain why. When we inquired, you informed us that the agency considers the research site to be "congressionally withdrawn." As our attorney explained in an October 8, 2014 memo, which we transmitted to you and is attached as Appendix I to this letter, that rationale is faulty. Nothing in the New Mexico Wilderness Act, Public Law No. 96-550, suggests that Congress intended to preclude other uses of the site beyond scientific research or that its inclusion in a wilderness inventory would otherwise conflict with Congress' intent in establishing the site. Indeed, scientific research is one of the public purposes and values of wilderness. In short, there are no apparent legal barriers to inclusion of the site in the wilderness inventory.

Moreover, any potential, limited conflicts between particular research activities and other wilderness values likely could be avoided by excluding from the inventory the 1,000-acre principle facility where research activities are concentrated (about 3% of the site). That reasonable approach would allow the Forest Service to inventory and evaluate the remaining 30,000 acres for wilderness characteristics, as is contemplated by Chapter 70 of the draft directives.

Comments on Specific Wilderness Inventory Polygons

TWS and our conservation partners conducted field inventories the summers of 2012-2014 to identify wilderness quality lands across the forest. Using the Cibola's interactive online mapping tool, we submitted comments based on this field survey. The Forest Service must ensure that all of the comments that were submitted via the online mapping tool are included in the formal administrative record. Appendix II to this letter includes a subset of the comments that we or our partners submitted using the online tool; we provide comments only for those polygons

[2] Later, at slide 33, the PowerPoint states that the preliminary inventory results include areas "adjacent to existing wilderness or recommended wilderness study areas." This statement is inconsistent with the webpage and slides 22 and 25 of the PowerPoint, and still does not accurately reflect the correct Chapter 70 criteria.

where we conducted a field survey. We are providing this appendix to make certain that the administrative record includes comments relevant to each polygon that we surveyed. The appendix also includes a printed version of the Forest Service's preliminary wilderness inventory maps on which we demarcated the inventory polygon to which our comments pertain.

Ecosystem Representation

As described in detail in Appendix III to this letter, the representation of different ecosystem types in the National Wilderness Preservation System (NWPS) and other protected areas (e.g., Research Natural Areas (RNAs), ecological or botanical areas, or other conservation designations) is critically important to conserving biological diversity and ecological integrity. Because protecting ecosystem integrity and diversity is a central goal and substantive requirement of the 2012 National Forest System Land Management Planning Rule, the Forest Service must evaluate and incorporate ecosystem representation information into its assessment and planning processes, including the wilderness evaluation process and consideration of designated areas pursuant to 36 C.F.R. § 219.7(c)(2)(v) & (vii).

To that end, we conducted an analysis of ecosystem representation in wilderness at the national- and forest-level scales to provide the Forest Service with the best available scientific information. The results of that analysis (which are included and described in detail in Appendix III) show that the Cibola National Forest hosts numerous ecosystem types that are poorly-represented in the NWPS both regionally and nationally. The ongoing wilderness inventory and evaluation and planning processes present the Forest Service with a crucial opportunity to begin to remedy that under-representation by prioritizing protection of diverse ecosystems through recommended wilderness and other conservation-oriented designations such as RNAs, ecological or botanical areas, etc. Only by utilizing ecosystem representation information to establish a network of recommended wilderness and other protected areas that represent the full expression of ecosystem diversity can the Forest Service satisfy the substantive mandates of the 2012 Planning Rule to provide for ecological sustainability, integrity, and diversity.

Conclusion

Thank you for your attention to these issues. Please include these comments in the administrative record for the forest planning process. And please do not hesitate to contact us with any questions or if you would like to discuss these comments further.

We appreciate all of the hard work that you and the plan revision team have put into the wilderness inventory process. We look forward to continuing to work with you throughout the rest of the plan revision process.

Sincerely,

Joshua Hicks
Assistant Director, National Forest Action Center
The Wilderness Society
303-650-1148
josh_hicks@tws.org

Appendix I: Inclusion of Langmuir Research Site in Wilderness Inventory

To: Josh Hicks, Assistant Director, National Forest Action Center

From: Alison Flint, Counsel & Planning Specialist

Date: October 8, 2014

Re: Inclusion of Langmuir Research Site in Cibola NF wilderness inventory

Question Presented:

Would inclusion of the Langmuir Research Site in the wilderness inventory for the Cibola National Forest (or a potential recommendation that the lands encompassing the site be designated as wilderness) conflict with Congress' intent in establishing the site?

Brief Answer:

Likely no. There are no apparent legal barriers to inclusion of the 31,000-acre Langmuir Research Site in the Cibola's wilderness inventory. In particular, inclusion of the site in the inventory would not conflict with Congress' intent in establishing the site for scientific research purposes. While ultimate designation and management of the site as wilderness could potentially result in certain limited conflicts with Congress' intent that the site be managed to protect and enhance opportunities for scientific research, such conflicts likely could be avoided by excluding from the inventory the 1,000-acre "principle research facility" (approximately 3% of the site) where research activities are concentrated. That reasonable approach would allow the Forest Service to inventory and evaluate the remaining 97% of the site for wilderness characteristics and determine whether to carry the area (or a portion of the area) forward in the NEPA process, and ultimately whether to recommend it for wilderness designation.

Background:

The New Mexico Wilderness Act of 1980 (the "Act"), Public Law No. 96-550, 96 Stat. 3221 (Dec. 19, 1980), designated certain lands in the Gila, Cibola, Apache, Lincoln, Carson, and Santa Fe National Forests as wilderness. Title II of the Act established the Langmuir Research Site in the Cibola National Forest "in order to encourage scientific research into atmospheric processes and astronomical phenomena, and to preserve conditions necessary for that research." *Id.* §§ 201, 205(a). The 31,000-acre site includes a "principle research facility" of approximately 1,000 acres, or about 3% of the total site. *Id.* § 205(a). Congress found that "the high altitude and freedom from air pollution and night luminosity caused by human activity make the research site uniquely suited" to particular types of research. *Id.* § 202.

The Act provides the Forest Service with broad discretion – through the land and resource management planning process – to "administer, protect, and regulate use of the research site in accordance with the laws, rules, and regulations applicable to National Forest System lands, and in such manner as will best contribute to purposes of this Act." *Id.* §§ 203, 205(b). Congress placed some limitations on that discretion, however, by identifying four specific management objectives for the site: (1) that the 1,000-acre principal research facility "be

managed primarily for scientific research purposes," with "[d]ispersed recreation, grazing, and other uses" permitted to the extent they are "compatible with scientific research;" (2) that the entire site "be managed to enhance scientific research objectives," with research activities, equipment, and structures permitted in accordance with the governing plan; (3) that roads "be limited to those necessary for scientific research activities and other reasonable activities," with motor vehicle use restricted to designated roads; and (4) that "small instrumented research rockets" be permitted to land in designated areas. *Id.* § 205(e)-(f). The Act also authorizes the Forest Service to issue a special use permit to the New Mexico Institute of Mining and Technology for the site. *Id.* § 204. A 1992 special use permit covers the 1,000-acre principle research facility and authorizes "use of rockets, weather balloons, buried monitoring stations (kivas), overhead wires, buried utilities, waterlines, improvements, roads, towers, and storage area, and other uses."[1]

Pursuant to the 2012 National Forest Planning Rule, 36 C.F.R. § 219.7(c)(2)(v), and proposed revisions to Chapter 70 of the Forest Service Land Management Planning Handbook 1909.12, the Cibola National Forest is in the process of completing its initial inventory of lands with wilderness characteristics that may be suitable for inclusion in the National Wilderness Preservation System. The Forest Service did not include the Langmuir Research Site in its initial inventory. According to planning staff on the Cibola National Forest, the agency considers the research site to be "congressionally withdrawn" because the requirements in the Act establishing the site could run counter to wilderness management.

Discussion:

Inclusion of the Langmuir Research Site in the Cibola's wilderness inventory would not conflict in any direct or apparent way with Congress' intent in establishing the site, as expressed in Title II of the New Mexico Wilderness Act of 1980. The language of the Act demonstrates Congress' intent that the site be managed to protect and enhance scientific research opportunities. *See* Public Law No. 96-550, §§ 203, 205. However, nothing in the Act suggests that Congress intended to preclude or limit other uses of the site, such that the area should be considered congressionally "withdrawn." To the contrary, the Act makes clear that the site is to be managed "in accordance with the laws, rules, and regulations [generally] applicable to national Forest System lands." *Id.* § 203; *accord id.* § 205(b), (c) (management plan to be developed pursuant to the National Forest Management Act, 16 U.S.C. § 1604, and in consultation with various stakeholders, including, *inter alia*, scientific agencies and conservation and wilderness interest groups). Moreover, while the entire 31,000-acre site is to "be managed to enhance scientific research objectives," only the 1,000-acre principle research facility is to "be managed *primarily* for scientific research purposes," with other uses permitted to the extent they are "compatible with scientific research." Public Law No. 96-550, § 205(f) (emphasis added).

More generally, Congress' intent that the site be used for scientific research is entirely compatible with the area's inclusion in the Cibola's wilderness inventory (or with an eventual

[1] A copy of the permit is available on the Langmuir Laboratory for Atmospheric Research's website at http://langmuir.nmt.edu/about/special-use-permit.

recommendation for wilderness designation). In fact, Congress made clear in section 4(b) the Wilderness Act of 1964 that scientific research is one of the "public purposes" of wilderness – on equal footing with recreation, scenic, educational, conservation, and historical uses. 16 U.S.C. § 1133(b) ("Except as otherwise provided in this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, *scientific*, educational, conservation, and historical use." (emphasis added)); *see also id.* § 1131(c) (defining wilderness to include, *inter alia*, areas that "contain ecological, geological, or other features of *scientific*, educational, scenic, or historical value" (emphasis added)); California Desert Protection Act of 1994, Public Law No. 103-433, 108 Stat. 4471, § 2(b)(1)(E) (Oct. 31, 1994) (congressional explanation that a primary purpose of wilderness is to "retain and enhance opportunities for scientific research in undisturbed ecosystems").[2]

While scientific research is one of the public purposes and values of wilderness, research activities can, in certain circumstances, conflict with management of an area to protect and preserve its wilderness character and values. [3] For example, Congress expressly permitted roads in the Langmuir Research Site to the extent "necessary for scientific research activities and other reasonable activities," Public Law No. 96-550, § 205(f), while wilderness management would preclude such roads, *see* 16 U.S.C. § 1133(c). In such instances, it is possible that management of the site as wilderness could conflict with Congress' intent that the site be managed to enhance scientific research opportunities.

Nevertheless, the possibility of certain, limited conflicts between scientific research activities and wilderness management should not preclude inclusion of the site in the Cibola's wilderness inventory. First, a majority of the scientific research activity that could potentially conflict with wilderness management is concentrated on the 1,000-acre principle research facility, which Congress directed "be managed *primarily* for scientific research purposes," Public Law No. 96-550, § 205(f) (emphasis added), and is covered by a Forest Service special use permit that authorizes certain uses that may conflict with wilderness values, *see supra* p. 2 & n.1. While it may be appropriate to exclude those 1,000 acres from the wilderness inventory, the agency should include the remaining 30,000 acres – covering approximately 97% of the site. The proposed revisions to Chapter 70 of the Forest Service Land Management Planning Handbook 1909.12 support this approach. For example, section 71 provides that the wilderness inventory must be reasonably broad and inclusive in order to effectively identify all lands that may have wilderness characteristics. FSH 1909.12, ch. 70, § 71.

Second, only by including the site (or a majority of the site) in the inventory, will the Forest Service have an opportunity to evaluate the wilderness characteristics of the area. *See* FSH 1909.12, ch. 70, § 72. In fact, the evaluation process looks in part at "the degree to which the

[2] Indeed, to facilitate that public purpose, the Forest Service in 1993 established the Aldo Leopold Wilderness Research Institute to manage and conduct research in wilderness.

[3] *See, e.g.*, David J. Parsons, *The Challenge of Scientific Activities in Wilderness*, USDA Forest Service Proceedings RMRS-P-15-VOL-3. 2000, *available at* http://www.fs.fed.us/psw/cirmount/meetings/ncbotany/Reed4_scientific%20research.pdf (concluding that, while scientific research "is an appropriate and necessary use of wilderness," it can require activities that conflict with other wilderness resources and values).

area may also contain ecological, geological, or other features of *scientific*, educational, scenic, or historic values," as required by the Wilderness Act. *Id.* § 72.1 (emphasis added); *accord* 16 U.S.C. § 1131(c). That comprehensive evaluation – along with additional information gleaned through public participation and coordination and consultation with interested stakeholders, including the New Mexico Institute of Mining and Technology and the National Science Foundation – will help reveal the likelihood of any potential conflicts between scientific research and wilderness management and the extent to which they can be mitigated or avoided.

Finally, should the Forest Service ultimately determine to recommend all or a portion of the research site for wilderness designation, Congress will have an opportunity to determine whether wilderness designation would conflict with its intent in establishing the research site. In the meantime, the Forest Service would retain discretion to manage the area both to preserve and protect its wilderness characteristics and its unique opportunities for scientific research.

Conclusion/Recommendation:

Inclusion of the Langmuir Research Site in the Cibola's wilderness inventory would not conflict in any direct or apparent way with Congress' intent in establishing the site for scientific research purposes. However, the Forest Service could avoid any potential, limited conflicts between particular research activities and other wilderness values by excluding from the inventory the 1,000-acre principle research facility – which covers only about 3% of the site. That reasonable approach would allow the Forest Service to inventory and evaluate the remaining 97% of the site for wilderness characteristics and determine whether to carry the area (or a portion of the area) forward in the NEPA process, and ultimately whether to recommend it for wilderness designation.

Appendix II: Comments on Specific Wilderness Inventory Polygons

TWS and our conservation partners conducted field inventories the summers of 2012-2014 to identify wilderness quality lands across the forest. Using the Cibola's interactive online mapping tool, we submitted comments based on this field survey. The Forest Service must ensure that all of the comments that were submitted via the online mapping tool are included in the formal administrative record. This appendix includes a subset of the comments that we or our partners submitted using the online tool; we provide comments only for those polygons where we conducted a field survey. Many of these comments were lifted directly from the online mapping tool and so descriptions of "areas" within specific polygons may have lost some necessary context. To restore some of that context, the annotated maps at the end of the appendix spatially identify the polygon to which these comments relate. We are providing this appendix to make certain that the administrative record includes comments that are relevant to each polygon that we surveyed.

Magdalena Ranger District

San Mateo Mountains

Polygon D3_ADJ7

This area should have been included in the preliminary wilderness inventory: It's roadless and meets the inventory criteria. The wilderness inventory boundary should have followed the IRA boundary here. The distance between roads 1068 and 1052 is nearly a mile-wide, sufficiently wide for these roads to not intrude into the polygon. Further, following the IRA boundary, or something close, would enable the FS to align the inventory boundary better with area's topographic features as opposed to how the boundary is currently drawn. Comment submitted on 11/18/2014 and recorded as comment #24082 and 24085.

This area should be included in the wilderness inventory. It's roadless and meets the inventory criteria. The FS should use roads 138 and 330 to establish the boundary. The distance between these roads is over a half-mile wide at the entrance; sufficiently wide for this land to be included with the D3_ADJ7 polygon. Additionally, the FS should not allow roads 1043, 1041, and 1040 - at the southern end of the 'peninsula' - to disqualify this land. The Magdalena District's TMP will likely close these spur roads to public motorized use. Furthermore, the Magdalena's TAP Report notes that these roads are low value and not needed. These roads appear to serve no purpose and lead to no facility. Road 1040 is overgrown with vegetation, and the portion that is visible only lasts a few dozen meters before the elements have begun to reclaim it. Comment submitted on 11/20/2014 and recorded as comment #24582.

Other than the missing areas described above, the wilderness inventory boundaries for polygon D3_ADJ7 were correct delineated. The impacts of man are substantially unnoticeable, and the area appears predominantly natural, with sweeping views of the Rio Grande Valley. Solitude is abundant and opportunities for primitive forms of recreation are outstanding. Here is a photograph looking

northeast across the polygon. Photo submitted on 11/18/14 as recorded as comment #24090.

Polygon D3_ADJ8

These two comments are associated with an area that is not included in the preliminary wilderness inventory for polygon D3_ADJ8.

- This area is roadless (as defined by the agency's draft inventory and evaluation Handbook as well as the FACA recommendations) and meets the inventory criteria; it should have been included in the wilderness inventory. The FS should use roads 96 and 138 to establish the boundary. The distance between these roads is over a half-mile wide at the southern "entrance" and much of the area remains this wide, which is sufficiently wide for this land to be included with the D3_ADJ8 polygon. Comment submitted on 9/18/2014 and recorded as comment # 18347.

