Paleontological Survey of the Grand Staircase-Escalante National Monument, Garfield and Kane Counties, Utah

John R. Foster, Alan L. Titus, Gustav F. Winterfeld, and Martha C. Hayden
Utah Geological Survey
and
Alden H. Hamblin
Grand Staircase-Escalante National Monument
(Currently: Fremont Indian State Park and Museum)

Special Study 99 **2001**
UTAH GEOLOGICAL SURVEY
a division of
UTAH DEPARTMENT OF NATURAL RESOURCES

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Paleontological Survey - GSENM

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ABSTRACT

Grand Staircase-Escalante National Monument contains abundant fossil material in most formations within its borders. These formations range in age from Permian to Cretaceous. More than 800 individual fossil localities are known so far, and almost all areas of the monument that were examined contain at least some fossil material. Important new findings of this survey include: several partial dinosaur skeletons in the Kaiparowits Formation; a ceratopsian skull in the Wahweap Formation; the previously unreported presence of many ammonoid and bivalve genera in the monument in the Dakota, Tropic, and Straight Cliffs Formations; the first fossils of any kind from the Entrada Sandstone within the monument, including a dinosaur tracksite containing more than 250 tracks of at least 30 individuals; previously unrecognized sites and abundances of vertebrate ichnogenera in the Navajo, Kayenta, Moenave, and Chinle Formations; the first ichnofossil material from the Wingate Sandstone in the monument; and a previously unreported sponge genus from the Kaibab Limestone. The Cretaceous rocks exposed within the monument contain one of the best and most continuous records of Late Cretaceous terrestrial life in the world (Kirkland and others, 1998; Eaton and others, 1999). Research on these strata is still in its earliest stages.

INTRODUCTION AND DATA SOURCES

The Grand Staircase-Escalante National Monument was created on September 18, 1996 by Presidential Proclamation No. 6920. The U.S. Bureau of Land Management (BLM) was retained as manager of lands within the new monument and given three years to prepare a management plan. One of the many resources described in the proclamation is paleontology. Paleontological information on the monument was scattered through numerous publications and reports with no one source of information available to monument managers or planners. The Utah Geological Survey (UGS) began work on a preliminary report of paleontological resources within the monument shortly after it was established. This resulted in publication of UGS Circular 96, "A Preliminary Inventory of Paleontological Resources Within the Grand Staircase-Escalante National Monument," by David D. Gillette and Martha C. Hayden, in 1997; this report contains a bibliography of most known references to paleontology in the monument, and the reader is referred to this publication for that information.

In late summer of 1997, the BLM entered into a cooperative agreement with the UGS. This agreement provided funding for a project that would provide land managers with a comprehensive overview of the paleontological resources in the monument (this report). The bulk of known information concerning the fossil resources of the monument is contained in two databases at the UGS, one containing comprehensive information on paleontological sites in Utah, and the other consisting of a bibliography of Utah paleontology that contains site information. These two databases were used to assemble locality data on the monument. Additional information was solicited from paleontologists who are currently conducting, or have recently conducted, field investigations in the area.

The UGS locality database is organized by county, and the record of fossil sites in Kane and Garfield Counties, the two counties containing the monument, was relatively extensive. However, the accuracy of these locality records varied from general statements of the occurrence of a fossil in southern Utah, or Kane County (for example), to precise information with detailed map coordinates and photographs. Most sites were not precisely recorded, however. The UGS paleontology section improved and expanded the database by field verification and accurate plotting of previously reported and new sites in fossiliferous formations with Global Positioning System (GPS) technology.

GEOGRAPHY

The Grand Staircase-Escalante National Monument covers more than 1.9 million acres in southern Utah (figure 1). The region consists of relatively flat-lying strata locally

warped along north-south-oriented folds that together form the three broad landscapes of the Grand Staircase, Kaiparowits Plateau, and Escalante Canyons. Many of these folds are asymmetrical anticlines with a steeply dipping (monocline) limb and gently dipping (homocline) limb. Extension of the Basin and Range to the west caused vertical offset along the Paunsaugunt and Sevier faults (Doelling, 1975), although significant development along these structures has been documented in the Cretaceous (Peterson, 1969; Eaton and Nations 1991; Eaton and others, 1993). The eastern and western geologic boundaries of the monument are defined by the Waterpocket Fold (the monoclinal east limb of the Circle Cliffs anticline) and the Paunsaugunt fault, respectively. Strata along the Paunsaugunt fault are offset by as much as 242 meters (800 ft), down to the west.

The generally northward-tilted strata of the monument are structurally partitioned by the East Kaibab monocline (The Cockscomb), where strata dip up to 80 degrees. The Grand Staircase portion of the monument lies west of The Cockscomb. Between The Cockscomb and the Straight Cliffs lies the Kaiparowits Plateau, a wedge-shaped topographic highland which is also a geological basin comprised of Cretaceous rocks (Peterson, 1969; Eaton, 1991). Within the Kaiparowits Plateau, numerous gentle, northward-trending folds are also present (Smoky Mountain, Upper Valley, Reese Canyon, and Escalante anticlines) that were active during the Cretaceous (Peterson, 1969). Northeast of the Straight Cliffs and extending to the Waterpocket Fold lie the Escalante Canyons, a landscape typified by "slickrock" benches and many deeply dissected canyons.

GEOLOGIC HISTORY

The Colorado Plateau has a geologic history reaching back over a billion years. Approximately 270 million years of this history is revealed in the rocks, paleontology, and scenery of the monument (Baars, 1972; Hintze, 1988) (figure 2). The oldest rocks record a time when the equator angled northeast from what is now southern California past the southeastern corner of Utah. The area of the monument was a marginal marine lowland of streams, floodplains, and tidal flats. The sea lay to the west, but occasionally spread east across the area, leaving beds of limestone with diverse shells, sponges, and other fossils between red beds of coastal sandstone and mudstone. The Hermit Shale, Toroweap Formation, Kaibab Limestone, and Moenkopi Formation (Baars, 1972; Blakey and others, 1993; Blakey, 1996), which crop out in the Circle Cliffs and at Buckskin Mountain, record these events covering the first 45 million years of geologic history in the monument (middle Permian through Early Triassic time, 280-235 Ma).

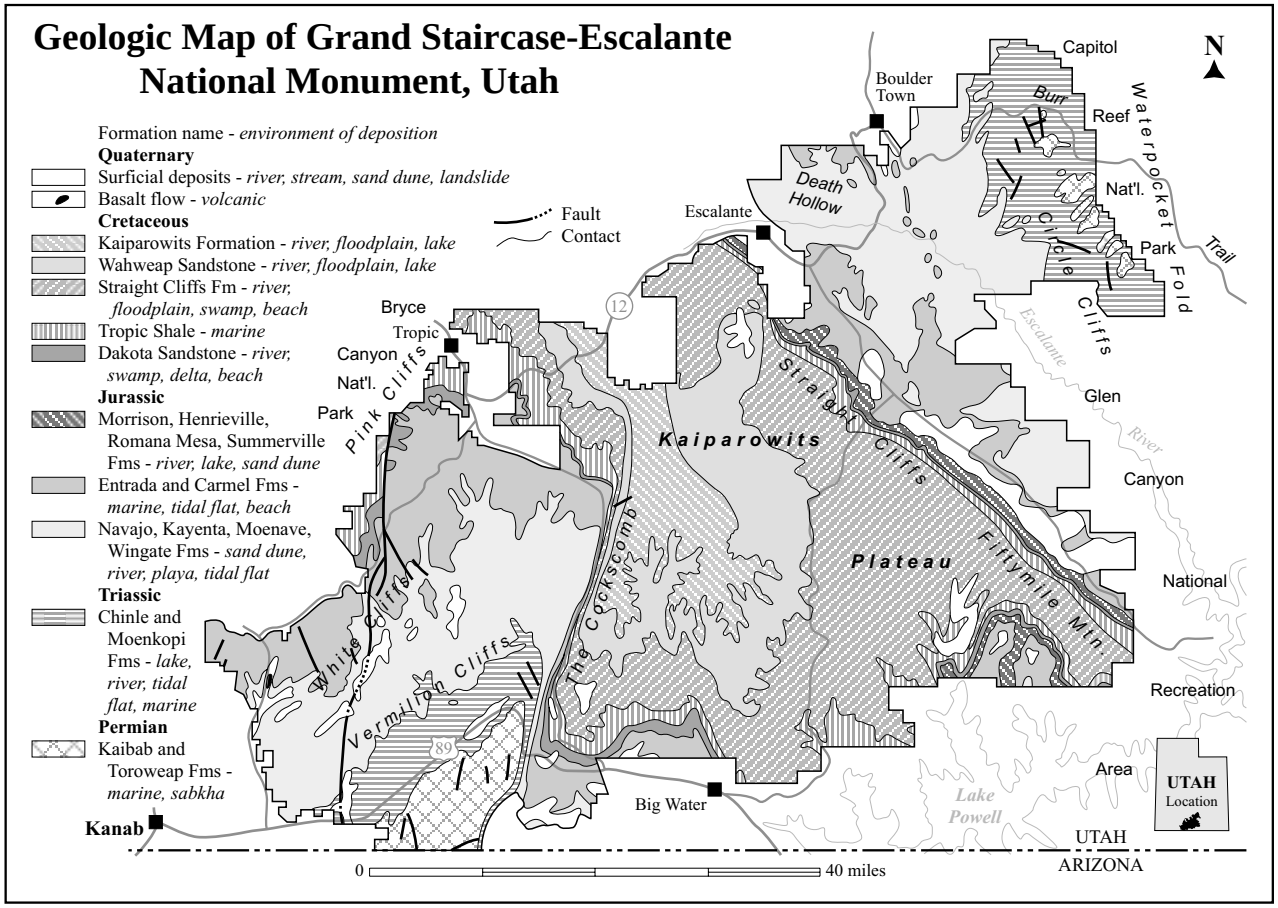

Figure 1. *Generalized geologic map of the Grand Staircase-Escalante National Monument.*

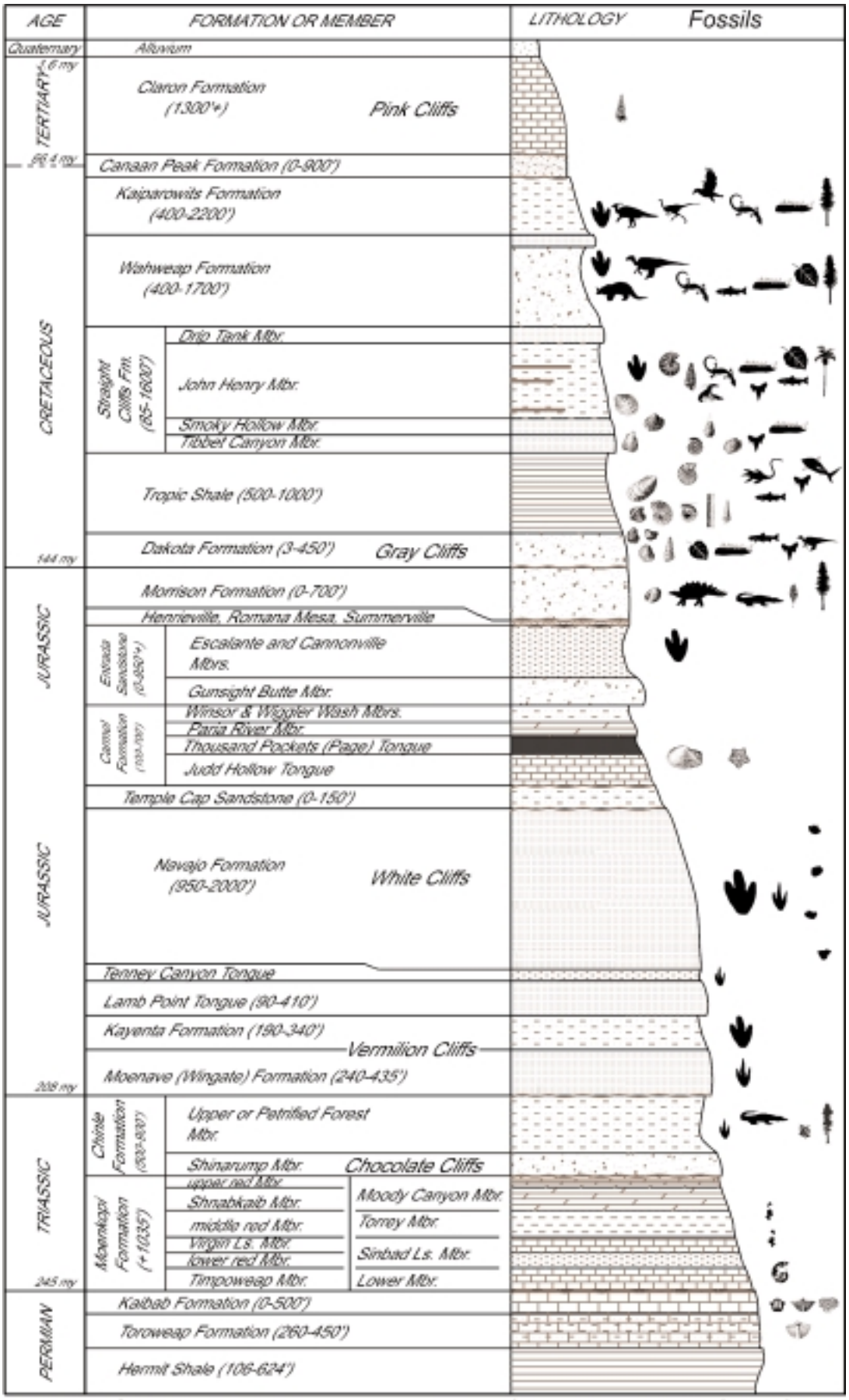

Figure 2. *Generalized stratigraphic column, showing formations and typical fossils found in the Grand Staircase-Escalante National Monument.*

Rocks that record the transition between the Permian and Triassic are absent due to several million years of erosion and/or nondeposition between the Kaibab and Moenkopi. Likewise, a portion of the Middle Triassic is not represented above the Moenkopi Formation. Reptile and horseshoe crab tracks are found in terrestrial beds of the Moenkopi Formation.

The Circle Cliffs (figure 1) reveal remarkable specimens of petrified wood, including logs exceeding 27 meters (90 ft) in length. These logs represent conifer trees stranded on Late Triassic river floodplains. Cellular tissues have been replaced by silica derived from altered volcanic ash found in the Chinle Formation (Dubiel, 1994). Fossils of other plants, fish, amphibians and reptiles, tracks of early dinosaurs, and freshwater clam and gastropod shells also give hints of the 20-million-year Late Triassic interval of monument history (230-210 Ma). Beds of the Moenkopi and the ledge formed by the Shinarump Member of the Chinle form the Chocolate Cliffs of the Grand Staircase in the southwestern part of the monument. The Petrified Forest Member of the Chinle Formation forms the colorful multi-hued slopes above the Chocolate Cliffs.

During the latest Triassic and extending into Early Jurassic time (210-187 Ma), this region was covered by great sand dunes. The depositional environment changed from windblown sand dunes to stream-deposited sand beds and back to sand dunes (Lutrell, 1993; Peterson, 1994). Early Jurassic rocks in the monument form the Vermilion Cliffs (Wingate/Moenave and Kayenta Formations) and White Cliffs (Navajo Sandstone) of the Grand Staircase (figure 1) and are responsible for most of the scenery in the Escalante Canyons area. Though generally devoid of fossils, these rocks occasionally exhibit the fossilized tracks of reptiles, including small to medium-sized dinosaurs.

Locally underlain by the Page Sandstone, the Middle Jurassic (185-165 Ma) is represented by the Carmel Formation throughout the monument. It is composed of color-banded layers of sandstone, limestone, calcareous shale, siltstone, gypsum, and mudstone deposited in and near the southern edge of a shallow sea that advanced into the area from the north. Limestones contain some marine fossils of molluscs, brachiopods, crinoids, coral, and algae. Desert sand dunes of the Entrada Sandstone formed on top of the Carmel Formation as the sea retreated to the north (Lutrell, 1993; Peterson, 1994). Another period of erosion occurred before the Late Jurassic (157-148 Ma) Morrison Formation (famous for its dinosaur fossils) was deposited by lakes and east-flowing streams (Peterson, 1994). The Morrison is found on the east side of the monument at the foot of the Straight Cliffs and southeast of the Kaiparowits Plateau (figure 1). It is absent from the west side of the monument where it was removed by erosion prior to Late Cretaceous time. Early Cretaceous erosion and nondeposition represent a period of 50 million years.

During Late Cretaceous time, compressive forces formed mountains to the west and provided sediments for streams flowing northeast into a great continental sea. Even farther west explosive volcanic centers rained ash over much of North America. The continental sea covered most of the interior of North America from the Arctic to the Gulf of Mexico, splitting North America in half. Subsidence along the western mountain front led to the accumulation of a thick sediment wedge that thinned to the east across southern Utah. The shoreline fluctuated from east to west creating a series of alternating terrestrial and marine deposits covering more than 20 million years of time over the last half of the Cretaceous Period (95-75 Ma) (Elder and Kirkland, 1993, 1994). The Dakota Formation was deposited on remnants of either Morrison (east) or Entrada (west) and is a mix of stream sediments and nearshore marine deposits. The Dakota was covered by open marine muds of the Tropic Shale. Deposition continued, with the sea retreating to the east, resulting in the stacked coastal deposits of the Straight Cliffs Formation, and the progressively more inland deposits of the Wahweap Formation, with the Kaiparowits Formation marking the final phase of marine influence in the region. These formations are seen on and around the Kaiparowits Plateau and form the Gray Cliffs of the Grand Staircase.

The thickness, continuity, and broad temporal distribution of the Kaiparowits Plateau's stratigraphy provide unrivaled opportunities to study the paleontology of the Late Cretaceous Period. Significant fossils, including marine and brackish-water molluscs, turtles, crocodilians, lizards, dinosaurs, fish, and mammals have been documented in the Dakota Formation, Tropic Shale, and Wahweap Formation, and from the Tibbet Canyon, Smoky Hollow, and John Henry members of the Straight Cliffs Formation in recent years. Within the monument, these formations have produced the only evidence in our hemisphere of a terrestrial vertebrate fauna, including mammals and dinosaurs, from the 20 million years spanning the Cenomanian through Santonian ages. This sequence of rocks, including the overlying Wahweap and Kaiparowits Formations, contains one of the best and most continuous records of Late Cretaceous terrestrial life in the world (Kirkland and others, 1998; Eaton and others, 1999). Research on these strata is still in its earliest stages.

Following a period of deformation and erosion, the Canaan Peak Formation was deposited, and it straddles the boundary between Cretaceous and Tertiary time (about 65 Ma) (Schmitt and others, 1991). The dinosaurs became extinct at this time and radical changes began to occur in the geology of the monument region. In the early Tertiary several large lakes occupied an area from southwestern Wyoming to southwestern Utah. The Claron Formation, seen as the Pink Cliffs at Powell Point and Bryce Canyon, was deposited at this time. The Tertiary Period lasted about 64 million years, during which time Utah experienced uplifts, folding, faulting, and volcanism. Only the first 20 million years of the Tertiary is recorded in the

region, but it was a critical interval in the development of the mammal-dominated ecosystem existing today. Uplift of the Colorado Plateau and Utah in general over the past 15 million years activated the erosional cycle that uncovered geologic formations dating back 270 million years and created the topography and scenery we now see in the monument. Twenty sedimentary geological formations are exposed in the monument, and fossils are known from all but three of these formations. Quaternary sediments (younger than 1.6 million years) also occur in the monument and have a potential for producing Pleistocene fossils.

METHODS

We inventoried areas that seemed to have a reasonable combination of exposure, fossil-producing lithology, and accessibility. We prospected as many formations and geographic areas as possible within the time and access constraints. Known paleontological sites were identified and located on topographic maps. Geological formations known or predicted to contain important paleontological resources were only spot surveyed for new fossil localities, because a comprehensive survey of the monument would take many years and was beyond the scope of this project. Identified sites were logged in Universal Transverse Mercator (UTM) grid system coordinates using GPS units and most fossil identifications were made in the field. We collected some of the more important specimens for more precise identification. These specimens will be or have been cataloged in the Utah Museum of Natural History in Salt Lake City. Locality information was transferred to a Geographic Information System (GIS) database for plotting.

