3.9 PALEONTOLOGY

Fossils are the remains, traces, or imprints of ancient organisms preserved in or on the earth's crust that provide information about the history of life on earth. Paleontological resources do not include any materials associated with an archeological resource, which consist of material remains of past human life or activities that are over 100 years old (as defined in section 3(1) of the Archeological Resources Protection Act of 1979, as amended (16 U.S.C. 470bb(1)).

3.9.1 Regional Overview

At approximately 125 miles in length, the Uintah Mountains are the largest east-west-trending mountain range in the western hemisphere (Hansen 1969). The Uintah Basin is an asymmetrical elongate basin. The Uintah Mountains flank the northern length of the basin and the Book Cliffs/Tavaputs Plateau flank the southern margin. The Uintah Basin, Uintah Mountains, and Book Cliffs/Tavaputs Plateau are the dominant physiographic provinces of northeastern Utah. The Uintah Mountains rise to elevations greater than 13,000 ft (nearly 4000 m). This mountain range includes many of the highest peaks in Utah.

The Uintah Basin is situated in the central portion of the VPA. It has a geologic history of several orogenies (mountain building events) and a series sea level changes evidenced in the various rock formations and in the fossil record. The rock outcrops in the VPA are primarily sedimentary and span more than 2.8 billion years (Ga) of geologic history. These sedimentary deposits include Precambrian marine clastics, Paleozoic shelf deposits, Mesozoic terrestrial deposits, Tertiary basin fill and lake deposits, and Late Tertiary and Quaternary basin fill, glacial deposits, and alluvium (Diamond Mountain RMP 1990). In other words, the sedimentary rocks within the VPA formed and deposited in a variety of ancient environments more than 65 million years ago.

3.9.2 Evaluation of Paleontological Resource and Conditions

The BLM has identified four objectives for the management of fossil resources on lands it administers. They are: 1) locating, evaluating, managing, and protecting fossil resources; 2) facilitating appropriate scientific, educational and recreational uses of fossils; 3) ensuring that proposed land uses do not inadvertently damage or destroy important fossil resources; and 4) fostering public awareness of the Nation's rich paleontological heritage (BLM 1998:01). The BLM considers vertebrate fossils, as a group, to be scientifically significant; invertebrate and plant fossils may be determined to be significant on a case-by-case basis. Petrified wood is treated as a mineral material and may be collected or purchased under the Material Sales Act of 1947 (as amended), but cannot be obtained under the General Mining Law of 1872.

In 1998, the BLM released H-8270-1, General Procedural Guidance for Paleontological Resource Management. This handbook established a simple tri-level classification system for the "ranking of [geographic] areas according to their potential to contain vertebrate fossils, or noteworthy occurrences of invertebrate or plant fossils (BLM 1998:II-3)" using the following criteria:

- **Condition 1 –** Areas that are known to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. Consideration of paleontological resources will be necessary if the [Vernal] Field Office review of available information indicates that fossils are present in the area.

- **Condition 2 –** Areas with exposures of geological units or settings that have a high potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. The presence of geological units from which such fossils have been recovered elsewhere may require further assessment of these same geological units where they are exposed in the area of consideration.
- **Condition 3 –** Areas that are very unlikely to produce vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils based on their surficial geology, igneous (formed from lava) or metamorphic (changed by heat and pressure) rocks, extremely young alluvium (deposited by rivers), colluvium (deposited by gravity on slopes), or aeolian (deposited by wind) deposits or the presence of deep soils.

Using data gathered from the Utah Geological Survey, this section identifies areas according to their potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils.

3.9.2.1 Condition 1 Areas

For the purpose of this management plan, all vertebrate fossil localities were identified as to section, township, and range. Any section that contained one or more (maximum of 36) vertebrate fossil localities was identified as a Condition 1 area. The total area (the sum of all sections containing one or more vertebrate or trace fossil locality) for Condition 1 areas is approximately 147,062 acres (59,514 Ha). Fossil localities that lack specific geographic information were not considered.

3.9.2.2 Condition 2 Areas

Areas where geological units that yield vertebrate fossils or significant invertebrate or plant fossils elsewhere are identified as Condition 2 areas for the purposes of this management plan. Outcrops of units such as the Morrison, Mesa Verde, Mancos, Moenkopi, Green River, Uintah, Wasatch, Chinle, and Navajo/Nugget Formations should be considered as Condition 2 areas in the VPA. All of these units contain vertebrate fossils in other locations and may require further assessment where they are exposed in the VPA. Areas where these units are covered or obscured are not Condition 2 areas. The total acreage included in sections in which vertebrate or other scientifically significant fossils may be expected to occur is approximately 1,173,741 acres (474,998 Ha). Although significant fossils have not yet been found in these areas, there is high potential for their discovery.

Fossil localities that lack specific geographic information were not considered.

3.9.2.3 Condition 3 Areas

Condition 3 areas are not known to contain any paleontological localities and do not appear (at this time) to have geological units likely to produce vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. Condition 3 areas make up approximately 446,946 acres (180,873 Ha) of the VPA.[1]

[1] Calculations for condition areas acreages do not include State, Tribal, or Private lands.