- The FS should not allow roads 865, 867, 861, 873, and the numerous other short spur roads in the vicinity to disqualify this land. These roads are unmaintained and very rough. The Magdalena District's TMP will likely close these routes to public motorized use. Furthermore, the Magdalena Ranger District's Travel Analysis Report found that these roads are low value and notes that the roads are not needed. These roads appear to serve no purpose and lead to no facility. This area should be included in the inventory. Comment submitted on 9/18/2014 and recorded as comment # 18350.

These two comments are associated with an area that is not included in the preliminary wilderness inventory for polygon D3_ADJ8.

- This area is roadless (as defined by the agency's draft inventory and evaluation Handbook as well as the FACA recommendations) and meets the inventory criteria; it should have been included in the wilderness inventory. The FS should use roads 138 and 330 for the inventory boundary. The distance between these roads is over a mile wide at the southern "entrance" and remains over a mile wide for most of the area; sufficiently wide for this land to be included with the D3_ADJ8 polygon. Comment submitted on 9/18/2014 and recorded as comment # 18353.

- The FS should not allow roads 1012 and 1042 (as well as the numerous other short spur roads in the vicinity) to disqualify this land. These roads are unmaintained and very rough. The Magdalena District's TMP will likely designate these routes for administrative use only and close them to public motorized use. Furthermore, the Magdalena District's Travel Analysis Report found that these roads are low value and not needed. These roads appear to serve no purpose and lead to no facility. This area should be included in the inventory. Comment submitted on 9/18/2014 and recorded as comment #18357.

Other than the missing areas described in comments # 18357 and 18353, the wilderness inventory boundary for polygon D3_ADJ8 was correctly delineated. The impacts of man are substantially unnoticeable. Solitude is abundant and opportunities for primitive forms of recreation are outstanding. This photograph shows the northern side of the polygon D3_ADJ8. Photograph submitted on 11/18/2014 and recorded as comment # 24095.

This photograph looks west and was taken in this general vicinity. It shows the east side of polygon D3_ADJ8. The eastside of the polygon boasts lots of opportunity for backcountry recreation, is predominantly natural (barring a few roads) and has wilderness characteristics; it meets all of the wilderness inventory criteria. Photograph and comment submitted on 11/19/2014 and recorded as comment # 24460.

This area is roadless, remote, undeveloped, wild and beautiful. This photo was taken south of the Apache Kid Wilderness and looks north into the wilderness area. Comment and photo submitted on 9/18/2014 and recorded as comment # 18365.

This comment would not load into the interactive map so we are providing it here. This photograph is taken from the west side of polygon D3_ADJ8 and looks east. It shows the west side of the polygon in the foreground and the Apache Kid Wilderness in the background. Due to its size, its roadless characteristics, remarkable views, rugged topography, vegetation, and proximity to the Apache Kid Wilderness, this side of the polygon possesses outstanding opportunities for hiking, camping, backpacking, hunting, and horseback-riding and other forms of primitive recreation. The area appears predominately natural and free of improvements that are substantially noticeable. The polygon meets all of the wilderness inventory criteria and should recommended for wilderness.

Polygon D3_5K16

Several comments and a photo were submitted regarding an area that is not included in the preliminary wilderness inventory on the north side of polygon D3_5K16. Three of these comments are here:

- This route does not exist. There is a steel barrier at the end of this route into Bear Trap Canyon Campground, and there has been obvious decommissioning efforts within the past couple of years. There is no evidence of motor vehicle use on this route, so the barrier and decommissioning efforts are working! The Magdalena Travel Management Plan proposed action has this route proposed for closure, and slated for Maintenance Level 1 status, if not eventual obliteration. The route does not exist on the ground and should be removed from the system network as it pertains to potential wilderness in this area. Comment submitted on 9/10/2014 and recorded as comment # 17310.

- Taking into consideration the information provided by this person about Road 808, this road should not disqualify the land to the north from being included in the wilderness inventory. This land is roadless and meets the inventory criteria. Comment submitted on 9/16/2014 as a response to #17310. Recorded as comment # 18135.

- The triangle to the north should be included for wilderness all the way to the existing wilderness boundary on the east side of the Bear Trap canyon road. Comment submitted on 9/19/2014 as a response to #17310. Recorded as comment # 18627.

This area is roadless and meets the agency's inventory criteria; it should have been included in the wilderness inventory. The FS should use road 549 as the northern boundary and 73 for the southern boundary. The distance between Roads 219A and 549, at its most narrow spot, is over a half-mile wide and then the area extends to well over two miles wide; sufficiently wide for this whole area to be included with the D3_5K16 polygon. Roads 838, 837, and 836 will likely be closed to public motorized use as a result of the Magdalena District's Travel Plan. These routes are also naturally reclaimed and do not exist on the ground. Comment submitted on 11/19/2014 and recorded as comment # 24527.

The following three comments are associated with an area that is not included in the preliminary wilderness inventory for polygon D3_5K16:

- Given the comments that roads 845 and 844 are naturally reclaimed, polygon D3_5K16 should be extended down to include this area. It's part of the larger landscape of wilderness quality land. Comment submitted on 11/19/2014 and recorded as comment # 24531.

- Roads 844 and 845: "I have personally walked both of these roads, and they do not exist on the ground. Lots of vegetative regrowth is occurring and there is no evidence of motor vehicle use on either route. The Magdalena Travel Management Plan proposed action has both of these routes proposed for closure, and slated for MaintenanceLevel 1 status. I understand that without the TMP Proposed Action being finalized that these routes are in a bit of limbo situation, but nonetheless, they do not exist on the ground and should be removed from the system network as it pertains to potential wilderness in this area. Furthermore, these routes could be ideal candidates for decommissioning as nature is already beginning to reclaim them." Comment and photo submitted on 9/10/2014 and recorded as comment # 17297.

- Road 840: "This route is not evident out in the field, other than a single erosion trench. There has been some remediation efforts in the last two years, and the route has been proposed for closure in the Magdalena Ranger District Travel Management Plan proposed action. The route should be removed from the system network, to allow for increased potential wilderness in this area." Comment and photo submitted on 9/10/2014 and recorded as comment # 17314.

The following two comments are associated with an area that is not included in the preliminary wilderness inventory for polygon D3_5K16:

- This segment of Road 862 is not connected to the other roads in the area and is therefore not accessible to public motorized use. I believe the portions of road 862 on either side of this segment are in storage (ML1) and not open to public travel. The Magdalena District's travel plan proposes to close this segment of road 862 to public motorized use. The Travel Analysis Report notes that the road is low value and is not needed. Primary access to this road is via FS Road 73. However, at the junction of FS Road 73 and 73A, the FS has already erected a barrier and displayed a sign stating ROAD CLOSED. The Forest Service should not disqualify the surrounding lands from the wilderness inventory because of this road segment. The surrounding lands are

roadless (as defined by the agency's inventory Handbook at Ch. 70) and meet the inventory criteria. Comment submitted on 9/16/2014 and recorded as comment # 18128.

- These roads (852 and 858) are not connected to the other roads in the area. I believe all of these roads are stored ML 1 roads that are closed to public motorized use and not ML 2s. If these are in fact in ML 1s then the agency should not have used them to disqualify the surrounding lands from the inventory. Regardless, even if the public is technically allowed to drive these roads, they aren't accessible because they aren't connected to the adjacent road network. Further, the Magdalena District's travel plan proposes to close all of these roads to public motorized use. The Travel Analysis Report notes that these roads are low value and are not needed. The Forest Service should not disqualify the surrounding lands from the wilderness inventory because of these roads. The surrounding lands are roadless (as defined by the agency's Ch. 70 inventory handbook) and meet the inventory criteria. Comment submitted on 9/16/2014 and recorded as comment # 18132.

Photo taken at the headwaters of Chimney Canyon, looking northwest at the Datil Mountains on the horizon. There are lots of places to explore and opportunities to experience solitude in this area. I agree with the FS' inventory - this area definitely has wilderness character. Other than the missing areas described above, the wilderness inventory boundary for polygon D3_5K16 was correctly delineated. The impacts of man are substantially unnoticeable, and the area appears predominantly natural. Solitude is abundant and opportunities for primitive forms of recreation are outstanding. Photo and comment submitted on 9/18/14 as recorded as comment #18380.

Magdalena Mountains

Polygon D3_5K2

As we explained in the body of this letter and in Appendix I, the Forest Service should not have excluded the Langmuir Research Site from the wilderness inventory. We provided the following comments on the online tool:

- The FS should include the 31,000 acre Langmuir Research Site in the wilderness inventory. The area meets the inventory criteria laid out by the FS, is wild and undeveloped, and appears natural. In particular, inclusion of the site in the inventory would not conflict with Congress' intent in establishing the site for scientific research purposes. While management of the site as wilderness could potentially result in certain limited conflicts with Congress' intent that the site be managed to protect and enhance opportunities for scientific research, such conflicts likely could be avoided by excluding from the inventory the 1,000-acre principle research facility (approximately 3% of the site) at the top of the mountain where research activities are concentrated. That reasonable approach would allow the USFS to inventory and evaluate the remaining 97% of the site for wilderness characteristics and determine whether to carry the area (or a portion of the area) forward in the NEPA process. Comment submitted 11/02/2014 and recorded as comment # 22841.

- Opportunities to experience solitude and participate in primitive recreation are plentiful within the roadless lands of the Langmuir Site. There are several excellent hiking trails through the area that offer scenic vistas of the vast and beautiful landscape that surrounds the Magdalenas. The chance to stargaze and marvel the night skies are unmatched. There are interesting canyons to explore and wildlife to view or hunt. This area is roadless and should be included in the wilderness inventory. Comment submitted 11/02/2014 and recorded as comment # 22844.

Datil Mountains

Polygon D3_5K11

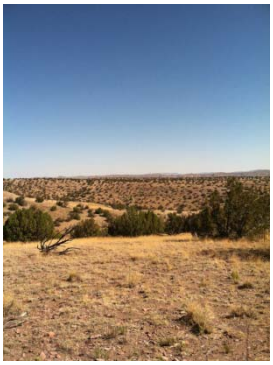
Photograph looking north across this area and taken near the base of road 100A. This small parcel should be included in polygon D3_5K11. Like the rest of 5K11, this parcel is free of substantially noticeable man-made improvements and appears natural. Comment and photo submitted on 11/19/2014 and recorded as comment # 24248.

Other than a few small areas on the southern perimeter, the wilderness inventory boundary for polygon D3_5K11 was correctly delineated. The impacts of man are substantially unnoticeable. Outstanding opportunities for primitive recreation abound; the feeling of solitude is a dominate in the area. This photograph looks east at Madre Mountain IRA, which is inside the polygon, from Forest Road 6. Comment and photo submitted on 11/19/2014 and recorded as comment # 24230.

Polygon D3_5K10

The wilderness inventory boundary for polygon D3_5K10 was correctly delineated. Similar to polygon D3_5K11, lands within polygon D3_5K10 are free of substantially noticeable manmade improvements. The scenery found throughout the area is alluring, with significant geological features, numerous open meadows to explore, and dramatic ridgelines that offer exceptional views. The Datil Mountains are an isolated landscape within the Cibola Forest that offers solitude. This photograph looks east into the Datil IRA, which is inside the polygon. Comment and photo submitted on 11/19/2014 and recorded as comment # 24241.

Bear Mountains



Polygon D3_5K7

Ch. 71.21 outlines the size criteria that the agency should follow during the inventory. Criterion 3 instructs the agency to include areas in the inventory that are “contiguous to existing wilderness, primitive areas, administratively

recommended wilderness, or wilderness inventories of other Federal ownership, regardless of their size." The FS narrowed this criterion by including only those areas that are 'adjacent to existing Wilderness, regardless of size.' This area is an example where the FS did not include in the inventory an area that is less than 5,000 acres but is adjacent to a BLM Wilderness Study Area (WSA), which qualifies as administratively recommended wilderness. The travel plan will likely close to public motorized use the last mile of 354XA, which would mean that no publicly available motorized roads and trails would be designated in the area. This area meets all of the inventory criteria and has wilderness characteristics. This photograph looks north across the area. Photo and comment submitted on 11/19/2014 and recorded as comment # 24217.

Other than the large areas that are missing from the wilderness inventory – as detailed in Arian Pregenzer's comments below – the wilderness inventory boundaries for polygons D3_5K7 and D3_5K6 were correctly delineated. The impacts of man are substantially unnoticeable, and the area appears predominantly natural. Solitude is abundant and opportunities for primitive forms of recreation are outstanding. Here is a photograph looking northeast across the polygon. Photo submitted on 11/18/14 as recorded as comment #24090.

Mt. Taylor Ranger District

Polygon #D2_5K12

The following comment and photo were submitted by Nathan Newcomer on 9/11/14 and recorded as comment # 17472: "This area is called the Guadalupe Inventoried Roadless Area, and it is immediately adjacent to several BLM WSAs. I believe the Cibola USFS is correct in showing that this area possesses potential wilderness, due to the remoteness of the area, its size, important elk habitat, and archeological history."

Sandia Ranger District

D5_ADJ5

With so many trailheads, hiking trails, picnic tables, and other developed rec facilities while also offering easy access to an incredible wilderness area, the Forest Service should create a special area that emphasizes outdoor education. This polygon and the area to the south could be managed to retain its natural character (i.e., no new road building, etc.) with an emphasis on outdoor learning. Comment submitted on 11/19/2014 and recorded as comment # 24487.

Comments on Forest Service Bear, Magdalena, and Sandia Mountains Inventory
Submitted by Arian Pregenzer

Magdalena Ranger District

Bear Mountains and Environs

1. **Inventoried Roadless Area at NE corner adjacent to D3_5K7 that was left out of FS inventory:** This beautiful, remote area should be included as part of the wilderness inventory. CR12A, CR12B and CR12C are accessible only by an ATV, and are slated to be closed in the TMP "proposed action." I hiked throughout this area in the summer of 2014 and found it to be free of vehicle tracks and human development, except for a couple places where the permitee has put PVC into a spring at the end of CR12C. The permitee accesses areas on horse because of the impassibility of so-called roads. Access to this area from 354E is behind a locked gate, making it easy to prevent unauthorized access. Access from the north is very difficult, up very rugged arroyos. Would be easy to lock the gate at the forest boundary on CR12A. I saw no people during several days of hiking in the area, other than the permittee at his house (small private area about half a mile W of 354 on 354E). There are stunning canyons and springs toward the end of CR12A (see picture), and the ruins of a homestead at the end of CR12B.

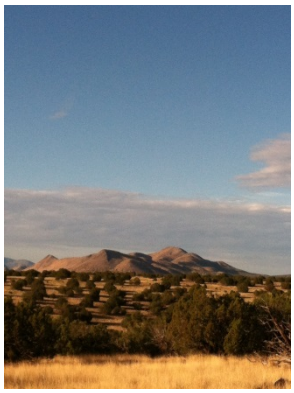
2. **Area north of my property, bordering BLM WSA:** This remote and undeveloped area should be included as part of the Forest Service inventory as it would connect the BLM Sierra Ladrones WSA and the Bear Mountains. The only current human development in the entire area is an active stock tank and solar panel one mile up 354XA in Baca Canyon, at the point where the TMP proposed action suggests closing 354XA, but nothing beyond that. There is a disconnected, rusted out windmill about a mile up 354U that is not in use. 354U would only be accessible by ATV after about the first half mile. Baca Canyon is a rare riparian area to the east of 354, with ruins of an old homestead. There is no sign of vehicle tracks (except along one fenceline for less than half mile) in the entire area south of Baca Canyon to my property and 354O. Very remote, with sandstone canyons, beautiful views of the Bears and Sierra Ladrones. I own the only private property in the area and have stipulated in my will that it be treated as wilderness after my demise.

Area south of my property bordering 354O and 354: This small area should also be included in the wilderness inventory. I own the property to the north would consider donating part of my land so as to provide contiguity. There is no development in this area, no vehicle tracks, and the land is in good condition.

3. **General D3_5K7:** This area is rightly included as part of the Wilderness Inventory. It includes the heart of the Bear Mountains, Hell's Mesa and countless rugged, wild canyons, especially on the eastern side. There are mountain lion, bear, elk, deer and countless birds at the many riparian areas. I've spent many hours over the last 20 years hiking and wandering in this area and have never seen a single person. It is a perfect place for solitude and experiencing the vastness of New Mexico.

4. **D3_5K7 East Side: north of 354P, west to Bears ridgeline, south of CR12E:** This eastern area of the Bear Mountains is clearly worthy of wilderness consideration. It has rugged canyons, many riparian areas, and countless havens for wildlife. The picture shows the beautiful and iconic Hell's Mesa. The roads suggested for closure in the Travel Management Plan Proposed Action are not used, and most are not accessible except by ATV.

5. **General D3_5K6:** This area is rightly included as part of the Wilderness Inventory. It includes the southern section of the Bears as well as many foothills. In my opinion, it is also right to include areas for consideration that are not part of the "inventoried roadless area" as they are contiguous to it, and free of viable roads. I'll provide more detailed comments on particular areas, but want to voice general support for including this area. The photo shows some of the lovely foothills of the Bears, just N or 506.



