SVP
SOCIETY OF VERTEBRATE PALEONTOLOGY
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Society of Vertebrate Paleontology

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3 February 2017

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Re: RIN 1093–AA16

To The U.S. Department of the Interior (c/o Julia Brunner),

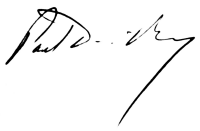
This letter provides feedback from the Society of Vertebrate Paleontology (SVP; http://www.vertpaleo.org) about the Department of the Interior's proposed regulations (Regulation Identifier Number 1093–AA16) for the Paleontological Resources Preservation Act (PRPA). The SVP is a nonprofit scientific organization with over 2,000 professionals, amateurs, students, and others interested in vertebrate paleontology, and the views expressed here are based on SVP's function that it is organized exclusively for educational and scientific purposes and to preserve and protect paleontological resources and sites (see http://vertpaleo.org/the-Society/Mission-and-Purpose.aspx). We here submit our comments, including concerns and recommendations, on the proposed regulations.

Our point-by-point comments are listed below, but one of our most important recommendations is to grant permission at the time of permitting (or final reporting) for disseminating specific locality information for sites that are not deemed to be sensitive. Geographic and temporal analyses are arguably the top priority in today's science, aided by the digitization of literature, databasing of repository catalogues, introduction of GPS geocoded photography, and growth of data portals. Many subfields within the science of paleontology can no longer advance if geographic coordinates of paleontological sites and associated paleontological data are kept confidential. At the same time, of course, paleontologically significant sites must be protected from vandalism and looting, and some sites must be protected for non-paleontological reasons. We recommend that sites be graded against a checklist of risk factors at the time of permitting and again when the researcher's final report is submitted. Permission would then be granted to disseminate specific locality information for sites below an established risk threshold.

Toward this end, we have appended best practice guidelines established by SVP for disseminating contextual data associated with vertebrate fossils. The best practice document is written for a global perspective, not just for sites on federal land, and recommends releasing of

geographic coordinates and other associated information unless a site ranks high on the sensitivity scale. This recommendation is fundamentally consistent with the recommendations by the National Science and Technology Council in their report "Principles for Promoting Access to Federal Government-Supported Scientific Data and Research Findings through International Scientific Cooperation." That report is no longer available on the White House website, to our dismay, but it can be found on the federal archive site at https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/NSTC/iwgodsp_principles_0.pdf. The key aim of our recommendation is to strike the balance between the need for confidentiality to protect non-renewable resources and the need for dissemination of data for the advancement of paleontological science within the limits of PRPA.

Sharing the recognition that fossils and fossil localities are nonrenewable resources, SVP strongly supports PRPA, and we look forward to continuing to work with our federal partners to improve ways to protect sensitive paleontological sites and to advance the science of paleontology at the same time. Questions concerning our letter and comments should be addressed to Dr. P. David Polly (SVP President: pdpolly@indiana.edu) and Dr. Kenshu Shimada (Chair of SVP's Government Affairs Committee: kshimada@depaul.edu). Thank you for the opportunity to comment.



P. David Polly, President

Emily J. Rayfield, Vice President

John A. Long, Past President

The Society of Vertebrate Paleontology's comments on the Department of the Interior's proposed regulations (RIN 1093–AA16, herein referred to as 'the document') for the Paleontological Resources Preservation Act.

1. General comments

Overall, we like the draft regulations. They strike an appropriate balance between protection, research, and casual use. The text is generally clear and addresses many of the uncertainties expressed by SVP members since the Act was adopted in 2009. There are two areas of special concern to us—authorization to disclose locality data and authorization for reproduction and consumptive use—about which we make specific recommendations below.

2. General word usage comments

(a) The three key words 'preserve,' 'manage,' and 'protect' are used together throughout the document, but their sequence varies from place to place. For example, the 'Summary' section (page 88173) gives the expression "preserve, manage, and protect", whereas "manage, protect, and preserve" is used in pages 88174 (middle column), 88175 (right column), 88187 (left column), 88188 (middle and right columns), and 88191 (left column). Yet, "preserve, protect, and manage" is used on page 88176 (middle column). Although the differences in sequence do not have any impact on their meaning, we recommend the same sequence to be used throughout the document. We think the most logical order is "manage, preserve, and protect."

(b) The document uses the phrase "provide information about the history of life on earth" in several places. We suggest that 'Earth' be capitalized to specifically refer to the planet Earth, and not earth as in 'soil,' 'dirt,' or 'ground.' We should point out that Earth is properly capitalized in the document in the expression "Earth's crust" on pages 88175 (right column) and 88188 (middle column), and "Earth's surface" on pages 88186 (middle column) and 88195 (left column).

(c) There are inconsistencies in hyphenation for 'non' throughout the document: e.g., (a) "non-renewable" vs. "nonrenewable," (b) "non-vertebrate" vs. "nonvertebrate," and (c) "non-commercial" vs. "noncommercial."

3. Page 88173 (middle column), "Summary"

Comment: The document uses the phrase "maintenance of confidentiality of specific locality data," but as we elaborate later in this comment letter, we recommend the expression 'management of sensitive locality data that may need to be kept confidential.'

4. Page 88174 (right column), § 49.5 of Subpart A (Managing, Protecting, and Preserving Paleontological Resources)

Comment: The document defines "Authorized officers," but the qualifications for who may serve as "Authorized officer" are not specified. Because paleontological preservation law and managing paleontological recourses are technically complex, we strongly recommend that authorized officers

have a graduate degree in paleontology or a related natural science field, with the possible exceptions of the Secretary and bureau directors.

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5. Page 88174 (right column) through page 88175, § 49.5 of Subpart A (Managing, Protecting, and Preserving Paleontological Resources)

Comment: The document states "Paleontological resources that are determined by the authorized officer as not furthering or no longer furthering paleontological knowledge, public education, or management of paleontological resources (such as resources that lack provenience or are overly redundant) may, nevertheless, because they are still of paleontological interest and provide information about the history of life on earth, be assigned to project or working collections, including non-museum collections." There are two comments on this statement. First, the word "project" should be in plural to read 'projects.' Second (and a very critical point), the following statement must be added: 'However, paleontological resources that have been accessioned into the collection of a long-term repository and been assigned permanent catalog numbers must not be assigned to projects or working collections, including non-museum collections, without consultation with local repository staff and their deaccessioning policies because the fossils may have been referenced or described in published scientific literature under the identifiers of the repository or there may be researchers still working on them.'