Each locality was given a Sensitivity Level rating to characterize the significance of its fossil resources. The ratings are based on BLM guidelines and include five classes:

Class I (Critical) --Any locality producing type, very rare, or reference fossil material.

Class II (Significant) --Any locality producing rare or unusually well-preserved material.

Class III (Important) --Any locality producing common but abundant fossil material.

Class IV (Insignificant) --Any locality producing poorly preserved or less abundant but common material.

Class V (Unimportant) --Any locality producing very poorly preserved and/or less abundant material.

We investigated more than 800 fossil localities in 17 geological formations within the monument (table 1). Most of the localities are in the Upper Cretaceous units, which are generally more fossiliferous and thus more heavily prospected than the older units. Still, almost all formations have some fossil material in them and very few areas were found to be entirely barren. Interestingly, some of the more fossiliferous formations, such as the Kaiparowits and Wahweap Formations, and formations that are generally fossiliferous in areas outside of the monument, such as the Morrison Formation, produced largely fragmentary and unidentifiable material. Clearly, excavations are required to produce well-preserved identifiable specimens.

***Table 1**. Number of currently known fossil localities in each formation within Grand Staircase-Escalante National Monument.*

Claron Formation	1*
Kaiparowits Formation	164
Wahweap Formation	73
Straight Cliffs Formation	166
Tropic Shale	191
Dakota Formation	124
Morrison Formation	16
Entrada Sandstone	5
Carmel Formation	14
Page Sandstone	1
Navajo Sandstone	8
Kayenta Formation	11
Moenave Formation	10
Wingate Sandstone	1
Chinle Formation	44
Moenkopi Formation	25
Kaibab Limestone	13

** Float material derived from outcrops just outside monument.*

A number of the fossils identified from different formations represented the first reported occurrence of that taxon within the monument boundaries. These newly identified taxa are listed in table 2. A complete listing of sites known through 1999 can be found in the appendix,

***Figure 3.** The type section of the Permian Kaibab Formation, Fossil Mountain Member through the lowest part of the Timpoweap Member, Kaibab (Buckskin) Gulch, Kane County, Utah.*

Table 2. *List of taxa found within the Grand Staircase-Escalante National Monument during this paleontological survey that were previously unknown from the monument. Includes taxa that represent more specific identifications than in previous reports.*

Kaibab Limestone
Sponge
Actinoceolia

Moenkopi Formation
Ammonoids
Pseudosageoceras multilobatum
Submeekoceras
Nautiloids
Genus indeterminate
Reptiles
Tracks
?Akropus

Chinle Formation
Plants
Sphenopsida
Neocalamites?
Araucarian stem and branch impressions and casts
Reptiles
Tracks
Pseudotetrasauropus
Rhynchosauroides
?Gwyneddichnium
Large reptile track

Wingate Sandstone
Reptiles
Theropod dinosaur trackway

Moenave Formation
Reptiles
Tracks
Grallator
?Anomoepus
Reptile trackway (*Batrachopus*)

Kayenta Formation
Reptiles
Tracks
Grallator
Eubrontes
Kayentapus
?Anomoepus

Navajo Sandstone
Reptiles
Tracks
Brasilichnium
Eubrontes
?Grallator

Carmel Formation
Bivalves
Pronoella
Gastropods
Cossmannea

Entrada Sandstone
Reptiles
Tracks
Theropoda
?Megalosauripus
?Therangospodus

Morrison Formation
Invertebrate traces
Possible termite nest structures
Other vertical burrows
Reptiles
Goniopholid crocodilian teeth
Tracks
Sauropoda

Dakota Formation
Plants
Angiosperm leaves
Ammonoids
Calycoceras

Tropic Shale
Ammonoids
Euomphaloceras costatum

Straight Cliffs Formation
Reptiles
Dinosaur tracks

Wahweap Formation
Reptiles
Ceratopsian dinosaur skull

Kaiparowits Formation
Arthropods
Crayfish burrows?

which is a listing of all paleontological localities recorded in the Utah Geological Survey database.

FOSSIL-PRODUCING GEOLOGICAL FORMATIONS

This section provides some background information on formations in which fossil localities were recorded during this survey, including the inferred paleoenvironments and approximate ages of the units. Short summaries of the findings in each formation during this survey are also included.

Kaibab Limestone

The Permian Kaibab Limestone consists of tan, white, and gray limestone, dolomite, and sandstone with some nodular chert. It is exposed mainly in the area south of the Vermilion Cliffs, and in the center of the Circle Cliffs uplift. Although originally described from the Kaibab Plateau on the north side of the Grand Canyon, a type section was designated in Kaibab (Buckskin) Gulch (Noble, 1928) on the south side of the Grand Staircase (figure 3). As the type section, the fossil record at this site is of particular significance in regional geological studies. The Kaibab Limestone is 0 to 150 meters (0-495 ft) thick (Doelling and Davis, 1989) and, generally, the thickness increases to the west. The formation represents a calm, shallow marine

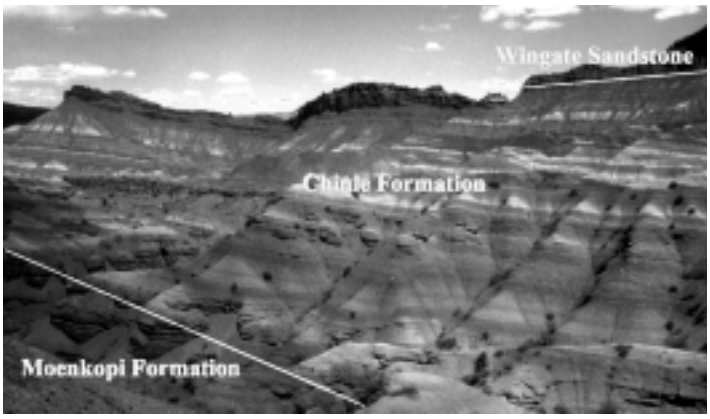

Figure 4. *Exposures of the Triassic and Lower Jurassic section (Moenkopi, Chinle, and Wingate Formations), view looking northeast from the Paria movie set road, Kane County, Utah.*

paleoenvironment (Girdley, 1974) and, in southern Utah, contains fossils of a wide variety of marine taxa, including corals, crinoids, sponges, bryozoans, brachiopods, bivalves, gastropods, ammonoids, nautiloids, conodonts, and at least six species of trilobites (McKee, 1938; Cisne, 1971; Gillette and Hayden, 1997).

The Kaibab contains abundant, sometimes well-preserved fossils within the monument, but the material is restricted to certain beds and thus does not occur at every exposure. The best sites are on the flanks of Fivemile Mountain.

Moenkopi Formation

The Lower Triassic Moenkopi Formation consists mostly of red to reddish-brown siltstone and sandstone with some claystone. The sandstones are thin bedded and have abundant, well-preserved ripple-marked surfaces. The Moenkopi is exposed mainly south of the Vermilion Cliffs, west of the Cockscomb (figure 4), and in much of the central Circle Cliffs uplift. It thickens from about 45 to 360 meters (148-1,188 ft) from east to west, and represents deposition in shallow marine, intertidal, and supratidal paleoenvironments (Blakey and others, 1993; Dubiel, 1994). The Moenkopi contains a mixture of marine and terrestrial fossil taxa, including plants, crinoids, brachiopods, gastropods, bivalves, ammonoids, nautiloids, arthropods, fish, reptiles, labyrinthodont amphibians, and reptile tracks (Gillette and Hayden, 1997).

Compared with the amount of exposure of the Moenkopi within the monument, few sites were found in this formation, but several sites produced significant material. Among these sites are one with ammonite material and another that produced particularly abundant horseshoe crab tracks (figure 5) (Hamblin and Foster, 2000).

Chinle Formation

In the monument area, the Upper Triassic Chinle Formation consists of two to four members: the Shinarump Member and Petrified Forest Member are present throughout; the Monitor Butte and Owl Rock Members are present mainly in the Circle Cliffs area (figure 6) (Stewart and others, 1972). Where all four members are present, the sequence, from oldest to youngest, is: Shinarump, Monitor Butte, Petrified Forest, and Owl Rock. The Shinarump Member is mainly tan and yellow-white, fine- to medium-grained sandstone and conglomeratic sandstone up to 30

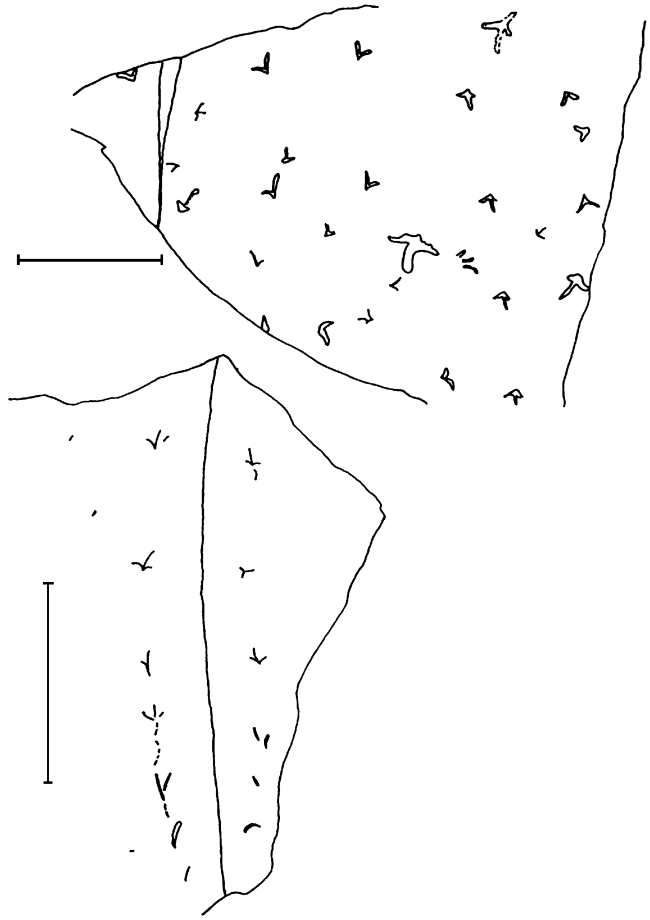

Figure 5. *Two slabs containing limulid tracks from the lower Moenkopi Formation, Canyon View locality (Ga464T). Scale bars = 10 cm.*

Figure 6. *Exposures of the Triassic and Lower Jurassic section - Chinle and Moenave Formations, Park Wash, Utah.*

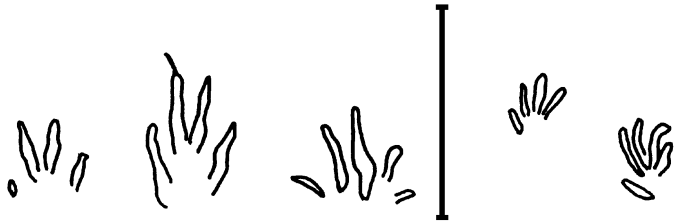

Figure 7. *Three tracks assigned to ?*Gwyneddichnium *(left) and two assigned to* Rhynchosauroides *(right), all from Brinkerhof Spring locality (Ga324T), Chinle Formation, Garfield County, Utah. Scale bar = 5 cm.*

meters (99 ft) thick. The Monitor Butte and Petrified Forest members are difficult to distinguish in some areas and consist of gray, gray-green, and maroon bentonitic claystones, and gray, soft-weathering sandstones; the Petrified Forest Member is often exposed in badlands areas and can be up to 180 meters (594 ft) thick. The Owl Rock Member consists of gray-green and red, non-bentonitic claystones and thin-bedded, gray and gray-green siltstones, sandstones, and limestones. The thickness of the Owl Rock is about 30 meters (99 ft). The total thickness of the Chinle Formation ranges from 120 to 300 meters (396-990 ft) (Doelling and Davis, 1989). Exposures of the Chinle can be found along the bases of the Vermilion and Circle Cliffs. The sediments of the Chinle represent river channels, floodplain soils and mudflats, and lakes (Stewart and others, 1972; Dubiel, 1994). The formation contains numerous terrestrial and freshwater fossils, including conifers, ferns, cycads, bivalves, fish, labyrinthodont amphibians, crocodile-like phytosaurs, North America's oldest dinosaurs, and many other distinctive extinct reptile groups.

The Chinle Formation in the monument did not produce a great amount of vertebrate or invertebrate material, though we located some beds with abundant freshwater clams. The most abundant fossil material in the Chinle is petrified wood. Some of the more significant finds made during this survey were vertebrate track localities that produced the first occurrences of several track types within the monument (Hamblin and Foster, 2000), and phytosaur and metoposaur remains found at the King Mine in the Vermilion Cliffs area (figures 7, 8a, and 8b).

Figure 8a. *Track assigned to* Pseudotetrasauropus *from the Chinle Formation at the Long Canyon Pass locality (Ga475PT), Garfield County, Utah.*

Figure 8b. *Cast of araucarian conifer branch from the Long Canyon Pass locality (Ga475PT), Chinle Formation.*

Wingate Sandstone

The Lower Jurassic Wingate Sandstone consists of tan to golden-tan and reddish, cliff-forming sandstone up to about 210 meters (693 ft) thick (Harshbarger and others, 1957). The sandstone is very fine to fine grained and contains large-scale, eolian cross-beds. The Wingate is exposed mainly in the eastern part of the monument and is the main component of the Circle Cliffs. The formation's sediments were deposited in a sand dune paleoenvironment along the eastern margin of an inland sea (Clemmensen and others, 1989), and few fossils, other than locally abundant footprints of dinosaurs and other animals, are known from this unit.

The Wingate Sandstone is difficult to prospect due to the vertical nature of its main exposure around the Circle Cliffs, but while working in the Chinle we often checked sandstone blocks (talus) of Wingate that were on the same slope. Only one site was found, but it contained a multi-step trackway of a small theropod dinosaur, the first known fossil material from the Wingate in the monument (Hamblin, 1998) (Hamblin and Foster, 2000).

Moenave Formation

The Lower Jurassic Moenave Formation, named by Harshbarger and others (1957), consists of orange-red and tan sandstone, red claystone, and some gray, pebbly conglomerate. The sandstone beds can be thin and interbedded with the claystones, but commonly are thick-bedded and can form ledges up to several meters thick. The formation is typically about 130 meters (429 ft) thick (Doelling and Davis, 1989). The Moenave occurs mainly in the western part of the monument, particularly along the Vermilion Cliffs, and it interfingers with the Wingate Sandstone to the east, which, like the Moenave, overlies the Chinle Formation (Lutrell, 1993). Thus, the Moenave represents braided streams, floodplains, lakes, sabkhas, and small dunes along the western margin of the large dune field represented by the Wingate Sandstone (Clemmensen and others, 1989). The Moenave contains fossils, including petrified wood, palynomorphs, fish, rare dinosaurs, the primitive crocodilian *Protosuchus*, and dinosaur and reptile tracks (Wilson, 1958; Spendlove, 1968; Lockley and Hunt, 1995; Gillette and Hayden, 1997).

Not much skeletal fossil material was found during our survey of the Moenave, but the lower part of this formation along the Vermilion Cliffs is potentially quite productive for vertebrate tracks and fish remains. We identified at least five sites having dinosaur tracks along these cliffs, and probably most exposures in that area would yield tracks if prospected.

Kayenta Formation

The Lower Jurassic Kayenta Formation, within the monument, consists of mostly reddish-brown sandstone and minor red claystone, though in parts of northeastern Arizona and westernmost Utah a silty and clayey facies persists (Harshbarger and others, 1957). The formation is exposed along the Vermilion Cliffs, above the Moenave Formation, and in the Escalante Canyons area, where it lies between the Wingate Sandstone and the Navajo Sandstone. In Garfield County, the Kayenta ranges from 45 to 105 meters (148-346 ft) in thickness (Doelling, 1975). The paleoenvironment of the formation is mostly sandy fluvial (Luttrell, 1986, 1993), and the unique fossils known from the unit regionally include petrified wood; bivalves; gastropods; three types of mammals; North America's oldest turtle; legless amphibians; a frog; a sphenodontid; a pterosaur; several crocodilians; three types of tritylodontid "reptiles;" the dinosaurs *Massospondylus*, *Scutellosaurus*, *Dilophosaurus*, and *Syntarsus*; and dinosaur and reptile tracks (Stokes and Bruhn, 1960; Clemens, 1986; Gaffney, 1986; Sues, 1986; Weishampel, 1990).

The Kayenta is another formation that does not seem to contain much fossil material within the monument. Most of the taxa known from the formation regionally come from a restricted, silty facies that apparently does not occur in south-central Utah, but the potential is high for good vertebrate material in the flat pebble conglomerate facies within the monument. Vertebrate bone fragments recovered during this survey were undiagnostic, but the Kayenta does have a number of vertebrate tracksites (figures 9a-b) and has the potential for many more. The formation also has several large petrified logs preserved in the monument near the White Cliffs.

Figure 9a. *Flag Point dinosaur trackway (Ka002T) in the Jurassic Kayenta Formation, Kane County, Utah.*

Figure 9b. *Rock art panel near the Flag Point dinosaur trackway (Ka002T), depicting dinosaur tracks.*

Navajo Sandstone

The Lower Jurassic Navajo Sandstone consists of white to gray, very fine- to fine-grained, cross-bedded sandstone (figure 10), with a few 1- to 2-meter-thick (3.3-6.6 ft) units of thin-bedded, gray limestone (figure 11). The sandstone cross-bed sets can be up to 15 meters (50 ft) thick (Peterson and Pipiringos, 1979) and the formation as a whole ranges from 120 to 420 meters (396-1,386 ft) thick, although in Zion Canyon it is up to 670 meters (2,211 ft) thick

Figure 10. *Navajo Sandstone exposures near the White Cliffs, Kane County, Utah.*

Figure 11. *Theropod dinosaur track (*Eubrontes*) from limestone bed at the West Swag site (Ka570T), Navajo Sandstone, Kane County, Utah.*

(Doelling, 1975). The Navajo usually weathers into high cliffs and steep, narrow canyons and thus is best exposed along the White Cliffs and in the Escalante Canyons area. The formation most likely represents eolian sand dune environments containing some lacustrine interdune areas (Doelling and Davis, 1989). The Navajo contains a limited number of fossils regionally, including tritylodontid reptiles and the dinosaurs *Segisaurus* and *Ammosaurus*, and dinosaur and other vertebrate footprints (Weishampel, 1990). The animals are similar to those of the underlying and intertonguing Kayenta Formation.

The Navajo is well exposed within the monument, though prospecting a vast area of the formation turned up only a few tracksites (figure 11). Still, the localities have produced several ichnogenera that were previously unknown within the monument (figure 12), and continued exploration of the interdune limestones and duneface sand facies should reveal more localities.