6. **Triangular Area between 354, 354L, and 506 (D3_5K6)**: I support including this area for consideration as Wilderness, with cherry stems for 354L and 354LL. The photo shows the Bears from the end of 354L. The little hills are almost untouched, beautiful, and have no development in them except as noted below. I drove and hiked all "roads" in the summer of 2014, and found that 354L becomes too rough for anything but an ATV just above the spot shown as the end of 354L on the Forest Service maps. At that point there is some significant development -- corrals, stock tanks, etc. There is also a stock tank at the end of 354LL, but nothing past that point. I also hiked 354J and K, and found no development. After hiking, I drove up 506 and found the exit of what could have been the continuation of 354LL. However, it was so badly eroded I couldn't drive in from 506. It looks like the

Bear Springs Ranch uses Bear Canyon as a shortcut to their development at the end of 354L, even though it is not a designated forest service road.

7. **Area from the ridge of Bears, south to 506, and south of 354N**. This eastern portion of the Bears is rightly included as worthy of consideration for wilderness. South of 354N (the northern boundary) there are no roads and no development. The photo shows a view of the Sierra Ladrones from a typical canyon in the Bears -- green after the monsoons.

8. **Area Immediately S and E of 24**: This section is definitely worthy of consideration for wilderness. I hiked and drove this area in the summer of 2014 and there is essentially no human development other than about 100 feet from 24. There is a stock tank, solar panels, and corral at the end of 24. I could find no evidence of 24B or 24BJ. 24A had some vehicle tracks, but no development, no PVC, excepting a bermed stock pond about 1.6 miles from 24. Vehicular traffic is not possible past this point. The photo shows a view of the San Mateo Mountains from the bottom of 24A.

9. **Area between 169 and 506, to origin of 24**: There is quite a lot of development associated with the Bear Springs ranch in this area near 169, including many new tracks and roads. 24C as shown on the FS map does not intersect 169, but it is definitely a track, although the only human development is a large stock tank at the SW end (shown in photo). I could find no evidence of 24CB or 24CE or 24 CA*B. However, there is a track about 200 feet in from 169 that parallels it. 506 L has a stock tank near 169 and about 2 miles in, but no other development. I'm hesitant to recommend this area for consideration of wilderness.

10. **West side of Bears above 24:** The western slopes and watersheds of the Bears are appropriately designated as having wilderness potential. Other than 123F, there is very limited access to any of this territory except through private property and behind locked gates. I hiked this area in the summer of 2014, and saw no evidence of development along 24CA, or 123F after the intersection with 123FAB, nor on 123FB. 123B is completely washed out by an arroyo at 123 (shown in photo), and there is no evidence of any vehicle traffic. 123 GB is behind a locked gate, and there is no evidence of vehicle traffic where it meets 123. I can see no reason not to close 123GB and GB within the national forest, 123B, and 123F after intersection with 123FAB.

11. **D3 5K5:** This area, which is the Goat Springs inventoried roadless area, should be thoroughly assessed for wilderness potential. It has numerous archaeological sites, and the hills are largely unscathed by human development.

12. **D3 5K4:** This area should be thoroughly assessed for wilderness potential. There is little evidence of human development and the Forest Service TMP proposed action recommends closing the tracks/roads in this area.

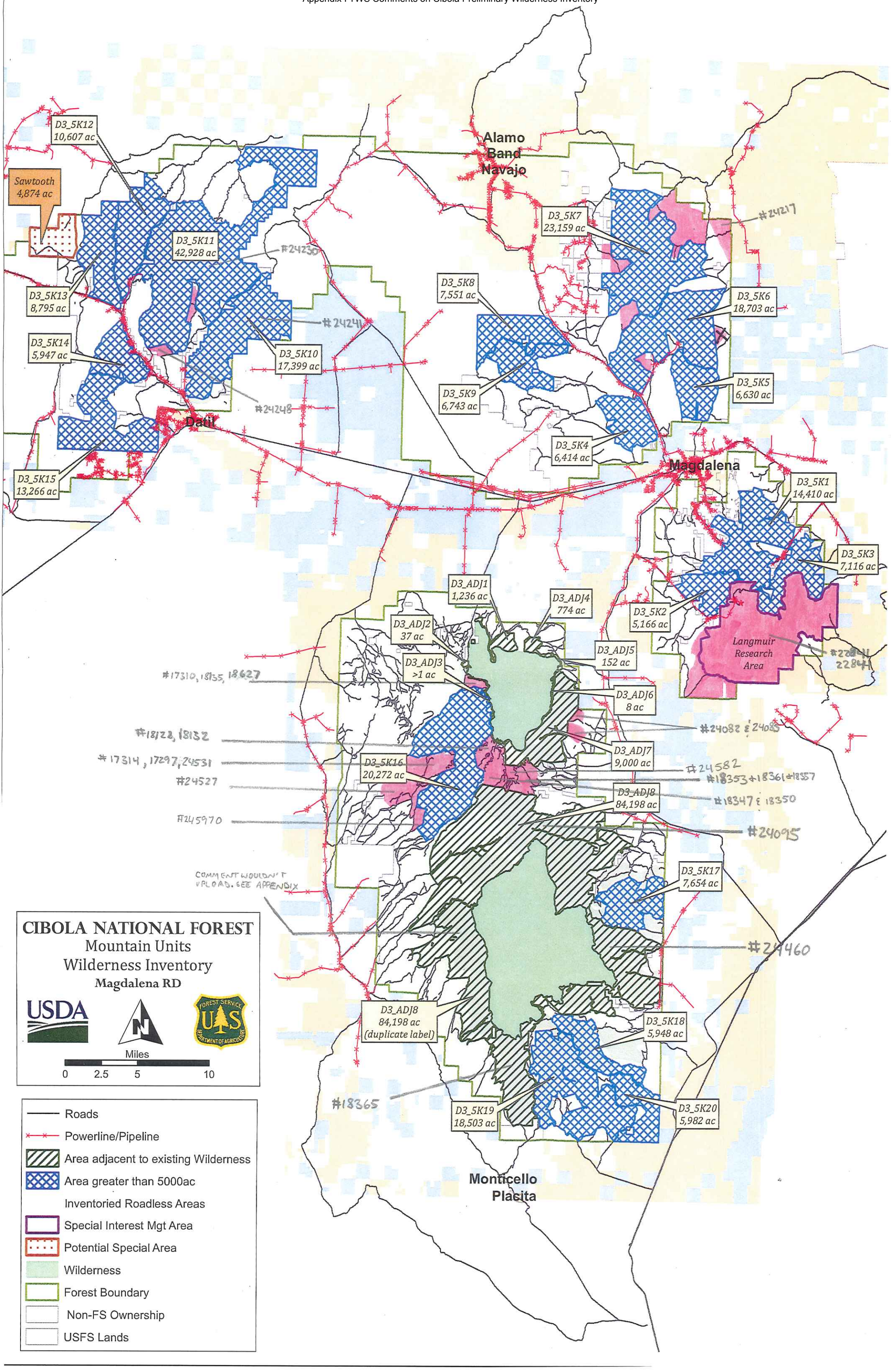
13. **D3 5K8 and D3 5K9n / Gallinas Mountains:** These large areas of pinon-juniper woodland should be thoroughly assessed for wilderness potential. There appears to be little human development, and few tracks or roads.

Magdalena Mountains

1. **D3_571, D3_5K3, and D3_5K2**: I had always thought that the Magdalena Mountains were already designated wilderness. The few mines and ruins of mines could easily be avoided, or cherry-stemmed. For the most part the Magdalenas are devoid of human development and provide wonderful opportunities for hiking, backpacking, and unsurpassed solitude. Please include this area as part of the wilderness assessment. (For some reason, the interactive map would not accept this polygon / comment. I entered it twice, and it doesn't appear.)

Sandia Ranger District

1. All of the areas adjacent to the Sandia Mountain Wilderness (D5_ADJ1 - D5_ADJ0) deserve to be included in this wilderness inventory. They should also be monitored more closely. I would also support clarifying the trails that are accessible to bikes in the area bordering Albuquerque Open Space, as each year more "ad hoc" bike trails are added. Designating as wilderness would be a great step forward.


D3_5K12
10,607 ac
Sawtooth
4,874 ac
D3_5K11
42,928 ac
#24236
D3_5K13
8,795 ac
#24241
D3_5K14
5,947 ac
D3_5K10
17,399 ac
#24248
Datil
D3_5K15
13,266 ac
Alamo
Band
Navajo
D3_5K7
23,159 ac
#24217
D3_5K8
7,551 ac
D3_5K6
18,703 ac
D3_5K9
6,743 ac
D3_5K5
6,630 ac
D3_5K4
6,414 ac
Magdalena
D3_5K1
14,410 ac
D3_5K3
7,116 ac
D3_ADJ1
1,236 ac
D3_ADJ4
774 ac
D3_ADJ2
37 ac
D3_5K2
5,166 ac
Langmuir
Research
Area
#22841
22844
D3_ADJ5
152 ac
D3_ADJ3
>1 ac
#17310, 18135, 18627
D3_ADJ6
8 ac
#24082 & 24083
#18128, 18132
#17314, 17297, 24531
D3_5K16
20,272 ac
D3_ADJ7
9,000 ac
#24582
#18353 & 18361 & 18557
#24527
D3_ADJ8
84,198 ac
#18347 & 18350
#245970
#24095
COMMENT WOULDN'T UPLOAD. SEE APPENDIX
D3_5K17
7,654 ac
#24460
D3_ADJ8
84,198 ac
(duplicate label)
D3_5K18
5,948 ac
#18365
D3_5K19
18,503 ac
D3_5K20
5,982 ac
Monticello
Placita
CIBOLA NATIONAL FOREST
Mountain Units
Wilderness Inventory
Magdalena RD
USDA
FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE
Miles
0 2.5 5 10
Roads
Powerline/Pipeline
Area adjacent to existing Wilderness
Area greater than 5000ac
Inventoried Roadless Areas
Special Interest Mgt Area
Potential Special Area
Wilderness
Forest Boundary
Non-FS Ownership
USFS Lands

CIBOLA NATIONAL FOREST
Mountain Units
Wilderness Inventory
Sandia RD

USDA

FOREST SERVICE U.S. DEPARTMENT OF AGRICULTURE

Miles
0 1 2 4

Santa Anna Pueblo
Bernalillo
Bernalillo
Placitas
Rio Rancho
Rio Rancho
Corrales
Sandia Pueblo
Albuquerque
Albuquerque
Albuquerque
Carnuel
Cedar Crest
Tijeras
Kirtland Air Force Base
Isleta Pueblo
Chilili Grant

D5_ADJ1
230 ac

D5_ADJ2
278 ac

D5_ADJ3
95 ac

D5_ADJ4
1,693 ac

D5_ADJ5
1,231 ac

D5_ADJ6
727 ac

D5_ADJ7
5 ac

D5_ADJ8
6 ac

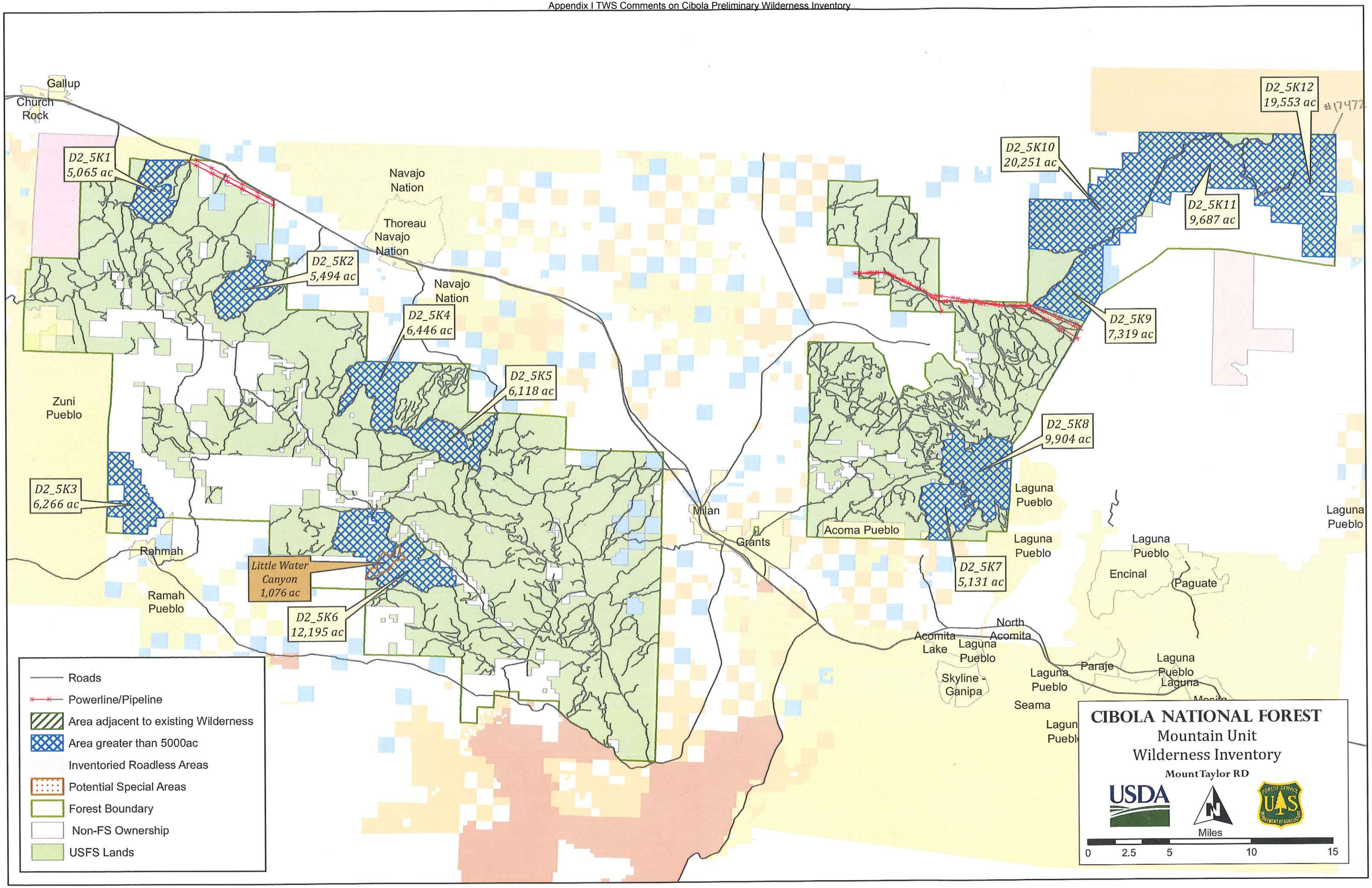
D5_ADJ9
333 ac

D5_ADJ10
80 ac

T'UF SHUR BIEN PRESERVATION TRUST AREA

#24987

- Roads
- Powerline/Pipeline
- Area adjacent to existing Wilderness
- Area greater than 5000ac
- Inventoried Roadless Areas
- Special Interest Mgt Area
- Military Withdrawal
- Wilderness
- Forest Boundary
- Non-FS Ownership
- USFS Lands


Gallup
Church Rock
D2_5K1
5,065 ac
Navajo Nation
Thoreau
Navajo Nation
D2_5K2
5,494 ac
Navajo Nation
D2_5K4
6,446 ac
D2_5K5
6,118 ac
Zuni Pueblo
D2_5K3
6,266 ac
Rahmah
Ramah Pueblo
Little Water Canyon
1,076 ac
D2_5K6
12,195 ac
Milan
Grants
D2_5K12
19,553 ac
#17472
D2_5K10
20,251 ac
D2_5K11
9,687 ac
D2_5K9
7,319 ac
D2_5K8
9,904 ac
Acoma Pueblo
Laguna Pueblo
D2_5K7
5,131 ac
Laguna Pueblo
Encinal
Paguate
Laguna Pueblo
Acomita Lake
North Acomita
Laguna Pueblo
Skyline - Ganipa
Laguna Pueblo
Paraje
Laguna Pueblo
Laguna
Seama
Roads
Powerline/Pipeline
Area adjacent to existing Wilderness
Area greater than 5000ac
Inventoried Roadless Areas
Potential Special Areas
Forest Boundary
Non-FS Ownership
USFS Lands
CIBOLA NATIONAL FOREST
Mountain Unit
Wilderness Inventory
Mount Taylor RD
USDA
Miles
0 2.5 5 10 15

Appendix III: Ecosystem Representation in the Cibola National Forest

These comments address the role of ecosystem representation in the Cibola National Forest's land management planning process – particularly its evaluation of areas that may be suitable for inclusion in the National Wilderness Preservation System (NWPS). As explained below and illustrated by the accompanying maps and data, the Cibola hosts numerous ecosystem types that are poorly-represented in the NWPS both regionally and nationally. Given the central importance of ecosystem diversity to conserving biological diversity and satisfying the requirements of the 2012 National Forest System Land Management Planning Rule, 36 C.F.R. part 219, the ongoing wilderness evaluation and planning process presents a crucial opportunity for the Cibola to increase the diversity of ecosystems that are protected as part of the NWPS or through other special designations.

