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before the

Subcommittee on Fisheries Conservation, Wildlife and Oceans and the Subcommittee on Forests and Forest Health

on H.R. 2416, the Paleontological Resources Preservation Act

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I am very honored to testify in support of H.R. 2416, The Paleontological Resources Preservation Act. This bill 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 in its membership 11,500 individual museum professionals and volunteers, 3100 institutions, and 1700 corporate members.

A heightened public interest in dinosaurs and other extinct life forms has given paleontologists an unprecedented opportunity to share with the public the excitement of recent advances in this fascinating science that records the history of life on our planet. Dinosaurs and fossils have become the window through which many young children get their first introduction to science, oftentimes inspiring a life-long interest or career in science. The fossil record is our only way of learning about the history of past life on our planet, and it is important for all Americans to have the opportunity to learn from this record. For this reason I'm pleased to see that H.R. 2416 calls for the establishment of a program to increase public awareness about the significance of paleontological resources on federal lands. As we confront important public policy issues including global climate change and the extinction of countless species of animals and plants, the fossil record provides a critical historical basis to help guide our decisions.

While it is gratifying that the public has become more interested in the history of life on our planet, and while paleontologists have become increasingly eager to share this knowledge, heightened visibility has also led to the increased commercialization of fossils. This has led to a black market trade in fossils from foreign countries (in violation of export laws) and to the theft of fossils from public and private lands in the United States.

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.

In a poll taken in 1991 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. 2416 does not change any current aspect of access to fossils on public lands on the part of amateurs, educators, or professional scientists. It does codify current land management authority and practice into uniform guidelines. This will help paleontologists to ensure that they are complying with the law when doing research on federal lands. It also will help increase the awareness of the cooperative spirit of amateurs and professionals and provides for stronger penalties for those who would destroy or permanently remove valuable fossils from our public heritage.

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 many 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 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. Figure 1 shows a Tyrannosaurus rex that was found on federal land by amateur paleontologist Kathy Wankel. 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 fifth 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. 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. 2416 will foster more and more opportunities like this and inspire the long-term preservation of these priceless national resources.

References:

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

Stucky, R.K., and S. Ware. 1991. Questionnaire concerning fossil collecting on Federal Lands. DMNH, Denver.

CAF Figure 1. This Tyrannosaurus rex that was found on federal land by amateur paleontologist Kathy Wankel. 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.