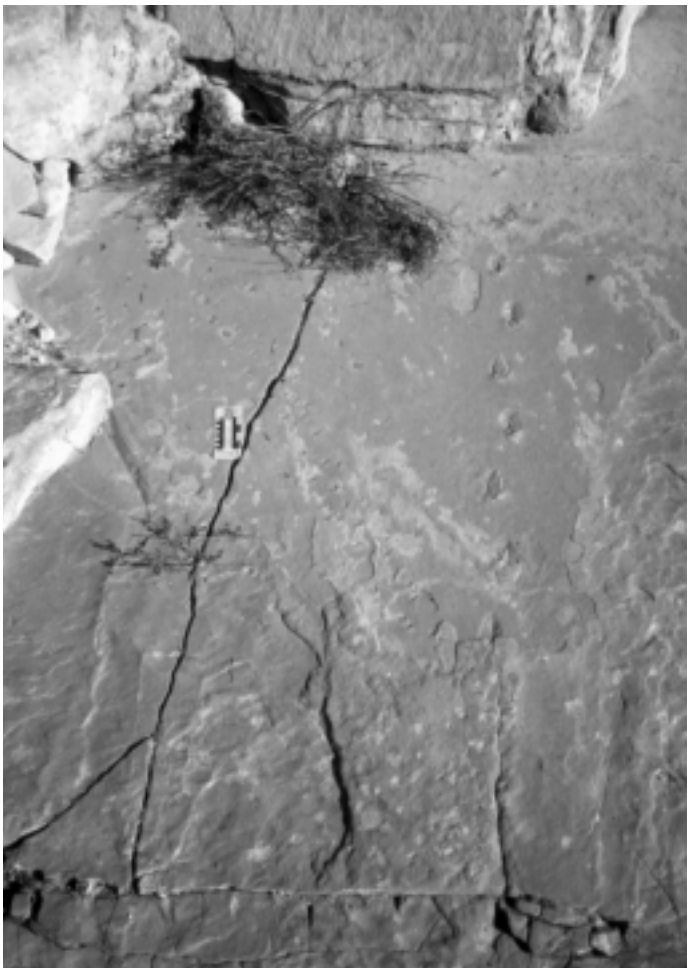

Figure 12. *Stokes Navajo tracksite (Ga001T), in a road cut along Highway 12, Navajo Sandstone, Garfield County, Utah.*

Page Sandstone

The Middle Jurassic Page Sandstone consists of red or light-gray, cross-bedded sandstone (Peterson and Pipiringos, 1979). It is separated from the underlying Navajo Sandstone by an unconformity, though it is similar in lithology to the Navajo and for a long time was included with it. The paleoenvironment may have been similar to that of the Navajo Sandstone. Two tongues of the Page extend northwestward from the type locality near Lake Powell and intertongue with the Carmel Formation. These tongues are the lower Harris Wash Tongue and the upper Thousand Pockets Tongue. The Page as a whole is about 56 meters (185 ft) thick at the type locality, but can be up to 88 meters (290 ft) thick (Peterson and Pipiringos, 1979). There have been no reports of fossil material from the Page.

The Page was not heavily prospected during this survey, but one possible vertebrate track was located. As Middle Jurassic terrestrial vertebrate skeletons are nearly unknown in North America, further prospecting of these rocks is clearly warranted.

Figure 13. *Carmel section at The Cockscomb, along U.S. Highway 89, Kane County, Utah.*

Carmel Formation

The Middle Jurassic Carmel Formation consists of reddish-brown, tan, golden-yellow, and gray units of sandstone, siltstone, and shale, with some limestone. The formation is about 30 to 100 meters (99-330 ft) thick (Peterson and Pipiringos, 1979) and generally thins eastward. The Carmel is exposed along the flats east of the Straight Cliffs, along Highway 89 east of The Cockscomb (figure 13), and above the White Cliffs between Skutumpah Terrace and Cannonville. The sediments represent shallow marine environments at the southwestern extent of an epicontinental sea that, during the Middle Jurassic, extended from Montana and western Wyoming down into central and western Utah (Imlay, 1980; Blakey and others, 1983). Fossils known from the Carmel include stromatolites, foraminiferans, radiolarians, corals, crinoids, brachiopods, bryozoans, starfish traces, bivalves, gastropods, ammonoids, ostracodes, invertebrate trace fossils, and dinosaur tracks (Nielson, 1990; Tang and Bottjer, 1997; Wilson, 1997; Lockley and others, 1998).

The Carmel is not particularly fossiliferous within the monument, and prospecting, mostly in the area southwest of Cannonville, turned up only a few localities. The Carmel is apparently more fossiliferous to the west of the monument, and the paucity of fossil material in the prospected areas may be a result of the original hypersalinity of the Carmel sea in this region (Fred Peterson, U.S. Geological Survey, written communication, 1998).

Entrada Sandstone

The Middle Jurassic Entrada Sandstone consists largely of reddish cross-bedded sandstone, tan and reddish-brown siltstone, and white to gray, large-scale cross-bedded sandstone. Overall, these lithologies correspond to the lower, middle, and upper members, respectively, of Zeller and Stephens (1973) and, more roughly, to the Gunsight Butte, Cannonville, and Escalante Members of Thompson and Stokes (1970). The Entrada is well exposed along Fiftymile Bench below the Straight Cliffs, as well as east of Cannonville and south of the Kaiparowits Plateau. It is less well exposed along The Cockscomb and southwest of Cannonville toward Kanab. The Entrada ranges from 0 to 270 meters (0-891 ft) thick and represents mainly eolian sand dune, interdune, tidal flat, and sabkha paleoenvironments. Other than dinosaur tracks and the external mold of the primitive crocodilian *Entradasuchus* from near Moab, Utah, few fossils are known from the Entrada.

Figure 14a. *Twentymile Wash dinosaur tracksite (Ga481T), from the Middle Jurassic Entrada Sandstone, Garfield County, Utah.*

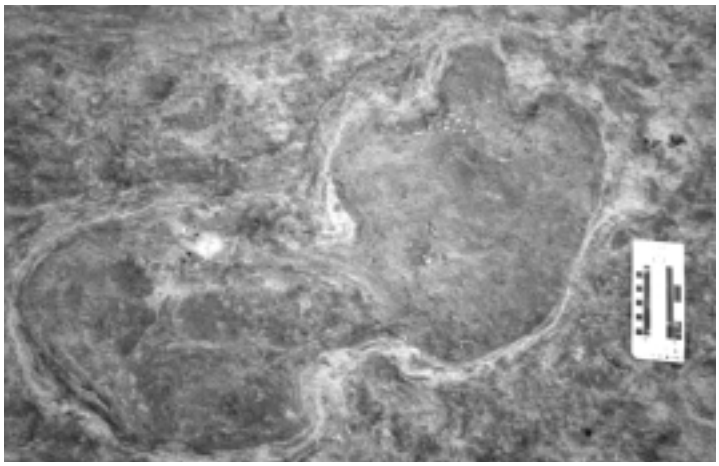

Figure 14b. *Dinosaur tracks at the Twentymile Wash dinosaur tracksite (Ga481T), Entrada Sandstone.*

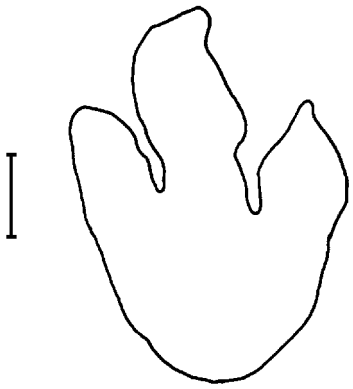

Figure 14c. *Outline of theropod dinosaur track from the Entrada Sandstone, Twentymile Wash dinosaur tracksite (Ga481T). Scale bar = 10 cm.*

Figure 15. *Exposures of the Upper Jurassic Morrison Formation, Straight Cliffs area, Garfield County, Utah.*

Figure 16*. Dakota-Tropic-Straight Cliffs section, looking north across Chimney Rock Canyon towards Jack Riggs Bench, Coyote Bench, northwest of Big Water, Kane County, Utah.*

The Entrada Sandstone had not produced any known fossil material in the monument prior to this survey (Gillette and Hayden, 1997), but a dinosaur tracksite was found near the top of the formation along the Straight Cliffs area (figures 14a-c), and we thus prospected other Entrada outcrops between Escalante and Fiftymile Mountain. We did find several tracksites within a few kilometers of the original and largest site, but unfortunately did not find any others along the Straight Cliffs (Foster and others, 2000). These track localities are significant in that they are some of the first to be found in the Entrada outside of the area around Moab, Utah.

Morrison Formation

The Upper Jurassic Morrison Formation consists of varying amounts of tan to white sandstone and conglomerate, red, maroon, gray, and green mudstone, and thin gray limestone. It is exposed within the monument mainly along Fiftymile Bench and just southwest of Fiftymile Mountain, north of Lake Powell (figure 15); it is not present west of the Kaiparowits Plateau where the overlying Dakota Formation lies directly on the Entrada Sandstone. The Morrison is up to 220 meters (726 ft) thick along Fiftymile Bench, and the members include the Tidwell, Salt Wash, Fiftymile, and Brushy Basin Members (Peterson and Turner-Peterson, 1987). The Tidwell is the basal member between the Entrada Sandstone and the Salt Wash; near the town of Escalante, the member overlying the Salt Wash is, as in other regions, the mudstone-rich Brushy Basin, but this upper member intertongues with the more sandy Fiftymile Member farther to the southeast. The paleoenvironment of the Morrison is a relatively low floodplain, with a system of rivers, ponds, lakes, and some playas and dune fields, extending from northern Arizona and New Mexico up into northern Montana (Dodson and others, 1980). Abundant fossils are known from the formation regionally, including plants, gastropods, bivalves, insect traces, conchostracans, crayfish, fish, lizards, sphenodontids, frogs, diverse small mammals, salamanders, crocodilians, pterosaurs, turtles, and more than 20 genera of dinosaurs (Chure and others, 1998).

The Morrison Formation within the monument proved to be generally less fossiliferous than in many other areas of the Colorado Plateau. Still, some significant sites were found. In particular, some of the best petrified logs known from the Morrison are within the monument.

Dakota Formation

The Dakota Formation in southern Utah is mostly Late Cretaceous (Cenomanian) in age (am Ende, 1991) and consists of sandstone, shale, and some coal. The lower member, which may be Early Cretaceous in age, is mostly conglomeratic sandstone; the middle member consists of interbedded sandstone and shale with some coal; and the upper member is mainly sandstone (Doelling and Davis, 1989). The Dakota is exposed along the Straight Cliffs, south of the Kaiparowits Plateau (figures 16 and 17), and up The Cockscomb to the area near Cannonville and Tropic. It is also present east of Bryce Canyon where many important microvertebrate localities have been recognized. The Dakota can be up to about 80 meters (264 ft) thick, and the middle member is the thickest, with the upper and lower members each typically just 10 to 15 meters (33-50 ft) thick. The Dakota represents, upward through its section, a general transition from fluvial to lagoonal and swamp to shallow, brackish, marine paleoenvironments (Doelling and Davis, 1989; Gustason, 1989). The upper member of the Dakota contains abundant marine molluscs, including ammonites and oysters, while the middle member contains plants, fish, freshwater rays and sharks, salamanders, lizards, crocodiles, turtles, dinosaurs, mammals, and freshwater bivalves and gastropods (figures 18-21) (Eaton, 1991; Eaton and others, 1997, 1999; Kirkland, 1987; Kirkland and others, 1998). Dinosaur eggshell has also been found (J.I. Kirkland, Utah Geological Survey, 1999,

Figure 17. *Overview of the Dakota Formation, Tropic Shale, and Straight Cliffs Formation, from the Smoky Mountain Road, Kane County, Utah.*

Figure 18. *Oyster coquina (*Exogyra [Costagyra] olisiponensis*) in the top 1 meter of the Dakota Formation at Blue Trail.*

verbal communication).

The Dakota Formation is reasonably fossiliferous and by prospecting and reinvestigating known sites during this survey, we identified several ammonoid and bivalve genera that had previously not been reported from within the monument. The earlier work of Jeff Eaton and Rich Cifelli (Eaton and Cifelli, 1988; Eaton, 1991) has revealed that the Dakota also contains significant earliest Late Cretaceous mammal localities, mostly within the monument. Additionally, the formation has been recognized as preserving the last remnant of an archaic freshwater fish fauna of largely Jurassic aspect (Kirkland, 1987). Some of these unique late Cenomanian fossil localities are as rich as any known in the Cretaceous, with all known species collected unique to this time and region.

Tropic Shale

The Upper Cretaceous Tropic Shale is late Cenomanian to middle Turonian (93-89 Ma) in age (Eaton, 1991) and consists almost entirely of dark gray mudstone. It is

Figure 19. Pycnodonte newberryi *and* Costagyra, *bivalves that are common at the top of the Dakota Formation.*

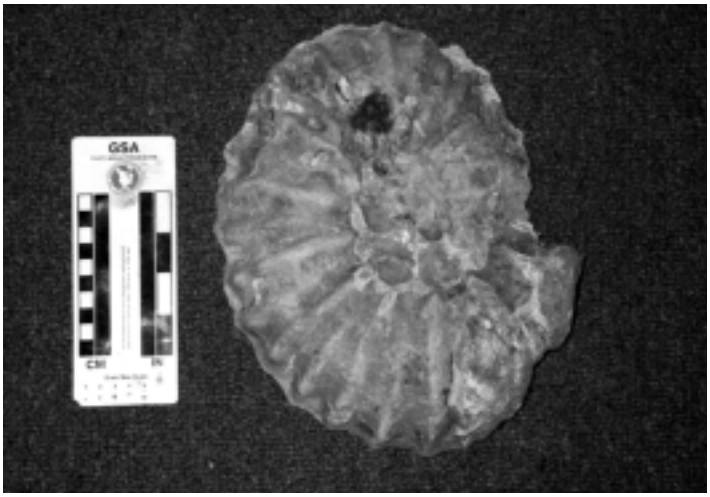

Figure 20. *?*Calycoceras *sp., an ammonite from the top of the Dakota Formation.*

Figure 21. *Fossil leaf from the Dakota Formation.*

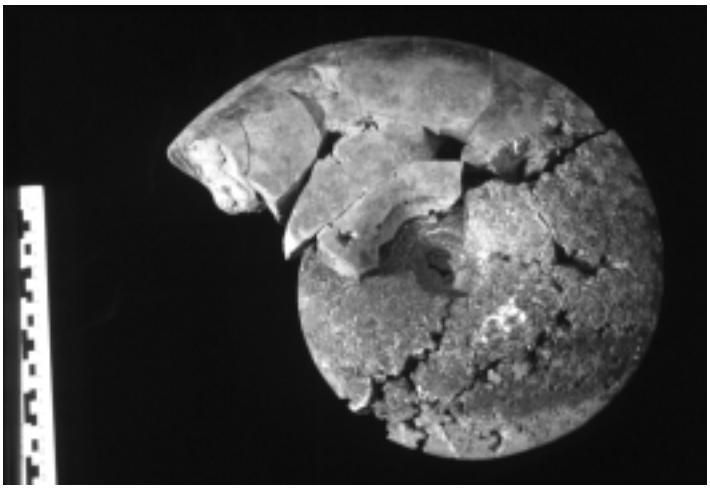

Figure 22. Placenticeras cumminsi, *a typical ammonite from the Tropic Shale.*

exposed south of the Kaiparowits Plateau (figures 16 and 17), along The Cockscomb, and in the area north of the town of Tropic, and is present but not particularly well exposed along the base of the Straight Cliffs south of Escalante. The Tropic Shale is generally about 150 to 300 meters (495-990 ft) thick (Doelling, 1975; Eaton and others, 1987), and represents a marine environment. Fossils found in the Tropic include corals, bivalves, gastropods, scaphopods, ammonoids (figure 22), crabs, invertebrate trace fossils, sharks, fish, and marine reptiles (Gillette and Hayden, 1997). The basal Tropic Shale is exceptionally fossiliferous and contains a particularly well-studied sequence of fossils spanning the Cenomanian-Turonian extinction event (Elder, 1987, 1989, 1991). Many of the molluscan taxa from this interval are unique to the southern Colorado Plateau (Stanton, 1893; Koch, 1977; Kirkland, 1996).

The Tropic Shale produced a number of fossils during the survey, including shark teeth and several bivalves and ammonoids not previously recognized from the monument. It should be noted that, because of the continuity of marine sediments, most of the fossil-bearing horizons within the Tropic Shale are continuous throughout the monument.

Straight Cliffs Formation

The Upper Cretaceous Straight Cliffs Formation is middle Turonian to earliest Campanian (89-84 Ma) in age (Eaton, 1991) and consists of four members containing differing amounts of tan sandstone, gray shale and mudstone, and coal. The members are, in ascending order, the Tibbet Canyon, Smoky Hollow, John Henry, and Drip Tank (figure 23). Most of the coal occurs in the Smoky Hollow and John Henry Members, and this is the most productive formation for coal in the monument area. The formation is well exposed along the Straight Cliffs south of Escalante, in much of the southern and eastern Kaiparowits Plateau

Figure 23. *The Straight Cliffs section (Tibbet Canyon, Smoky Hollow, John Henry, and Drip Tank Members) looking north to the confluence of Tibbet Canyon and Smoky Hollow, Kane County, Utah.*

Figure 24. *Dinosaur track casts (above hammer) from a coal seam in the lower John Henry Member of the Straight Cliffs Formation (Ka301T), Kane County, Utah.*

(figure 23), and up The Cockscomb to the vicinity of Henrieville and Tropic. The whole formation is about 420 meters (1,386 ft) thick on average (Doelling and Davis, 1989), and represents a mixture of fluvial, swamp, coastal floodplain, and shallow marine environments. A diverse assemblage of fossils is known from the Straight Cliffs Formation, including plants, gastropods, bivalves, ammonoids, crabs, invertebrate traces, marine and freshwater sharks, rays, bony fish, salamanders, frogs, turtles, lizards, crocodiles, pterosaurs, many types of dinosaurs, numerous mammals, and dinosaur tracks (figures 24 and 25) (Eaton and Cifelli, 1988; Cifelli, 1990a; Eaton, 1991, 1995; Eaton and others, 1997, 1999; Gillette and Hayden, 1997; Hamblin, 1998; Kirkland and others, 1998; Hamblin and Foster, 2000).

The Straight Cliffs Formation has in the past produced a number of important mammalian taxa (Eaton and Cifelli, 1988; Cifelli, 1990a), and most (if not all) of these vertebrate fossil sites have produced new taxa unique to North America and the world. These studies are in their very

***Figure 25**. Mold of a fossil log from the Drip Tank Member of the Straight Cliffs Formation in Tibbet Canyon, Kane County, Utah.*

***Figure 26a.** Wahweap Formation exposures at the ceratopsian skull locality (Ka536V); view looking southeast to Nipple Butte, Kane County, Utah.*

preliminary stages, since most of the outcrop area has not been surveyed, and the identified fossil groups have not been studied. During this survey, several ammonoid and bivalve genera were identified in the Straight Cliffs that had not been reported from the monument before. Overall, the formation is reasonably fossiliferous, and most outcrops contain at least some material.

