

I'd like to thank you for the opportunity to testify in favor of H.R. 554, the Paleontological Resources Preservation Act. I am an amateur paleontologist, and have seen firsthand how the increased public interest in paleontology has motivated many Americans to make an avocation of this fascinating field of study.

One of the most gratifying things for me has been the opportunity to collaborate with professional scientists - to learn from them, and to make my own small contribution to the advancement of scientific knowledge. I have had the pleasure in participating in fieldwork with the Dinamation International Society, the Universidad Autonoma de México, the Shuler Museum of Paleontology at Southern Methodist University, and the Ft. Worth Museum of Nature and History. I have been an active member of the Society of Vertebrate Paleontology, including serving as a member of its Government Affairs Committee since 1996 and as Affiliated Societies Liaison since 1997. I have been the Chairman of this Committee for the past several years and have been nominated for the position of Treasurer of the Society. By having amateurs like me serve in significant positions, the SVP has ensured that it reflects the interests of both professional and amateur paleontologists.

The PRPA has been endorsed by the Society of Vertebrate Paleontology, an organization of more than 2000 professional and amateur paleontologists, and by the American Association of Museums, which counts among its membership 11,500 individual museum professionals and volunteers, 3100 institutions, and 1700 corporate members.

Because of my personal interest in paleontology, and the nexus between paleontology and public policy I have studied the problems of illegal collection and theft of fossils from federal lands for the past several years. We urgently need stronger penalties for theft and destruction of fossils from public lands. Sadly, some of the most egregious cases of theft and vandalism have occurred on federal lands belonging to all Americans.

The rapidly increasing commercial value of fossils has created a situation where the limited penalties that exist are not sufficient to deter illegal collecting. In the Report "Fossils on Federal and Indian Lands" it was noted that "the fines currently imposed on fossil thieves are usually low compared to the lost resources. For example, one man who had stolen fossils from a national park over a period of years was fined a total of \$50." (Babbitt, 2000 p. 29)

In many cases the theft of fossils is so widespread and occurs so rapidly that we do not even know what is being lost. In a study commissioned by the Forest Service, it was found that almost one-third of the paleontological sites surveyed in the Oglala National Grassland showed evidence of unauthorized collecting. In 1999, the National Park Service identified 721 documented incidents of paleontological resource theft or vandalism, many involving multiple specimens, in the national parks between 1995 and 1998. (Babbitt, 2000 p. 28)

The increased commercial market for fossils worldwide has sometimes led to distortion of the fossil record. In some cases fossils have been altered in order to inflate their

commercial value. And we have lost significant specimens from further scientific investigation and exhibit, making it harder for people to see and examine for themselves the authentic objects in our museums. It is critical that scientifically significant fossils from federal lands, i.e. that portion of the fossil record that belongs to the American people, remain in the public domain so that everyone - children and adults, amateur and professional paleontologists may benefit from this irreplaceable resource.

I'd like to share with you a couple case histories that illustrate what is happening to this valuable public resource. I'm going to begin with the story of three *Allosaurus* specimens. *Allosaurus* was a large carnivorous dinosaur of the Jurassic period.

In 1991, the BLM discovered an illegal commercial collection taking place on federal land. The BLM contacted the Museum of the Rockies at Montana State University – Bozeman and asked them to collect the specimen and hold it in the public trust. As a result of this, the most complete *Allosaurus* ever found, which this commercial collector intended to sell to a private collector overseas, now has been saved for all the people of the United States. As a result of careful analysis of injuries sustained by this dinosaur and preserved in the bones, this particular specimen has yielded a treasure trove of information about how *Allosaurus* lived. The commercial collector, who had attempted to steal this fossil and the information it tells us, was never prosecuted.