I. Ecological Importance of Ecosystem Representation in Wilderness and Other Protected Areas

Wilderness and other protected conservation areas are the cornerstones of most regional, national, and international efforts to conserve biological diversity and ecological processes of natural ecosystems (Bertzky *et al*. 2012). Research has shown that protected areas reduce the loss, degradation, and fragmentation of natural habitats (Bruner *et al*. 2001; Naughton-Treves *et al*. 2005) and slow the rate of extinction of threatened species that occur therein (Butchart *et al*. 2012). Conversely, federal public lands in the United States that are managed for a variety of uses including mining, logging, and motorized recreation – and not primarily for conservation purposes – do not have the same benefits. Recognizing the central importance of protected areas in conserving biological diversity, the International Convention on Biological Diversity recommends that at least 17% of the world's terrestrial areas be conserved by 2020 (Woodley *et al*. 2012). To that end, the NWPS already serves as the world's largest national system of highly-protected conservation areas.[1]

Wilderness and other protected areas, however, can help achieve biodiversity targets only if they are located in the right places – that is, if they are ecologically representative of terrestrial ecosystems. This "representation" approach assumes that for protected areas to conserve genetic, species, and community diversity – as well as the composition, structure, function, and evolutionary potential of natural systems – they must encompass the full variety of ecosystems (Olson & Dinerstein 1998; Margules & Pressey 2000). In other words, protection of distinct ecological communities in turn

[1] The NWPS contains 21 million hectares in 690 units, covering nearly 1/5 of what the International Union for Conservation of Nature (IUCN) classifies as "category 1 areas," or the most natural and highly protected areas worldwide. By contrast, the IUCN classifies general Forest Service matrix lands as "GAP Status 3" – "Area having permanent protection from conversion of natural land cover for the majority of area. Subject to extractive uses of either broad, low-intensity type (eg. Logging) or localized intense type (eg. Mining)." – which is not considered a "protected" category for biodiversity purposes.

protects the species that rely on them and the natural ecological processes that are characteristic of those ecosystems (Rodrigues *et al*. 2004; Bunce *et al*. 2013). According to the Convention on Biological Diversity, the percentage of terrestrial ecosystems protected by 2020 (with a target of 17%) is one indicator of how well ecosystems are represented throughout the global network of protected conservation areas (Woodley *et al*. 2012).

Despite its importance, our analysis of ecosystem representation in the NWPS (Dietz *et al.* 2014 (*in revision*)) – which is described in detail below – shows that the NWPS suffers from a significant under-representation of many ecosystems. Over 20% (117) of the 553 types of unique ecosystems occurring on federal lands in the contiguous United States are not included in the NWPS. Even more concerning is that less than half of those 553 ecosystems are more than nominally represented: only 244 ecosystem types have at least 5% of their federal land area protected in the NWPS. And at a more reasonable 20% target for biodiversity conservation purposes, that number falls to only 113 ecosystems with at least 20% of their federal land area protected in the NWPS. 95% of that diversity was achieved by 1994, and wilderness designations over the past 15 years have added only 1 new ecosystem type above the 20% threshold. Moreover, there is not a clear correlation between how rare an ecosystem is on federal lands and how well it is represented in the NWPS. We found that there are many ecosystem types that are common on federal lands (covering over 100,000 hectares) but are poorly represented in the NWPS.

As we commemorate the 50th anniversary of the Wilderness Act (signed into law on September 3, 1964), it is important to begin to remedy this under-representation of ecosystems in the NWPS. Human population growth, climate change, and pressure for development and extraction of natural resources make wilderness and other protected areas increasingly vital to conserve biological diversity. Given those pressures and stressors, we must establish a network of connected wilderness and other protected areas that represent the full expression of ecosystem diversity.

II. Regulatory Requirements to Evaluate Ecosystem Representation

Given the regional, national, and global importance of ecosystem representation in the NWPS and other protected areas, the 2012 National Forest System Land Management Planning Rule requires the Forest Service to evaluate and incorporate ecosystem representation into its forest assessment and planning processes. Indeed, protecting ecosystem diversity is a central purpose of forest planning under the Rule:

> Plans will guide management of [National Forest System] land so that they are ecologically sustainable and contribute to social and economic sustainability; ***consist of ecosystems and watersheds with*** ecological integrity and ***diverse plant and animal communities***; and have the capacity to provide people and communities with ecosystem services and

> multiple uses that provide a range of social, economic, and ecological benefits for the present and into the future.

36 C.F.R. § 219.1(c) (emphasis added).

To satisfy the 2012 Planning Rule's ecosystem diversity mandate, forests are first required to identify and evaluate existing designated areas, including wilderness, and the potential need and opportunity for additional designated areas as part of the assessment phase. *Id.* § 219.6(b)(15). In doing so, the assessment should consider, among other things, whether there are "specific land types or ecosystems present in the plan area that are not currently represented or minimally represented within the wilderness system or system of research natural areas." Forest Service Handbook (FSH) 1909.12, ch. 10, § 14 (Feb. 14, 2013 draft).

Next, during the plan development or revision phase, the Forest Service is required to "[i]dentify and evaluate lands that may be suitable for inclusion in the [NWPS] and determine whether to recommend any such lands for wilderness designation." 36 C.F.R. § 219.7(c)(2)(v). In evaluating potential wilderness areas, the agency must, among other things, "[e]valuate the degree to which the area may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value." FSH 1909.12, ch. 70, § 72.1(4); *see also* 16 U.S.C. § 1131(c)(4) (wilderness, as defined by the Wilderness Act of 1964, "may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value"). "Such features or values may include[r]are plant or animal communities or rare ecosystems," with rare being "determined locally, regionally, nationally, or within the system of protected designations." FSH 1909.12, ch. 70, § 72.1(4).

In addition to identifying and evaluating areas to recommend for wilderness designation, the 2012 Planning Rule also requires the agency to "[i]dentify existing designated areas other than [wilderness] and determine whether to recommend any additional areas for designation." 36 C.F.R. § 219.7(c)(2)(vii). Those special designations may include, for example, ecological areas, botanical areas, or Research Natural Areas (RNAs), which are designed to "[m]aintain a wide spectrum of high quality representative areas that represent the major forms of variability . . . that, in combination, form a national network of ecological areas for research, education, and maintenance of biological diversity . . . [and s]erve as a baseline area for measuring long-term ecological changes." Forest Service Manual 4063.02; *see also* 36 C.F.R. § 219.19 (Forest Service may designate RNAs as part of planning process).

Complementing the requirement to consider ecosystem representation in determining suitability for wilderness and other special designations, the 2012 Planning Rule directs that plans generally provide for ecological sustainability and integrity and "the diversity of plant and animal communities and the persistence of native species." 36 C.F.R. §§ 219.8-219.9. The Forest Service cannot satisfy those substantive mandates without

adequately protecting ecosystem diversity in the plan area. For example, plans "must include plan components, including standards or guidelines, to maintain or restore the diversity of ecosystems and habitat types[, including r]are . . . plant and animal communities." *Id.* § 219.9(a)(2). With conflicting management and resource demands and human-caused stressors such as climate change that threaten ecosystem diversity and integrity, plans simply cannot restore or maintain the diversity of plant and animal communities absent a robust network of protected areas that adequately represent that diversity.

Collectively, these various procedural and substantive mandates commit the agency to a meaningful evaluation and consideration of under-represented and rare ecosystems, and to formulating and adopting plan components, recommendations, and designations that adequately protect and preserve the forest's diversity of plant and animal communities. In doing so, the agency is required to use "the best available scientific information." *Id.* § 219.3. As described in the methodology section below, we believe our analysis of ecosystem representation represents the best available scientific information, and we encourage the Forest Service to incorporate it into its wilderness evaluation and the broader planning process.

III. Methods and Analysis of Ecosystem Representation

Because the Cibola Forest Assessment did not address it, we conducted an analysis of ecosystem representation in wilderness at the national- and forest-level scales to provide the best available scientific information for the ongoing wilderness evaluation and forest planning processes.

According to the U.S. Geological Survey (USGS), the contiguous United States contains 565 terrestrial, non-developed ecosystems. In this study, we analyzed representation of those ecosystems by comparing their areas in the NWPS with their areas on federal land at both the national and forest levels in order to calculate a percent representation:

> Equation 1: *(area of ecosystem in the NWPS/area of ecosystem on federal land)*100*[2]
>
> Equation 2: *(area of ecosystem in the NWPS on the Cibola NF/area of ecosystem on the Cibola NF)*100*

We conducted these calculations at the finest scale for which consistent, spatially-explicit vegetative land-cover data is available: the 6th level of the National Vegetation

[2] We used federal land, as opposed to all land, within the contiguous United States to better assess where ecosystems are under-represented on lands potentially available for wilderness designation.

Classification System (NVCS 2008).[3] That data is from the USGS Gap Analysis Program (GAP) national land-cover data version 2 at 30-meter resolution (USGS 2011).

We obtained spatial data of the NWPS from the University of Montana College of Forestry and Conservation's Wilderness Institute at wilderness.net, which maintains the most up-to-date spatial data on wilderness areas. To map federal land area, we used the U.S. Protected Areas Database (PAD-US) version 1.3 (USGS 2012), which includes geographic boundaries, land ownership, land management, management designation, parcel name, area, and protection category.[4]

We overlaid the NWPS and all federal lands with land-cover data in a Geographic Information System (ArcGIS 10.2) to calculate and compare the total area of each ecosystem within the NWPS and federal land. We then calculated the percent of each ecosystem within the NWPS based on all area occurring on federal land (Equation 1, above).[5] This was part of a national assessment that we conducted (Dietz *et al.* 2014 (*in revision*)).

We did the same calculations at the forest level. We extracted land-cover data and clipped it to the forest boundary, and then calculated the percent of each ecosystem within the Cibola's four existing wilderness areas based on all federal land area occurring on the Forest (Equation 2, above).

Next we classified representation for each scale into four classes (<5%, 5-9.9%, 10-19.9%, ≥20%) and mapped them across the entire national forest. We considered ecosystems with <19.9% of their total area in the NWPS as inadequately represented.

We then brought the preliminary wilderness inventory data for the Cibola National Forest into Arc and created a new shapefile that included only the inventoried areas. This allowed us to focus our forest-specific analysis on the areas that are potentially suitable for wilderness designation by tabulating the area of each ecosystem occurring within each preliminary wilderness inventory area (see attached matrix, "Ecosystem Composition of Preliminary Wilderness Inventory Areas.xlsx"). Values within the matrix are the estimated acres of each ecosystem occurring within each preliminary wilderness inventory area.

[3] The NVCS classifications are as follows: 1) Class; 2) Subclass; 3) Formation; 4) Division; 5) Macrogroup; **6) Group (a.k.a. ecological system, to which we refer in this study as "ecosystem")**; 7) Alliance; and 8) Association.

[4] The PAD-US is a national inventory of terrestrial and marine protected areas that are managed to preserve biological diversity and other natural, recreation, and cultural uses.

[5] For example, when we say "boreal aspen-birch forest has 19% representation in NWPS," we mean that 19% of all federal land encompassing that ecosystem type is protected as wilderness in the NWPS.

We used these data to calculate the proportion (%) of each preliminary wilderness inventory area that is composed of ecosystems inadequately represented in the NWPS by each of the 3 lower representation classes (<5%, 5-9.9%, 10-19.9%) and for both scales of representation. For example, we calculated that 62% of Preliminary Inventory Unit D3ADJ2 is in under-represented ecosystem types.

IV. Results

Our analysis shows that the vast majority of preliminary wilderness inventory units contain high proportions of inadequately represented ecosystem types at both the forest-level and national scales (Tables 1 & 2; Maps 2 & 3). Over 80% of the lands in all 59 units contain inadequately represented ecosystem types at the national scale. The same is true for 52 of the 59 units at the forest level.

More broadly, our analysis found that only 11 of the 48 ecosystem types found on the Cibola are adequately represented at the forest level (Table 3, Tab 2). Under-represented ecosystem types comprise over 90% of the total forest area, with severely under-represented ecosystem types (<5%) covering over half of the entire forest area.

The story is similar at the national scale, with a total of 36 inadequately represented ecosystem types covering over 95% of the Cibola (Table 3, Tab 3; Map 2). Ecosystem types with less than 5% representation at the national scale cover just under half of the entire Cibola, while ecosystem types with less than 10% representation at that scale cover nearly 90% of the forest.

Notably, a handful of the most severely under-represented ecosystem types on the Cibola are also some of the most common ecosystem types, covering over 30% of the forest (Table 3, Tabs 2 & 3). For example, Colorado Plateau Pinyon-Juniper Woodland is the most prevalent ecosystem type on the forest – spanning over 600,000 acres – yet it falls into the lowest category of ecosystem representation (<5%). The second most prevalent ecosystem on the Cibola, the Southern Rocky Mountain Ponderosa Pine Woodland, covers over 500,000 acres of the Cibola, but less than 15% of its expanse is protected in the NWPS.

The attached maps and tables depict these results in detail, showing the following:

Map 1 “Preliminary Wilderness Inventory Units, Cibola National Forest”: Depicts each unit (polygon) in the preliminary wilderness inventory, outlined in black with hash marks, and with the forest boundary shaded gray.

Map 2 “Ecosystem Representation on the Federal Level“: Color depiction of the results of Equation 1 (above), showing the level of representation in the NWPS of each ecosystem type at the national scale. For example, areas shown in red depict

ecosystems that are represented in the NWPS at less than 5% of all available federal land. [inventory units outlined in black with cross-hatching]

Map 3 "Ecosystem Representation on the Forest Level": Color depiction of the results of Equation 2 (above), showing the level of representation in the NWPS of each ecosystem type at the forest level. [inventory units outlined in black with cross-hatching]

Table 1 "Cibola Inventory Representation Table": Proportion (%) of each wilderness inventory unit composed of under-represented ecosystem types on the Cibola National Forest based on national- or forest-level representation. Representation of each ecosystem type was quantified based on all available area on federal land and the individual forest. All ecosystems with <20% representation in the NWPS at each scale were broken into 3 levels of representation (<5%, 5-9.9%, and 10-19.9%). This table allows one to prioritize potential wilderness inventory units by proportion of land area that is composed of under-represented ecosystems, at three levels.

Table 2 "Ecosystem Composition of Preliminary Wilderness Inventory Areas": Values within the matrix are the estimated acres of each ecosystem type occurring within each preliminary wilderness inventory unit. This table depicts the specific ecosystem composition of each inventory unit.

Table 3, Tabs 1-3 "Cibola National Forest Ecosystems Representation": These tables depict which ecosystems are under-represented at the forest-level and national scales. Tab 1 shows a complete list of ecosystem types found on the Cibola National Forest, and the proportion of each type in the NWPS at the forest-level and national scales. Tabs 2 and 3 show representation breakdowns at the three levels (<5%, 5-9.9%, and 10-19.9%) at the forest-level and national scales.

V. Recommendations

Sufficient ecosystem representation in the NWPS and other protected areas is crucial to achieving ecological integrity of the diverse plant and animal communities found in the Cibola National Forest. As described above and depicted in the attached maps and tables, our analysis shows that under-representation of ecosystems in the NWPS is a significant problem on the Cibola. Our analysis also shows that the vast majority of lands in the preliminary wilderness inventory units contain under-represented ecosystem types. Thus, the ongoing wilderness evaluation and planning process presents the Forest Service with a critical opportunity to prioritize protection of ecosystem diversity and begin to remedy the under-representation of numerous ecosystem types in the NWPS.

To that end, we urge the Cibola National Forest to use the representation information in the attached tables and maps and described above to evaluate the importance of each inventoried area in achieving diverse ecosystem representation in wilderness at the regional and national scales. In addition, the forest should use this information more

broadly in its planning process and determinations whether to designate or recommend for designation other areas such as RNAs, ecological or botanical areas, etc. As described above, we believe that this information is the best available science on ecosystem representation, which the agency is legally required to use in its planning process.

If you have any questions about the analysis or data, or would like to have the data in another format, please contact Matt Dietz (415.710.7064; matt_dietz@tws.org) or Phil Hartger (303.802.1402; phil_hartger@tws.org).

Literature Cited

Bertzky, B., Corrigan, C., Kemsey, J. *et al*. (2012). *Protected planet report 2012: tracking progress towards global targets for protected areas*. IUCN, Gland, Switzerland and UNEP-WCMC, Cambridge, UK.

Bruner, A.G., Gullison, R.E., Rice, R.E. & da Fonseca, G.A.B. (2001). Effectiveness of parks in protecting tropical biodiversity. *Science*, **291**, 125-128.

Bunce, R.G.H., Bogers, M.M.B., Evans, D. *et al*. (2013). The significance of habitats as indicators of biodiversity and their links to species. *Ecol. Indic.*, **33**, 19-25.