Wahweap Formation

The Upper Cretaceous Wahweap Formation is early Campanian (84-80 Ma) in age and consists of gray mudstones and brownish sandstones, having a total formation thickness of about 330 to 450 meters (1,089-1,485 ft). It is well exposed on the Kaiparowits Plateau and represents fluvial channel and floodplain environments (Eaton, 1991). A diverse collection of fossils is known from the Wahweap, including plants, bivalves, gastropods, sharks, fish, turtles, lizards, crocodilians, dinosaurs, dinosaur tracks, and many types of mammals (figures 26-28) (Cifelli, 1990b, 1990c; Gillette and Hayden, 1997; Kirkland and others, 1998;

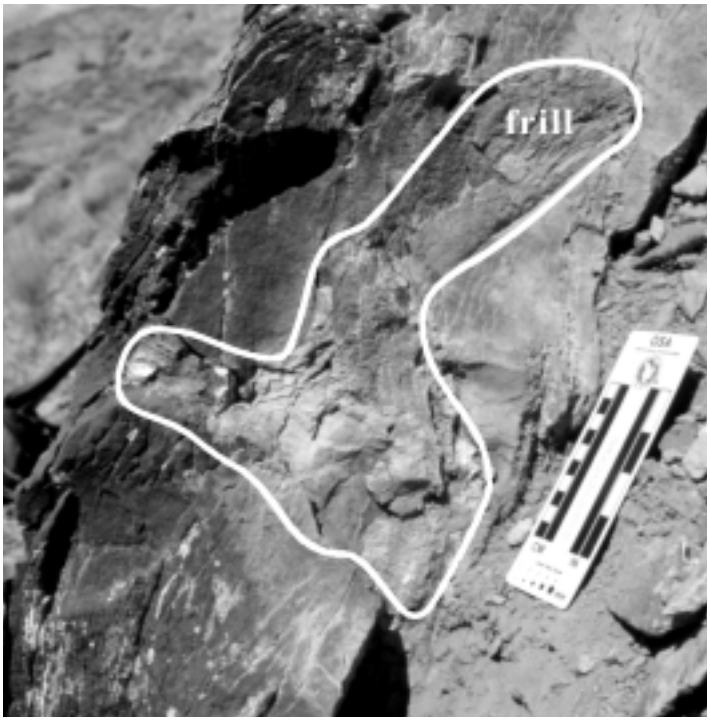

***Figure 26b**. Close-up of ceratopsian skull locality (Ka536V), Wahweap Formation.*

***Figure 27.** Fossil tree with root ball intact, Wahweap Formation, southeast of The Gut (Ka611P), western Kaiparowits Plateau, Kane County, Utah.*

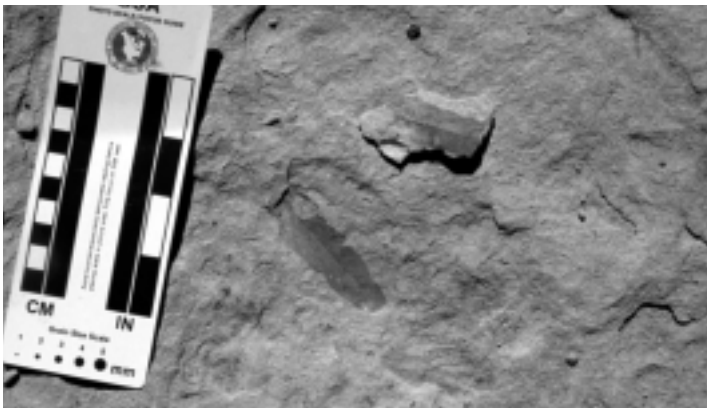

***Figure 28.** Fossil leaf from the Wahweap Formation near Tibbet Spring (Ka680VP), Kane County, Utah.*

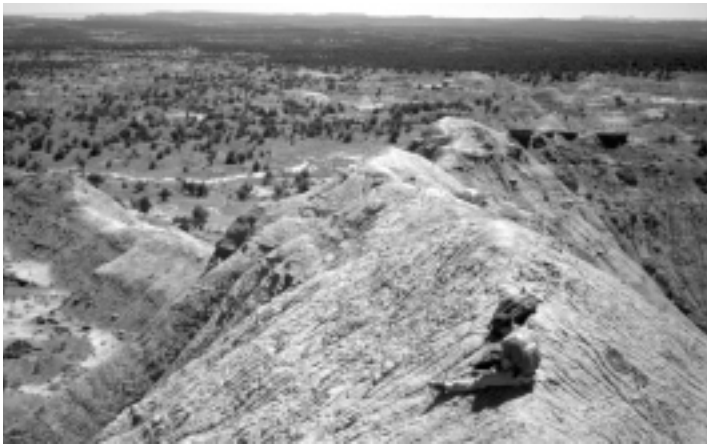

Figure 29. *Kaiparowits Formation exposures, view looking southwest at a dinosaur locality from a low spur on Horse Mountain, Kane County, Utah.*

Figure 30. *Articulated hadrosaur vertebrae (Ka352VP) from the Kaiparowits Formation, Kane County, Utah.*

Eaton and others, 1999; Hamblin and Foster, 2000).

The Wahweap Formation is generally fossiliferous, but in many cases the material is quite fragmentary. Some of the more significant finds in the formation in the past were several mammal sites reported by Cifelli (1990b, 1990c). Dinosaur skeletal remains are known from a number of areas, but are all unexcavated. Due to the limited skeletal material of early Campanian age (mainly Milk River Formation of Alberta, Canada), excavation of dinosaur remains from this formation should prove significant. The discovery of a ceratopsian dinosaur during this survey is the first definitive discovery of a horned dinosaur in the Wahweap Formation, and represents an undescribed species as no early Campanian horned dinosaur has ever been named in North America (figure 26). Additional dinosaur skeletal remains have now been recognized and await excavation and study.

Kaiparowits Formation

The Upper Cretaceous Kaiparowits Formation is late Campanian (80-75 Ma) in age and consists mainly of gray mudstones and soft-weathering sandstones, containing a few resistant, dark brown sandstone beds. The formation is well exposed in the upper Kaiparowits Plateau, particularly from Fourmile Bench up to The Blues. The thickness of the Kaiparowits Formation ranges from 780 to 910 meters (2,574-3,003 ft) (Doelling and Davis, 1989). The paleoenvironment was fluvial channels and floodplains that were, like the terrestrial deposits represented in underlying formations, on the western shore of the Western Interior Seaway (Roberts and Kirschbaum, 1995). The fossil material known from the Kaiparowits Formation includes plants, bivalves, gastropods, sharks, fish, amphibians, turtles, lizards, crocodiles, many types of mammals, and diverse dinosaur tracks and dinosaurs, including ceratopsians, hadrosaurs, tyrannosaurids, nodosaurids, and ornithomimids (Weishampel and Jensen, 1979; DeCourten and Russell, 1985; Eaton and Cifelli, 1988; Cifelli, 1990d; Gillette and Hayden, 1997, Kirkland and others, 1998; Eaton and others, 1999; Hamblin and Foster, 2000). Additionally, dinosaur eggshell fragments are abundant throughout much of the formation.

The Kaiparowits Formation is richly fossiliferous, and though most material is fragmentary, several potentially significant specimens were identified during this study, including partial turtles and partially articulated dinosaurs (figures 29 and 30). Some of the more important earlier finds were those of an ornithomimid dinosaur (DeCourten and Russell, 1985), the hadrosaur *Parasaurolophus* (Weishampel and Jensen, 1979), an abundance of well-preserved mammals near Wahweap Creek and other sites (Cifelli, 1990c, 1990d), and the partial skeleton of the large primitive bird *Avisaurus*, which was so well preserved that even the keratin over the wing claws was included (Hutchison, 1993).

Canaan Peak Formation

The Canaan Peak Formation is considered to be Latest Cretaceous to Paleocene in age, but is poorly dated. The 12- to 300-meter-thick (40-1,000 ft) cliff former consists of a coarse cobble conglomerate deposited by eastward-flowing braided rivers and rests unconformably on the Kaiparowits Formation. It is found only in the northern part of the monument (Eaton, 1991; Schmitt and others, 1991). Pollen recovered from the lower part of the formation indicates an early to middle Campanian age (Bowers, 1972), but is thought to be reworked from older rocks based on the diverse late Campanian vertebrate fauna in the thick underlying Kaiparowits Formation (Eaton, 1991).

No fossils were observed in the Canaan Peak during the course of this survey.

Claron Formation

The Claron Formation is believed to be Paleocene to

Eocene in age and ranges in thickness from 500 to 575 meters (1,650-1,897 ft) (Doelling, 1975). It consists mainly of pink to white limestone with some sandstone, conglomerate, and pyroclastics, and is exposed just outside the northwestern part of the monument. The Claron sediments appear to be lacustrine with some fluvial influence, and the fossils known from the formation are mainly plant impressions, palynomorphs, gastropods, and bivalves.

The only fossil material identified from the Claron during this survey were several gastropods contained in a piece of the formation that had eroded down onto the Tropic Shale.

IMPORTANT SITES

This section provides details of some of the localities investigated during our survey that have particularly interesting paleontological resources. The sites may have abundant fossils of relatively more common taxa or may have rare or unusually well-preserved specimens. Not all previously known important sites are listed, as many of these have already been published (see formations section), but we include previously known sites for which we found additional material. Locality names are followed by both the UGS locality number and Sensitivity Level classification in parentheses. A complete listing of sites known through 1999 can be found in the appendix, which is a listing of all paleontological localities recorded in the Utah Geological Survey database.

Kaibab Limestone (Permian)

Fivemile Mountain II (Ka554I: Class III)

This site is in a thick, tan limestone, and is along approximately 100 meters (330 ft) of outcrop that contains abundant crinoid stems and both branched and fenestellid-type bryozoans, along with some brachiopods and rugosid corals. It thus has one of the most diverse and abundant assemblages of invertebrates found in the Kaibab during the survey.

Head of Buckskin Gulch (Ka503I: Class I)

This site contains corals, crinoids, bryozoans, brachiopods, and sponges, including the first *Actinoceolia* known from the Kaibab within the monument.

Moenkopi Formation (Lower Triassic)

Canyon View (Ga464T: Class III)

This site is at a low ledge-forming outcrop of thin sandstones and thin, platy shales in the lower Moenkopi, west of Wolverine Loop Road in the Circle Cliffs area. Tracks were found in one level of the outcrop and are preserved as natural casts and impressions in slabs of thin-bedded siltstone (up to ~7 mm [0.28 in] thick). There are hundreds of limulid (horseshoe crab) tracks on the slabs at the site and at least five good trackways have been found so far (figure 5).

Studhorse East (Ga467T: Class II)

This locality right along the Burr Trail Road in the Circle Cliffs area consists of a sandstone block with a natural cast manus / pes set of a small vertebrate, possibly of the ichnogenus *Akropus*. The sandstone comes from a section of interbedded shale, siltstone, and sand with abundant ripple marks.

Northeast Horse Canyon (Ga468T: Class II)

This locality is in an interbedded sequence of thin, ripple-marked sandstones and shales and contains several vertebrate swim tracks preserved as natural casts. The sandstones weather out as large, flat slabs with abundant ripple marks on their surfaces.

West Horse Canyon (Ga463P: Class II)

This site contains several relatively large pieces of petrified wood. Plant material in general is relatively rare in the Moenkopi and this is the only plant locality found in this formation during the survey.

Quarry Ridge (Ka613VI: Class I)

This locality in the Virgin Limestone Member contains gastropods, bivalves, ammonites, and fragments of fish.

Chinle Formation (Upper Triassic)

Brinkerhof Spring (Ga324T: Class I)

This locality is in the northeastern Circle Cliffs area very close to the monument boundary with Capitol Reef. It is in the uppermost part of the Owl Rock Member of the Chinle Formation and consists of a bench of thin-bedded siltstone just below the cliffs of Wingate Sandstone. This site contains several dozen tracks of small reptiles; the tracks are 1 to 4 centimeters (0.4-1.6 in) long and are of two morphologies (*Rhynchosauroides* and *?Gwyneddichnium*; figure 7). In addition, there is a trackway of a large reptile with a pes length of 24 centimeters (10 in). The trackway consists of two successive left manus / pes sets and one right heel impression, as well as an apparent tail drag. Impressions of skin are preserved on some parts of some of the tracks. The front manus / pes set and part of the tail drag were on a block that had begun to erode out of the outcrop; these were collected, but much of the tail drag and the rear manus / pes set are still at the site, as are many of the small reptile tracks.

Long Canyon Pass (Ga475PT: Class II)

This site is in a thin-bedded siltstone in the Owl Rock Member above and mainly north of the Burr Trail Road, near the Circle Cliffs overlook. The site contains abundant impressions of araucarian conifer stems as well as vertebrate tracks, including those of a small theropod and the ichnogenus *Pseudotetrasauropus,* thought to represent a prosauropod dinosaur (figure 8a). One of the best-preserved specimens from the site contained, on one side, a natural cast of an araucarian conifer branch (figure 8b) and, on the other, the skin impression and partial footprint of a non-dinosaurian reptile, possibly the same type that made the big trackway at Brinkerhof Spring.

Paria Town Site (Ka232P: Class II)

This locality contains coniferous plant stems, petrified logs, seed bodies, and leaves, including material identified as *Neocalamites* (giant horsetail).

King Mine (Ka292VP: Class I)

This is a site near the Vermilion Cliffs that contains plant stem casts and metoposaur and phytosaur bones and teeth.

Paria Movie Set III (Ka557V: Class II)

This site is in the Petrified Forest Member southeast of Paria in a grayish, soft-weathering sandstone in the badlands exposure of Chinle below Gingham Skirt Butte. It produced two phytosaur teeth and contains numerous other bone fragments; it was one of the more potentially productive sites identified in the formation during this survey.

Petrified Forest Member General (Sites Ga474P, Ga476P, Ka558P: all Class III)

These sites are grouped as examples of sites demonstrating the abundance of petrified wood and logs, particularly in the Circle Cliffs area, in the Petrified Forest Member of the Chinle. Just about any Chinle locality in the Circle Cliffs can be expected to produce some petrified wood.

Shinarump Member General (Sites Ga469P, Ga470P: both Class III)

These sites are also grouped as examples of the abundance of petrified wood in the Shinarump Member, though it is less common and more fragmentary here than in the Petrified Forest Member.

Wingate Sandstone (Lower Jurassic)

Long Canyon Wingate (Ka323T: Class I)

This locality is near the base of the Wingate Sandstone cliffs in Long Canyon. It consists of the natural cast trackway of a small theropod dinosaur with pes tracks about 11 centimeters (4 in) long (*?Grallator*). This is the first record of fossil material from the Wingate in the monument.

Moenave Formation (Lower Jurassic)

Park Wash (Ka562T: Class I)

This site is near the base of the Moenave Formation in a series of thin, interbedded, fine to pebbly sandstone and shale layers below the first thick sandstone. These sandy interbedded units, which produced tracks, are interpreted as braided stream channels or bars in a sandy ephemeral stream system on the margin of the Wingate dunes (Clemmensen and others, 1989). This locality contains two small theropod tracks of the ichnogenus *Grallator*, one of which is very well preserved, and a slab with two manus/pes sets of a crocodylomorph. The same interbedded part of the lower Moenave contains tracks all along the Vermilion Cliffs between Fin Little Wash and Paria, a distance of nearly 20 kilometers (12 mi), and this unit may be expected to produce tracks almost anywhere it is exposed. Most commonly, the tracks are found on lighter colored slabs on talus slopes below the cliffs of thin, interbedded sands near the base of the Moenave.

Fin Little Overlook (Ka563T: Class III)

This is another site in the lower Moenave Formation; it contains several *Grallator* tracks and several possible tetradactyl tracks.

Fin Little II (Ka564T: Class III)

Another lower Moenave site, this locality contains many invertebrate traces in addition to a tridactyl dinosaur track that has a wide divarication of the digits and may represent *Anomoepus.*

Park Wash III (Ka565PT: Class III)

This locality contains natural casts of footprints including four isolated tracks and two short small theropod trackways, at least one of which is *Grallator.* The site is also in the lower Moenave.

Paria Movie Set IV (Ka566T: Class III)

This site contains a single natural cast track of a theropod. The track is 15 centimeters (6 in) long and is somewhat larger than most others found along the Vermilion Cliffs at this low level in the Moenave.

Kayenta Formation (Lower Jurassic)

Flag Point Tracksite (Ka002T: Class I)

This site has been known for some time and is a bit northeast of Flag Point on the rim of the Vermilion Cliffs.

The site contains more than 100 tracks and trackways of several dozen theropod dinosaurs. So far, the known tracks are all *Grallator* and *Eubrontes*. Below the site is a large panel of native rock art possibly depicting, among other things, one of the tracks (figure 9a b).

Flag Point II (Ka568T: Class II)

This locality is a little north and stratigraphically above the main Flag Point tracksite in a limestone just below the Lamb Point Tongue of the Navajo Sandstone. The site has two poorly preserved large theropod tracks (*?Eubrontes*) and one small dinosaur track with wide digit divarication, possibly *Anomoepus*.

Flag Point III (Ka567T: Class II)

This site is also north of the main site and is just downslope from Flag Point II. The site consists of numerous small to large, thin, whitish sandstone slabs (10-15 cm [4-6 in] thick) that contain a total of more than 50 tracks of small theropods (*Grallator*), including several short trackways. Also, there is at least one track of a moderately large theropod, possibly assignable to the ichnogenus *Kayentapus*.

Cockscomb West (Ka513VP: Class II)

This locality is one of very few in the Kayenta found during this survey to produce vertebrate bone fragments. Unfortunately, none of the material is identifiable.

Kayenta Koffeehouse (Ga477T: Class II)

Just south of Highway 12, across from the Kiva Koffeehouse, the Kayenta Koffeehouse tracksite is near the top of the Kayenta. The site has a dozen or so large and small theropod dinosaur tracks preserved in sandstone blocks, as well as tracks of unidentified small vertebrates.

Lower Long Canyon (Ka569T: Class II)

This site is east of Johnson Canyon Road in the basal Tenney Canyon Tongue of the Kayenta Formation. It is in a thin-bedded limestone just above an eolian sand of the Lamb Point Tongue of the Navajo Sandstone. The site contains two tracks of small theropod dinosaurs, each about 10 centimeters (4 in) long and on isolated slabs of limestone that have fallen out of the outcrop.

Calf Creek Trail (Ga478T: Class IV)

This site has three short, poorly preserved trackways of medium-sized ?theropods on a sandstone block several tens of meters off the Lower Calf Creek Falls trail.

Navajo Sandstone (Lower Jurassic)

West Swag (Ka570T: Class II)

This locality is west of Nipple Lake and just north of the road in a fairly prominent 1- to 2 meter-thick (3-7 ft) unit of limestone and minor sandstone between eolian units of the Navajo. The site has three natural cast tracks of small dinosaurs (probably the ichnogenus *Anomoepus*) as well as four large *Eubrontes* impression tracks (figure 11), one of which is quite deep and reasonably well preserved. There is also one odd vertebrate track that seems to have been impressed into one of the previously made ?*Anomoepus* tracks.

Park Wash II (Ka571T: Class II)

This site is in a dune-face deposit of the Navajo very close to the road along Park Wash and contains 10 or so tracks of the small non-dinosaurian ichnogenus *Brasilichnium*. These are believed to have been made by synapsid (mammal-like) "reptiles."

Stokes Navajo Tracksite (Ga001T / Ga322T: Class I)

This site was originally found by W. L. Stokes (Stokes, 1978) and relocated during this study. The site is on an exposed dune-face deposit in a road cut of Highway 12 several miles south of the Escalante River (figure 12). The tracks include two small theropod trackways and four trackways of *Brasilichnium*. The theropod trackways may be *Grallator*, but are too poorly preserved to be certain. This site should be protected and interpreted.

Stokes Area North (Ga479T: Class II)

This site is several hundred meters from Ga322T and consists of numerous invertebrate trails on a dune-face deposit. Few other eolian outcrops in the Navajo have invertebrate trails preserved.

Page Sandstone (Middle Jurassic)

Powerlines (Ka579T: Class IV)

This site is in a canyon north of West Clark Bench and is in the Thousand Pockets Tongue of the Page Sandstone, between tongues of the Carmel Formation. A white, cross-bedded sandstone here preserves a possible small theropod track that may represent one of the first fossil occurrences in the Page.

Carmel Formation (Middle Jurassic)

Paria Valley (Ka075I: Class IV)

This locality contains the bivalve *Pronoella* and the gastropod *Cossmannea*, neither of which had previously been reported from within the monument in the Carmel.

North Hackberry I and II (Sites Ka578T and Ka576T: both Class III)

These sites are in the lower Carmel Formation at the extreme north end of Hackberry Canyon, and have abundant, large invertebrate trails in a formation that is commonly quite barren of fossils within the monument.

No Name Canyon (Ka577T: Class III)

This locality is also in the lower Carmel. It is several kilometers east of Hackberry Canyon, but has similar invertebrate traces.

Lone Pine Point (Ka572I: Class III)

This site is just above the Navajo in the lower Carmel and is a bed with abundant oysters; it is one of very few in-place examples of abundant fossil material in the Carmel identified in this survey.

Entrada Sandstone (Middle Jurassic)

Twentymile Wash Tracksite (Ga481T: Class I)

This locality is on a large sandstone bench just north of Collet Top Road along the Straight Cliffs. Some 250 tracks in more than 30 trackways of reasonably large theropod dinosaurs were identified here (figure 14); some trackways are 30 meters (100 ft) in length. A trackway of a large quadrupedal dinosaur with possible tail drag marks is also present at this site. The tracks occur in three levels in the upper part of the Entrada and were probably made on a wet tidal flat or interdune area, as much of the underlying sandstone (and some above) is eolian in origin. These are the first fossils of any type identified in the Entrada Sandstone within the monument.

Twentymile Wash Surrounding Sites (Ga480T, Ga482T, Ga483T: all Class I)

These sites are all within several kilometers of the main Twentymile Wash tracksite and are at the same stratigraphic level in the Entrada. The sites all contain tracks and trackways of large theropods, with similar preservation to the main site. The Cattle Tank locality (Ga483T) has about five tracks, Twentymile Wash West (Ga480T) more than 25, and the Right Hand Bowl locality (Ga482T) more than 50 tracks.