Unfortunately, the American people were much less fortunate in the case of another *Allosaurus* find. This *Allosaurus* was illegally collected from BLM land near Fremont Junction, Utah. The collector was not prosecuted because the lapse of the statute of limitations. Last year the commercial fossil dealer, who purchased the *Allosaurus* for \$90,000 and sold it to a Japanese collector for \$400,000, plead guilty to receipt of stolen property and was sentenced to 1 year probation. His company was fined \$50,000. A profit of \$260,000 is not a deterrent. We simply must have stronger penalties and have specific laws protecting fossils on federal lands in order to deter this type of illegal activity.

The Fruita Paleontological Area near Grand Junction, Colorado became the first management area specially protected by the Bureau of Land Management solely because of fossils in 1976. Specimens from this area include *Allosaurus*, *Apatosaurus*, *Camarasaurus*, *Ceratosaurus*, *Dryosaurus*, and *Stegosaurus*. It has also yielded numerous microvertebrate and invertebrate remains and has facilitated reconstruction of the ecological community in which these animals lived. During a trip to the Fruita Paleontological Area I was able to learn much about the important research being done there. Unfortunately, I also witnessed the damage that is occurring there because of theft and vandalism.

Figure 1 shows the remains of what was once a largely intact allosaur vertebrae. The entire portion of the vertebrae that was protruding from the surrounding matrix has been sheared off.

Figure 2 shows what was probably once a major portion of an allosaur skeleton. We will never know what scientific information this specimen would have yielded.

In Figure 3 we see the imprint showing where a *Diplodocus* femur was stolen from Dinosaur Hill, a quarry just a short distance from the FPA.

I would like to share a little bit of information with you about how paleontological research is done and why this legislation is essential to ensuring maximal public benefit from this research.

Many kinds of fossils, including those of most vertebrates (backboned animals), are rare for several reasons. Many organisms are not readily preserved as fossils because they do not have hard parts. Only rather unusual sedimentary rock environments preserve soft parts long enough to become fossilized. Also, organisms can only be preserved where sediments accumulate at a fairly high rate. Most organic remains are not buried fast enough to contribute to the fossil record. Vertebrate fossils are much less common than invertebrate and plant fossils. Although we are fortunate to have some exceptions, spectacular deposits of diverse and complete organisms are rare over the history of the earth. The majority of fossil vertebrate species are extremely rare or are represented by a single unique specimen. For these reasons the chances of any vertebrate becoming a fossil are very small. Thus, individual vertebrate fossils are extremely valuable as bearers of information about the past. Furthermore, fossils of extinct groups are not renewable. More fossils will be discovered and collected, but always from a finite supply. More than 99% of all life forms that have ever lived on Earth are already extinct and are only potentially known by fossils.

Fossils themselves cannot tell the full story of life on Earth and they must be supplemented with contextual data. The rocks in which the fossils are found provide information about ancient environments and climates, the age of the fossils, position in a historical sequence, and their paleogeographic location. Fossil assemblages can also provide information about ecological interactions and communities.

A fossil collected without this information has lost much of its value, and we know little more than that this animal lived and died. In contrast, when contextual data are collected and studied, we begin to understand how the animal lived and its place in the balance of nature. As paleontologists and geologists learn more ways to interpret ancient environments and ecological communities from fossil assemblages in their original context, this information becomes more and more valuable and important. These contextual data allow us to bring these animals to life for tens of millions of visitors to our museums, to the many young children who have hands-on experience with original specimens, and to the American public.

Our understanding of evolutionary processes and the tree of life comes primarily from comparing the skeletons from different animals to each other. In order to do this researchers must be able to compare new specimens with those previously unearthed. Oftentimes a new analysis many years later shows our earlier understanding was

incomplete or mistaken. For example, when Dr. John Ostrom was doing research on *Deinonychus*, a dinosaur similar to the *Velociraptor* popularized in Jurassic Park, he found that a specimen thought to be a carnivorous dinosaur was actually the rare early bird *Archaeopteryx*. Ostrom's research was critical in establishing the link between dinosaurs and birds that became a proudly recited fact for every young dinosaur aficionado. Only when specimens are properly collected and permanently preserved in public institutions can researchers access these specimens in order to make these comparisons. And when these comparisons and interpretations are made education and the general public greatly benefit by having access to this new interpretive knowledge through media reports, books, and the Internet.