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6. Page 88175 (left column), § 49.5 of Subpart A (Managing, Protecting, and Preserving Paleontological Resources)

Comment: The document states "Paleontological resources would mean any fossilized remains, traces, or imprints of organisms preserved in or on the Earth's crust." We recommend expanding the description of paleontological resources to explain what plant, invertebrate, and vertebrate paleontological resources are. It should be noted that, while the word 'plant' and 'invertebrate' occur throughout the document, not even once is the word 'vertebrate' mentioned in the text (except 'non-vertebrate'). We suggest to add something like the following sentence immediately after the aforementioned sentence: "Paleontological resources are represented by, but not limited to, prehistoric photosynthetic organisms including plants as well as prehistoric vertebrates (animals with backbones or notochordal skeletal support, such as fishes, amphibians, reptiles, birds, and mammals) and invertebrates (animals and animal-like organisms without backbones commonly represented by microscopic and macroscopic shelled forms in the fossil record)."

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7. Page 88175 (left column), § 49.5 of Subpart A (Managing, Protecting, and Preserving Paleontological Resources)

Comment: The document states "Fossils that are merely in geographical proximity to archaeological resources but are not necessarily in an archaeological context, are therefore not necessarily archaeological resources." However, the use of the wording "not necessarily" could lead to a misconstrued possibility that proximity alone could still allow fossils to erroneously be considered archaeological resources. Therefore, we suggest the sentence to end with the wording '...are therefore not archaeological resources.'

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8. Page 88175 (left column), the bottom-most three lines, § 49.5 of Subpart A (Managing, Protecting, and Preserving Paleontological Resources)

Comment: The document states "Fossils that the authorized officer determines to not have paleontological interest or not provide information ..." which is grammatically awkward. We suggest "Fossils that the authorized officer determines not to have paleontological interest or not to provide information ..."

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9. Page 88175 (middle & right columns), § 49.5 of Subpart A (Managing, Protecting, and Preserving Paleontological Resources)

Comment: Throughout the two columns on page 88175, the phrase 'non-vertebrate microfossils' occur. We suggest the phrase 'microscopic non-vertebrate paleontological resources' to be in line with the expression used for the rest of the document and to be more easily understood in regards to 'microscopic.'

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10. Page 88175 (right columns), § 49.5 of Subpart A (Managing, Protecting, and Preserving Paleontological Resources)

Comment: The document states "However, in accordance with section 6311 of PRPA, the proposed rule would not require a permit for the collection of conodonts or nonvertebrate microfossils in association with authorized oil, gas, geothermal, or other minerals activities that are permitted under other authorities." However, we think the phrase "minerals activities" should be 'mineral activities' or 'mineral-related activities.'

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11. Page 88175 (right columns) AND page 88188 (middle column), § 49.5 of Subpart A (Managing, Protecting, and Preserving Paleontological Resources)

Comment: The document states "Paleontological site would mean a locality, location, or area where a paleontological resource is found." However, a 'locality' or 'location' signifies a point, and 'area' indicates two-dimensional plane. It must be acknowledged that a paleontological site is not only about a point or a plane on a map, but also concerns the subsurface. Therefore, we recommend the following phrasing: "Paleontological site would mean a locality, location, or area, including its subsurface, where a paleontological resource is found."

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12. Page 88176 (left and middle columns) AND page 88188 (left column), § 49.25 of Subpart A (Managing, Protecting, and Preserving Paleontological Resources)

Comment: The document states that its implementation would "(1) Further the purposes of the PRPA; (2) not create risk of harm to or theft or destruction of the resource or site containing the resources; and (3) be in accordance with other applicable laws." It further describes how specific paleontological locality information will be restricted via written agreements with individuals seeking disclosure of this information. There are two main concerns with this section. First, there is no methodology described for assessing potential harm to paleontological resources. We strongly encourage specific language to be included that indicates how potential harm will be

assessed. On this note, we strongly recommend reference to SVP's best practice guidelines (see Appendix) for assessing said harm. Second, the restriction of detailed locality data will usually be at cross purposes to scientific need, as described in the "Principles for Promoting Access to Federal Government-Supported Scientific Data and Research Findings through International Scientific Cooperation" issued by the Interagency Working Group on Open Data Sharing Policy of the Subcommittee on International Issues of the Committee on Science of the National Science and Technology Council in December, 2016 https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/NSTC/iwgodsp_principles_0.pdf (note: this report is currently unavailable from the White House website and we hope it will return once the new administration's redesign is complete). In addition, the National Science Foundation (NSF), which funds a great deal of paleontological research on federal (and other) lands, requires sharing of all data discovered during NSF funded research. NSF's mandate may frequently be at odds with the requirements of § 49.25.

13. Page 88176 (middle column) AND page 88188 (right column), § 49.30 of Subpart A (Managing, Protecting, and Preserving Paleontological Resources)

Comment: The document states "(a) The bureaus will develop plans and procedures for the inventory and monitoring of paleontological resources on and from federal land in accordance with applicable laws and regulations. (b) The bureaus will manage, protect, and preserve paleontological resources on and from federal land using scientific principles and expertise. (c) Activities under paragraphs (a) and (b) of this section will be coordinated with other agencies, non-federal partners, the scientific community, and the general public where appropriate and practicable." We very much welcome all these action items, but we strongly recommend that the officers who handle these activities have strong university-level training in paleontology. As discussed elsewhere in this comment letter, paleontological preservation law and managing paleontological recourses are technically complex that require a unique set of scientific skills. We therefore strongly urge full-time paleontology staff with a graduate degree in paleontology or in a related natural science field who would handle all the paleontological resources activities proposed in § 49.30.

14. Page 88176 (middle column) AND page 88189 (left column), § 49.35 of Subpart A (Managing, Protecting, and Preserving Paleontological Resources)

Comment: The document states "The bureaus will establish a program to increase public awareness about the significance of paleontological resources." To satisfactorily accomplish this goal, we recommend that each of the four bureaus have at least one full-time paleontology outreach coordinator who is familiar with science and the field of paleontology.

15. Page 88176 (right column) AND page 88189 (left column), § 49.40 of Subpart A (Managing, Protecting, and Preserving Paleontological Resources)

Comment: The section includes a phrase "other authorities". We presume these are other legislative acts such as NAGPRA but we recommend elaborating the statement to make it clearer.

16. Page 88176 (right column) AND page 88189, § 49.60 of Subpart B (Paleontological Resources Permitting—Requirements, Modifications, and Appeals)

Comment: The document imposes a number of qualification requirements for permit applicants, but no minimum qualifications are required for authorized officers who will review permit applications. Paleontological preservation law and managing paleontological resources are technically complex and require a unique set of scientific skills separate and distinct from archaeology. This is particularly problematic for Reclamation and FWS that do not have any full-time staff with a paleontology background. We therefore strongly recommend Reclamation and FWS to add full-time paleontology staff with graduate training in paleontology who would be qualified to assess paleontological permit applications in those bureaus, especially with regard to granting permission for release of locality data and consumptive uses.