Morrison Formation (Upper Jurassic)

Cedar Wash (Ga488V: Class II)

This site is on the top of a small, round butte just north of Cedar Wash Road. A single goniopholid-type crocodilian tooth was found in a pebbly sandstone in the Salt Wash Member. This is the only vertebrate material found in the Morrison during the survey that could be identified to any reasonable level; all other material was fragmentary.

Croton Bench (Ka580T: Class III)

This locality north of Lake Powell in a very sandy part of the upper Morrison (Fiftymile Member) contains three possible sauropod track natural casts. The casts are composed of sandstone and extend down into mudstone, and if these are indeed tracks, the site would be one of the southwestern-most localities for sauropod tracks in the Morrison.

Sand Ridge (Ga487T: Class III)

This is a locality in the lower Morrison north of Twentymile Wash, along the Straight Cliffs. A single structure in a sandstone block here may be a rhizolith with evidence of a termite nest. These structures are not uncommon in the Morrison in other areas (Hasiotis and Demko, 1998), and their occurrence here would not be surprising.

Little Desert (Ga489P: Class II)

This site is just west of Escalante and south of Highway 12, and preserves about two dozen sections of petrified logs as well as smaller fragments of petrified wood.

Green Bowl (Ga443P: Class II)

This locality is a bit west of Ga489P and has similar petrified logs. Although petrified wood is not uncommon in the Morrison in other regions, these sites are interesting because large petrified logs do not commonly occur in the Morrison.

Dakota Formation (Upper Cretaceous)

Paria River Bluff (Ka028I: Class III)

This site contains the bivalve *Pycnodonte* and the ammonoid *Calycoceras*, the latter of which was previously unreported from the Dakota within the monument.

West Wahweap Creek (Ka387I: Class III)

A rather large (~25 cm [10 in]) oyster (*Ostrea*) was found in a sandstone near the top of the Dakota at this locality.

Nipple Creek (Ka102IT: Class III)

This locality also contains *Pycnodonte*, as well as the arthropod trace fossil *Ophiomorpha*.

Oyster Pavement (Ka581I: Class III)

This site is along a road east of Cottonwood Creek Road. The road, as well as the slopes on either side, are covered with oysters and oyster fragments from the upper Dakota.

Cad's Crotch North (Ka402I: Class IV)

This site near the top of the Dakota contains the oyster *Flemingostrea*.

Grosvenor Arch I (Ka399VIP: Class II)

This locality, in a sandstone just east of the arch, contains turtle bones, fish teeth, and plant stems, as well as the bivalves *Anodonta, Rhabdotophorus,* and *Protelliptio*.

Grosvenor Arch II (Ka288IP: Class I)

This site contains abundant *Inoceramus* fossils as well as an external mold of the ammonite *Metoicoceras* ?*mosbyense*. This is one of the more western occurrences of this ammonite species within the monument.

Cave Point Creek (Ka584I: Class IV)

This locality is in the extreme southeastern part of the monument just off Hole-in-the-Rock road. It has a block of sandstone with abundant oysters, most probably from the Dakota, on a slope composed of an eroding Quaternary stream gravel terrace.

Yellow Creek (Ga521I: Class IV)

This site contains the oysters *Ostrea* and *Crassostrea*.

Henrieville Creek I (Ga406I: Class IV)

This locality contains the bivalves *Brachiodontes* and *Crassostrea*.

Henrieville Creek II (Ga514IP: Class III)

This site contains the previously unreported gastropod *Viviparus*, as well as well-preserved plant stems and angiosperm leaves.

Tropic Shale (Upper Cretaceous)

Walt Slope (Ga495V: Class II)

This site is a few kilometers north of the town of Tropic and is a slope of Tropic Shale below Walt Bench. It produced a single, large, well-preserved shark tooth.

Nipple Creek Trail (Ka692I: Class III)

This locality is in the lower Tropic and contains, in concretions, several types of ammonoids, including *Euomphaloceras, Worthoceras,* and *Pseudocalycoceras*.

Hattie Green (Ka606I: Class III)

Several different types of ammonoids are found at this site low in the Tropic. Inoceramid bivalves and gastropods occur here also.

Cottonwood Wash (Ka609I: Class II)

This site contains several types of ammonoids and is one of several in the Tropic to produce the bivalve *Pycnodonte*.

Straight Cliffs Formation (Upper Cretaceous)

Walt Bench (Ga496VI: Class III)

This site is in the basal Smoky Hollow Member of the Straight Cliffs Formation north of Tropic and contains fossils all along the top of the bench. The most abundant fossils found here are oysters, which occur by the thousands on the ground and in a 2- to 3-meter-high (7-10 ft) sandstone ledge. Abundant clams and a shark tooth were also identified during the survey, as well as the crustacean ichnogenus *Ophiomorpha*.

South Smoky Mountain (Ka171VIP: Class I)

This locality is in the lower Drip Tank Member of the Straight Cliffs and contains dinosaur ribs, teeth, and vertebrae, as well as plant stems.

Upper Surprise Valley (Ka586P: Class III)

This locality consists of abundant plant material, including several nearly complete angiosperm leaf impressions, from light-colored siltstone fragments on a talus slope. The abundance of material here indicates good potential if the producing level could be located precisely.

Horse Creek II (Ga503VIP: Class III)

This site contains abundant bivalves, gastropods, and plant fragments, as well as an indeterminate, large dinosaur bone and a mold of a shark tooth. All the material originates in a channel sandstone.

Horse Creek III (Ga502P: Class IV)

This site consists of a single, fairly well-preserved angiosperm leaf impression in a sandstone.

Kelly Grade (Ka143I: Class I)

This locality in the Tibbet Canyon Member contains gastropods and oysters and other bivalves, including *Brachiodontes*.

The Scorpion (Ka301T; Ka518T; Ka605T: Class II)

These sites are in coal seams in the lower John Henry Member and contain several casts of possible dinosaur tracks (figure 24).

Wahweap Formation (Upper Cretaceous)

Josh's Ceratopsian Skull, North Nipple Butte (Ka536V: Class I)

This locality is just north of Nipple Butte and is in a

brown, cross-bedded sandstone. A relatively complete ceratopsian dinosaur skull with jaw elements is encased in the sandstone (figure 26), and nearby are fragmentary remains of a turtle and a microvertebrate site. It is difficult to tell exactly how much of the ceratopsian skull is still in the outcrop, but it appears to contain much of the jaws and frill.

Jorge's Cliffs (Ga501VIP: Class II)

This site up on the slopes and cliffs north of Highway 12 contains relatively abundant bone material in the sandstones and pebbly sandstones. Taxa identified include gar fish, a crocodile, indeterminate dinosaurs, a theropod dinosaur, bivalves, and gastropods. Most of the material is fragmentary, but there appears to be good potential at the site.

Little Valley View (Ga507VIP: Class III)

This locality is near an anthill in the Wahweap and contains gastropods, turtles, gar fish, and petrified wood.

Southeast Gut (Ka611P: Class II)

This locality is a road cut southeast of The Gut on the western Kaiparowits Plateau and contains a partial tree trunk preserved with the root ball intact (figure 27). The fossil is in a channel sand and consists mostly of impressions of the trunk and has little petrified wood.

Little Valley Amphitheater (Ga508V: Class III)

This is another locality that contains mostly small material, including scales, bone fragments, and gar teeth. The site is in a gray mudstone.

Kaiparowits Formation (Upper Cretaceous)

Gar (Ka239VIP: Class I)

This locality contains gastropods, bivalves, turtle bone, and indeterminate dinosaur bone, along with a possible hadrosaur dinosaur jaw bone.

End of Spur (Ka354V: Class I)

A partially articulated dinosaur and a turtle are found at this locality in a sandy blue gray-green claystone.

Whole Croc (Ka248V: Class I)

This site contains a nearly complete crocodilian and an edentulous mammal jaw.

Spur West (Ka353V: Class I)

A nearly complete soft-shelled turtle is eroding out of a sandstone at this site.

Whole Turtle (Ka247V: Class I)

A locality close to Ka248V (Whole Croc), this site contains an articulated turtle skeleton.

North Squaw Bench II (Ka594VI: Class II)

This site contains bivalves, gastropods, and a partially intact turtle shell in a channel sandstone.

Upper Long Flat (Ka352VP: Class I)

Turtle fragments, petrified wood, and a partially articulated hadrosaur dinosaur are found at this locality.

West Upper Wahweap (Ka612VIP: Class I)

This site has abundant fragmentary material of dinosaurs, turtles, crocodilians, bivalves, and plant impressions.

Claron Formation (Paleocene/Eocene)

Butler Valley North (Ka610I: Class IV)

This locality consists of limestone pieces on a slope of Tropic Shale. The limestone pieces seem to have eroded down from the Claron Formation and contain non-marine gastropods (?*Viviparus*).

FOSSIL COLLECTIONS

Fossil collections made during the course of this survey are curated at the Utah Museum of Natural History (UMNH), University of Utah, Salt Lake City, Utah. A complete list of these specimens will be available at a later date. In addition to the Utah Museum of Natural History, the following institutions also have fossil collections from the Grand Staircase-Escalante National Monument:

- Brigham Young University, Earth Science Museum, Provo, Utah (BYU ESM)
- Museum of Northern Arizona, Flagstaff, Arizona (MNA)
- Oklahoma Museum of Natural History, University of Oklahoma, Norman, Oklahoma (OMNH)
- United States National Museum, Smithsonian Institution, Washington, D.C. (USNM)
- United States Geological Survey, Denver, Colorado (USGS)
- University of California, Museum of Paleontology, Berkeley, California (UCMP)
- University of Colorado Museum, Boulder, Colorado (UCM)

There are undoubtedly many other museums, geology departments, and other institutions that also have fossil collections from the large area that is now the Grand Staircase-Escalante National Monument. A summary of all paleontological collections from the monument is beyond the scope of this report, although these important data may be compiled at a later date.

The goal of the Utah Geological Survey in maintaining a statewide paleontological database is to integrate locality data with stratigraphic and taxonomic data, to most effectively manage the state's paleontological resources. Other researchers have recently compiled paleontologic data of a limited scope, including the marine and brackish-water invertebrate fossil collections made by the U.S. Geological Survey (Pollock and others, 1997), and the Cretaceous vertebrate faunas from the Kaiparowits Plateau (Eaton and others, 1999). Museums and other institutions should be contacted individually for further information about fossils in their collections from the Grand Staircase-Escalante National Monument.

CONCLUSIONS

Most formations within the Grand Staircase-Escalante National Monument contain at least some fossil material and some formations are quite fossiliferous. Important marine invertebrate assemblages are present in several of the marine Cretaceous formations, and important Mesozoic mammal faunas exist in the terrestrial deposits of the Upper Cretaceous. Also, the older deposits of the Jurassic appear to contain a potential abundance of vertebrate tracks. Future prospecting should reveal even more fossil localities of importance within the monument boundaries.

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APPENDIX - LOCALITY DATABASE TABLE

This appendix is a locality database table of sites investigated during this survey. The following fields are included in this table:

- The UGS paleontological locality number: Co. = County; No. = Number; V= Vertebrate; I = Invertebrate; P = Plant; T = Track or Trace; and M = Microfossil
- Locality Name: (Where assigned)
- Map Name: USGS Topographic Map, 7.5' quadrangle unless otherwise noted; map name may be unknown for older localities that were not relocated during this survey
- Sensitivity Level Classification: (Where assigned)
- Class I (Critical) --Any locality producing type, very rare, or reference fossil material
- Class II (Significant) --Any locality producing rare or unusually well-preserved material
- Class III (Important) --Any locality producing common but abundant fossil material
- Class IV (Insignificant) --Any locality producing poorly preserved or less abundant but common material
- Class V (Unimportant) --Any locality producing very poorly preserved and/or less abundant material
- Map Symbol: Indicates geologic age, formation, and member (see key below)
- Miscellaneous Abbreviations: indet. = indeterminate; w = with; incl. = including; croc. = crocodilian; Hwy = Highway; N = north; S = south; E = east; W = west

This table contains only a portion of the data that were collected for these paleontological localities, and which are part of a comprehensive statewide database. Many older sites from the published literature were not relocated during this survey. Because complete data for these sites are not available, there are some gaps in the data listed in this table. The complete database also includes detailed locality and stratigraphic data and other information that are not included herein. These locality data are on file at the Utah Geological Survey.

Formation Abbreviations (Map Unit Labels) for the Paleontological Database

Tc	Claron
Kk	Kaiparowits
Kw	Wahweap
Ksd	Straight Cliffs, Drip Tank Member
Ksj	Straight Cliffs, John Henry Member
Kss	Straight Cliffs, Smoky Hollow Member
Kst	Straight Cliffs, Tibbet Canyon Member
Ks	Straight Cliffs (no member identified)
Kt	Tropic
Kd	Dakota
Jm	Morrison
Js	Summerville
Jcu	Curtis
Je	Entrada
Jc	Carmel
Jp	Page
Jn	Navajo
Jk	Kayenta
Jw	Wingate
Jmo	Moenave
TRco	Chinle, Owl Rock Member
TRcp	Chinle, Petrified Forest Member
TRcm	Chinle, Monitor Butter Member
TRcs	Chinle, Shinarump Member
TRc	Chinle (no member identified)
TRm	Moenkopi
Pk	Kaibab

Kaibab Formation Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map Symbol	Preserved Taxa
Ga	030		I				Circle Cliffs, bluffs on W side of creek at junction	Wagon Box Mesa or Moody Creek 15'		Pk	invertebrates
Ga	032		I				Section 1: White Canyon, 2 miles NW of Stud Horse Peaks, Circle Cliffs	Wagon Box Mesa 15'		Pk	invertebrates
Ga	033		I				Section 3: east-central Circle Cliffs	Wagon Box Mesa 15'		Pk	invertebrates
Ga	036		I				Section 4: North Fork Creek, Silver Falls Creek tributary, central Circle Cliffs	Wagon Box Mesa or Moody Creek 15'		Pk	invertebrates
Ga	064		I				USGS Lot 4380	Wagon Box Mesa 15'		Pk	invertebrates
Ga	065		I				USGS Lot 4381: Junction of Green River and Silver Falls Road (and in bluffs on west side of road)	Wagon Box Mesa 15'		Pk	invertebrates
Ga	462		I				Wagon Box View	Wagon Box Mesa	III	Pk	brachiopods, crinoids, bryozoans
Ka	011		I			M	Kaibab Type Section	Pine Hollow Canyon	I	Pk	crinoids, gastropods
Ka	503		I				Head of Kaibab (Buckskin) Gulch	Eightmile Pass		Pk	productid and martinoid brachiopods
Ka	504		I				Buckskin Gulch - Kaibab Type Locality	Pine Hollow Canyon		Pk	rugose coral, bryozoa, crinozoans, compositid and dityoclostid brachiopods
Ka	553		I				Fivemile Mt. 3	West Clark Bench	III	Pk	turitellid gastropods, brachiopods?
Ka	554		I				Fivemile Mt. 2	Pine Hollow Canyon	III	Pk	crinoids, brachiopods including spiriferids, rugose corals, bryozoans
Ka	555		I				Fivemile Mt. 1	Pine Hollow Canyon	IV	Pk	bivalves

Moenkopi Formation Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	006		I				USGS Mesozoic Locality 25255, Circle Cliffs	Pioneer Mesa		TRm	gastropods, *Myalina*, *Aviculopecten*, *Lingula*
Ga	007		I				USGS Mesozoic Locality 25254	Pioneer Mesa		TRm	*Myalina*, *Meekoceras*, gastropods
Ga	008		I				Circle Cliffs	Wagon Box Mesa or Moody Creek 15'		TRm	*Myalina*
Ga	009		I				USGS Mesozoic Locality 25250, Circle Cliffs	Wagon Box Mesa 15'		TRm	*Aviculopecten*
Ga	252		I				Loc U10: Horse Canyon, NW part of Circle Cliffs, units 1-3	Steep Creek Bench or Lamp Stand		TRm	poorly preserved pelecypods
Ga	325				T			Lamp Stand	II	TRm	vertebrate tracks
Ga	326				T			Lamp Stand	II	TRm	vertebrate tracks
Ga	463			P			West Horse Canyon	Lamp Stand	II	TRm	petrified wood
Ga	464				T		Canyon View	Wagon Box Mesa	III	TRm	~5 good limulid trackways and many individual tracks
Ga	465		I				8G0318	Wagon Box Mesa	IV	TRm	bivalves
Ga	466				T		White Canyon	Bitter Creek Divide	III	TRm	invertebrate traces, vertebrate tracks
Ga	467				T		Studhorse East	Wagon Box Mesa	II	TRm	?*Akropus*, small manus/pes, tetradactyl pes, tetra or tridactyl manus tracks
Ga	468				T		Northeast Horse Canyon	Lamp Stand	II	TRm	possible vertebrate track: swim track, scrape mark
Ga	610				T			Horse Pasture Mesa	III	TRm	?swim tracks

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	611				T			Horse Pasture Mesa	III	TRm	?swim tracks
Ga	612				T			Horse Pasture Mesa	III	TRm	?swim tracks
Ka	004				T		Camp, 1951/Peabody, 1956 Moenkopi Tracksite, 3 miles southwest of Paria	Five Mile Valley		TRm	lacertoid tracks
Ka	009		I				Telegraph Flat	Eightmile Pass	III	TRm	molluscs
Ka	016		I				head of Kaibab (Buckskin) Gulch (Ka016a)	Eightmile Pass		TRm	gastropods, ?ammonites, bivalves
Ka	017		I				Mouth of Limestone (Buckskin) Gulch (Ka017b)	Pine Hollow Canyon	IV	TRm	bivalves and gastropods
Ka	222		I				Quarry Ridge, central Kane County	Petrified Hollow or Pine Hollow Canyon		TRm	gastropod beds
Ka	613	V	I				Quarry Ridge	Petrified Hollow	II	TRm	ammonites: *Submeekoceras*, *Pseudosagoceras;* bivalves; gastropods; fish cephalon
Ka	615				T		Alden Hamblin 12/21/98 tracksite	Fivemile Valley	III	TRm	3 sets of 3 toe marks, insect trails?
Ka	676				T		near Camp's 1951 Moenkopi tracksite	Fivemile Valley	III	TRm	lizard-like tracks
Ka	689				T			Fivemile Valley	III	TRm	"swim" tracks

Chinle Formation Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	011		I	P			Strat Section U14: Silver Falls Creek, SW Circle Cliffs	Wagon Box Mesa or Moody Creek 15'		TRcs	tree trunks
Ga	022			P			Circle Cliffs, Monocotyledon locality 10	Wagon Box Mesa 15'		TRc	*Sphenozamites*
Ga	026			P			3.5 miles E of Wagon Box Mesa and 2 miles E of Water Pocket Canyon	Wagon Box Mesa 15'		TRcs	petrified wood
Ga	040			P			about 3000' N 25° W of the Lampstand, northern Circle Cliffs	Lamp Stand		TRcs	petrified wood
Ga	199			P			Wolverine Petrified Wood Area (BLM), Circle Cliffs	Wagon Box Mesa		TRc	petrified wood
Ga	200			P			"The Gulch" - where Steep Creek and Long Canyon meet	King Bench		TRc	petrified wood
Ga	228			P			Circle Cliffs area, E side of Capitol Reef Natl Park	Steep Creek Bench or King Bench		TRcs	petrified wood
Ga	229			P			Circle Cliffs area	Steep Creep Bench or King Bench		TRcs	petrified wood
Ga	253			P			Loc U10: Horse Canyon, NW part of Circle Cliffs, units 4-8	Steep Creek Bench or Lamp Stand		TRcs	fossil wood
Ga	260			P			Circle Cliffs	Lamp Stand		TRcs	*Sphenozamites*
Ga	270			P			Egg Canyon	Steep Creek Bench		TRc	petrified wood
Ga	317			P				Pioneer Mesa	II	TRcp	petrified wood
Ga	318			P			Wolverine Petrified wood site	Pioneer Mesa	I	TRcp	petrified wood
Ga	321			P			Wolverine Petrified wood site	Pioneer Mesa	II	TRcp	fern leaves