Although much of the need for this legislation had been driven by the increase in the commercial value of fossils, it's important to note that many fossils of enormous scientific value do not have as huge commercial value. The scientific value of fossils can be determined by the Secretary of the Interior based on existing case law and uniform regulations for determining the archeological value of archeological resources under the Archeological Resources Protection Act.

In a poll taken of America's major museums, more than 49% of the 1.8 million specimens of dinosaurs and other fossil vertebrates in their collections were from public lands. Of the overall total, amateurs had donated more than 100,000 specimens to museums and significantly less than 1 % of the specimens came from commercial collectors (Stucky and Ware, 1991).

H.R. 554 puts no new restrictions on amateur paleontologists like me. Any collecting that amateur paleontologists and rock collectors can legally do today will still be permitted under the PRPA. For example, an amateur collector can legally collect common plants and invertebrates on BLM and FS land without a permit. This would still be allowed under the casual collecting provision in Section 5 (a) (2). Collection of vertebrate fossils requires a permit under existing rules and regulations. Collecting on NPS lands is by permit only. In sum, nothing changes.

One thing that should be of interest is that although the Forest Service has been allowing rock collecting in National Forests, they really have no legal authority for doing so as current agency "organic acts," do not specifically address this recreational use of public lands. Without specific authority this practice may be in jeopardy and future administrations could take away this privilege. The problems inherent in not having this authorization spelled out clearly were seen in the issuance of the Forest Service's 1994 proposed rules which would have prohibited amateur rock, mineral and fossil collecting on all National Forest system lands. It is estimated that 30,000 to 70,000 comments were received from amateurs opposed to eliminating amateur collecting. The PRPA gives the needed Congressional authorization for amateur collecting on public lands. Nothing in this bill restricts rock collecting. Section 12 (2) specifically states that "Nothing in this Act shall be construed to ..... apply to, or require a permit for, amateur collecting of a rock, mineral ,or invertebrate or plant fossil that is not protected under this Act."

The paleontological community is strongly in favor of laws protecting fossils on public lands, and of prohibiting their collection for commercial use. Several years ago, the Society of Vertebrate Paleontology (SVP) added a Statement of Ethics to its bylaws to help the society and its members handle ethical issues such as those raised by increasing commercialization. I summarized the SVP Ethics Statement and a subsequent Joint Position Statement by the Paleontological Society as follows: "The SVP Ethics Statement contains several principles that are particularly noteworthy for their public policy implications. It begins by recognizing that vertebrate fossils are usually unique or rare, and that they are part of our natural heritage. The Ethics Statement assigns to vertebrate paleontologists the responsibility of ensuring that pertinent detailed contextual data are recorded when vertebrate fossils are collected and notes that collection and preparation should be done by properly trained personnel. The importance of proper curation and the assurance of access for future researchers are recognized by the Ethics Statements' provision that scientifically significant vertebrate specimens should be curated and accessioned in institutions charged in perpetuity with conserving fossil vertebrates for scientific study and education. The Ethics Statement further recognizes the responsibility of paleontologists to expeditiously disseminate information to other paleontologists and to the general public. Perhaps the most important part of the SVP Ethics Statement from a public policy perspective is the conclusion that "The barter, sale, or purchase of scientifically significant vertebrate fossils is not condoned unless it brings them into, or keeps them within, a public trust" (SVP, 1994).