17. Page 88177 (right column) AND page 88190, § 49.75(a)(8) of Subpart B (Paleontological Resources Permitting—Requirements, Modifications, and Appeals)

Comment: The document states "(8) Permittee must report suspected resource damage or theft of paleontological or other resources to the authorized officer as soon as possible, but not to exceed 48 hours after learning of such damage or theft." We suggest to modify the phrase "suspected resource damage or theft" to 'suspected or apparent resource damage or theft.' Likewise, we suggest to modify "after learning of such damage or theft" to 'after learning of such suspected or apparent damage or theft.'

18. Page 88177 (right column), § 49.75(a)(9) of Subpart B (Paleontological Resources Permitting—Requirements, Modifications, and Appeals)

Comment: The document states "To avoid a situation where bureaus or repositories could have large collections of paleontological resources that are costly to maintain or no longer contribute to science, the proposed rule would allow the authorized officer to determine that specimens that are found to be redundant, lack adequate associated data, or otherwise are determined not to further paleontological knowledge, public education, or management of paleontological resources may be removed from museum collections and placed into working collections." We are concerned that such determinations not be made by authorized DOI officials without consultation with repository staff. Generally, repositories do not accession material that is not expected to become part of the permanent archive because of the importance of reproducing scientific results. Accessibility and permanency of paleontological resources in repositories are paramount to the science of paleontology. Therefore, we cannot stress enough the importance of adding the following sentence immediately after the particular aforementioned sentence: 'However, paleontological resources that have been accessioned into a long-term repository with permanent catalog numbers should not be removed without following that repository's deaccessioning policy, which will normally be to transfer the material to another permanent repository.' We also recommend that a similar statement be made in § 49.75(a)(9) on page 88190.

19. Page 88179 (middle column), § 49.210 of Subpart C (Management of Paleontological Resource Collections)

Comment: The document states "For repository managers concerned that the curation requirements of PRPA and the proposed rule could lead to unrealistic or burdensome curation requirements, the proposed rule addresses these concerns in three ways." We suggest inserting 'who are' between the words "managers" and "concerned."

20. Page 88179 (middle column), § 49.210 of Subpart C (Management of Paleontological Resource Collections)

Comment: The document states "If the authorized officer determines that a collection formerly met this standard but no longer does, then part or all of the collection may be removed from the approved repository, transferred to a working collection, or managed in other ways consistent with DOI standards in 411 DM and bureau museum management procedures." As described above, we recommend that such decisions be made in consultation with repository staff and following the repository's deaccessioning policy. Accessibility and permanency of paleontological resources in repositories is paramount to the science of paleontology. Therefore, we cannot stress enough the importance of adding the following sentence immediately after the particular aforementioned sentence: 'However, paleontological resources that have been accessioned into a long-term repository with permanent catalog numbers should not be removed without following that repository's deaccessioning policy, which will normally be to transfer the material to another permanent repository. If such a transfer is needed, that fact should be disseminated to the scientific community through formal publication in scientific literature. Under no circumstance should paleontological resources with permanent catalogue numbers be transferred to working collections.'

21. Page 88179 (middle column), § 49.210 of Subpart C (Management of Paleontological Resource Collections)

Comment: The document states "If the specimens in a collection are determined by the authorized officer to no longer have paleontological interest or provide information about the history of life on earth, then they are not paleontological resources as defined in PRPA and the proposed rule." Related to a point made above, this sentence must be followed by a statement similar to: 'However, paleontological resources that have been accessioned into a long-term repository with permanent catalog numbers should not be removed without following that repository's deaccessioning policy, which will normally be to transfer the material to another permanent repository.'

22. Page 88179 (right column), § 49.215 of Subpart C (Management of Paleontological Resource Collections)

Comment: The document states "Bureaus may transfer all or portions of collections of paleontological resources to other federal bureaus (including the Smithsonian) either by loan or by administrative transfer without changing the fact that they are owned by the Federal Government."

Related to a point made above, this sentence must be followed by a statement something like 'However, paleontological resources that have been accessioned into a long-term repository with permanent catalog numbers should not be removed without following that repository's deaccessioning policy, which will normally be to transfer the material to another permanent repository, and public announcement of this transfer should be made.'

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23. Page 88179 (right column), § 49.215 of Subpart C (Management of Paleontological Resource Collections)

Comment: The document states "Proposed § 49.215(a)(11) would clarify that one of the terms and conditions is a statement that employees cannot take any action that results in collection encumbrance, seizure, theft, damage, or other issues, and closely follows 36 CFR part 79 and DOI policy in 411 DM." We suggest that this sentence explicitly qualify employees as 'employees of the repository' as given in the actual proposed regulation on page 88192 under § 49.215(a)(11) for the sake of clarity.

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24. Page 88179 (right column), § 49.220(a)(1) of Subpart C (Management of Paleontological Resource Collections)

Comment: The document states "Proposed § 49.220(a)(1) would make collections and locality data available subject to the confidentiality provisions of the proposed rule and PRPA." The requirements in this section will be extremely difficult to implement. Fossils collected on federal lands have been placed in many repositories around the county. In order to fulfill this requirement, each institution may have to adopt new collections management policies for the paleontological resources from federal lands and would have to manage the data associated with these specimens differently from their non-federal holdings. If this regulation applies retroactively to material already accessioned, the burden of identifying which parts of their collections are confidential may be substantial. We are concerned that many repositories may refuse to accept paleontological specimens from federal lands to relieve themselves of the burden of separately managing the data on these fossils.

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25. Page 88180 (left column) AND page 88192 (middle column), § 49.300(b)&(c) of Subpart D (Prohibited Acts)

Comment: Part (c) says "Sell or purchase or offer to sell or purchase any paleontological resource if the person knew or should have known such resource to have been excavated, removed, sold, purchased, exchanged, transported, or received from federal land." This section is confusing because presumably fossils cannot be purchased or exchanged from federal land. We suggest deleting part (c) entirely because it appears to repeat what is said more clearly in part (b). We also think a definition of 'should have known' would be helpful.

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26. Page 88180 (middle column) AND page 88192 (middle column), § 49.400 (b)(1)&(2) of Subpart E (Criminal Penalties)

Comment: The document has a passage "… if the sum of the commercial and scientific value of the paleontological resources involved and the cost of response, restoration, and repair of the

resources and sites...” The word ‘sites’ needs to be elaborated by replacing it with the phrase ‘and paleontological sites where the resources originated.’