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	324				T		Brinkerhoff Spring	Bitter Creek Divide	I	TRco	tracks *(Rhynchosauroides)*
Ga	433	V		P				Lampstand	II	TRc	indet. reptile, wood
Ga	461	V		P				Pioneer Mesa	III	TRc	indet. reptile, wood
Ga	469			P			NE White Canyon Flat	Bitter Creek Divide	III	TRcs	abundant conifer? wood, some logs
Ga	470			P			Check Dams	Lamp Stand	IV	TRcs	conifer? wood
Ga	471	V	I	P			King Bench	Lamp Stand	II	TRc	indet. vertebrate, bivalves, petrified wood
Ga	472		I	P			Silver Falls Creek	Wagon Box Mesa	IV	TRcs	bivalves, petrified wood
Ga	473	V					Bronco Eater 2	Lamp Stand	II	TRc	indet. vertebrate
Ga	474			P			Bronco Eater 1	Lamp Stand	III	TRc	trees (conifers) ~dozen logs and stumps
Ga	475			P	T		Long Canyon Pass	Lamp Stand	II	TRc	small theropod track: *Pseudotetrasauropus*, invertebrate tracks; conifer stem impression
Ga	476			P			Circle Cliffs Wood	Lamp Stand	III	TRc	trees (?conifers): stumps and log sections, 2-3ft diameter, in place
Ga	515			P			Conoco State: Bitter Creek Divide, Section 36	Bitter Creek Divide		TRcs	silicified wood
Ga	605	V					Harvard University Museum of Comparative Zoology 1997 field locality	Pioneer Mesa		TRc	bone fragments
Ga	606	V					Harvard University Museum of Comparative Zoology 1997 field locality	Pioneer Mesa		TRc	bone fragments
Ga	607	V					Harvard University Museum of Comparative Zoology 1997 field locality	Pioneer Mesa		TRc	?phytosaur jaw fragment

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	607	V					Harvard University Museum of Comparative Zoology 1997 field locality	Pioneer Mesa		TRc	?phytosaur jaw fragment
Ga	613			P				Silver Falls Bench	IV	TRc	petrified wood
Ka	177			P			Flame Agate Valley, Red (Vermilion) Cliffs	Petrified Hollow	IV	TRcs	*Auracarioxylon* - wood at top of Chinle throughout area, stripped by collectors
Ka	215			P			Sec U-23: Fossil Wood Wash, 17 miles SW of Paria	Petrified Hollow	IV	TRc	*Auricarioxylon arizonicum* (wood)
Ka	216		I				Sec U-24: Paria	Calico Peak		TRc	unidentified bivalves, probably *Unio*
Ka	217	V					Paria, Utah	Fivemile Valley		TRc	stereospondylous amphibian skull bone
Ka	232			P			Hills NW of old Paria ghost town	Fivemile Valley		TRc	petrified wood
Ka	292	V		P			King Mine	Eightmile Pass	I	TRc	metoposaur and phytosaur bones; other bones, a tooth
Ka	506			P			Calico Butte - No Man's Mesa	Five Mile Valley	III	TRcs	petrified logs of *Auricarioxylon*
Ka	507			P			Watson Cabin	Calico Peak	IV	TRcp	jasperized petrified wood
Ka	556		I				Paria Movie Set V	Fivemile Valley	III	TRc	bivalves
Ka	557	V					Paria Movie Set III	Fivemile Valley	II	TRc	2 phytosaur teeth, bone fragments
Ka	558			P			Paria Movie Set II	Fivemile Valley	III	TRc	petrified log ~4 ft long
Ka	559			P			Paria Movie Set I	Fivemile Valley	IV	TRc	petrified wood
Ka	560			P			Fin Little III	Nephi Point	IV	TRc	petrified wood

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	561		I	P			Chinle Clams	Calico Peak	IV	TRc	bivalves, wood

Moenave Formation Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	300				T		Alden 4/25/98	Calico Peak	III	Jmo	dinosaur track
Ka	508	V					Petrified Hollow	Petrified Hollow	III	Jmo	fish teeth, bones and scales
Ka	509				T		Watson Cabin	Calico Peak	III	Jmo	*Grallator*: track of 3-toed dinosaur
Ka	510				T		Watson Cabin	Calico Peak	IV	Jmo	questionable *Grallator* track - per A. Hamblin
Ka	562				T		Park Wash	Eightmile Pass	I	Jmo	2 *Grallator* tracks, invertebrate traces, 2 reptile manus/pes sets
Ka	563				T		Fin Little Overlook	Nephi Point	III	Jmo	4 *Grallator* tracks (~10 cm length), possible tetradactyl tracks
Ka	564				T		Fin Little 2	Nephi Point	III	Jmo	dinosaur tracks ?*Anomoepus*; invertebrate traces
Ka	565			P	T		Park Wash III	Eightmile Pass	III	Jmo	small theropod tracks (?*Grallator*); wood
Ka	566				T		Paria Movie Set IV	Fivemile Pass	III	Jmo	theropod tracks (~15 cm)
Ka	690				T			Eightmile Pass	II	Jmo	3-toed dinosaur tracks: ?*Grallator*

Wingate Formation Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	323				T			King Bench	I	Jw	dinosaur tracks

Kayenta Formation Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	477				T		Kayenta Coffeehouse	Calf Creek	II	Jk	theropod and indet. vertebrate tracks incl *Grallator*?, *Eubrontes*?
Ga	478				T		Calf Creek Trail	Calf Creek	IV	Jk	theropod track, medium size; 2-4 step trackways
Ka	002				T		Flag Point Dinosaur Tracksite	Johnson Lakes	II	Jk	dinosaur tracks
Ka	298				T		Alden 4/20/98	Calico Peak	III	Jk	dinosaur? tracks
Ka	299				T		Alden 4/25/98	Calico Peak	III	Jk	dinosaur? tracks
Ka	513	V		P			Cockscomb West	Five Mile Valley	II	Jk	dinosaur? bone (isolated piece); conglomerate w/wood 30' below
Ka	535			P				West Clark Bench	V	Jk	wood
Ka	567				T		Flag Point III	Johnson Lakes	II	Jk	50+ *Grallator* tracks, 1 *Kayentapus* and 1 indet. theropod dinosaur track
Ka	568				T		Flag Point II	Johnson Lakes	II	Jk	*Eubrontes* (2), ?*Anomoepus*, dinosaur tracks
Ka	569				T		Lower Long Canyon	Pine Point	II	Jk	2 small theropod tracks
Ka	621				T		Harry Barber tracksite	Johnson Lakes	II	Jk	dinosaur tracks, possibly *Eubrontes*

Navajo Sandstone Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	001				T		Stokes Navajo Tracksite: Hwy 12, south of Escalante River crossing	Tenmile Flat	II	Jn	vertebrate tracks (3-toed), also worm markings
Ga	314				T			Roger Peak	I	Jn	
Ga	319				T			Escalante	I	Jn	reptile tracks
Ga	322				T		Stokes Navajo Tracksite (duplicate)	Calf Creek	II	Jn	3-toed dinosaur tracks: 4 *Brasilichium* and 2 small theropod trackways
Ga	479				T		Stokes Area North	Tenmile Flat	II	Jn	invertebrate trails
Ka	297			P				Big Hollow Wash	II	Jn	wood
Ka	570				T		West Swag	Deer Range Point	II	Jn	4 large and 3 small theropod tracks (*Eubrontes*, ?*Anomoepus*) lacertoid? track
Ka	571				T		Park Wash II	Deer Spring Point	II	Jn	non-dinosaurian vertebrate tracks (~10) *Brasilichnium*

Page Sandstone Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	579				T		Power Lines	West Clark Bench	II	Jp	possible small theropod tracks

Carmel Formation Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	031		I				Section 4: Averitt Hollow	Bull Valley Gorge		Jc	Cretaceous oysters derived from Kd
Ka	075		I				Paria Valley	Bull Valley Gorge or Cannonville		Jc	invertebrates
Ka	076		I				Averitt Hollow	Bull Valley Gorge		Jc	Cretaceous oysters derived from Kd
Ka	189				T		Sec 4: Dry Valley Wash	Bull Valley Gorge or Cannonville		Jc	trace fossils
Ka	190			P	T		Sec 5: Paria Valley from 5 miles S of Cannonville	Bull Valley Gorge	V	Jc	*Planolite*-type traces (tadpole ss. unit); plant stems (algal mats)
Ka	198		I				Paria Valley, 5 miles S of Cannonville	Cannonville		Jc	invertebrates
Ka	512			P			Sheep Creek	Bull Valley Gorge	V	Jc	cryptalgal mats-stromatolites
Ka	572		I				Lone Pine Point	Cutler Point	III	Jc	oysters
Ka	573		I				Deer Range Canyon	Bull Valley Gorge	IV	Jc	oysters
Ka	574		I		T		West Sheep Creek	Bull Valley Gorge	IV	Jc	gastropods, bivalves, invertebrate traces
Ka	575		I				Lick Wash	Deer Spring Point	IV	Jc	clams, oysters, other bivalves
Ka	576				T		North Hackberry 2	Slickrock Bench	III	Jc	invertebrate traces
Ka	577				T		No Name Canyon	Slickrock Bench	III	Jc	invertebrate traces
Ka	578				T		North Hackberry 1	Slickrock Bench	III	Jc	invertebrate traces

Entrada Sandstone Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	480				T		20 Mile Wash West	Seep Flat	I	Je	theropod tracks (25+)
Ga	481				T		Twentymile Wash Tracksite	Seep Flat	I	Je	3-toed and quadraped tracks: cf. *Brontopodus*, ?*Megalosauripus*, ?*Therangospodus*
Ga	482				T		Right Hand Bowl	Seep Flat	I	Je	theropod tracks
Ga	483				T		Cattle Tank Tracks	Seep Flat	I	Je	theropod tracks ~5
Ga	484			P			Cattle Tank Drainage	Seep Flat	IV	Je	petrified wood

Morrison Formation Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	290			P			Recreational collecting area: Alvey Wash, SW of Escalante	Canaan Creek		Jm	fossil wood
Ga	431			P				Seep Flat	II	Jm	large trees
Ga	443			P				Wide Hollow Reservoir	I	Jm	large trees
Ga	444	V		P				Wide Hollow Reservoir	II	Jm	dinosaur bone fragments, wood
Ga	485			P			8G0340	Dave Canyon	I	Jm	petrified wood, 7+ pieces
Ga	486			P			Cedar Wash 2	Dave Canyon	IV	Jm	petrified conifer? wood, ½ log ~25 cm across
Ga	487				T		Sand Ridge	Seep Flat	3	Jm	termite nest? (mold of root/termite nest in sandstone)
Ga	488	V					Cedar Wash	Dave Canyon	II	Jm	croc tooth (goniopholid-like): isolated tooth in conglomeratic sandstone
Ga	489			P			Little Desert	Wide Hollow Reservoir	II	Jm	trees: ~2 dozen logs
Ga	490	V					Wide Hollow View	Wide Hollow Reservoir	II	Jm	indet. vertebrate (bone scraps)
Ga	491	V					8G0301	Seep Flat	II	Jm	indet. vertebrate (bone scraps)
Ga	492			P			Collet Algae	Seep Flat	I	Jm	algae (stromatolite)
Ga	493			P			Right Hand Collet Canyon	Seep Flat	IV	Jm	petrified wood - 2 pieces on surface

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	608				T		Morrison tracksite	Seep Flat	II	Jm	quadraped (?sauropod) tracks
Ka	041		I	P			near head of Cottonwood Creek	Butler Valley		Jm	plant fragments, invertebrate fossil fragments
Ka	580				T		Croton Bench	Sit Down Bench	III	Jm	3 probable sauropod tracks, worm burrows

Dakota Formation Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	072		I				South of Tenmile Spring, East face of Kaiparowits Plateau	Seep Flat		Kd	invertebrates
Ga	086		I				Dry Creek East	Henrieville	IV	Kd	*Crassostrea soleniscus*, *Flemingostrea prudentia*
Ga	111			P			Willis Creek Canyon, Paunsaugunt Plateau	Bryce Point		Kd	pollen
Ga	138		I					Seep Flat		Kd	invertebrates
Ga	142		I				Collet Canyon	Seep Flat		Kd	invertebrates
Ga	192		I	P			Section measured on N side of canyon, Tropic area	Cannonville		Kd	invertebrates
Ga	278		I				USGS Locality D4710	Dave Canyon		Kd/Kt	invertebrates
Ga	316		I				Coal Bench South	Henrieville	IV	Kd	*Lingula*, 3 species of non-ostracean bivalves
Ga	392	V	I	P	T		Jared's First Bulldog (JGE8808)	Cannonville	I	Kd	fish: *Lepidotes*, sharks, rays, *Ceratodus*; lizards; frogs; salamanders; turtles; crocs; dinosaurs: hadrosaur, ankylosaur, theropod; mammals: 6 species of multituberculates, 5 species of marsupials
Ga	406		I				Henrieville Creek	Henrieville	IV	Kd	*Crassostrea soleniscus*, *Brachidontes* sp., other bivalves
Ga	432	V						Seep Flat	III	Kd	turtle

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	494		I				Insect Wash	Seep Flat	IV	Kd	bivalves, probably from Kd
Ga	514		I	P			Henrieville Creek	Henrieville	III	Kd	*Viviparus*, well preserved plant stems and leaves
Ga	521		I				Yellow Creek	Cannonville	IV	Kd	*Ostrea*, *Crassostrea*
Ga	522		I	P			Yellow Creek	Cannonville	IV	Kd	1. large conifer logs and stumps 2. thin-bedded sandstone with small marine bivalves
Ga	523	V	I	P	T		South Middle Bench	Henrieville	II	Kd	unioid bivalves, turtle, wood, possible 3-toed dinosaur track
Ga	529	V	I				Bulldog Bench	Cannonville	I	Kd	vertebrates, invertebrates
Ga	530	V	I				Bulldog Bench	Cannonville	I	Kd	vertebrates, invertebrates
Ga	531	V	I				Bulldog Bench	Cannonville	I	Kd	vertebrates, invertebrates
Ga	532	V	I	P			Bulldog Bench	Cannonville	I	Kd	vertebrates, invertebrates
Ga	533	V	I	P			Bulldog Bench	Cannonville	I	Kd	vertebrates, invertebrates
Ga	534	V	I				Bulldog Bench	Cannonville	I	Kd	vertebrates, invertebrates
Ga	540		I				Pollack Locality 1: USGS D13673; Yellow Creek	Bryce Point		Kd	*Veloritina*, ?*Caryocorbula varia*, oyster fragments, brackish water bivalves
Ga	556		I				Pollack Locality 70: USGS D5176	Wide Hollow Reservoir		Kd	*Pinna*, *Flemingostrea prudentia*, *Phelopteria gastrodes*, *Exogyra*, *Callistina*, *Pholadomya*, *Anatimya*, *Metoicoceras* cf. *M. defordi*

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	557		I				Pollack Locality 71: USGS D5462	Wide Hollow Reservoir		Kd	*Phelopteria gastrodes, Flemingostrea prudentia, Exogyra olisiponensis, Callistina*
Ga	558		I				Pollack Locality 72: USGS D5464	Wide Hollow Reservoir		Kd	*Flemingostrea prudentia*
Ga	567		I				Pollack Locality 81: USGS D5460	Dave Canyon		Kd	*Calycoceras* (possibly a new species)
Ga	568		I				Pollack Locality 82: USGS D8020	Dave Canyon		Kd	*Trigonarca*?, *Flemingostrea prudentia, Exogyra*
Ga	570		I				Pollack Locality 84: USGS D4707	Dave Canyon		Kd	*Exogyra* (*Costagyra*) *olisiponensis*
Ga	574		I				Pollack Locality 88: USGS D5177	Dave Canyon		Kd	*Exogyra* (*Costagyra*) *olisiponensis*
Ga	578		I				Pollack Locality 92: USGS D9631	Dave Canyon		Kd	*Protarca*? *tramitensis, Panis, Panope*
Ga	585		I				Pollack Locality 99: USGS D12470	Seep Flat		Kd	*Exogyra* (*Costagyra*) *olisiponensis*
Ga	602	V					UCMP Locality V98160: Straight Cliffs Dakota E3	Dave Canyon		Kd	turtle fragments
Ka	014		I	P	T		tributary of Coyote Creek	Lower Coyote Spring		Kd	invertebrates, plants, trace fossils
Ka	028		I				Paria River Bluffs	Fivemile Valley	III	Kd	*Exogyra olisiponensis, Plicatula, Pycnodonte, Pseudocalycoceras*, other bivalves
Ka	040		I				Chimney Rock Canyon	Lower Coyote Spring	IV	Kd	*Exogyra olisponensis, Ostrea, Pycnodonte kellumi*
Ka	043			P			West side of Little Red Valley; see also 42Ka373P (8K0146a)	East of the Navajo	IV	Kd	Large logs: wood in conglomerate, reworked from Jm, some in situ

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	045			P			East Side of Paria River	Fivemile Valley	III	Kd	well preserved leaves in clay beds; petrified wood derived from TRc or Jm
Ka	047		I	P	T		Coyote Creek Tributary	Lower Coyote Spring	III	Kd	*Exogyra olisiponensis*, *Ostrea*, silicified tree trunks, *Thalassinoides*
Ka	054	V	I				near head of Rock Creek	Blackburn Canyon		Kd/ Kt	bone fragments
Ka	096		I				Section 1: Southern Kaiparowits region: Wahweap Creek (42Ka096aI)	Nipple Butte	III	Kd	*Exogyra olisiponensis, Pycnodonte* sp.
Ka	097		I				Section 2: Southern Kaiparowits region: East Wahweap Creek (42Ka097aI)	Nipple Butte	III	Kd	*Crassostrea soleniscus*, *Brachiodontes* sp., rare *Flemingostrea prudentia*
Ka	098			P			Section 3: Southern Kaiparowits region	Nipple Butte	IV	Kd	pollen
Ka	099		I				Section 4: Southern Kaiparowits region: Nipple Creek Trail	Nipple Butte	III	Kd	*Serpula, Turitella whitei, Lima, Pycnodonte newberryi, Sciponoceras gracile*
Ka	102		I		T		Section 7: Southern Kaiparowits region: Nipple Creek (42Ka102b)	Glen Canyon City	III	Kd	*Exogyra olisiponensis, Pycnodonte kellumi, Ophiomorpha, Metoicoceras mosbyense*
Ka	103		I				Section 9: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	105	V	I				Section 11: Southern Kaiparowits region			Kd/Kt	invertebrates, vertebrates
Ka	108	V	I				Section 18: Southern Kaiparowits region			Kd/Kt	invertebrates, vertebrates
Ka	109		I	P			Section 19: Southern Kaiparowits region			Kd	invertebrates, plants
Ka	111		I				Section 22: Southern Kaiparowits region			Kd/Kt	invertebrates

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	112		I				Section 25: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	113		I				Section 26: Southern Kaiparowits region			Kd	invertebrates
Ka	115		I				Section 29: Southern Kaiparowits region			Kd	invertebrates
Ka	116		I				Warm Creek Bench - Section 31: Southern Kaiparowits region	Smoky Hollow	III	Kd	*Ostrea* sp., *Brachiodontes* sp.
Ka	118		I				Section 35: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	120		I				Section 51: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	121	V	I				Section 52: Southern Kaiparowits region			Kd	invertebrates
Ka	123			P			Section 85: Southern Kaiparowits region			Kd	plants
Ka	124		I				Section 100: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	125		I				Section 101: Southern Kaiparowits region (Ka125a see also Ka378I = Ka125b)	Sit Down Bench	IV	Kd	Ostrea sp.
Ka	126		I				Section 105: Southern Kaiparowits region: Croton Canyon	Sit Down Bench	III	Kd	lower horizon: *Ostrea*, small nuculid bivalves; upper: *Pycnodonte kellumi*
Ka	127		I				Section 114: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	128		I				Section 115: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	130		I				Section 133: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	131		I				Section 137: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	132		I				Section 138: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	133		I				Section 140: Southern Kaiparowits region			Kd/Kt	invertebrates