In order to ensure that the SVP's public policy recommendations and initiatives regarding fossils on federal lands were also reflective of the wider paleontological community, the SVP initiated a dialogue with the Paleontological Society. Together these two scientific societies include several thousand individuals, representing more than 90% of professional paleontologists and a very large proportion of amateur paleontologists. This dialogue culminated in 1999 when the two societies issued the joint position statement *Paleontological Resources on U.S. Public Lands*. The PS-SVP joint statement advocates public policy which, like the SVP Ethics Statement, recognizes that fossils are part of our scientific and natural heritage. It goes on to find that fossils on public lands belong to all the people of the United States and that, as such, they need special protection, and should not be collected for commercial purposes. The joint statement concludes that the two societies strongly support actions which "protect fossils on public lands as finite natural resources; encourage responsible stewardship of fossils for educational, recreational, and scientific purposes; promote legitimate access to, and responsible enjoyment of, paleontological resources on public lands by the public and amateur paleontologists for personal use, and by the professional paleontological community, including professional paleontologists from outside the U.S.; and bring fossils from public lands into public institutions where they are available for purposes of education and scientific research" (PS and SVP, 1999)." (Summary from Vlamis, 2001) The Society of Vertebrate Paleontology has endorsed The Paleontological Resources Preservation Act.

Similarly the American people support the type of stewardship of fossils on federal lands which is embodied in H.R. 554. MKTG, INC., a market research firm that has conducted over 10,000 studies since its founding in 1979, conducted a survey of American public

opinion regarding fossils. This survey of 300 American adults analyzed public responses both to a hypothetical situation involving the discovery of a fossil, and to a series of more general questions pertaining to fossils. A random calling program was utilized which gave every telephone in the US the same probability of being called. The survey results have an accuracy rate of +/- 7%. The findings of this survey are detailed in Vlamis (2001).

Several key points that demonstrate public support for the principles embodied in H.R. 554. When the hypothetical find is assumed to have been made on public land 86.6 percent agree with the statement that "The fossil is part of our heritage, it belongs to everyone in the United States", 80.0 percent with the statement that "There should be a law against my selling the fossil", 81.0 percent with the statement that "There should be a law against my taking the fossil out of the United States", and 81.0 percent disagree with the statement that "The fossil is mine, finders keepers". The consistency of responses when asked in a variety of different ways is striking.

In the second part of the survey, 85.3 percent agreed with the statement that that "Fossils of animals with backbones are part of our national heritage and should be protected in much the same way that archeological remains (human artifacts) are now protected"; and, 88.0 percent agreed that "If laws are created to restrict the collection of fossils on public lands, the only people who should be allowed to collect them are people with appropriate skills for doing so and with a permit for that purpose. All the fossils that they find should go into museums and universities prepared to protect them" (Vlamis, 2001). The American people want our natural heritage preserved as a national treasure.

I've talked with people who have expressed concern about the false labeling provision in Section 7 (b) of the PRPA and fear that people could be prosecuted for inadvertently misidentifying fossils. The false labeling offense applies only when a false statement is made in association with a criminal offense under Section 7 of the PRPA and the criminal offense only occurs if one knowingly violates this law. It is in the bill so that unscrupulous collectors can't circumvent the law by intentionally misidentifying scientifically significant fossils as common plant or invertebrate fossils, or by labeling fossils collected from federal lands as coming from nearby private land. This is not new authority as the agencies have the authority now to make a charge of "false labeling," and if applicable, would be made in association with a charge under theft of federal property at 18 USC 641. The basis for this section of the bill is 18 USC 1001.

Some have argued for reversing the existing policy of not allowing commercial collecting of fossils on federal lands with the exception of petrified wood, citing a 1987 report from the National Academies of Science. The recommendations of this report were considered in the DOI Report, Fossils on Federal Lands (Babbitt, 2000), and have been implemented to the extent possible under existing law. This policy dates back to the 1915 Earl Douglass decision. The decision in this case that the dinosaur bones found by Mr. Douglass were not locatable minerals within the meaning of mining laws laid the groundwork for the establishment of Dinosaur National Park, a national treasure visited

by thousands of Americans every year. There are sound reasons for continuing this long-standing policy.