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27. Page 88181 (right column) AND page 88195 (left column), § 49.575 of Subpart F (Civil Penalties)

Comment: The document states “Proposed § 49.575 would state that civil penalties collected under this subpart are available without further appropriation to the bureau that administers the federal land or paleontological resources that were the subject of the violation, and may be used by the bureau for several purposes, including: Protection, restoration, or repair of the paleontological resources and sites that were the subject of the action, and protection, monitoring, and study of the resources and sites; and provision of educational materials to the public about paleontological resources, paleontological sites, or resource protection; or payment of rewards.” We suggest that, if possible, the penalties collected under this subpart should be available for preparation and curation of the paleontological resources. “Preparation, stabilization, and conservation” are mentioned in the section on costs of response, restoration and repair (§ 49.610) but not here. We suggest to explicitly state that the collected civil penalties should also be made available to cover preparation and curation costs.

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28. Page 88181 (left column), § 49.525 of Subpart F (Civil Penalties)

Comment: The document states “When doubling penalties for subsequent violations, the authorized officer must be mindful of § 49.525(d), which caps penalties at an amount equaling twice the cost of response, restoration, and repair plus twice the cost of scientific or fair market value of the resources (whichever is greater).” First, the phrase “fair market value” should be replaced with ‘commercial’ (see page 88181 [left column], § 49.605, where it states that the word ‘commercial’ should be used for the purpose of the proposed rule). Second, the phrase “value of the resources” should be expanded to read explicitly “value of the paleontological resources and/or paleontological sites.”

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29. Page 88181 (middle column), § 49.555 of Subpart F (Civil Penalties)

Comment: The acronym “OHA” on page 88181 is the first occurrence of the abbreviation in the entire document, and yet, it is not spelled out what it stands for.

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30. Page 88181 (right column), ‘introductory paragraph’ of Subpart G (Determining Values and the Costs of Response, Restoration, and Repair)

Comment: The document states “Proposed subpart G would provide direction on determining values and the cost of response, restoration, and repair under this part. The authorized officer may consult with subject matter experts, such as resource specialists, area specialists, and law enforcement specialists, in determining these values.” The end of the last sentence should add a phrase ‘and costs’ to read ‘in determining these values and costs.’ In addition, “area specialists” presumably include professional paleontologists; if not, this should be specified.

31. Page 88182 (left column), § 49.610 of Subpart G (Determining Values and the Costs of Response, Restoration, and Repair)

Comment: The document states "Proposed § 49.610 would define the cost of response, restoration, and repair. In some cases, it may be appropriate for the estimated cost of response, restoration, and repair to be peer reviewed. The values and costs should be determined by paleontologists with appropriate expertise." It is not clear why 'values' is mentioned in a paragraph on cost of response, restoration, and repair. Values include scientific value (§ 49.600) and commercial value (§ 49.605), and professional paleontologists are not typically able to assess commercial value.

32. Page 88182 (middle column), § 49.805 of Subpart I (Casual Collection of Common Invertebrate or Plant Paleontological Resources on Bureau of Land Management and Bureau of Reclamation Administered Lands)

Comments: The document states "The BLM is requesting public comment regarding the range of designations listed in § 49.805(a)(2) as prohibiting or restricting casual collection, including whether and why additional designations should be included or currently proposed designations excluded from the list" where § 49.805(a)(2) reads "On BLM-administered national monuments, national conservation areas, outstanding natural areas, forest reserves, or cooperative management and protection areas, except where allowed by other statutes, executive orders, regulations, or land use plans." We consider the range of designations to be adequate for the purpose of PRPA although this is primarily because casual collection falls outside SVP's purview as no vertebrate fossils are subject to casual collecting.

33. Page 88182 (right column), § 49.810 of Subpart I (Casual Collection of Common Invertebrate or Plant Paleontological Resources on Bureau of Land Management and Bureau of Reclamation Administered Lands)

Comments: The document states "If a knowledgeable collector makes an unanticipated discovery of an uncommon paleontological resource while casually collecting, that collector shall not collect that resource because he or she is not authorized to do so. Instead, the collector should alert the relevant bureau. If the collector wishes to pursue collection, he or she must obtain a permit to collect the uncommon resource. If the collector does collect the uncommon resource without a permit, that collector may be subject to penalties." We suggest to remove the word 'knowledgeable' from the first sentence. This is because casual collection may be done by knowledgeable individual (including professional paleontologists) or 'not so knowledgeable' person who may still recognize certain uncommon fossils (e.g., complete dinosaur skull). Also, we believe that this is an important paragraph that should be spelled out also in the actual regulation (page 88195 [right column] – 88196 [left column]), and not only in "Supplementary information."

34. Page 88182 (right column), § 49.810 of Subpart I (Casual Collection of Common Invertebrate or Plant Paleontological Resources on Bureau of Land Management and Bureau of Reclamation Administered Lands)

Comments: The document states "These amounts represent a balance between PRPA's mandate to

allow casual collecting and other laws that require the bureaus to protect and manage other natural and cultural resources." We suggest the three key words used throughout the document should also be used in this sentence to read "These amounts represent a balance between PRPA's mandate to allow casual collecting and other laws that require the bureaus to manage, preserve, and protect other natural and cultural resources."

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35. Page 88183 (left column) AND page 88196 (left column), § 49.810(a)(4) of Subpart I (Casual Collection of Common Invertebrate or Plant Paleontological Resources on Bureau of Land Management and Bureau of Reclamation Administered Lands)

Comments: The document states "Proposed § 49.810(a)(4) would address the uses to which casually collected resources can be put. Casually collected resources may be used only for noncommercial personal use, which means a use other than purchase, sale, financial gain, or research" and "Non-commercial personal use means a use other than for purchase, sale, financial gain, or research." We are wondering why 'research' is included in the last part of these sentences. Does this mean that casually collected specimens can never be used for research? There are many instances where casually collected specimens may be useful for professional research, especially if they are later accessioned into a repository. We recommend that a statement be added to clarify whether a repository can accept casual collections that are from DOI lands and, if so, should they be managed as if they had been collected for research purposes. We also recommend defining "research" to clarify whether, for example, a child who has made a casual collection can legitimately use it later in a classroom science project.

