



Frequently Asked Questions about National Monuments and Vertebrate Fossils

Why are vertebrate fossils important for science?

Fossils are the only direct evidence we have for the history of life on our planet. Vertebrates are animals with backbones and skeletons, the group of organisms to which we belong, but only a fraction of the vertebrate species that have lived are preserved in the fossil record.

Are vertebrate fossils rare?

Vertebrates fossils are generally rare. Paleontologists must rely on the fossil record to understand, how, when and where extinct species lived, and how they originated and became extinct. But many fossil species are known from only a handful of specimens, sometimes just one, so even incomplete fossils can be scientifically important because they fill in knowledge gaps.

Why are vertebrate fossils part of our natural heritage?

Our natural heritage includes sites of scientific value that are part of the legacy we inherit from past generations. The history of our land, water, and life are important to us all. Vertebrate fossils are a special part of that history because they tell *our* story.

How are vertebrate fossils protected in the United States?

Most places in the U.S. have no protection for vertebrate fossils. Exceptions include federal land, where they are protected by the Paleontological Resources Preservation Act (2009) or designated as national monuments, and some state lands. Unprotected fossils are often lost from the public trust and from science, either destroyed or taken into private collections.

Aren't vertebrate fossils on federal land completely protected by the Paleontological Resources Preservation Act (PRPA)?

Not completely. While PRPA makes non-permitted handling or collection of vertebrate fossils illegal, it is not an environmental law and does not mandate protection from competing uses, like mining or grazing. When there is a conflict from such alternative uses, the potential impacts on paleontological resources are analyzed through the National Environmental

Policy Act (NEPA) and may result in mitigation. Monument status provides better protection, however, because activities such as mining and grazing are generally not allowed and such status offers incentives for scientific study that go beyond the broad mandate set forth in the PRPA.

Why are national monuments important for paleontological science?

Conferring national monument status is the primary way to protect specific landmarks, historic and prehistoric structures, and objects of *scientific* interest on federal land. About 20 national monuments have been designated specifically to conserve paleontological resources. These designations not only protect the fossils, but they mandate scientific study.

Why were Grand Staircase-Escalante and Bears Ears National Monuments established?

Vertebrate fossils were key reasons that both Grand Staircase-Escalante and Bears Ears were created. The exceptionally rich sequence of fossil-bearing rocks at Grand Staircase was the top reason why that monument was created in 1996 under the Antiquities Act and ratified by Congress just two years later. Archaeological resources, Native American cultural areas, and paleontological resources were the three primary reasons for establishing Bears Ears.

Aren't all the important fossil sites inside the revised monument boundaries at Grand Staircase-Escalante and Bears Ears?

No. Before partitioned, Grand Staircase-Escalante protected a sweep of Earth's history from just before the largest mass extinction event in our history 251 million years ago until just before the asteroid impact that ended the reign of dinosaurs about 67 million years ago. More than 700 scientifically important fossil sites representing this time span have been cut out of the monument. Bears Ears used to protect a sweep of Earth's history from the time when early vertebrates first walked on land about 310 million years ago until the late Mesozoic about 100 million years ago. Virtually all of the older part of this sequence has been cut from the monument, including more than 100 of its most spectacular fossil localities.

Why is it important for scientists to revisit sites once the fossils have been collected?

Science is a process. Our understanding of the past represents evaluation of all available fossils and other pieces of evidence by thousands of scientists. Progress in paleontology is not just new fossil finds. It also entails a long series of observations, interpretations, debates, and reinterpretations. Being able to revisit old data with fresh ideas and new techniques is absolutely critical to good science. For paleontology, that means reanalyzing the same fossils and revisiting the sites from which they were originally collected. Excising scientific sites from national monuments exposes them to damage or destruction and therefore threatens good scientific practice because it may become impossible to reproduce previous results.