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	175					M	Willis Creek Canyon, Alton Coal Field	Bryce Point		Kd	pollen
Ka	176					M	Kaiparowits Coal Field	Seep Flat		Kd	pollen
Ka	178			P			Straight Cliffs, Hole in the Rock Trail			Kd	petrified wood
Ka	179		I				Grosvenor's Arch (road .35 mile E of arch)	Butler Valley		Kd	*Exogyra olisiponensis; Pycnodonte newberryi*
Ka	209		I		T		Wahweap Creek (East)	Nipple Butte	IV	Kd	*Ophiomorpha* trace fossils, *Exogyra olisiponensis*
Ka	218	V					Rim Rocks II	Bridger Point		Kd	croc, turtle, fish, mammal tooth
Ka	219	V					Rim Rocks III	Bridger Point		Kd	croc, turtle, fish
Ka	220	V					2nd Lungfish (The Rimrocks)	Bridger Point		Kd	turtle, fish (*Lepidotes*, lungfish)
Ka	224	V		P			UP&L Glen Canyon-Sigurd transmission line	Bridger Point	II	Kd	plant debris and impressions; turtle bone
Ka	226		I				UP&L Glen Canyon-Sigurd transmission line	Fivemile Valley	IV	Kd	bivalve bed - mostly *Exogyra*; *Pycnodonte newberryi*
Ka	228		I				UP&L Glen Canyon-Sigurd transmission line: Upper Cottonwood Creek	Butler Valley	IV	Kd	*Brachidontes* sp; *Corbula* (?) *Ostrea soleniscus*
Ka	229			P			Butler Valley North	Butler Valley	IV	Kd	silicified wood, incl tree trunk cross sections
Ka	230		I				UP&L Glen Canyon-Sigurd transmission line: Butler Valley North	Butler Valley	IV	Kd	*Brachidontes*, *Crassostrea soleniscus*
Ka	288		I	P			Grosvenor Arch II	Butler Valley		Kd	plant stems, pelecypods, ammonite
Ka	289	V						Lower Coyote Spring		Kd	turtle shell

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	291		I					Five Mile Valley		Kd	Dakota bivalve bed: *Exogyra* and other forms
Ka	344	V					Dodson	Lower Coyote Spring		Kd	turtle
Ka	373			P			West Little Valley Bench	Sit Down Bench	III	Kd	large logs of petrified wood
Ka	374		I				Wahweap Creek (Ka097a); Pollack Locality 34 (USGS D4623)	Nipple Butte	III	Kd	*Exogyra olisiponensis*; *Ostrea* sp.
Ka	375		I				Wahweap Creek (Ka097b); Pollack Locality 33 (USGS D5080)	Nipple Butte	III	Kd	*Ostrea prudentia* (*Flemingostrea*), *O. soleniscus*
Ka	376		I				Wahweap Creek (East) (Ka09bae??)	Nipple Butte	III	Kd	*Crassostrea soleniscus, Flemingostrea prudentia, Brachiodontes, Corbula*
Ka	377		I				Nipple Creek (Ka102a; see also Ka102(b)	Glen Canyon City	III	Kd	*Unio* sp. (non marine clam)
Ka	378		I				West Croton Canyon (Ka125b)	Sit Down Bench	III	Kd	*Exogyra* (?) sp.; *Pycnodonte kellumi*
Ka	379		I				Upper Cottonwood Creek	Butler Valley	IV	Kd	small *Corbula* type bivalves
Ka	380		I				UP&L Glen Canyon-Sigurd transmission line: Upper Cottonwood Creek	Butler Valley	IV	Kd	*Pycnodonte newberryi* and *Exogyra olisiponensis*
Ka	381	V	I				Butler Valley North (= Ka230b)	Butler Valley	IV	Kd	nuculid bivalve taxa - *Ostrea* sp.
Ka	384	V		P			Rim Rocks	Lower Coyote Spring	II	Kd	turtle
Ka	385		I				Paria River Bluff	Fivemile Valley	III	Kd	*Exogyra olisiponensis*, *Ostrea* sp., *Pycnodonte* sp.
Ka	387		I				West Wahweap Creek	Nipple Butte	III	Kd	very large *Ostrea* (10 in)

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	388		I				Nipple Creek Trail	Nipple Butte	III	Kd	*Crassostrea* sp., *Exogyra olisiponensis*
Ka	389		I				Paria-Rim Rocks	Fivemile Valley	III	Kd	*Metoicoceras* (?*M. geslinianum*) *Pycnodonte*, *Plicatula*, *Exogyra olisiponensis*
Ka	390		I				Cottonwood Creek; Pollack Locality 29 (USGS D3708)	Fivemile Valley	IV	Kd	*Flemingostrea prudentia* (?)
Ka	391		I				Rock House Cave	Fivemile Valley	IV	Kd	*Exogyra olisiponensis, Pycnodonte* sp.
Ka	392		I				Cottonwood Creek: Pollack Locality 27 (USGS D13631) E of Cottonwood Creek	Fivemile Valley	IV	Kd	*Ostrea soleniscus, Flemingostrea prudentia, Exogyra* sp. (uncommon)
Ka	393		I				Cottonwood Wash; Pollack Locality 24 (USGS D13765)	Calico Peak	IV	Kd	*Rhyncostrea* sp., *Ostrea*
Ka	394		I				Cottonwood Wash; Pollack Locality 21 (USGS D13549) NW of Cottonwood Creek road	Calico Peak	IV	Kd	*Exogyra* (*Costagyra*) *olisiponensis*
Ka	395	V					Nipple Creek Trail	Glen Canyon City	II	Kd	turtle
Ka	397		I	P			Croton Bench	Sit Down Bench	III	Kd	*Pycnodonte kellumi* at top; *Ostrea* in coaly interval
Ka	398		I				Wiggler Wash	Henrieville	III	Kd	*Plicatula* sp, *Flemingostrea prudentia*, *Lima* sp, indet. bivalve
Ka	399	V	I	P			Grosvenor Arch	Butler Valley	II	Kd	*Anodonta, Rhabdotophorus, Protelliptio*, fish teeth, turtle, plant stems

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	400		I				Grosvenor Arch	Butler Valley	IV	Kd	*Ostrea* sp., *Parmicorbula* sp.; *Lingula*, *Veloritina*
Ka	401			P			Grosvenor Arch	Butler Valley	III	Kd	petrified wood
Ka	402		I				Cad's Crotch North; Pollack Locality 17 (USGS D7301)	Butler Valley	IV	Kd	*Flemingostrea prudentia*
Ka	403		I				Cad's Crotch North; Pollack Locality 18 (USGS D7302)	Butler Valley	IV	Kd	*Pycnodonte newberry, Exogyra olisiponensis; Exogyra* cf. E. *robusta*
Ka	404		I				Butler Valley Neck	Butler Valley	IV	Kd	*Exogyra olisiponensis*, at least 3 other bivalve genera
Ka	581		I				Oyster Pavement	Lower Coyote Spring	III	Kd	oysters
Ka	582	V	I		T		8K0435	Bridger Point	II	Kd	fish vertebrae, bivalves, invertebrate traces
Ka	583		I				Willis Creek	Bull Valley Gorge	IV	Kd	oysters
Ka	584		I				Cave Point Creek	Sooner Bench	IV	Kd	bivalves (oysters)
Ka	622		I				Pollack Locality 6: USGS D12483	Henrieville		Kd	*Exogyra* (*Costagyra*) *olisiponenis*
Ka	623		I				Pollack Locality 14: USGS D13633, Grosvenor Arch, same locality as Ka399I	Butler Valley		Kd	*Inoceramus mesabiensis, I. reduncus, Caryocorbula*
Ka	625		I				Pollack Locality 31 (USGS D13547)	Fivemile Valley		Kd	*Exogyra (Costagyra) olisiponensis, Pycnodonte kellumi, Metoicoceras mosbyense*

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	626		I				Pollack Locality 31 (USGS D6055) about 1 mile NW of Chimney Rock	Lower Coyote Spring		Kd	*Nucula, Nuculana, Inoceramus, Brachiontes, Cymbophora, Corbula Natica, Metoicoceras defordi;* age: *Dunveganoceras conditum/mosbyense*
Ka	628		I				Pollack Locality 37 (USGS D4622)	Nipple Butte		Kd	*Flemingostrea prudentia, Brachidontes*: brackish-water bivalves
Ka	659		I				Pollack Locality 127 (USGS D8882)	Big Hollow Wash		Kd	*Acanthocardia tritus*
Ka	666		I				Pollack Locality 134 (USGS D7292)	Blackburn Canyon		Kd	*Phelopteria*, cf *P. gastrodes, Rhynchostreon levis, Plicatula* cf *P. goldenana, Metoicoceras defordi*
Ka	669		I				Pollack Locality 137 (USGS D8021)	Sooner Bench		Kd	*Plicatula, Exogyra, Acanthocardia tritis*

Tropic Shale Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	070		I				"Fossil Beds": 3 miles north of Henrieville	Henrieville		Kt	*Serpula, Sciponoceras gracile, Pycnodonte newberryi, Turitella whitei*
Ga	074		I				South of Tenmile Spring, Kaiparowits Plateau	Seep Flat		Kt	invertebrates
Ga	078		I	P			Section at Collett Canyon, starting at mouth and extending 5 miles south	Seep Flat		Kt	invertebrates
Ga	085		I				Section measured just north of Henrieville, by Henrieville-Escalante road	Henrieville	IV	Kt	*Pycnodonte newberryi, Exogyra* sp.
Ga	126			P			USGS Mesozoic Locality D288, 1 mile N of Cannonville	Cannonville		Kt	charophytes: *Atopochara*
Ga	146		I				South of Tenmile Spring	Seep Flat		Kt	invertebrates
Ga	193	V	I				Dry Creek East	Henrieville	III	Kt	*Pycnodonte newberryi, Exogyra* sp.
Ga	194	V	I				Dry Hollow East	Henrieville	IV	Kt	*Collignonoceras woolgari*, other bivalves, fish scales
Ga	198	V	I				Section exposed aprox 4 miles N of Henrieville	Henrieville	III	Kt	mollusks, shark teeth
Ga	218		I				1.5 miles NE of Henrieville and .25 mile E of Hwy 54 (Hwy 12)	Henrieville		Kt	ammonites and other invertebrates
Ga	219		I				2 miles NE of Henrieville and .25 mile E of Hwy 54 (Hwy 12)	Henrieville		Kt	ammonites and other invertebrates
Ga	220		I				2.5 miles NE of Henrieville and .25 mile E of Hwy 54 (Hwy 12)	Henrieville		Kt	ammonites and other invertebrates

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	221		I				2 miles SE of Tropic and .25 mile E of Hwy 54 (Hwy 12)	Cannonville		Kt	ammonites and other invertebrates
Ga	273		I		T		D.B.-UP-12: UP&L Glen Canyon to Sigurd transmission line survey: Dry Hollow	Henrieville	IV	Kt	bivalves and trace fossils, *Baculites yokoyamai, Mytiloides* sp.
Ga	275		I				USGS Locality D4707	Dave Canyon		Kt	*Exogyra*
Ga	276		I				USGS Locality D4708 and D5424	Dave Canyon		Kt	invertebrates
Ga	277		I				USGS Locality D4709	Dave Canyon		Kt	invertebrates
Ga	278		I				USGS Locality D4710	Dave Canyon		Kd/Kt	invertebrates
Ga	279		I				USGS Locality D4711 and D5460	Dave Canyon		Kt	D4711: *Metoicoceras*; D5460: *Calycoceras*
Ga	280		I				USGS Locality D4712	Dave Canyon		Kt	*Collignoniceras*
Ga	281		I				USGS Locality D4713	Dave Canyon		Kt	*Ostrea* sp., *Collignoniceras*
Ga	282		I				USGS Locality D5177 and D5178	Dave Canyon		Kt	invertebrates
Ga	283		I				USGS Locality D5459	Dave Canyon		Kt	*Placenticeras*
Ga	288		I				Recreational collecting area east of Henrieville: Lower Henrieville Creek	Henrieville	IV	Kt	bivalves and gastropods
Ga	315		I				"Fossil Beds" East	Henrieville	IV	Kt	*Pycnodonte newberryi*
Ga	407		I				"Fossil Beds" East	Henrieville	III	Kt	*Serpula*, *Sciponoceras gracile*, *Turitella whitei*
Ga	408		I				"Fossil Beds" East	Henrieville	III	Kt	*Metoicoceras geslinianum*, *Sciponoceras gracile*, bivalves and gastropods

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	409		I				Yellow Creek	Cannonville	IV	Kt	*Pycnodonte newberryi*
Ga	410		I				Yellow Creek	Cannonville	II	Kt	*Summitomoceras* sp, *Sciponoceras gracile, Metoicoceras geslinianum, E. septemseriatum*
Ga	411		I				Yellow Creek	Cannonville	III	Kt	*Burroceras irregulare, Neocardioceras* sp, *Placenticeras cumminsi, Drepanochilus* sp., *Inoceramus pictus*, other small bivalves
Ga	412		I				Middle Bench West	Henrieville	IV	Kt	*Pycnodonte newberryi*
Ga	413		I				Middle Bench West	Henrieville	III	Kt	serpulids, *Turitella whitei*, pectins, *Inoceramus pictus, Pycnodonte newberryi, Euomphaloceras septemseriatum, Pseudocalycoceras* sp., *Sciponoceras gracile, Metoicoceras geslinianum*
Ga	414		I				Middle Bench West	Henrieville	III	Kt	*E. septemseriatum, Worthoceras vermiculum, Perissoptera prolabiata, Lucina*
Ga	415		I				West Middle Bench	Henrieville	IV	Kt	*Pycnodonte newberryi, Exogyra olisiponensis*
Ga	416		I				West Middle Bench	Henrieville	III	Kt	*Metoicoceras geslinianum, Sciponoceras gracile, Allocrioceras annulatum, Pholadomya, Turitella whitei*
Ga	417		I				Henrieville Creek	Henrieville	IV	Kt	*Pycnodonte newberryi, Exogyra* sp.

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	418		I				Henrieville Creek	Henrieville	III	Kt	*Serpula, Sciponoceras gracile, Turitella whitei*, misc bivalves and gastropods
Ga	419		I				Henrieville Creek	Henrieville	III	Kt	*Sciponoceras gracile, Metoicoceras geslinianum, U septemseriatum*
Ga	420		I				Henrieville Creek	Henrieville	IV	Kt	*Pycnodonte newberryi, Exogyra* sp.
Ga	421		I				Henrieville Creek	Henrieville	III	Kt	*Sciponoceras gracile, M. geslinianum*, bivalves, gastropods
Ga	422		I				Henrieville Creek	Henrieville	III	Kt	*Burroceras* sp.
Ga	495	V					Walt Slope	Tropic Canyon	II	Kt	shark tooth
Ga	524		I				Tropic Road Cut	Cannonville	IV	Kt	*Pycnodonte newberryi*
Ga	525		I				Tropic Road Cut	Cannonville	III	Kt	*Sciponoceras gracile*, serpulid tubes
Ga	526		I				Tropic Road Cut	Cannonville	IV	Kt	*Metoicoceras geslinianum, Allocrioceras, Pesissoptera prolabiata, Sciponoceras gracile, Psilomya* sp
Ga	527		I				Dry Creek East	Henrieville	III	Kt	*Sciponoceras gracile, Lima utahensis*, serpulids, *Turitella whitei*
Ga	528		I				Dry Creek East	Henrieville	III	Kt	*Sciponoceras gracile Metoicoceras geslinianum Perissoptera prolabiata Allocrioceras*
Ga	541		I				Pollack Locality 2: USGS D13674; Yellow Creek	Bryce Point		Kt	*Inoceramus pictus, Pycnodonte newberryi, Psilomya meeki, Euspira?*

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	542		I				Pollack Locality 3: USGS D13675; Yellow Creek	Cannonville		Kt	*Placenticeras pseudoplacenta, Burroceras irregulare*
Ga	543		I				Pollack Locality 4: USGS D13669	Tropic Canyon		Kt	*Collignoniceras woolgari* (middle Turonian guide fossil)
Ga	546		I				Pollack Locality 60: USGS D5426	Canaan Creek		Kt	*Inoceramus, Ostrea, Prionocyclus hyatti*
Ga	563		I				Pollack Locality 77: USGS D5179	Canaan Creek or Dave Canyon		Kt	*Ostrea sp. , Collignoniceras woollgari*
Ga	565		I				Pollack Locality 79: USGS D4713	Dave Canyon		Kt	*Ostrea sp., Collignoniceras woollgari*
Ga	566		I				Pollack Locality 80: USGS D4711	Dave Canyon		Kt	*Metoicoceras geslinianum*
Ga	569		I				Pollack Locality 83: USGS D4712	Dave Canyon		Kt	*Collignoniceras woollgari*
Ga	571		I				Pollack Locality 85: USGS D4710	Dave Canyon		Kt	20+ species from *Euomphaloceras septemseriatum* zone fauna
Ga	572		I				Pollack Locality 86: USGS D4708	Dave Canyon		Kt	20+ species
Ga	573		I				Pollack Locality 87: USGS D5424	Dave Canyon		Kt	*Protarca?, Exogyra, Plicatula hydrotheca, Veniella*
Ga	575		I				Pollack Locality 89: USGS D5178	Dave Canyon		Kt	*Breviarca, Ostrea, Psilomya meeki, Inoceramus pictus, Rhynchostreon, Euspira?, Perissoptera prolabiata, Turitella whitei, Dentalium*
Ga	576		I				Pollack Locality 90: USGS D4709	Dave Canyon		Kt	*Rhynchostreon levis, Camptonectes platessa, Psilomya meeki, Corbula kanabensis*
Ga	577		I				Pollack Locality 91: USGS D5459	Dave Canyon		Kt	*Placenticeras stantoni*

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	579		I				Pollack Locality 93: USGS D5458	Carcass Canyon or Seep Flat		Kt	*Metoicoceras geslinianum*
Ga	580		I				Pollack Locality 94: USGS D5457	Seep Flat		Kt	*Rhynchostreon, Psilomya meeki, Turritella whitei, Sciponoceras gracile, Allocrioceras annulatum*
Ga	581		I				Pollack Locality 95: USGS D6027	Seep Flat		Kt	*Inoceramus, Rhynchostreon, Sciponoceras gracile, Metoicoceras geslinianum*
Ga	586		I				Pollack Locality 100: USGS D12471	Seep Flat		Kt	*Pycnodonte newberryi, Plicatula*
Ga	587		I				Pollack Locality 101: USGS D12472	Seep Flat		Kt	typical *Sciponoceras gracile* zone fauna, incl *Pinna, Inoceramus, Pycnodonte*
Ka	032		I				Section 8: Willis Creek	Bull Valley Gorge or Rainbow Point		Kt	invertebrates
Ka	048	V	I	P			near head, west branch Last Chance Creek			Ks/Kt	invertebrates
Ka	054	V	I				near head of Rock Creek	Blackburn Canyon		Kd/Kt	invertebrates
Ka	100		I				Section 5: Southern Kaiparowits region: Nipple Creek Trail	Nipple Butte	III	Kt	*Metoicoceras, Drepanochilus sp, Sciponoceras gracile, Pycnodonte newberryi*
Ka	101		I				Section 6: Southern Kaiparowits region			Kt	invertebrates
Ka	103		I				Section 9: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	104		I				Section 10: Southern Kaiparowits region			Kt	invertebrates
Ka	105	V	I				Section 11: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	106		I				Section 13: Southern Kaiparowits region			Kt	invertebrates

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	107		I				Section 14: Southern Kaiparowits region			Kt	invertebrates
Ka	108	V	I				Section 18: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	110		I				Section 20: Southern Kaiparowits region			Kt	invertebrates
Ka	111		I				Section 22: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	112		I				Section 25: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	114		I				Section 28: Southern Kaiparowits region			Kt	invertebrates
Ka	117		I				Section 34: Southern Kaiparowits region: Pasture Point Canyon	Smoky Hollow	III	Kt	*Sciponoceras gracile*, serpulids
Ka	118		I				Section 35: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	119		I				Section 41: Southern Kaiparowits region			Kt	invertebrates
Ka	120		I				Section 51: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	122		I				Section 82: Southern Kaiparowits region			Kt	invertebrates
Ka	124		I				Section 100: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	127		I				Section 114: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	128		I				Section 115: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	129		I				Section 116: Southern Kaiparowits region			Kt	invertebrates
Ka	130		I				Section 133: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	131		I				Section 137: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	132		I				Section 138: Southern Kaiparowits region			Kd/Kt	invertebrates
Ka	133		I				Section 140: Southern Kaiparowits region			Kd/Kt	invertebrates