Butchart, S.H.M., Scharlemann, J.P.W., Evans, M.I. *et al*. (2012). Protecting important sites for biodiversity contributes to meeting global conservation targets. *PLOS ONE*, **7** (3): e32529, 1-8.

Dietz, M.S., R.T. Belote, G.H. Aplet, and J.L. Aycrigg (2014). *In Revision*. The world's largest wilderness preservation system after 50 years: an assessment of ecosystem representation. *Biological Conservation* XX: xxx-xxx.

Margules, C.R. & Pressey, R.L. (2000). Systematic conservation planning. *Nature*, **405**, 243-253.

National Vegetation Classification System, Version 2, Feb. 2008. (2008). Vegetation Subcommittee, Federal Geographic Data Committee. FGDC-STD-005-2008.

Naughton-Treves, L., Holland, M.B. & Brandon, K. (2005). The role of protected areas in conserving biodiversity and sustaining local livelihoods. *Annu. Rev. Env. Res.*, **30**, 219-252.

Olson, D.M. & Dinerstein, E. (1998). The global 200: A representation approach to conserving the Earth's most biologically valuable ecoregions. *Conserv. Biol.*, **12**, 502-515.

Rodrigues, A.S.L., Andelman, S.J., Bakarr, M.I. *et al*. (2004). Effectiveness of the global protected areas network in representing species diversity. *Nature*, **428**, 640-643.

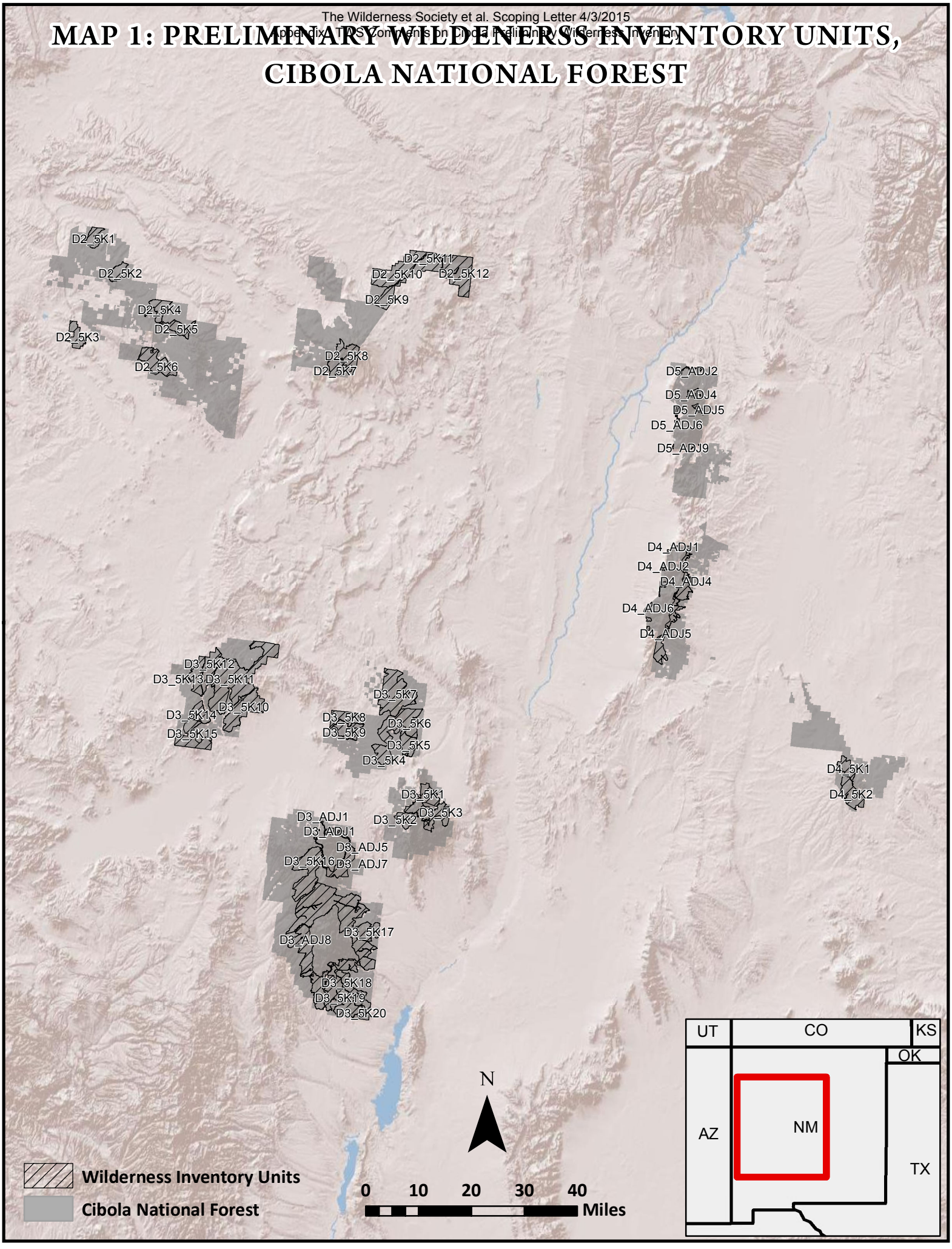
US Geological Survey, Gap Analysis Program (GAP). (2011). *National Land Cover*, version 2, August 2011. Accessed 15 January 2014: http://gapanlysis.usgs.gov.

US Geological Survey, Gap Analysis Program (GAP). (2012). *Protected Areas Database of the United States* (PAD-US), version 1.3, combined feature class, Nov. 2012. Accessed 15 January 2014: http://gapanalysis.usgs.gov/padus.

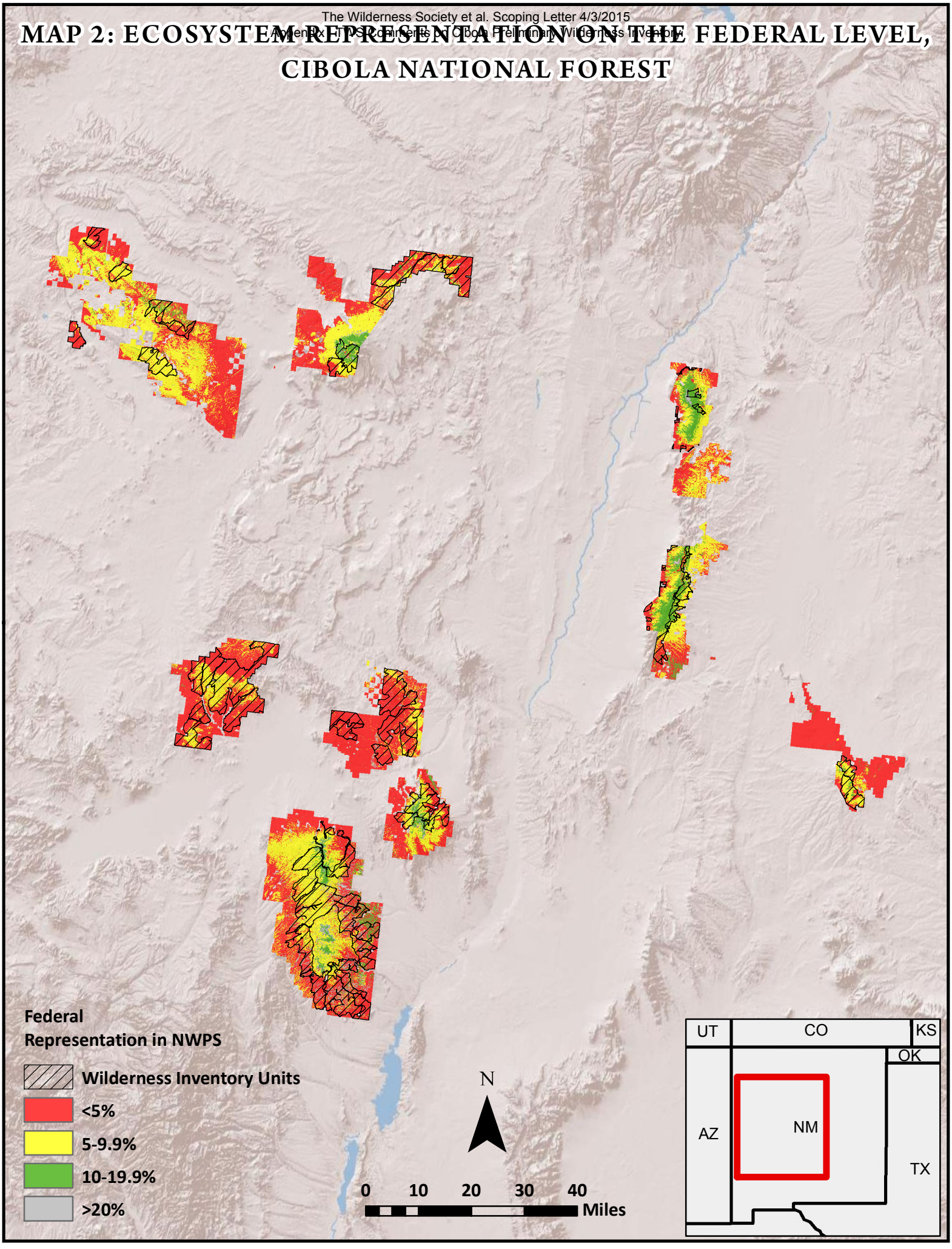
The Wilderness Act. (1964). Public Law 88-577, 16 U.S.C. 1131-1136, 88th Congress, Second Session, September 3, 1964.

Woodley, S., Bertzky, B., Crawhall, N. *et al*. (2012). Meeting Aichi target 11: What does success look like for protected area systems? *Parks*, **18**, 23-36.

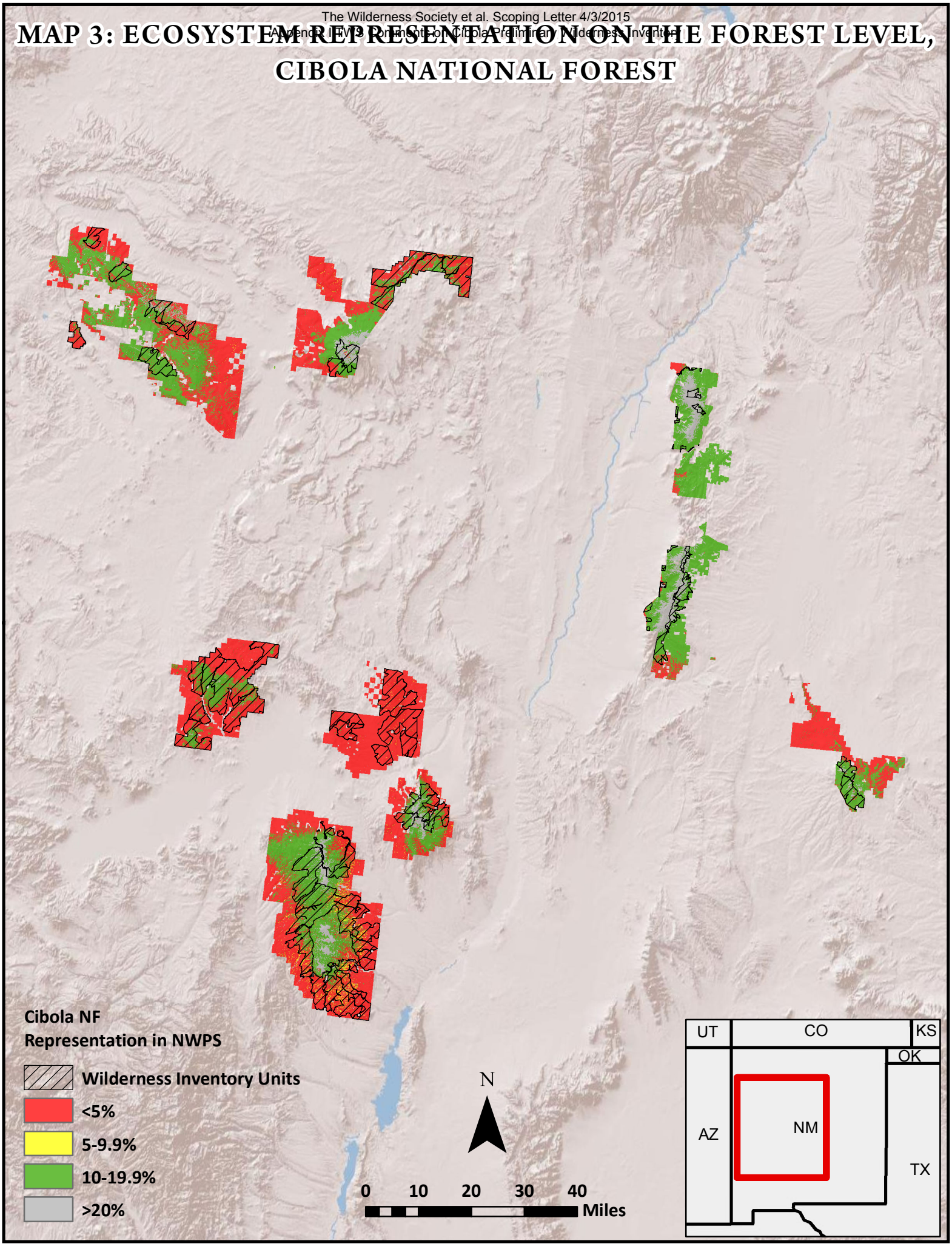
MAP 1: PRELIMINARY WILDERNESS INVENTORY UNITS, CIBOLA NATIONAL FOREST



MAP 2: ECOSYSTEM REPRESENTATION ON THE FEDERAL LEVEL, CIBOLA NATIONAL FOREST



MAP 3: ECOSYSTEM REPRESENTATION ON THE FOREST LEVEL, CIBOLA NATIONAL FOREST



Cibola National Forest, Underrepresented Ecological Systems ("Ecosystems")

	Federal Representation				Forest Representation			
Wilderness Inventory Unit	*<5%*	*5-9.9%*	*10-19.9%*	*<20%*	*<5%*	*5-9.9%*	*10-19.9%*	*<20%*
D3_ADJ2	62.6	37.4	0.0	100.0	62.6	0.0	37.4	100.0
D4_ADJ8	95.4	3.8	0.0	99.2	0.0	0.0	100.0	100.0
D4_ADJ7	88.9	8.6	1.5	98.9	9.1	0.0	89.4	98.5
D4_ADJ6	94.7	2.0	1.8	98.5	24.1	0.0	74.1	98.2
D4_ADJ1	56.1	41.0	3.0	100.0	4.3	0.0	91.8	96.2
D5_ADJ9	98.3	1.2	0.0	99.5	1.0	0.0	99.0	100.0
D5_ADJ7	54.5	45.5	0.0	100.0	0.0	0.0	100.0	100.0
D5_ADJ6	99.8	0.2	0.0	100.0	2.2	5.4	92.5	100.0
D2_5K3	93.3	5.8	0.4	99.5	86.1	0.4	13.1	99.6
D5_ADJ3	96.8	2.0	1.2	100.0	0.0	0.0	98.8	98.8
D3_5K20	88.6	4.0	2.6	95.2	95.8	2.4	0.1	98.3
D3_ADJ3	0.0	31.5	47.3	78.8	0.0	0.0	31.5	31.5
D3_ADJ6	91.8	4.4	0.0	96.2	76.1	0.0	23.9	100.0
D3_ADJ1	46.7	53.1	0.2	100.0	46.7	0.0	53.1	99.8
D3_5K8	98.6	1.1	0.0	99.7	98.6	0.2	1.1	100.0
D4_5K2	26.1	67.4	6.5	100.0	3.3	0.0	89.5	92.8
D3_5K11	62.1	36.8	0.1	99.1	64.9	0.2	34.5	99.5
D4_ADJ5	37.9	30.6	31.2	99.8	8.5	0.0	62.5	71.0
D4_ADJ3	86.4	12.2	0.0	98.6	47.6	0.0	52.4	100.0
D4_ADJ2	89.9	9.8	0.0	99.7	3.0	0.0	97.0	100.0
D2_5K9	35.1	57.8	0.0	93.0	45.7	0.0	53.7	99.5
D2_5K12	74.8	21.3	1.4	97.5	73.0	1.0	24.6	98.6
D5_ADJ8	100.0	0.0	0.0	100.0	0.0	0.0	100.0	100.0
D2_5K5	70.5	24.9	4.3	99.8	70.5	0.1	25.1	95.6
D2_5K1	77.7	20.0	2.0	99.7	75.6	0.2	22.2	98.0
D3_5K19	67.0	15.9	1.6	84.6	78.1	13.0	7.6	98.7
D3_5K16	6.2	79.5	11.5	97.1	6.2	0.2	79.5	85.9
D3_ADJ7	42.3	43.5	7.7	93.4	39.9	3.8	47.7	91.5
D3_5K4	89.8	5.9	0.1	95.8	98.6	1.4	0.0	100.0
D3_5K9	97.9	2.0	0.0	99.9	98.0	0.1	2.0	100.0