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36. Page 88184 (left column), "Regulatory Flexibility Act (RFA)"

Comment: The document states "This proposed rule will not have a significant economic effect on a substantial number of small entities under the RFA (5 U.S.C. 601 et seq.). This certification is based on the cost-benefit and regulatory flexibility analyses found in the report titled "Proposed Paleontological Resources Preservation Regulations, 43 CFR part 49: Economic Analysis In Support Of E.O. 12866 and Regulatory Flexibility Act Compliance," which can be viewed at www.blm.gov/paleontology by clicking on the link entitled "Proposed Paleontological Resources Preservation Regulations, 43 CFR part 49: Economic Analysis In Support Of E.O. 12866 and Regulatory Flexibility Act Compliance." We have looked at the Economic Analysis report and are deeply concerned that FWS has no employees trained in paleontology, yet states that "FWS will not change its management of paleontological resources, because it already manages these resources in the manner required by the proposed regulations. FWS will continue to rely on existing FTEs for all aspects of management" (page 27). We must point out that FWS manages 110 million acres of land. This land coverage is more than that of NPS which has a skeleton paleontology crew of 12 full-time paleontology positions nation-wide that do not even include still desperately needed FTEs to manage paleontological resources at Agate Fossil Beds National Monument, Tule Springs Fossil Beds National Monument, and Waco Mammoth National Monument. Contrary to FWS's claim that "it already manages these resources in the manner required by the proposed regulations," we are not aware of any inventory, monitoring, resource management, protection, and outreach conducted by FWS specifically targeting paleontological resources as required by PRPA. Paleontological preservation law and managing paleontological recourses are technically complex. We therefore strongly urge FWS to consider adding multiple

new full-time paleontology staff with a graduate degree in paleontology or in a related natural science field to fulfill tasks required by PRPA. Reclamation is in a similar state. The Economic Analysis report states "Reclamation does not currently dedicate any FTE solely to paleontological resource management. Instead, approximately 20 cultural resources program staff address paleontological resource management requirements as collateral duty" (page 20). The report further states that "Reclamation offices will likely continue to utilize existing FTEs to implement permitting, resource management, data confidentiality protection, and collection management requirements" (page 25). We interpret that those approximately 20 full-time 'cultural resources program staff' are mostly, if not all, archaeologists (who must not be confused with paleontologists). It must be emphasized that archaeology and paleontology are separate disciplines, thus requiring different skill sets. Therefore, it is imperative to recognize that paleontological resource management duties must be handled by people who have solid training in science and have practical experiences dealing with paleontological resources in the field and repository setting. We therefore strongly urge Reclamation to consider adding multiple new full-time paleontology staff with a graduate degree in paleontology or in a related natural science field to fulfill tasks required by PRPA.

The proposed PRPA rule document states that PRPA was modeled after the Archaeological Resources Protection Act of 1979 (page 88174). That Act prompted DOI to hire many archaeologists, which includes about 500 in the four bureaus of the DOI (BLM = about 220; NPS about 224, Reclamation = about 38; and FWS about 16). In contrast, there are currently only 21 full-time 'paleontology' staff in the four DOI bureaus combined (BLM = 9; NPS = 12; Reclamation = 0; and FWS = 0). The variety of paleontological resources is much greater and therefore requires a wider range of expertise. The 500 archaeologists manage cultural remains that are found in only the last 16,000 years of the Earth's sedimentary record; in contrast, paleontological resources represent more than a billion year record of life preserved in the Earth's crust. It should also be pointed out that BLM manages 248.2 million acres of land (55% of four DOI bureaus), FWS 110 million acres (25% of four DOI bureaus), NPS 84 million acres (19% of four DOI bureaus), and Reclamation = 6.6 million acres (1% of four DOI bureaus), not counting subsurface. Besides paleontologists, PRPA will also require the need for more federally-employed fossil preparators and collection managers who conduct day-to-day paleontological resources preservation and inventory. In addition, each of the four bureaus will also need outreach personnel who are familiar with science and the field of paleontology to comply with § 49.35 of PRPA that proposes to "establish a program to increase public awareness about the significance of paleontological resources" (page 88189). Although we do not expect for DOI to hire 475 additional full-time paleontology staff to match with the number of archaeologists, we recommend bringing the total number of paleontological staff to somewhere between 50 and 100 (i.e., still only about 1/10 of the total number of archaeologists in the four bureaus). The size of this staff is not unreasonable to satisfactorily manage paleontological resources on the immense DOI lands and preserve and protect paleontological resources and sites required by PRPA. In particular, the total lack of full-time paleontology staff in FWS and Reclamation would be viewed as irresponsible because adequate care of paleontological resources and sites on their lands will not be possible without people who are actually trained in paleontology.

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37. Pages 88184 (right column) and 88185 (left column), "Paperwork Reduction Act of 1995 (PRA)"

Comment: In describing needed information for permit application, the document states "(3) Description, estimated start and end dates of proposed work, and maps and other location information" and "(7)" also discusses locality information. Will permit applications be accessible to the public? Agencies in DOI/authorized officers need to keep in mind that the release of locality information may need to be controlled for 'sensitive' paleontological sites, and therefore, permit applications should not be made public unless 'paleontological potential and sensitivity' are carefully assessed.

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38. Pages 88186 (middle column), "National Environmental Policy A"

Comment: The document states "PRPA provides specific authority and limits under which this activity can take place. In particular, PRPA allows for "casual collecting," which is defined as "the collecting of a reasonable amount of common invertebrates and plant paleontological resources for noncommercial personal use, either by surface collection or the use of non-powered hand tools resulting in only negligible disturbance to the Earth's surface and other resources" (Pub. L. 111-11, section 6301(1), 123 Stat. 1172), and specifies that the Secretary of the Interior is to determine how these terms are to be defined." We note that the Secretary of the Interior must not modify the definition to include 'vertebrate paleontological resources' for casual collecting.

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39. Page 88188 (left column), § 49.5 of Subpart A (Managing, Protecting, and Preserving Paleontological Resources)

Comment: The document states "Collection means paleontological resources removed from geological context or taken from federal land, and associated records or replicas." However, first, it is not clear what is meant by use of "or" in this sentence. Second, this is the only sentence in the entire document that uses the word 'replicas' while 'reproductions' is used for all other references to replicas. Therefore, for clarity, we recommend changing the wording to: 'Collections means paleontological resources, including associated records and reproductions, removed from geological context on federal lands.'

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40. Page 88188 (left column), § 49.5 of Subpart A (Managing, Protecting, and Preserving Paleontological Resources)

Comments: The document states "Curatorial services means managing and preserving a museum collection over the long term according to Department and bureau museum and archival standards and practices." We point out that, typically, 'archival standards' refers to archiving documents, not specimens. We recommend to change the wording to: 'Department, bureau, and current professional museum standards and practices.'