Proper stewardship of any public resource should seek to ensure that the resource is properly protected from harm, that any use of the resource maximizes the value of the use to the public, and that the benefits of use of the resource accrue to the entire public. In cases where the resource in question is renewable, a market-based sale of rights to use of the resource simultaneously benefits the general public and the acquirer of these rights. Examples of these types of resources include grazing rights, which can be managed such that the grazing use does not destroy other important uses of the land, and timber rights, which can include a mandate to ensure that reforestation is part of the harvesting program.

For other resources, utilization of the value embodied in the resource requires that it be consumed. Extractable minerals and energy sources have no intrinsic value when they are lying in the ground; they do, however, contain significant value when they are extracted, refined, and used in manufacturing or converted into energy. Again, a market-based sale of these rights can ensure that these benefits are distributed to the public at large.

Some have proposed that vertebrate fossils on federal public lands be treated in an analogous manner to the above - that rights to harvest them be sold on some type of market-based basis. Such an approach is both impractical and unwise. The parallel with timber and other renewable resources is inappropriate because fossils are nonrenewable. Similarly, treating fossils like oil, gas, etc. is impractical and ill-advised because the greatest value of fossils lies not in their consumption, but in the information they convey.

The PRPA will not interfere with mining on federal lands. Section 12.1 of the PRPA states that "Nothing in this Act shall be construed to —(1) invalidate, modify, or impose any additional restrictions or permitting requirements on any activities permitted at any time under the general mining laws, the mineral or geothermal leasing laws, laws providing for minerals materials disposal, or laws providing for the management or regulation of the activities authorized by the aforementioned laws including but not limited to the Federal Land Policy Management Act (43 U.S.C. 1701 –1784), the Mining in the Parks Act, the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 -1358), and the Organic Administration Act (16 U.S.C. 478, 482, 551);"

I would like to conclude by telling you about one example of the kind of cooperation, which exists between federal agencies, amateur paleontologists and professional paleontologists. Amateur paleontologist Kathy Wankel discovered a *Tyrannosaurus rex* on federal land. She reported this find to dinosaur paleontologist Jack Horner of the Museum of the Rockies at Montana State University, Bozeman. The MOR was able to collect this fossil and the contextual data and to learn much more about this animal known to all schoolchildren. Dr. Horner is currently in the ninth year of a field study in the Charles M. Russell National Wildlife Refuge in eastern Montana. To date eight *Tyrannosaurus rex* skeletons have been discovered. The field study is yielding valuable information about this most famous of the dinosaurs and the environment in which it

lived. Just last week a paper on this specimen was published in the journal *Science*. This paper used new techniques to recover soft tissue from this specimen and to extract proteins from this tissue. A comparison of these proteins with those found in chickens offers the first molecular evidence for the close evolutionary relationship between *T. rex* and modern birds. Many more benefits that are expected to flow from this ongoing research,

The work of the Museum of the Rockies has made it possible for the National Museum of Natural History, Smithsonian Institution, to collect one of these specimens. Thus, our National Museum will be able to display an actual specimen of this celebrated American dinosaur for the first time. The passage of H.R. 554 will foster more and more opportunities like this and inspire the long-term preservation of these priceless national resources.

The amateur and professional paleontological communities and the general public need the information from fossils found on federal lands and they want these fossils to be protected from theft and vandalism.

#### References:

BABBITT, B. 2000. Report of the Secretary of the Interior: Fossils on Federal and Indian Lands

PALEONTOLOGICAL SOCIETY AND SOCIETY OF VERTEBRATE PALEONTOLOGY. 1999. Joint Position Statement by The Paleontological Society and The Society of Vertebrate Paleontology on Paleontological Resources on U.S. Public Lands

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ADD OTHER REFS

#### Appendix 1

Society of Vertebrate Paleontology By-Law on Ethics

Article 9. Statement of Ethics.