D4_5K1	36.2	55.5	8.3	100.0	14.9	0.0	77.7	92.6
D3_5K5	70.8	27.7	1.4	99.9	99.8	0.2	0.0	100.0
D3_5K7	80.6	15.1	1.2	96.9	97.9	1.6	0.4	99.9
D3_5K10	82.7	15.6	0.0	98.3	83.1	0.4	15.8	99.3
D4_ADJ4	8.8	48.9	42.3	100.0	0.0	0.0	50.7	50.7
D2_5K6	5.8	93.0	0.8	99.6	5.8	0.0	93.0	98.8
D2_5K4	28.4	47.5	23.9	99.9	28.4	0.0	47.5	75.9
D2_5K2	18.4	78.1	3.3	99.8	17.2	0.0	79.3	96.5
D2_5K10	68.5	23.0	6.3	97.8	69.9	0.1	23.5	93.5
D2_5K11	53.5	40.6	2.9	97.0	53.5	0.0	43.5	97.0
D3_5K13	58.2	41.1	0.0	99.3	58.2	0.3	41.5	100.0
D3_ADJ4	92.7	0.8	0.0	93.5	93.6	5.7	0.7	100.0
D3_ADJ5	83.4	8.4	0.0	91.9	95.6	4.4	0.0	100.0
D3_5K18	65.1	12.5	6.5	84.1	72.8	13.5	12.0	98.3
D3_5K17	52.9	6.7	26.7	86.4	82.0	9.2	6.2	97.4
D5_ADJ4	2.6	6.4	86.3	95.3	0.0	0.0	7.2	7.2
D3_ADJ8	45.5	38.6	5.1	89.1	49.0	7.5	39.9	96.4
D3_5K2	34.6	49.4	12.0	96.0	34.5	0.1	49.5	84.0
D3_5K1	29.0	49.1	16.8	94.8	25.8	0.6	52.4	78.8
D3_5K6	75.5	22.4	0.1	98.0	99.0	0.9	0.2	100.0
D3_5K15	66.2	31.9	0.5	98.6	66.3	0.4	32.2	98.9
D3_5K14	89.8	10.2	0.0	100.0	89.8	0.0	10.2	100.0
D3_5K12	60.1	39.6	0.1	99.7	60.1	0.0	39.8	99.9
D2_5K7	46.3	52.5	0.4	99.2	46.3	0.1	52.6	99.0
D2_5K8	2.8	29.3	58.3	90.4	2.9	0.5	29.2	32.6
D5_ADJ1	98.6	1.4	0.0	100.0	56.3	0.0	43.7	100.0
D5_ADJ2	87.2	10.6	1.0	98.9	24.5	0.0	74.4	99.0
D5_ADJ5	3.3	23.5	73.2	99.9	0.0	0.0	23.7	23.7
D3_5K3	47.9	40.6	9.1	97.6	39.5	0.4	50.2	90.0

Values are the estimated acres of each ecosystem occurring within each wilderness inventory area.

	Wilderness Inventory Units				
Ecosystem	D3_ADJ2	D4_ADJ8	D4_ADJ7	D4_ADJ6	D4_ADJ1
Apacherian-Chihuahuan Mesquite Upland Scrub	0	0	0	0	0
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	0	0	0	0	0
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0	0	0	0	0
Chihuahuan Sandy Plains Semi-Desert Grassland	0	0	0	0	0
Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	0	0	0	0	0
Colorado Plateau Mixed Bedrock Canyon and Tableland	0	0	0	0	0
Colorado Plateau Pinyon-Juniper Woodland	23,818	0	0	0	0
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	0	0	0	0	0
Inter-Mountain Basins Big Sagebrush Shrubland	0	0	0	0	0
Inter-Mountain Basins Greasewood Flat	0	0	0	0	0
Inter-Mountain Basins Juniper Savanna	0	0	0	7,005	0
Inter-Mountain Basins Mixed Salt Desert Scrub	0	0	0	0	0
Inter-Mountain Basins Montane Sagebrush Steppe	0	0	0	0	0
Inter-Mountain Basins Semi-Desert Grassland	0	0	0	0	0
Inter-Mountain Basins Semi-Desert Shrub Steppe	0	0	0	0	0
Inter-Mountain Basins Shale Badland	0	0	0	0	0
Inter-Mountain Basins Volcanic Rock and Cinder Land	0	0	0	0	0
Madrean Juniper Savanna	0	0	0	0	0
Madrean Pinyon-Juniper Woodland	0	0	0	0	0
Mogollon Chaparral	0	0	0	0	0
North American Arid West Emergent Marsh	0	0	0	0	0
North American Warm Desert Active and Stabilized Dune	0	0	0	0	0
North American Warm Desert Bedrock Cliff and Outcrop	0	0	0	0	0
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	0	0	0	0	0
North American Warm Desert Wash	0	0	0	0	0
Rocky Mountain Alpine-Montane Wet Meadow	0	0	0	0	0
Rocky Mountain Aspen Forest and Woodland	0	0	0	0	0
Rocky Mountain Cliff, Canyon and Massive Bedrock	0	0	0	0	0
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	0	0	8,607	16,413	801
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	0	0	0	0	2,402

Ecosystem	D3_ADJ2	D4_ADJ8	D4_ADJ7	D4_ADJ6	D4_ADJ1
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	0	0	0	0	0
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	0	0	0	0	0
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	0	1,801	3,403	10,808	0
Rocky Mountain Subalpine-Montane Riparian Shrubland	0	0	0	0	0
Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland	0	0	2,602	5,204	4,203
Southern Rocky Mountain Juniper Woodland and Savanna	14,211	8,607	27,621	7,005	115,089
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	0	0	27,822	159,123	10,208
Southern Rocky Mountain Montane-Subalpine Grassland	0	215,967	247,792	493,783	142,110
Southern Rocky Mountain Pinyon-Juniper Woodland	0	0	0	0	0
Southern Rocky Mountain Ponderosa Pine Woodland	0	0	2,202	7,806	4,203
Western Great Plains Cliff and Outcrop	0	0	1,601	5,804	2,002
Western Great Plains Foothill and Piedmont Grassland	0	0	0	0	0
Western Great Plains Riparian Woodland and Shrubland	0	0	0	0	0
Western Great Plains Shortgrass Prairie	0	0	0	0	0

Values are the estimated acres of each ecosystem occurring within each wilderness inventory area.

Ecosystem	D5_ADJ9	D5_ADJ7	D5_ADJ6	D2_5K3	D5_ADJ3
Apacherian-Chihuahuan Mesquite Upland Scrub	0	0	0	0	0
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	0	0	0	0	0
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0	0	0	0	0
Chihuahuan Sandy Plains Semi-Desert Grassland	0	0	0	0	0
Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	0	0	0	0	0
Colorado Plateau Mixed Bedrock Canyon and Tableland	0	0	0	0	0
Colorado Plateau Pinyon-Juniper Woodland	0	0	0	4,771,897	0
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	0	0	0	0	0
Inter-Mountain Basins Big Sagebrush Shrubland	0	0	0	0	0
Inter-Mountain Basins Greasewood Flat	0	0	0	0	0
Inter-Mountain Basins Juniper Savanna	0	0	0	0	0
Inter-Mountain Basins Mixed Salt Desert Scrub	0	0	0	801	0
Inter-Mountain Basins Montane Sagebrush Steppe	0	0	0	70,855	0
Inter-Mountain Basins Semi-Desert Grassland	0	0	0	0	0
Inter-Mountain Basins Semi-Desert Shrub Steppe	0	0	0	0	0
Inter-Mountain Basins Shale Badland	0	0	0	0	0
Inter-Mountain Basins Volcanic Rock and Cinder Land	0	0	0	0	0
Madrean Juniper Savanna	0	0	0	0	0
Madrean Pinyon-Juniper Woodland	0	0	0	0	0
Mogollon Chaparral	0	0	0	0	0
North American Arid West Emergent Marsh	0	0	0	0	0
North American Warm Desert Active and Stabilized Dune	0	0	0	0	0
North American Warm Desert Bedrock Cliff and Outcrop	0	0	0	0	0
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	0	0	0	23,618	0
North American Warm Desert Wash	0	0	0	0	0
Rocky Mountain Alpine-Montane Wet Meadow	0	0	0	0	0
Rocky Mountain Aspen Forest and Woodland	0	0	0	0	0
Rocky Mountain Cliff, Canyon and Massive Bedrock	0	0	0	0	0
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	0	0	0	406,915	0
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	0	0	0	0	0

Ecosystem	D5_ADJ9	D5_ADJ7	D5_ADJ6	D2_5K3	D5_ADJ3
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	0	0	0	0	0
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	0	0	0	4,203	0
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	1,401	0	0	0	0
Rocky Mountain Subalpine-Montane Riparian Shrubland	0	0	0	0	0
Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland	0	0	0	2,802	1,001
Southern Rocky Mountain Juniper Woodland and Savanna	3,403	2,002	1,001	328,054	1,601
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	2,802	0	13,210	0	0
Southern Rocky Mountain Montane-Subalpine Grassland	273,812	2,202	496,585	0	79,462
Southern Rocky Mountain Pinyon-Juniper Woodland	0	0	0	0	0
Southern Rocky Mountain Ponderosa Pine Woodland	0	0	0	17,213	0
Western Great Plains Cliff and Outcrop	0	0	0	0	0
Western Great Plains Foothill and Piedmont Grassland	0	0	0	0	0
Western Great Plains Riparian Woodland and Shrubland	0	0	0	0	0
Western Great Plains Shortgrass Prairie	0	0	0	0	0

Values are the estimated acres of each ecosystem occurring within each wilderness inventory area.

Ecosystem	D3_5K20	D3_ADJ3	D3_ADJ6	D3_ADJ1	D3_5K8
Apacherian-Chihuahuan Mesquite Upland Scrub	3,860,390	0	0	0	0
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	66,051	0	0	0	0
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0	0	0	0	0
Chihuahuan Sandy Plains Semi-Desert Grassland	200	0	0	0	0
Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	535,415	0	0	0	0
Colorado Plateau Mixed Bedrock Canyon and Tableland	0	0	0	0	0
Colorado Plateau Pinyon-Juniper Woodland	314,444	0	75,659	588,456	6,568,688
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	0	0	0	0	0
Inter-Mountain Basins Big Sagebrush Shrubland	55,843	0	0	0	1,601
Inter-Mountain Basins Greasewood Flat	0	0	0	0	0
Inter-Mountain Basins Juniper Savanna	0	0	0	0	0
Inter-Mountain Basins Mixed Salt Desert Scrub	147,314	0	0	0	1,401
Inter-Mountain Basins Montane Sagebrush Steppe	2,202	0	0	0	68,453
Inter-Mountain Basins Semi-Desert Grassland	0	0	0	0	0
Inter-Mountain Basins Semi-Desert Shrub Steppe	0	0	0	0	0
Inter-Mountain Basins Shale Badland	32,625	0	4,003	0	0
Inter-Mountain Basins Volcanic Rock and Cinder Land	0	0	0	0	0
Madrean Juniper Savanna	2,602	0	0	0	0
Madrean Pinyon-Juniper Woodland	59,046	0	0	0	801
Mogollon Chaparral	91,671	0	0	0	0
North American Arid West Emergent Marsh	0	0	0	0	0
North American Warm Desert Active and Stabilized Dune	0	0	0	0	0
North American Warm Desert Bedrock Cliff and Outcrop	0	0	0	0	0
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	131,102	0	0	0	15,812
North American Warm Desert Wash	80,262	0	0	0	0
Rocky Mountain Alpine-Montane Wet Meadow	0	1,801	0	0	0
Rocky Mountain Aspen Forest and Woodland	0	1,801	0	0	0
Rocky Mountain Cliff, Canyon and Massive Bedrock	0	71,455	0	0	0
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	0	0	20,416	0	0
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	0	0	0	0	0

Ecosystem	D3_5K20	D3_ADJ3	D3_ADJ6	D3_ADJ1	D3_5K8
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	0	0	0	0	0
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	0	0	0	0	0
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	3,803	0	0	0	3,002
Rocky Mountain Subalpine-Montane Riparian Shrubland	0	124,496	0	0	0
Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland	0	11,409	0	400	0
Southern Rocky Mountain Juniper Woodland and Savanna	0	111,486	4,604	669,318	73,857
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	0	0	0	0	0
Southern Rocky Mountain Montane-Subalpine Grassland	0	0	0	0	0
Southern Rocky Mountain Pinyon-Juniper Woodland	0	0	0	0	0
Southern Rocky Mountain Ponderosa Pine Woodland	0	31,424	0	1,801	0
Western Great Plains Cliff and Outcrop	600	0	0	0	0
Western Great Plains Foothill and Piedmont Grassland	0	0	0	0	0
Western Great Plains Riparian Woodland and Shrubland	0	0	0	0	0
Western Great Plains Shortgrass Prairie	0	0	0	0	0

Values are the estimated acres of each ecosystem occurring within each wilderness inventory area.

Ecosystem	D4_5K2	D3_5K11	D4_ADJ5	D4_ADJ3	D4_ADJ2
Apacherian-Chihuahuan Mesquite Upland Scrub	0	0	278,015	0	0
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	0	0	0	0	0
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0	0	0	0	0
Chihuahuan Sandy Plains Semi-Desert Grassland	0	0	0	0	0
Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	0	0	0	0	0
Colorado Plateau Mixed Bedrock Canyon and Tableland	0	1,401	0	0	0
Colorado Plateau Pinyon-Juniper Woodland	0	23,545,239	0	0	0
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	0	5,204	0	0	0
Inter-Mountain Basins Big Sagebrush Shrubland	0	73,657	0	0	0
Inter-Mountain Basins Greasewood Flat	0	0	0	0	0
Inter-Mountain Basins Juniper Savanna	0	0	3,002	2,402	0
Inter-Mountain Basins Mixed Salt Desert Scrub	0	1,051,414	0	23,818	0
Inter-Mountain Basins Montane Sagebrush Steppe	0	358,678	0	0	0
Inter-Mountain Basins Semi-Desert Grassland	0	0	0	0	0
Inter-Mountain Basins Semi-Desert Shrub Steppe	0	0	0	0	0
Inter-Mountain Basins Shale Badland	0	11,409	0	0	0
Inter-Mountain Basins Volcanic Rock and Cinder Land	0	0	0	0	0
Madrean Juniper Savanna	26,020	0	3,403	0	0
Madrean Pinyon-Juniper Woodland	7,406	0	281,818	0	0
Mogollon Chaparral	0	0	2,002	0	0
North American Arid West Emergent Marsh	0	0	0	0	0
North American Warm Desert Active and Stabilized Dune	0	0	0	0	0
North American Warm Desert Bedrock Cliff and Outcrop	0	0	0	0	0
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	0	72,856	0	0	0
North American Warm Desert Wash	0	0	0	0	0
Rocky Mountain Alpine-Montane Wet Meadow	0	4,604	0	0	0
Rocky Mountain Aspen Forest and Woodland	0	10,608	7,206	0	0
Rocky Mountain Cliff, Canyon and Massive Bedrock	0	105,282	0	0	0
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	17,013	0	39,831	3,202	0
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	73,257	0	76,459	0	0

Ecosystem	D4_5K2	D3_5K11	D4_ADJ5	D4_ADJ3	D4_ADJ2
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	0	0	0	0	0
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	0	23,618	0	0	0
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	0	110,886	12,410	5,804	801
Rocky Mountain Subalpine-Montane Riparian Shrubland	0	10,408	0	0	0
Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland	234,382	21,617	972,754	0	0
Southern Rocky Mountain Juniper Woodland and Savanna	6,147,963	13,170,202	2,714,503	25,820	31,224
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	28,622	0	163,527	173,334	6,605
Southern Rocky Mountain Montane-Subalpine Grassland	1,995,746	0	2,782,756	187,946	276,414
Southern Rocky Mountain Pinyon-Juniper Woodland	0	5,404	0	0	0
Southern Rocky Mountain Ponderosa Pine Woodland	352,673	17,013	1,518,576	0	0
Western Great Plains Cliff and Outcrop	57,244	0	801	2,802	3,002
Western Great Plains Foothill and Piedmont Grassland	175,936	0	26,220	0	0
Western Great Plains Riparian Woodland and Shrubland	1,801	0	0	0	0
Western Great Plains Shortgrass Prairie	0	0	0	0	0

Values are the estimated acres of each ecosystem occurring within each wilderness inventory area.