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41. Page 88191 (middle column), § 49.200(b) of Subpart C (Management of Paleontological Resource Collections)

Comment: The document states "The curation of paleontological resources collected from federal land before January 6, 2017 is governed by the terms and conditions of the original collection permit or agreement." This would mean that study of any fossils that belong to DOI may be discouraged until the final PRPA rule goes into effect because the exact terms and conditions

cannot be ascertained until then. In order to eliminate any potential legal complications that may become a burden for both certain repositories and the DOI, we recommend the date to be pushed back to the day when the final PRPA rule goes into effect.

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42. Page 88191 (middle column), § 49.205(a)(5) of Subpart C (Management of Paleontological Resource Collections)

Comment: The document states "Deposit would meet the bureau's management goals for the collection" but is the word 'deposit' the same as 'repository' in this context? If so, we suggest to place "deposit" with 'repository.'

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43. Page 88191 (middle column), § 49.205(a)(6) of Subpart C (Management of Paleontological Resource Collections)

Comment: The document states "(6) Repository will not release specific location data to the public except as consistent with § 49.25 or as provided in an agreement between the repository and the bureau." As we commented above on § 49.220(a)(1), we are concerned that repositories may refuse to accession paleontological specimens subject to special data sharing restrictions when these restrictions violate their existing collection management policies.

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44. Page 88191 (right column), § 49.215(a)(5) of Subpart C (Management of Paleontological Resource Collections)

Comment: The document states "(5) Statement that collections are available for scientific and educational uses and that the specific location data may be shared consistent with § 49.25." As noted in our cover letter, much of modern paleontological research deals with the distribution of fossil specimens and taxa through geologic time and geographic space. Specific location data are necessary for many studies of diversity and biogeography. Furthermore, editors and reviewers frequently require that they be presented in published papers to ensure replicability. As explained more fully above, we recommend that sites routinely be cleared for release of detailed information at the time of permitting or final reporting when they fall below an established threshold of sensitivity as determined from a checklist like the one we present in 'Appendix' attached here.

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45. Page 88192 (left column), § 49.220(a)(3) of Subpart C (Management of Paleontological Resource Collections)

Comment: The document states "Obtain approval of the authorized officer on a case-by-case basis before conducting or allowing reproduction or consumptive use of part or all of the collection, unless another procedure for obtaining such approval is defined in the agreement between the bureau and the approved repository." Reproduction (casting or scanning of specimens) and consumptive use of paleontological resources (such as sampling for isotopes or making thin sections for histological or taxonomic studies) are routine research procedures. This clause could have a significant inhibitory effect on research if permission must be sought for every instance of reproduction or consumptive sampling. Even standard preparation techniques such as acid baths or matrix removal could be categorized as "consumptive," whereas conversely many digital reproduction techniques, such as photography and computer assisted tomographic (CAT) or laser

scanning, are non-invasive and non-destructive. It is conceivable that the majority of research conducted on fossils would require permission based on this clause. We suggest that some accommodation be made for these procedures at the time of permitting, especially for invertebrate fossils, microfossils, and scrap bone. We also suggest that permission to reproduce specimens with these techniques be explicitly granted in the regulations. To alleviate the burden that would be imposed on DOI's authorized officers, repository staff, and researchers, we recommend that consumptive use and reproduction be allowed unless otherwise stipulated in the permitting process. We suggest the following wording to replace the above:

> 'Reproduction and consumptive use are allowed when research needs dictate, except when otherwise specified during the permitting process. Non-destructive digital reproduction, such as photography, computer assisted tomographic (CAT) scanning, and laser scanning, is always permitted. For material that is restricted, approval must be obtained from the authorized officer on a case-by-case basis before conducting or allowing reproduction or consumptive use.'

If this suggestion is unacceptable, we offer the following alternative language:

> 'Blanket approval for reproduction or consumptive use may be requested from the authorized officer as part of the permitting process or by later request. In other cases, the approved repository must obtain approval of the authorized officer on a case-by-case basis. Non-destructive digital reproduction such as photography, computer assisted tomographic (CAT) scanning, or laser scanning may be conducted without special permission.'

We also recommend that the officers who are authorized officers to make decisions about reproduction or consumptive use have a graduate degree in paleontology or a related discipline.

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46. Page 88193 (middle column), § 49.525(b) of Subpart F (Civil Penalties)

Comment: The document states "(b) Scientific and commercial values and the cost of response, restoration, and repair are determined under subpart G of this part." To be specific, we suggest to add a phrase 'of the paleontological resources and paleontological sites' between the words "repair" and "are" to read: '(b) Scientific and commercial values and the cost of response, restoration, and repair of the paleontological resources and paleontological sites are determined under subpart G of this part.'

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47. Page 88193 (middle column), § 49.530(b) of Subpart F (Civil Penalties)

Comment: In order to maintain grammatical structure, we suggest adding a word 'and' between statement (3) and statement (4) where the period that concludes statement (3) should be replaced with a semicolon. This will prevent a potential misunderstanding of 'and' with 'or.'

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48. Page 88193 (right column), § 49.535(c) of Subpart F (Civil Penalties)

Comment: Like § 49.535(a)(2), a line that would say 'via certified mail, return receipt requested, or other verifiable delivery method' should be added.

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49. Page 88194 (middle column), § 49.550(a) of Subpart F (Civil Penalties)

Comment: The acronym "OHA" is used without indicating what it stands for until the paragraph gives the address of the office at the end.

50. Page 88194 (middle column), § 49.550(c) of Subpart F (Civil Penalties)

Comment: Like § 49.550(a), a line that would say 'via certified mail, return receipt requested, or other verifiable delivery method' should be added.

51. Page 88194 (right column), § 49.555(a) of Subpart F (Civil Penalties)

Comment: The phrase "Ad Hoc Board" should be elaborated to read 'Ad Hoc Board of Appeals.' By adding the two words there, the following one-sentence paragraph on page 88187 can be deleted entirely: "Ad Hoc Board means an Ad Hoc Board of Appeals appointed by the Director, Office of Hearings and Appeals, Department of the Interior."

52. Page 88195 (left column), § 49.600 of Subpart G (Determining Values and the Costs of Response, Restoration, and Repair)

Comment: The section (§ 49.600) lists possible sources of costs for scientific value. Although that section states "are not limited to," we suggest specifically adding 'Preparation and stabilization' to the list, perhaps as Item '(c)' where subsequent items to be reassigned to (d) ['Laboratory analysis'] through (g) ['Lost visitor services or experience']. This is because preparation and stabilization of paleontological resources are time-consuming and generally costly.