Several goals for the Society of Vertebrate Paleontology follow from its mission statement (Constitution Article 1): to discover, conserve, and protect vertebrate fossils

and to foster the scientific, educational, and personal appreciation and understanding of them by amateur, student and professional paleontologists, as well as the general public. Fossil vertebrates are usually unique or rare, nonrenewable scientific and educational resources that, along with their accompanying contextual data, constitute part of our natural heritage. They provide data by which the history of vertebrate life on earth may be reconstructed and are one of the primary means of studying evolutionary patterns and processes as well as environmental change.

It is the responsibility of vertebrate paleontologists to strive to ensure that vertebrate fossils are collected in a professional manner, which includes the detailed recording of pertinent contextual data (e.g. geographic, stratigraphic, sedimentologic, taphonomic).

It is the responsibility of vertebrate paleontologists to assist government agencies in the development of management policies and regulations pertinent to the collection of vertebrate fossils, and to comply with those policies and regulations during and after collection. Necessary permits on all lands administered by federal, state, and local governments, whether domestic or foreign, must be obtained from the appropriate agency(ies) before fossil vertebrates are collected. Collecting fossils on private lands must only be done with the landowner's consent.

Fossil vertebrate specimens should be prepared by, or under the supervision of, trained personnel.

Scientifically significant fossil vertebrate specimens, along with ancillary data, should be curated and accessioned in the collections of repositories charged in perpetuity with conserving fossil vertebrates for scientific study and education (e.g. accredited museums, universities, colleges, and other educational institutions).

Information about vertebrate fossils and their accompanying data should be disseminated expeditiously to both scientific community and interested general public.

The barter, sale, or purchase of scientifically significant vertebrate fossils is not condoned unless it brings them into, or keeps them within, a public trust. Any other trade or commerce in scientifically significant vertebrate fossils is inconsistent with the foregoing, in that it deprives both the public and professionals of important specimens, which are part of our natural heritage.

## Appendix 2

### Joint Position Statement by The Paleontological Society and The Society of Vertebrate Paleontology on Paleontological Resources on U.S. Public Lands

The Paleontological Society and The Society of Vertebrate Paleontology are committed to increasing scientific knowledge, educational benefits, and appreciation of the natural world based on fossils - for everyone - child or adult, the general public, or amateur or

professional paleontologists. Fossils are an invaluable part of our scientific and natural heritage. They yield detailed information about the history of life and of our planet, and provide lessons for the modern world and our future.

Many important fossil localities occur on U.S. public lands and belong to all people of the United States, including future generations. The Society of Vertebrate Paleontology and The Paleontological Society therefore support the development of policies and practices that can be used by different federal agencies to regulate the collection of fossils on U.S. public lands in an appropriate, clear and consistent manner.

Many fossils are common (for example, many non-vertebrate fossils) and should be allowed to be collected – in a responsible way - by any amateur or professional paleontologist, thus allowing them to experience and benefit from the excitement of discovery, recovery, identification and study. In particular, because of the benefits that derive from increased public appreciation of fossils, it is important that the participation of amateurs in paleontology is not discouraged by Federal policies and practices.

Other fossils are rare (for example, many vertebrate fossils and some non-vertebrate fossils), and require special protection, especially from destruction by vandalism or commercial exploitation. In particular, because of the dangers of overexploitation and the potential loss of irreplaceable scientific information, commercial collecting of fossil vertebrates on public lands should be prohibited, as in current regulations and policies. The commercial collecting of other paleontological resources on U.S. public lands should be strictly regulated by permit through the appropriate land management agencies. Regulations and polices regarding the collection of paleontological resources from U.S. public lands should be strictly enforced.

In this context, the Council of The Paleontological Society and the Executive Committee of The Society of Vertebrate Paleontology strongly support actions that:

- i) protect fossils on public lands as finite natural resources,
- ii) encourage responsible stewardship of fossils for educational, recreational, and scientific purposes,
- iii) promote legitimate access to, and responsible enjoyment of, paleontological resources on public lands by the public and amateur paleontologists for personal use, and by the professional paleontological community, including professional paleontologists from outside the U.S.; and

bring fossils from public lands into public institutions where they are available for purposes of education and scientific research.