Ecosystem	D2_5K9	D2_5K12	D5_ADJ8	D2_5K5	D2_5K1
Apacherian-Chihuahuan Mesquite Upland Scrub	0	0	0	0	0
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	0	0	0	0	0
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0	0	0	0	0
Chihuahuan Sandy Plains Semi-Desert Grassland	0	0	0	0	0
Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	0	0	0	0	0
Colorado Plateau Mixed Bedrock Canyon and Tableland	0	114,689	0	0	6,605
Colorado Plateau Pinyon-Juniper Woodland	451,149	11,893,213	0	3,821,160	3,294,552
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	0	34,227	0	0	0
Inter-Mountain Basins Big Sagebrush Shrubland	0	7,005	0	0	0
Inter-Mountain Basins Greasewood Flat	0	108,884	0	0	0
Inter-Mountain Basins Juniper Savanna	0	0	0	0	0
Inter-Mountain Basins Mixed Salt Desert Scrub	700,943	68,053	0	0	1,201
Inter-Mountain Basins Montane Sagebrush Steppe	1,859,641	704,546	0	56,444	137,507
Inter-Mountain Basins Semi-Desert Grassland	0	12,810	0	0	0
Inter-Mountain Basins Semi-Desert Shrub Steppe	0	0	0	0	0
Inter-Mountain Basins Shale Badland	0	1,401	0	0	0
Inter-Mountain Basins Volcanic Rock and Cinder Land	0	0	0	0	0
Madrean Juniper Savanna	0	0	0	0	0
Madrean Pinyon-Juniper Woodland	0	0	0	0	0
Mogollon Chaparral	18,014	0	0	0	0
North American Arid West Emergent Marsh	0	2,202	0	1,201	0
North American Warm Desert Active and Stabilized Dune	0	0	0	0	0
North American Warm Desert Bedrock Cliff and Outcrop	0	0	0	0	0
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	2,002	55,243	0	5,004	9,207
North American Warm Desert Wash	0	0	0	0	0
Rocky Mountain Alpine-Montane Wet Meadow	0	0	0	0	0
Rocky Mountain Aspen Forest and Woodland	0	0	0	0	0
Rocky Mountain Cliff, Canyon and Massive Bedrock	15,012	0	0	3,002	0
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	0	262,203	0	4,203	96,475
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	0	0	0	0	0

Ecosystem	D2_5K9	D2_5K12	D5_ADJ8	D2_5K5	D2_5K1
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	0	17,213	0	0	0
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	0	371,688	0	0	0
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	427,931	1,201	0	1,401	4,604
Rocky Mountain Subalpine-Montane Riparian Shrubland	1,401	0	0	0	0
Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland	0	111,687	0	12,610	1,201
Southern Rocky Mountain Juniper Woodland and Savanna	3,107,007	3,667,841	0	1,371,863	907,703
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	0	0	0	0	0
Southern Rocky Mountain Montane-Subalpine Grassland	0	15,812	13,210	0	0
Southern Rocky Mountain Pinyon-Juniper Woodland	0	3,002	0	1,201	0
Southern Rocky Mountain Ponderosa Pine Woodland	1,601	137,106	0	225,375	88,869
Western Great Plains Cliff and Outcrop	0	0	0	0	0
Western Great Plains Foothill and Piedmont Grassland	0	0	0	0	0
Western Great Plains Riparian Woodland and Shrubland	0	0	0	0	0
Western Great Plains Shortgrass Prairie	0	0	0	0	0

Values are the estimated acres of each ecosystem occurring within each wilderness inventory area.

Ecosystem	D3_5K19	D3_5K16	D3_ADJ7	D3_5K4	D3_5K9
Apacherian-Chihuahuan Mesquite Upland Scrub	3,524,330	0	3,202	0	0
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	74,057	0	0	0	0
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0	0	0	0	0
Chihuahuan Sandy Plains Semi-Desert Grassland	0	0	0	0	0
Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	377,092	0	0	0	0
Colorado Plateau Mixed Bedrock Canyon and Tableland	0	0	0	0	0
Colorado Plateau Pinyon-Juniper Woodland	6,843,101	1,042,007	3,059,370	4,323,149	5,757,060
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	1,001	0	0	86,867	0
Inter-Mountain Basins Big Sagebrush Shrubland	172,333	0	0	515,199	0
Inter-Mountain Basins Greasewood Flat	2,802	0	0	77,060	0
Inter-Mountain Basins Juniper Savanna	0	0	0	0	0
Inter-Mountain Basins Mixed Salt Desert Scrub	1,567,414	0	112,087	336,861	801
Inter-Mountain Basins Montane Sagebrush Steppe	45,035	82,064	0	180,140	41,232
Inter-Mountain Basins Semi-Desert Grassland	0	0	0	0	0
Inter-Mountain Basins Semi-Desert Shrub Steppe	1,201	0	0	3,002	0
Inter-Mountain Basins Shale Badland	142,310	0	32,225	236,984	1,001
Inter-Mountain Basins Volcanic Rock and Cinder Land	4,403	600	0	0	0
Madrean Juniper Savanna	0	2,002	0	0	0
Madrean Pinyon-Juniper Woodland	157,922	12,009	24,619	7,806	0
Mogollon Chaparral	185,744	221,772	72,456	0	0
North American Arid West Emergent Marsh	0	2,002	0	0	0
North American Warm Desert Active and Stabilized Dune	27,221	0	0	0	0
North American Warm Desert Bedrock Cliff and Outcrop	5,204	0	0	0	0
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	2,159,873	32,825	310,841	4,403	5,604
North American Warm Desert Wash	55,443	0	0	0	0
Rocky Mountain Alpine-Montane Wet Meadow	0	62,448	4,003	0	0
Rocky Mountain Aspen Forest and Woodland	0	22,618	6,405	0	0
Rocky Mountain Cliff, Canyon and Massive Bedrock	3,603	183,542	2,802	0	0
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	189,347	0	355,075	0	801
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	1,201	0	1,801	0	0

Ecosystem	D3_5K19	D3_5K16	D3_ADJ7	D3_5K4	D3_5K9
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	0	0	0	0	0
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	69,854	6,805	101,879	0	0
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	0	0	0	0	0
Rocky Mountain Subalpine-Montane Riparian Shrubland	0	493,382	388,101	0	0
Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland	10,608	520,603	86,267	0	0
Southern Rocky Mountain Juniper Woodland and Savanna	1,010,983	14,485,821	3,405,438	0	114,689
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	0	0	0	0	0
Southern Rocky Mountain Montane-Subalpine Grassland	0	0	0	0	0
Southern Rocky Mountain Pinyon-Juniper Woodland	0	1,801	0	0	0
Southern Rocky Mountain Ponderosa Pine Woodland	13,210	1,062,023	125,497	0	0
Western Great Plains Cliff and Outcrop	0	0	0	0	0
Western Great Plains Foothill and Piedmont Grassland	0	0	0	0	0
Western Great Plains Riparian Woodland and Shrubland	0	0	0	0	0
Western Great Plains Shortgrass Prairie	0	0	0	0	0

Values are the estimated acres of each ecosystem occurring within each wilderness inventory area.

Ecosystem	D4_5K1	D3_5K5	D3_5K7	D3_5K10
Apacherian-Chihuahuan Mesquite Upland Scrub	3,202	42,233	837,849	0
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	0	0	0	0
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0	0	7,806	0
Chihuahuan Sandy Plains Semi-Desert Grassland	0	0	0	0
Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	0	0	0	0
Colorado Plateau Mixed Bedrock Canyon and Tableland	0	0	0	0
Colorado Plateau Pinyon-Juniper Woodland	0	3,564,962	14,620,326	12,620,777
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	0	4,804	13,811	0
Inter-Mountain Basins Big Sagebrush Shrubland	0	385,098	578,048	24,619
Inter-Mountain Basins Greasewood Flat	0	4,804	0	0
Inter-Mountain Basins Juniper Savanna	0	0	0	0
Inter-Mountain Basins Mixed Salt Desert Scrub	0	1,648,877	3,068,977	51,640
Inter-Mountain Basins Montane Sagebrush Steppe	9,007	221,572	622,682	266,607
Inter-Mountain Basins Semi-Desert Grassland	0	0	0	0
Inter-Mountain Basins Semi-Desert Shrub Steppe	0	801	46,836	0
Inter-Mountain Basins Shale Badland	0	0	211,164	0
Inter-Mountain Basins Volcanic Rock and Cinder Land	0	0	0	0
Madrean Juniper Savanna	56,043	0	17,614	34,627
Madrean Pinyon-Juniper Woodland	87,468	83,465	29,223	0
Mogollon Chaparral	0	0	11,809	0
North American Arid West Emergent Marsh	0	0	0	0
North American Warm Desert Active and Stabilized Dune	0	0	0	0
North American Warm Desert Bedrock Cliff and Outcrop	0	0	222,773	0
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	0	8,407	326,653	66,652
North American Warm Desert Wash	0	0	0	0
Rocky Mountain Alpine-Montane Wet Meadow	0	0	0	0
Rocky Mountain Aspen Forest and Woodland	0	0	0	0
Rocky Mountain Cliff, Canyon and Massive Bedrock	0	0	5,404	112,487
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	0	0	2,402	0
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	45,635	0	0	0

Ecosystem	D4_5K1	D3_5K5	D3_5K7	D3_5K10
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	0	0	0	0
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	0	0	55,643	10,808
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	0	0	27,021	69,854
Rocky Mountain Subalpine-Montane Riparian Shrubland	0	0	0	0
Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland	186,344	0	0	0
Southern Rocky Mountain Juniper Woodland and Savanna	2,523,355	0	5,804	2,384,447
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	301,434	0	0	0
Southern Rocky Mountain Montane-Subalpine Grassland	1,012,985	0	0	0
Southern Rocky Mountain Pinyon-Juniper Woodland	0	0	1,401	4,203
Southern Rocky Mountain Ponderosa Pine Woodland	102,880	0	0	0
Western Great Plains Cliff and Outcrop	24,219	0	0	0
Western Great Plains Foothill and Piedmont Grassland	190,948	0	0	0
Western Great Plains Riparian Woodland and Shrubland	5,004	0	0	0
Western Great Plains Shortgrass Prairie	0	0	0	0

Values are the estimated acres of each ecosystem occurring within each wilderness inventory area.

Ecosystem	D4_ADJ4	D2_5K6	D2_5K4	D2_5K2
Apacherian-Chihuahuan Mesquite Upland Scrub	0	0	0	0
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	0	0	0	0
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0	0	0	0
Chihuahuan Sandy Plains Semi-Desert Grassland	0	0	0	0
Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	0	0	0	0
Colorado Plateau Mixed Bedrock Canyon and Tableland	0	1,001	0	0
Colorado Plateau Pinyon-Juniper Woodland	0	601,666	1,561,009	794,415
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	0	0	0	0
Inter-Mountain Basins Big Sagebrush Shrubland	0	0	0	0
Inter-Mountain Basins Greasewood Flat	0	0	0	0
Inter-Mountain Basins Juniper Savanna	0	0	0	0
Inter-Mountain Basins Mixed Salt Desert Scrub	0	0	0	0
Inter-Mountain Basins Montane Sagebrush Steppe	0	25,820	84,866	52,841
Inter-Mountain Basins Semi-Desert Grassland	0	0	0	0
Inter-Mountain Basins Semi-Desert Shrub Steppe	0	0	0	0
Inter-Mountain Basins Shale Badland	0	0	0	0
Inter-Mountain Basins Volcanic Rock and Cinder Land	0	0	0	0
Madrean Juniper Savanna	0	2,802	0	0
Madrean Pinyon-Juniper Woodland	0	0	0	0
Mogollon Chaparral	0	30,824	0	0
North American Arid West Emergent Marsh	0	0	0	0
North American Warm Desert Active and Stabilized Dune	0	0	0	0
North American Warm Desert Bedrock Cliff and Outcrop	0	0	0	0
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	0	0	0	0
North American Warm Desert Wash	0	0	0	0
Rocky Mountain Alpine-Montane Wet Meadow	0	0	0	0
Rocky Mountain Aspen Forest and Woodland	400	0	0	0
Rocky Mountain Cliff, Canyon and Massive Bedrock	0	15,412	8,407	11,409
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	97,676	0	0	62,048
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	462,558	0	0	0

Ecosystem	D4_ADJ4	D2_5K6	D2_5K4	D2_5K2
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	0	0	0	0
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	1,801	0	0	0
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	0	0	0	0
Rocky Mountain Subalpine-Montane Riparian Shrubland	49,038	5,004	0	0
Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland	780,405	43,634	90,470	12,810
Southern Rocky Mountain Juniper Woodland and Savanna	3,218,894	10,196,299	2,751,932	3,855,186
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	0	0	0	0
Southern Rocky Mountain Montane-Subalpine Grassland	16,213	0	0	0
Southern Rocky Mountain Pinyon-Juniper Woodland	2,002	7,206	0	0
Southern Rocky Mountain Ponderosa Pine Woodland	1,948,710	28,422	1,296,805	150,116
Western Great Plains Cliff and Outcrop	0	0	0	0
Western Great Plains Foothill and Piedmont Grassland	0	0	0	0
Western Great Plains Riparian Woodland and Shrubland	0	0	0	0
Western Great Plains Shortgrass Prairie	0	0	0	0

Values are the estimated acres of each ecosystem occurring within each wilderness inventory area.

Ecosystem	D2_5K10	D2_5K11	D3_5K13	D3_ADJ4	D3_ADJ5
Apacherian-Chihuahuan Mesquite Upland Scrub	0	0	0	0	2,602
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	0	0	0	0	0
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0	0	0	0	0
Chihuahuan Sandy Plains Semi-Desert Grassland	0	0	0	0	0
Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	0	0	0	0	0
Colorado Plateau Mixed Bedrock Canyon and Tableland	20,416	0	0	0	0
Colorado Plateau Pinyon-Juniper Woodland	10,810,174	3,219,094	4,395,205	643,699	106,482
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	3,002	0	0	0	0
Inter-Mountain Basins Big Sagebrush Shrubland	139,908	0	200	0	801
Inter-Mountain Basins Greasewood Flat	1,401	0	0	0	801
Inter-Mountain Basins Juniper Savanna	0	0	0	0	0
Inter-Mountain Basins Mixed Salt Desert Scrub	322,450	4,203	0	3,603	11,409
Inter-Mountain Basins Montane Sagebrush Steppe	1,225,149	1,441,517	203,558	0	2,202
Inter-Mountain Basins Semi-Desert Grassland	3,403	0	0	0	0
Inter-Mountain Basins Semi-Desert Shrub Steppe	0	0	0	0	0
Inter-Mountain Basins Shale Badland	3,403	0	4,003	5,204	5,804
Inter-Mountain Basins Volcanic Rock and Cinder Land	0	0	0	0	0
Madrean Juniper Savanna	0	0	0	0	0
Madrean Pinyon-Juniper Woodland	0	0	0	0	0
Mogollon Chaparral	0	801	0	0	0
North American Arid West Emergent Marsh	0	0	0	0	0
North American Warm Desert Active and Stabilized Dune	0	0	0	0	0
North American Warm Desert Bedrock Cliff and Outcrop	0	0	0	0	0
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	21,417	0	23,018	39,831	5,204
North American Warm Desert Wash	0	0	0	0	0
Rocky Mountain Alpine-Montane Wet Meadow	0	0	0	0	0
Rocky Mountain Aspen Forest and Woodland	0	0	0	0	0
Rocky Mountain Cliff, Canyon and Massive Bedrock	33,026	13,010	0	0	0
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	26,420	0	0	2,602	0
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	0	0	0	0	0

Ecosystem	D2_5K10	D2_5K11	D3_5K13	D3_ADJ4	D3_ADJ5
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	0	0	0	0	0
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	12,410	0	0	0	0
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	322,650	251,595	26,821	0	0
Rocky Mountain Subalpine-Montane Riparian Shrubland	0	0	0	0	0
Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland	210,363	19,615	0	0	0
Southern Rocky Mountain Juniper Woodland and Savanna	3,800,944	3,536,740	3,251,118	2,002	0
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	0	0	0	0	0
Southern Rocky Mountain Montane-Subalpine Grassland	48,237	0	0	0	0
Southern Rocky Mountain Pinyon-Juniper Woodland	241,187	19,615	1,001	0	0
Southern Rocky Mountain Ponderosa Pine Woodland	679,126	211,564	0	0	0
Western Great Plains Cliff and Outcrop	0	0	0	0	0
Western Great Plains Foothill and Piedmont Grassland	0	0	0	0	0
Western Great Plains Riparian Woodland and Shrubland	0	0	0	0	0
Western Great Plains Shortgrass Prairie	0	0	0	0	0

Values are the estimated acres of each ecosystem occurring within each wilderness inventory area.