53. Page 88195 (middle column), § 49.610 of Subpart G (Determining Values and the Costs of Response, Restoration, and Repair)

Comment: The document states "The cost of response, restoration, and repair of a paleontological resource or paleontological site is determined by the authorized officer ..." The word "or" should be replaced by 'and/or' because there is a chance both the resource and site require attention.

54. Page 88195 (middle column), § 49.610(d) of Subpart G (Determining Values and the Costs of Response, Restoration, and Repair)

Comment: The document states "Fossil preparation, stabilization, and conservation" but in order to be consistent with expressions used elsewhere in the document, it should be rephrased as 'Preparation, stabilization, and preservation of the resources.'

55. Page 88195 (right column), § 49.810(a) of Subpart I (Casual Collection of Common Invertebrate or Plant Paleontological Resources on Bureau of Land Management and Bureau of Reclamation Administered Lands)

Comment: The document states "Casual collecting means the collecting without a permit of a reasonable amount of common invertebrate or plant paleontological resources for non-commercial personal use, either by surface collection or the use of non-powered hand tools, resulting in only negligible disturbance to the Earth's surface or paleontological or other resources." Since casually collected fossils can be later recognized as being scientifically significant, we suggest adding the following sentences: 'Casually collected invertebrate or plant paleontological resources may later

be recognized to be scientifically significant, and can then be deposited in an approved repository. If a casually collected fossil resource is later cataloged into a repository, ownership of that specimen reverts back to the Federal agency managing the land at the time it was collected or under current management.'

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56. Page 88196 (left column), § 49.810(a)(3) of Subpart I (Casual Collection of Common Invertebrate or Plant Paleontological Resources on Bureau of Land Management and Bureau of Reclamation Administered Lands)

Comment: In order to maintain grammatical structure, we suggest adding a word 'and' between statement (ii) and statement (iii). This will prevent a potential misunderstanding of 'and' with 'or.'

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57. Page 88196 (left& middle columns), § 49.810(b) of Subpart I (Casual Collection of Common Invertebrate or Plant Paleontological Resources on Bureau of Land Management and Bureau of Reclamation Administered Lands)

Comments: The document states "In order to preserve paleontological or other resources, or for other management reasons, the authorized officer may establish limitations on casual collecting, including but not limited to reducing the weight of common invertebrate or plant paleontological resources below the amount specified in this subpart; limiting the depth of disturbance; establishing site-specific dates or locations for collecting; or establishing what is common in a specific area." In order to maintain grammatical structure, we suggest adding a phrase 'and/or' immediately after the last semicolon in the sentence.

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END OF COMMENTS (Appendix to follow)

Appendix. The Society of Vertebrate Paleontology's official best practice guidelines for repositing and disseminating contextual data associated with vertebrate fossils (http://vertpaleo.org/the-Society/Governance-Documents/Best-Practice-Guidelines-for-Repositing-and-Dissem.aspx).

Best Practice Guidelines for Repositing and Disseminating Contextual Data Associated with Vertebrate Fossils

I. Introduction

The Society of Vertebrate Paleontology (**SVP**) strives to promote reproducibility of research results by ensuring that scientifically important vertebrate fossils and their contextual data are placed permanently in public-trust repositories to make them always accessible for researchers seeking to verify past results and to conduct new studies. By recognizing that fossils and fossil localities are nonrenewable resources, SVP strongly supports legal regulations such as those provided for the Paleontological Resources Preservation Act (**PRPA;** 16 U.S.C. §§ 470aaa – aaa-11) of 2009 that call for management and preservation of paleontological resources based on scientific principles and drawing on scientific expertise.

SVP's Code of Ethics makes it the responsibility of vertebrate paleontologists to assist government agencies in developing management policies and to comply with those policies once enacted (Article 12, Section 2 of SVP Bylaws). In the U.S., PRPA Section 6304(c)(3) requires that the location of fossils collected on Federal land "will not be released by the permittee or repository without the written permission of the Secretary." The passage of PRPA creates an opportunity for our Society to review best practices for distribution of contextual data (i.e., locality and stratigraphic information) for all vertebrate fossils, not just those from U.S. Federal lands.

This document describes professional best practices for repositing and disseminating contextual data associated with vertebrate fossils, especially locality and stratigraphic information. A working group led by SVP's Government Affairs Committee assembled this guide with input from field paleontologists, museum researchers, collection managers, and database managers. By following these best practices, researchers and repository personnel will facilitate preservation of paleontological resources in the field and maximize the scientific value of research collections now and in the future. These recommendations draw on recommendations from the Global Biodiversity Information Facility (GBIF) *Guide to Best Practices for Generalising Sensitive Species Occurrence Data* (http://www.gbif.org/resource/80512). Although the best practices presented here are meant as guidelines, SVP expects members to be aware of these professional standards as they develop and to provide the Society with feedback to help improve them.

II. Principles

As required by SVP's Code of Ethics, pertinent contextual data, including location and stratigraphic information, should be accurately recorded for every vertebrate fossil at the time of collection. These data should be archived along with the specimens in an appropriate, publically accessible and permanent repository (Article 12, Sections 1 and 4 of Bylaws). The contextual data augment the scientific value of the specimens. In cases where release of these data will not create

risk of harm to, or theft or destruction of, resources remaining at the collecting site (sometimes including non-paleontological resources), they should be disseminated freely to facilitate research, education, resource management, and other public benefit uses.

A. Contextual data must be archived with each specimen in a public-trust repository whose mission is to make both specimens and contextual data permanently accessible for scientific research, education, and other uses. Fossil locality data should be recorded to the greatest accuracy possible and fully georeferenced, down to meters or even centimeters where possible, and should be reposited along with stratigraphic and other metadata, detailed maps, measured sections, field notes, photographs, and other associated documents. The data should be precise enough that future researchers will be able to return to the collecting site when additional information or specimens are required. For fossils collected from regulated properties such as U.S. Federal lands, the contextual data should also be reported to, and archived with, each relevant land management agency.

B. Research publications that use contextual data should clearly identify the repository that houses the associated specimens and should explicitly reference the corresponding specimen and site catalog numbers so that interested parties can locate the original specimens and their associated data (i.e., reproducible published scientific results).

C. Wherever possible, contextual data should be disseminated widely and freely.

D. In some cases, public access to contextual data, especially the precise location of the collecting site, can result in harm to fossils, contextual information (e.g., taphonomic and sedimentologic data), or to non-paleontological resources (e.g., endangered species or delicate ecosystems) that remain in the field. In such cases, distribution of information may need to be controlled although the presumption remains in favor of release. Any restrictions placed on the dissemination of contextual data should be adhered to rigorously by the collector, repository, and all parties with whom the data have been shared.

E. The sensitivity of all contextual data, especially the location of the collecting site (criteria defined below), should be reviewed by an agency responsible for, or the owner of, the land where the fossils were collected, the repository, and the collector/permittee. In order not to hinder research, curation, and education, the review should be completed as expeditiously as possible.

F. Dissemination of contextual data should be restricted only when there is a genuine risk. Restricting contextual data may affect the precision of research based on aggregated data, such as analysis of fossil occurrences in the Paleobiology Database, iDigBio, or other such public data portals. Therefore, restrictions should be imposed only if absolutely necessary, whereas all contextual data should be made available for research upon request.

G. Repository managers and other data providers should consider the needs of users for access to contextual data and other documentation when they evaluate sensitivity and weigh the impacts of disseminating data and restricting their access. For paleontological sites on U.S.

Federal lands that fall under PRPA, this determination is, by law, the responsibility of the agency (permitter) that manages the land.

H. In cases where restrictions are placed on access to contextual data, the original data should be retained intact by the repository. Original data should never be altered, falsified, or discarded.

I. Because research depends on the accuracy of data, users should be informed about omissions or changes that have been made to metadata in the interest of protecting a site. In cases where redacted data are disseminated, especially cases where the precision of geographic coordinates or stratigraphic placement has been purposefully reduced to protect the location of the collection site, the fact that this has been done should be distributed as part of the metadata for that specimen. In public databases, such as repository catalogs or data aggregators like the Paleobiology Database, redacted records should be indicated with appropriate wording, rather than by leaving fields blank or null.

J. Users of contextual data should respect any and all restrictions that have been imposed by data providers. If granted enhanced access to restricted information, users must not compromise or otherwise infringe its confidentiality.

K. Whenever a data provider receives an application for access to restricted data, the assumption of continued sensitivity should be avoided. Rather, the occasion should be used as an opportunity to re-evaluate the determination. Decisions made by government agencies to release previously restricted contextual data must be made in consultation with the repository in order to meet the needs of non-Federal partners, the scientific community, and the general public. Cooperation with relevant governmental bodies is particularly important for repositories or situations where a 'freedom of information access' law applies in order to discuss potential ramifications of sharing requested sensitive information prior to its formal release.

III. Determining Sensitivity

Custodians of contextual data, including land managers, repository curators, repository collections staff, and data aggregators, are responsible for evaluating whether data in their possession should be regarded as 'sensitive.' Sensitive information is here defined as any contextual data, which, if released to the public, would create risk of harm to, or theft or destruction of, the resource or its origin (e.g., localities containing the paleontological resource), or adverse effect to a person or people. For vertebrate fossils, such potential harm most often stems from the possibility of damage to, or theft of, additional specimens of a rare taxon or additional parts of an individual organism that has previously been partially collected. Factors that should be taken into account when determining sensitivity include the type and level of threat, uniqueness of the taxon or attribute, type of information, and whether it is already publicly available. Note that non-paleontological factors may also make a site sensitive, including environmental and ecological factors. A criterion-based approach is outlined below to assist in evaluating these factors.

A. Criteria for Impact of Harm

An answer of 'yes' to any of the following criteria indicates potential of harm from human activity. The more 'yes' answers, the more likely the impact of harm there is.

1. Are there taxa that occur only at this site?
2. Do rare taxa occur at this site?
3. Does the site yield unusually complete or exceptionally well preserved fossils?
4. Is this site a unique or rare exemplar of its geological age or geographic provenance?
5. Is the site likely produce additional specimens that will add significantly to the knowledge of variation within a taxon or to the completeness of a paleocommunity?
6. Are contextual field data that remain at the site easily damaged or destroyed?
7. Have excavation and contextual documentation of the site been completed?
8. Are scientifically important fossils that remain at the site easily damaged?
9. Is the site easily located because of proximity to roads or to easily visited or identifiable landmarks?

B. Criteria for Determining Sensitivity

An answer of 'yes' to any of the following criteria indicates increased sensitivity of the data. The more 'yes' answers, the more likely the impact of harm there is.

1. Is the content and detail of the contextual data such that their release would enable someone to carry out activities that are harmful to fossils or data that remain at the site?
2. Would release of the contextual data bring them into the public domain for the first time?
3. Would release of contextual data damage a partnership or relationship that is essential for preserving the site?
4. Would increased traffic to the site endanger non-paleontological resources, including endangered species, environmentally sensitive areas, or native American cultural patrimony?
5. In cases where the contextual data do not include the precise location of a site, would its disclosure allow the location to be easily inferred from other publicly available information sources?

C. Recommendations for Georeferencing Based on Sensitivity Category

The above criteria should be used to assign a sensitivity category for sites using the following table. These criteria are intended to assist assessment, and are not prescriptive. Decision-making should incorporate the best available scientific principles and expertise. Geographic data should be disseminated with the following precision.

Category	Sensitivity	Georeference Guideline
4	Extreme	Location not released, or released only as broad categorical information (formation/ region/ county, etc.) without georeference coordinates.
3	High	Georeference rounded to 0.01 degree (or nearest 1.5 km)
2	Medium	Georeference rounded to 0.001 degree (or nearest 0.5 km)
1	Low	Georeference unrestricted (i.e., full precision released)

As a point of reference, 'high sensitivity' (i.e., two decimal places in decimal degrees) roughly correspond to resolution no greater detail than the nearest kilometer, or the last three places in Universal Transverse Mercator (UTM) coordinates.

IV. Implementation for Data Providers, Aggregators, and Distributors

Data custodians such as repositories or federal, state, and local governmental units should routinely provide complete unrestricted access to contextual data in their care unless these data have been assigned a sensitivity category of '2' or higher, as outlined above. Georeference coordinates for fossil occurrences should only be completely withheld for the most extremely sensitive sites. The following additional guidelines for dissemination of data should be followed.

A. Authors should provide georeferenced coordinates for fossil occurrences, preferably with maps and photographs, based on the sensitivity category of the site in question. For fossils with 'high' to 'extreme' sensitivity, publically accessible media (e.g., publications, public and conference presentations, social media, broadcast media, etc.) should not include images (photographs or video) containing landmarks that allow the sited to be easily located (e.g., highways, named/mapped geographic features, etc.). Authors should state whether the coordinates they provide are at full or reduced precision.

B. Data aggregators and distributers should continue to allow access to fossil site location data that are already in the public domain through scientific publications or occurrence databases and should add previously restricted occurrence coordinates whenever their sensitivity is deemed to have decreased to an appropriate level. Data aggregators must indicate via metadata those coordinates whose precision has been reduced when they redistribute georeference data.