Ecosystem	D3_5K18	D3_5K17	D5_ADJ4	D3_ADJ8	D3_5K2
Apacherian-Chihuahuan Mesquite Upland Scrub	980,960	1,633,065	0	3,901,222	0
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	32,825	38,430	0	78,060	0
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0	0	0	0	0
Chihuahuan Sandy Plains Semi-Desert Grassland	0	0	0	0	0
Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	40,231	17,013	0	57,044	0
Colorado Plateau Mixed Bedrock Canyon and Tableland	0	0	0	13,410	0
Colorado Plateau Pinyon-Juniper Woodland	2,157,872	1,557,607	0	26,062,389	1,590,232
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	2,002	0	0	2,202	0
Inter-Mountain Basins Big Sagebrush Shrubland	5,404	0	0	10,608	0
Inter-Mountain Basins Greasewood Flat	1,201	5,004	0	85,066	0
Inter-Mountain Basins Juniper Savanna	0	0	0	801	0
Inter-Mountain Basins Mixed Salt Desert Scrub	271,010	252,796	0	2,587,404	0
Inter-Mountain Basins Montane Sagebrush Steppe	20,616	39,831	0	1,098,251	8,607
Inter-Mountain Basins Semi-Desert Grassland	0	0	0	0	0
Inter-Mountain Basins Semi-Desert Shrub Steppe	0	0	0	0	0
Inter-Mountain Basins Shale Badland	46,836	116,690	0	403,312	0
Inter-Mountain Basins Volcanic Rock and Cinder Land	0	0	400	153,319	0
Madrean Juniper Savanna	400	137,707	0	147,114	0
Madrean Pinyon-Juniper Woodland	295,829	1,837,824	0	2,712,101	0
Mogollon Chaparral	81,863	171,333	0	1,420,100	0
North American Arid West Emergent Marsh	0	0	0	685,531	0
North American Warm Desert Active and Stabilized Dune	0	0	0	7,406	0
North American Warm Desert Bedrock Cliff and Outcrop	0	801	0	2,402	0
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	720,358	627,686	0	5,587,328	2,802
North American Warm Desert Wash	44,434	0	0	0	0
Rocky Mountain Alpine-Montane Wet Meadow	0	0	2,002	4,604	58,045
Rocky Mountain Aspen Forest and Woodland	0	0	67,853	0	4,003
Rocky Mountain Cliff, Canyon and Massive Bedrock	0	0	0	14,211	121,494
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	275,013	231,179	11,609	2,958,692	4,403
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	1,801	6,805	27,822	48,037	0

Ecosystem	D3_5K18	D3_5K17	D5_ADJ4	D3_ADJ8	D3_5K2
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	1,001	0	0	4,003	0
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	3,202	16,213	0	519,002	0
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	0	7,406	1,001	168,731	0
Rocky Mountain Subalpine-Montane Riparian Shrubland	0	0	9,808	38,430	21,817
Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland	1,001	0	679,326	212,164	91,271
Southern Rocky Mountain Juniper Woodland and Savanna	364,082	173,334	97,075	25,851,226	2,289,373
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	0	0	0	0	0
Southern Rocky Mountain Montane-Subalpine Grassland	0	0	0	0	0
Southern Rocky Mountain Pinyon-Juniper Woodland	0	0	6,805	34,627	0
Southern Rocky Mountain Ponderosa Pine Woodland	5,804	0	614,076	831,044	445,745
Western Great Plains Cliff and Outcrop	0	5,604	0	13,611	0
Western Great Plains Foothill and Piedmont Grassland	0	0	0	0	0
Western Great Plains Riparian Woodland and Shrubland	0	0	0	0	0
Western Great Plains Shortgrass Prairie	0	9,007	0	27,421	0

Values are the estimated acres of each ecosystem occurring within each wilderness inventory area.

Ecosystem	D3_5K1	D3_5K6	D3_5K15	D3_5K14	D3_5K12
Apacherian-Chihuahuan Mesquite Upland Scrub	0	68,253	0	0	0
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	0	0	0	0	0
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0	0	0	0	0
Chihuahuan Sandy Plains Semi-Desert Grassland	0	0	0	0	0
Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	0	0	0	0	0
Colorado Plateau Mixed Bedrock Canyon and Tableland	0	0	0	0	0
Colorado Plateau Pinyon-Juniper Woodland	3,321,973	11,353,795	7,855,685	4,782,705	5,577,120
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	3,202	43,434	0	0	0
Inter-Mountain Basins Big Sagebrush Shrubland	600	424,529	9,007	0	15,212
Inter-Mountain Basins Greasewood Flat	3,603	36,228	0	0	0
Inter-Mountain Basins Juniper Savanna	0	0	0	0	0
Inter-Mountain Basins Mixed Salt Desert Scrub	10,408	3,757,511	4,003	0	2,602
Inter-Mountain Basins Montane Sagebrush Steppe	7,005	769,996	31,024	20,816	136,105
Inter-Mountain Basins Semi-Desert Grassland	0	0	0	0	0
Inter-Mountain Basins Semi-Desert Shrub Steppe	0	801	0	0	0
Inter-Mountain Basins Shale Badland	1,601	202,757	2,202	0	0
Inter-Mountain Basins Volcanic Rock and Cinder Land	0	2,802	0	0	0
Madrean Juniper Savanna	0	801	1,801	0	0
Madrean Pinyon-Juniper Woodland	0	17,013	0	0	0
Mogollon Chaparral	54,842	0	0	0	0
North American Arid West Emergent Marsh	0	0	0	0	0
North American Warm Desert Active and Stabilized Dune	0	0	0	0	0
North American Warm Desert Bedrock Cliff and Outcrop	0	3,403	0	0	0
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	71,455	111,887	47,837	0	801
North American Warm Desert Wash	0	0	0	0	0
Rocky Mountain Alpine-Montane Wet Meadow	161,325	0	2,002	0	1,601
Rocky Mountain Aspen Forest and Woodland	140,309	0	6,005	0	600
Rocky Mountain Cliff, Canyon and Massive Bedrock	217,368	0	70,054	0	0
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	419,125	0	0	0	0
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	0	0	0	0	0

Ecosystem	D3_5K1	D3_5K6	D3_5K15	D3_5K14	D3_5K12
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	0	0	0	0	0
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	15,012	13,010	1,201	0	0
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	10,208	801	36,428	0	24,019
Rocky Mountain Subalpine-Montane Riparian Shrubland	348,070	0	6,005	0	0
Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland	861,267	0	22,017	0	801
Southern Rocky Mountain Juniper Woodland and Savanna	6,356,924	11,809	3,802,145	543,221	3,772,522
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	0	0	0	0	0
Southern Rocky Mountain Montane-Subalpine Grassland	0	0	0	0	0
Southern Rocky Mountain Pinyon-Juniper Woodland	801	0	3,603	600	0
Southern Rocky Mountain Ponderosa Pine Woodland	964,947	0	26,220	0	4,604
Western Great Plains Cliff and Outcrop	0	0	0	0	0
Western Great Plains Foothill and Piedmont Grassland	0	0	0	0	0
Western Great Plains Riparian Woodland and Shrubland	0	0	0	0	0
Western Great Plains Shortgrass Prairie	0	0	0	0	0

Values are the estimated acres of each ecosystem occurring within each wilderness inventory area.

Ecosystem	D2_5K7	D2_5K8	D5_ADJ1	D5_ADJ2	D5_ADJ5
Apacherian-Chihuahuan Mesquite Upland Scrub	0	0	0	0	0
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	0	0	0	0	0
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0	0	0	0	0
Chihuahuan Sandy Plains Semi-Desert Grassland	0	0	0	0	0
Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	0	0	0	0	0
Colorado Plateau Mixed Bedrock Canyon and Tableland	0	0	0	0	0
Colorado Plateau Pinyon-Juniper Woodland	2,116,840	250,194	0	0	0
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	0	0	0	0	0
Inter-Mountain Basins Big Sagebrush Shrubland	0	0	0	0	0
Inter-Mountain Basins Greasewood Flat	0	0	0	0	0
Inter-Mountain Basins Juniper Savanna	0	0	2,602	0	0
Inter-Mountain Basins Mixed Salt Desert Scrub	11,209	4,403	0	0	0
Inter-Mountain Basins Montane Sagebrush Steppe	4,604	1,601	0	0	0
Inter-Mountain Basins Semi-Desert Grassland	0	0	0	0	0
Inter-Mountain Basins Semi-Desert Shrub Steppe	0	0	0	0	0
Inter-Mountain Basins Shale Badland	0	0	0	0	0
Inter-Mountain Basins Volcanic Rock and Cinder Land	0	0	0	0	0
Madrean Juniper Savanna	2,802	0	0	0	0
Madrean Pinyon-Juniper Woodland	0	0	0	0	0
Mogollon Chaparral	2,602	0	0	0	0
North American Arid West Emergent Marsh	0	0	0	0	0
North American Warm Desert Active and Stabilized Dune	0	0	0	0	0
North American Warm Desert Bedrock Cliff and Outcrop	0	0	0	0	0
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	5,204	43,434	0	0	0
North American Warm Desert Wash	0	0	0	0	0
Rocky Mountain Alpine-Montane Wet Meadow	15,812	100,878	0	0	0
Rocky Mountain Aspen Forest and Woodland	7,806	60,247	0	0	600
Rocky Mountain Cliff, Canyon and Massive Bedrock	1,201	647,502	0	0	0
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	10,808	0	0	2,002	2,202
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	0	0	0	0	34,227

Ecosystem	D2_5K7	D2_5K8	D5_ADJ1	D5_ADJ2	D5_ADJ5
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	0	0	0	0	0
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	2,802	0	0	0	0
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	1,801	1,201	0	2,802	0
Rocky Mountain Subalpine-Montane Riparian Shrubland	9,607	1,804,998	0	0	8,006
Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland	2,002	746,178	0	1,801	171,533
Southern Rocky Mountain Juniper Woodland and Savanna	2,410,868	2,603,817	400	26,420	260,001
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	0	0	114,689	61,247	0
Southern Rocky Mountain Montane-Subalpine Grassland	0	0	90,670	154,520	0
Southern Rocky Mountain Pinyon-Juniper Woodland	0	0	0	0	801
Southern Rocky Mountain Ponderosa Pine Woodland	7,406	2,643,848	0	801	630,488
Western Great Plains Cliff and Outcrop	0	0	0	0	0
Western Great Plains Foothill and Piedmont Grassland	0	0	0	0	0
Western Great Plains Riparian Woodland and Shrubland	0	0	0	0	0
Western Great Plains Shortgrass Prairie	0	0	0	0	0

Values are the estimated acres of each ecosystem occurring within each wilderness inventory area.

Ecosystem	D3_5K3
Apacherian-Chihuahuan Mesquite Upland Scrub	0
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	0
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0
Chihuahuan Sandy Plains Semi-Desert Grassland	0
Chihuahuan Stabilized Coppice Dune and Sand Flat Scrub	0
Colorado Plateau Mixed Bedrock Canyon and Tableland	0
Colorado Plateau Pinyon-Juniper Woodland	2,355,425
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	0
Inter-Mountain Basins Big Sagebrush Shrubland	97,275
Inter-Mountain Basins Greasewood Flat	0
Inter-Mountain Basins Juniper Savanna	0
Inter-Mountain Basins Mixed Salt Desert Scrub	22,818
Inter-Mountain Basins Montane Sagebrush Steppe	4,604
Inter-Mountain Basins Semi-Desert Grassland	0
Inter-Mountain Basins Semi-Desert Shrub Steppe	0
Inter-Mountain Basins Shale Badland	3,803
Inter-Mountain Basins Volcanic Rock and Cinder Land	0
Madrean Juniper Savanna	0
Madrean Pinyon-Juniper Woodland	43,233
Mogollon Chaparral	2,202
North American Arid West Emergent Marsh	0
North American Warm Desert Active and Stabilized Dune	0
North American Warm Desert Bedrock Cliff and Outcrop	0
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	22,618
North American Warm Desert Wash	0
Rocky Mountain Alpine-Montane Wet Meadow	9,808
Rocky Mountain Aspen Forest and Woodland	24,619
Rocky Mountain Cliff, Canyon and Massive Bedrock	62,649
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	611,474
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	0

Ecosystem	D3_5K3
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	0
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	25,620
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	0
Rocky Mountain Subalpine-Montane Riparian Shrubland	121,494
Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland	230,979
Southern Rocky Mountain Juniper Woodland and Savanna	2,580,599
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	0
Southern Rocky Mountain Montane-Subalpine Grassland	0
Southern Rocky Mountain Pinyon-Juniper Woodland	0
Southern Rocky Mountain Ponderosa Pine Woodland	185,544
Western Great Plains Cliff and Outcrop	0
Western Great Plains Foothill and Piedmont Grassland	0
Western Great Plains Riparian Woodland and Shrubland	0
Western Great Plains Shortgrass Prairie	0

Ecological Group ("Ecosystem")	Wilderness	Non-Wilderness	All Cibola NF	% Cibola Wilderness	% Fed Wilderness
North American Warm Desert Bedrock Cliff and Outcrop	993	19,306	20,300	4.89	47.11
North American Warm Desert Volcanic Rockland	0	2	2	0.00	46.19
Rocky Mountain Subalpine-Montane Riparian Shrubland	436	2,483	2,918	14.93	38.72
Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland	417	1,968	2,385	17.47	32.92
Rocky Mountain Subalpine Mesic Spruce-Fir Forest and Woodland	836	2,189	3,025	27.65	31.71
Rocky Mountain Alpine-Montane Wet Meadow	0	44	44	0.00	30.53
Rocky Mountain Subalpine-Montane Limber-Bristlecone Pine Woodland	2,779	6,700	9,479	29.32	30.25
North American Warm Desert Riparian Woodland and Shrubland	0	5	5	0.00	25.70
Rocky Mountain Cliff, Canyon and Massive Bedrock	545	3,827	4,372	12.46	23.40
Madrean Pine-Oak Forest and Woodland	122	566	689	17.76	23.10
Mogollon Chaparral	1,550	5,441	6,992	22.17	21.46
Inter-Mountain Basins Juniper Savanna	60	6,505	6,565	0.91	20.71
North American Warm Desert Active and Stabilized Dune	0	92	92	0.00	18.69
North American Warm Desert Wash	0	439	439	0.00	18.58
North American Warm Desert Lower Montane Riparian Woodland and Shrubland	0	262	262	0.00	17.15
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	8,808	20,742	29,550	29.81	13.35
Southern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest and Woodland	20,703	51,081	71,784	28.84	12.78
Southern Rocky Mountain Montane-Subalpine Grassland	331	1,618	1,949	16.99	12.24
Rocky Mountain Aspen Forest and Woodland	5,414	13,319	18,733	28.90	12.07
Madrean Pinyon-Juniper Woodland	65	19,104	19,169	0.34	10.26
Southern Rocky Mountain Ponderosa Pine Woodland	63,787	506,479	570,266	11.19	9.20
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	42	58	100	41.87	6.60
North American Arid West Emergent Marsh	188	1,082	1,270	14.79	6.56
Inter-Mountain Basins Montane Sagebrush Steppe	5	280	285	1.64	6.51
Inter-Mountain Basins Semi-Desert Grassland	99	54,502	54,601	0.18	6.29
Inter-Mountain Basins Volcanic Rock and Cinder Land	0	1,052	1,052	0.00	6.17
Apacherian-Chihuahuan Mesquite Upland Scrub	0	871	871	0.00	5.78
Southern Rocky Mountain Pinyon-Juniper Woodland	13,508	78,974	92,482	14.61	4.98
Colorado Plateau Mixed Bedrock Canyon and Tableland	4	636	640	0.66	4.91
Inter-Mountain Basins Shale Badland	4	56	60	7.41	4.48
Southern Rocky Mountain Juniper Woodland and Savanna	751	51,370	52,120	1.44	4.44
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	1,560	14,268	15,828	9.85	4.42
Colorado Plateau Pinyon-Juniper Woodland	12,144	642,155	654,299	1.86	3.96
Rocky Mountain Gambel Oak-Mixed Montane Shrubland	1,197	3,492	4,689	25.52	3.68
Madrean Juniper Savanna	0	1,207	1,207	0.00	3.34
Inter-Mountain Basins Greasewood Flat	7	618	624	1.07	2.81
Inter-Mountain Basins Big Sagebrush Shrubland	50	706	756	6.62	2.62
Western Great Plains Cliff and Outcrop	0	20	20	0.00	2.47
Inter-Mountain Basins Semi-Desert Shrub Steppe	454	38,805	39,259	1.16	2.38
Chihuahuan Sandy Plains Semi-Desert Grassland	0	147	147	0.00	1.78
Inter-Mountain Basins Mixed Salt Desert Scrub	0	9,267	9,267	0.00	1.71
Western Great Plains Foothill and Piedmont Grassland	15	423	437	3.36	1.59
Apacherian-Chihuahuan Semi-Desert Grassland and Steppe	15	37,812	37,828	0.04	1.49
Rocky Mountain Lower Montane-Foothill Shrubland	0	28	28	0.00	1.41
Western Great Plains Riparian Woodland and Shrubland	0	134	134	0.00	1.18
Colorado Plateau Mixed Low Sagebrush Shrubland	0	33	33	0.00	0.86
Chihuahuan Creosotebush, Mixed Desert and Thorn Scrub	0	1,686	1,686	0.00	0.71
Western Great Plains Shortgrass Prairie	0	13,708	13,708	0.00	0.52
All Cibola NF Lands	**136,888**	**1,615,563**	**1,752,451**	**7.81**	**10.49**