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	134		I			M	Section T1: Southern Kaiparowits region			Kt	invertebrates
Ka	136	V	I				Section T5: Southern Kaiparowits region			Kt	invertebrates
Ka	137		I				Section T7: Southern Kaiparowits region			Kt	invertebrates
Ka	138		I				Section T8: Southern Kaiparowits region			Kt	invertebrates
Ka	144		I				Section S20: Southern Kaiparowits region			Kt/Kst	invertebrates
Ka	146		I				Section S29: Southern Kaiparowits region			Kt/Kst	invertebrates
Ka	147		I				Section S30: Southern Kaiparowits region			Kt/Kst	invertebrates
Ka	148		I				Section S34: Southern Kaiparowits region			Kt/Kst	invertebrates
Ka	149		I				Section S6: Southern Kaiparowits region			Kt/Kst	invertebrates
Ka	150		I				Section T4: Southern Kaiparowits region			Kt/Kst	invertebrates
Ka	225		I				UP&L Glen Canyon-Sigurd transmission line	Fivemile Valley	III	Kt	*Watinoceras* sp., indet. vascoceratid ammonite, *Ostrea*
Ka	227		I				UP&L Glen Canyon-Sigurd transmission line	Horse Flat		Kt	*?Watinoceras sp.?*
Ka	231		I				UP&L Glen Canyon-Sigurd transmission line	Henrieville		Kt	*Exogyra, Gryphaea, Ostrea*
Ka	355		I				Upper Warm Creek Canyon	Tibbet Bench	III	Kt	*Collignoniceras woolgari regulare*
Ka	357		I				Wahweap Creek (the Scorpion)	Nipple Butte	III	Kt	*Inoceramus* sp; *Mytiloides* sp; *Ostrea* sp.
Ka	405		I				Pariah River Bluff	Fivemile Valley	II	Kt	typical upper *Sciponoceras* zone assemblage

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	406		I				Pariah River Bluff	Fivemile Valley	II	Kt	*Inoceramus, Neocardioceras juddi, Burroceras irregulare*, gastropods, bivalves
Ka	408		I				Wahweap Creek	Glen Canyon City	II	Kt	*Neocardioceras juddi, Burroceras irregulare, Allocrioceras, Inoceramus, Drepanochilus*, fish scales, bivalves
Ka	409		I				Wahweap Creek	Nipple Butte	II	Kt	*Sciponoceras gracile*, serpulid tubes *Turitella whitei, Cardium, Pycnodonte*
Ka	410		I				Wahweap Creek	Nipple Butte	II	Kt	*Metoicoceras geslinianum, Allocrioceras, Worthoceras gibbosum, Euomphaloceras*
Ka	411		I				Nipple Creek	Glen Canyon City	II	Kt	*Burroceras irregulare?, Thomasites?, Inoceramus pictus, Lucina?*
Ka	412		I				Nipple Creek: Pollack Locality 42 (USGS D12474)	Glen Canyon City	III	Kt	*Mytloides* sp., *Pseudoperna bentonensis*
Ka	413		I				Nipple Creek: Pollack Locality 43 (USGS D12475)	Glen Canyon City	III	Kt	*Mytiloides sp, Pseudoperna bentonensis, Placenticeras*
Ka	414		I				Nipple Creek: Pollack Locality 44 (USGS D12476)	Glen Canyon City	III	Kt	*Mytiloides columbianus, Pseudoperna bentonensis, Watinoceras reesidei*
Ka	415		I				Nipple Creek: Pollack Locality 45 (USGS D12477)	Glen Canyon City	III	Kt	*Mytiloides columbianus*
Ka	416		I				Nipple Creek: Pollack Locality 46 (USGS D12478)	Glen Canyon City	III	Kt	*Mytiloides columbianus*, indet. ammonite

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	417		I				Nipple Creek: Pollack Locality 47 (USGS D12479)	Glen Canyon City	III	Kt	*Tragodesmoceras* sp.
Ka	418		I				Nipple Creek: Pollack Locality 48 (USGS D12480)	Glen Canyon City	III	Kt	*Mytiloides mytiloides, Kamerunoceras* sp.
Ka	419		I				Nipple Creek: Pollack Locality 49 (USGS D12481)	Glen Canyon City	III	Kt	*Mytiloides mytiloides, Morrowites subdepressus*
Ka	420		I				Nipple Creek: Pollack Locality 50 (USGS D12482)	Glen Canyon City	III	Kt	*Mytiloides mytiloides, Kamerunoceras? Baculites, Peuebloites greenhornensis*
Ka	421		I				The Scorpion	Nipple Butte	III	Kt	*C. woolgari* - specimens preserved w gypsum, probably over shale impressions
Ka	422		I				Pasture Point Canyon	Smoky Hollow	III	Kt	*Metoicoceras geslinianum* (very large: 10") serpulids, *Turitella whitei, Cerithium, Pycnodonte, Sciponoceras gracile*
Ka	423		I				Warm Creek	Warm Creek Bay	III	Kt	invertebrates
Ka	424		I				Warm Creek	Warm Creek Bay	III	Kt	*Sciponoceras gracile, Metoicoceras geslinianum, E septemseriatum, Lucina, Worthoceras vermiculum, Allocrioceras annulatum, Perissoptera*
Ka	425		I				Chimney Rock Canyon	Lower Coyote Spring	III	Kt	serpulids, *Turitella whitei, Sciponoceras gracile, Pycnodonte newberryi*

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	426		I				Chimney Rock Canyon	Lower Coyote Spring	III	Kt	*Metoicoceras geslinianum, Sciponoceras gracile, Allocrioceras annulatum*
Ka	427		I				West Wahweap Creek	Nipple Butte	III	Kt	*Metoicoceras geslinianum, Sciponoceras gracile, Drepanochilus, Lucina, Turitella whitei*
Ka	428		I				West Wahweap Creek	Nipple Butte	III	Kt	*Metoicoceras geslinianum, Sciponoceras gracile*
Ka	429		I				East Wahweap Creek; Pollack Locality 36 (USGS D4627)	Nipple Butte	III	Kt	*Metoicoceras geslinianum, Sciponoceras gracile, Drepanochilus, Lucina*
Ka	430		I				East Wahweap Creek; Pollack Locality 38 (USGS D4626)	Nipple Butte	III	Kt	*Metoicoceras geslinianum, Sciponoceras gracile, Turitella whitei*, serpulids
Ka	431		I				Paria Rim Rocks	Fivemile Valley	III	Kt	*Burroceras irregulare, Sciponoceras gracile, Neocardioceras, Lucina, Drepanochilus*
Ka	432		I				Paria Rim Rocks	Fivemile Valley	III	Kt	*Burroceras iregulare*, indet. bivalves and gastropods (specimens crushed)
Ka	433		I				Rock House Cave	Fivemile Valley	I	Kt	*Burroceras irregulare, Inoceramus* sp, *Drepanochilus, Neocardioceras juddi*
Ka	434		I					Fivemile Valley	III	Kt	*Sciponoceras gracile, Metoicoceras, Allocrioceras, Euomphaloceras, Turitella*

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	435		I				Pollack Locality 28 (USGS D13768)	Fivemile Valley	III	Kt	*Morrowites subdrepessus* (ammonite)
Ka	436		I				Cottonwood Wash; Pollack Locality 30 (USGS D13545) S of Cottonwood Creek road	Fivemile Valley	III	Kt	*Watinoceras coloradoense, Mytiloides, Ostrea; Vascoceras birchbyi* zone
Ka	437		I				Cottonwood Wash	Fivemile Valley	III	Kt	*Metoicoceras geslinianum Allocrioceras annulatum Sciponoceras gracile, Turitella whitei, Pycnodonte newberryi*
Ka	438		I				Cottonwood Wash	Fivemile Valley	III	Kt	*Burroceras irregulare Inoceramus pictus Drepanochilus, Lucina*
Ka	439		I				Cottonwood Wash	Fivemile Valley	III	Kt	indet. ammonite probably *Metoicoceras*, *Drepanochilus*, other bivalves
Ka	440		I				Cottonwood Wash	Calico Peak	III	Kt	gastropods, *Inoceramus*, *Baculites yokayamai*, sharks teeth
Ka	441		I				Cottonwood Wash; Pollack Locality 26 (USGS D13767)	Calico Peak	III	Kt	*Watinoceras* sp, *Baculites* sp
Ka	442		I				Cottonwood Wash: Pollack Locality 25 (USGS D13765) same Locality as Ka393I	Calico Peak	III	Kt	*Pycnodonte newberryi, Metoicoceras geslinianum, Sciponoceras gracile*
Ka	443		I				Cottonwood Wash	Calico Peak		Kt	*Sciponoceras gracile, Metoicoceras geslinianum, E septemseriatum, Lucina, Allocrioceras annulatum, Turitella whitei*

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	444		I				Cottonwood Wash	Calico Peak	I	Kt	*Neocardioceras, Anisoceras, Metaptychoceras, Worthoceras, Drepanochilus, Inoceramus*
Ka	445		I				Cottonwood Wash	Calico Peak	III	Kt	*Morrowites depressus*
Ka	446		I				Cottonwood Wash	Calico Peak	II	Kt	*Neocardioceras, Anisococeras, Metaptychoceras, Drepanochilus, Inoceramus*
Ka	447		I				Cottonwood Wash; Pollack Locality 22 (USGS D13548) same locality as Ka394I	Calico Peak	III	Kt	*Sciponoceras gracile*, bivalves and gastropods
Ka	448		I				Cottonwood Wash; Pollack Locality 23 (USGS D13549) same locality as Ka394I	Calico Peak	III	Kt	*Watinoceras coloradoense Mytiloids columbianus*
Ka	449		I				Nipple Creek Trail	Nipple Butte	III	Kt	*Inoceramus* sp
Ka	461		I				Upper Warm Creek Canyon	Tibbet Bench	IV	Kt	*Collignoniceras woolgari*
Ka	462		I				Warm Creek	Smoky Hollow	III	Kt	*Serpula, Turitlla whitei, Sciponoceras gracile*
Ka	463		I				Warm Creek	Smoky Hollow	III	Kt	*Metoicoceras geslinianum, Sciponoceras gracile, Lucina, Periisptera, Allocrioceras, Euspira*
Ka	465		I				Upper Pasture Point Canyon	Smoky Hollow	III	Kt	*Sciponoceras gracile, Perissoptera prolabiata, Euspira, Lucina*
Ka	475		I				West Little Valley Bench	Sit Down Bench	III	Kt	*E septemseriatum, Sciponoceras gracile, Lucina, Drepanochilus ruidum*
Ka	476		I				West Little Valley Bench	Sit Down Bench	III	Kt	*Neocardioceras, Hamites simplex, Idiohamites, Inoceramus pictus, Pteria*

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	477		I				Croton Canyon	Sit Down Bench	III	Kt	*Serpula, Sciponoceras gracile, Turitella whitei, Drepanochilus*
Ka	479		I				North Sit Down Bench	Sit Down Bench	III	Kt	*Metoicoceras geslinianum, Sciponoceras gracile, Perissoptera, Lucina subundata, Euspira*
Ka	485		I				Surprise Canyon Trail	Sit Down Bench	III	Kt	serpulid bioherms, *Sciponoceras gracile*, other molluscs
Ka	487		I				Willis Creek	Bryce Point	III	Kt	*Metoicoceras geslinianum, Sciponoceras gracile*
Ka	488		I				Willis Creek	Bryce Point	III	Kt	small bivalves, *Drepanochilus rudium, Placenticeras cumminsi*
Ka	489		I				Willis Creek	Bryce Point	III	Kt	*Hamites* or *Anisoceras*, *Inoceramus*
Ka	490		I				Wiggler Wash	Henrieville	III	Kt	*Pycnodonte newberryi, Eucalycoceras* (?)
Ka	491		I				Wiggler Wash	Henrieville	III	Kt	*Turitella whitei, Inoceramus pictus, Sciponoceras gracile*
Ka	492		I				Wiggler Wash	Henrieville	III	Kt	*Serpula, Sciponoceras gracile, Turitella whitei, Allocrioceras, Euomphaloceras*
Ka	493		I				Wiggler Wash	Henrieville	III	Kt	*Pseudocalycoceras, Sciponoceras gracile, Metoicoceras geslinianum*, shark tooth, etc
Ka	494		I				Wiggler Wash	Henrieville	IV	Kt	*Mytiloides columbianus, Pseudoperna bentonensis*
Ka	495		I				Wiggler Wash	Henrieville	IV	Kt	*Mytiloides solumbianus, Kamerunoceras*

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	496		I				Cad's Crotch North; Pollack Locality 19 (USGS D7303)	Butler Valley	III	Kt	*Metoicoceras geslinianum, Sciponoceras gracile, Lucina Inoceramus*
Ka	497		I				Butler Valley North	Butler Valley	III	Kt	*Exogyra, Pycnodonte*, rare poorly preserved ammonites - unidentifiable
Ka	498		I				Butler Valley North	Butler Valley	III	Kt	serpulids, *Turtitella whitei, Sciponoceras gracile*
Ka	499		I				Butler Valley North	Butler Valley	III	Kt	*Perissoptera prolabiata, Sciponoceras gracile, Metoicoceras geslinianum*
Ka	500		I				Butler Valley North	Butler Valley	IV	Kt	*Pycnodonte newberryi*, rare *Exogyra*
Ka	501		I				Butler Valley Neck	Butler Valley	III	Kt	*Metoicoceras geslinianum, Sciponoceras gracile, Euomphaloceras, Psilomya*
Ka	502		I				Butler Valley Neck	Butler Valley	III	Kt	*Metoicoceras geslinianum, Sciponoceras gracile, Euomphaloceras, Psilomya*
Ka	606		I				Hattie Green Area	Five Mile Valley	III	Kt	*Allocrioceras annulatum, Sciponoceras gracile, Metoicoceras, Euomphaloceras, Turitella whitei, Inoceramus, Drepanochilus*
Ka	607		I				Rock House Cave	Five Mile Valley	II	Kt	*Metoicoceras geslinianum, Sciponoceras gracile, Turitella whitei, Drepanochilus*

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	609		I				Cottonwood Wash	Calico Peak	II	Kt	*Metoicoceras geslinianum, Sciponoceras gracile, Pycnodonte newberryi*
Ka	624		I				Pollack Locality 19: USGS D13760	Calico Peak		Kt	*Collignoniceras woollgari*
Ka	629		I				Pollack Locality 51 (USGS D12243)	Lone Rock (not Glen Canyon City)		Kt	typical *Sciponoceras gracile* fauna
Ka	630		I				Pollack Locality 52 (USGS D12244)	Lone Rock (not Glen Canyon City)		Kt	*Watinoceras*?
Ka	631		I				Pollack Locality 53 (USGS D12245)	Lone Rock (not Glen Canyon City)		Kt	*Mytiloides, Watinoceras*
Ka	632		I				Pollack Locality 54 (USGS D12246)	Lone Rock (not Glen Canyon City)		Kt	*Collignoniceras*
Ka	636		I				Pollack Locality 58 (USGS D4352)	Smoky Hollow		Kt	*Collignoniceras woollgari*
Ka	660		I				Pollack Locality 128 (USGS D7282)	Basin Canyon		Kt	*Nuculana, Mytiloides* cf *M. labia*
Ka	663		I				Pollack Locality 131 (USGS D12468)	Sit Down Bench		Kt	*Pteria, Inoceramus pictus, Hamites simplex, Idiohamites, Neocardioceras?*
Ka	671		I				Section on Willis Creek (Re-Assigned from Ga069I)	Bryce Point		Kt	invertebrates
Ka	692		I				Nipple Creek Trail (Section 4: Southern Kaiparowits Region)	Nipple Butte	III	Kt	*Euomphaloceras, Worthoceras, Pseudocalycoceras*

Straight Cliffs Formation Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	124		I	P			Sec 18: N side of Hwy 54 [12], 17 miles SW of Escalante	Pine Lake or Upper Valley		Ks	bivalve fragments, leaf impressions
Ga	164			P			Carcass Canyon, Kaiparowits Coal Field	Carcass Canyon		Ks	pollen
Ga	195	V	I	P				Henrieville		Ks	fossil wood, bivalves, gastropods, fish scales, bone fragments, turtle scutes
Ga	272	V	I		T		D.B.-UP-11: UP&L Glen Canyon to Sigurd transmission line survey	Henrieville		Ks	bivalves, burrows, croc
Ga	306	V					Jimmy Canyon 4 Locality: MNA 995-1 (Museum of Northern Arizona	Pine Lake	II	Kss	microvertebrates (mammals)
Ga	309	V		P			MNA 1003-1; OMNH V4; field no PC-3	Henrieville	II	Kss	microvertebrates (mammals); wood
Ga	353	V					Heward Creek 1	Bryce Point		Ks	microvertebrates (mammals)
Ga	377	V					OMNH V60	Pine Lake		Kss	microvertebrates (mammals)
Ga	423		I				Henrieville Creek	Henrieville	III	Kst	*Prionocyclus hyatti, I. howelli,* other bivalves, gastropods
Ga	424	V	I				Henrieville Creek	Henrieville	IV	Ksj	bivalves, gastropods, worn saurian bone
Ga	425	V						Pine Lake	IV	Ks	vertebrates
Ga	426	V	I					Pine Lake	IV	Ks	indet. vertebrate, invertebrates
Ga	427	V						Pine Lake	IV	Ksj	vertebrates
Ga	428	V						Pine Lake	IV	Ksj	vertebrates

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	429	V						Pine Lake	IV	Ksj	vertebrates
Ga	430	V						Pine Lake	IV	Ksj	vertebrates
Ga	455		I					Canaan Creek	II	Kst	bivalves - *Exogyra*?
Ga	496	V	I				Walt Bench	Tropic Canyon	III	Ks	oysters, clams, shark tooth, *Ophiomorpha* (invertebrate trail)
Ga	497			P			Pet Hollow I	Canaan Creek	IV	Ks	wood impressions/carbon in unique hematite concretions
Ga	498		I				Pet Hollow II	Canaan Creek	IV	Ks	bivalves, large inoceramids
Ga	499	V	I	P			Coad Bed Canyon	Canaan Creek	III	Ks	shark teeth (3 types), bivalves, plant material
Ga	500		I				Honking Cows	Canaan Creek	IV	Ks	bivalves (oysters) in cross-bedded sandstone
Ga	502			P			Horse Creek III	Canaan Peak	IV	Ksj	angiosperm leaf impressions
Ga	503	V	I	P			Horse Creek II	Canaan Peak	III	Ksj	dinosaur, chelonia (turtle), shark tooth, plant impressions, bivalves, gastropods
Ga	504		I				Horse Creek I	Canaan Peak	IV	Ksj	bivalves
Ga	536		I				Pardner Canyon	Henrieville	III	Kst	*Spathites* sp, *Prionocyclus* sp, large *Inoceramus* sp
Ga	537		I				Canyon East of Dry Hollow	Pine Lake	III	Kss	oysters (*Crassostrea*?), serpulid worms
Ga	544		I				Pollack Locality 5: USGS D13670	Pine Lake		Kst	*Phelopteria gastrodes, Inoceramus, Pleurocardia pauperculum, Tellina modesta*

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	545		I				Pollack Locality 59: USGS D13775	Canaan Creek		Kst	*Inoceramus* n. sp. (probably *Prionocyclus hyatti* zone)
Ga	547		I				Pollack Locality 61: USGS D5188	Canaan Creek		Ks	*Ostrea*
Ga	548		I				Pollack Locality 62: USGS D5180	Canaan Creek		Ks	*Volviceramus involutus*
Ga	549		I				Pollack Locality 63: USGS D5182	Canaan Creek		Ks	*Ostrea coalvillensis*
Ga	550		I				Pollack Locality 64: USGS D5185	Canaan Creek		Ks	*Crassostrea soleniscus*
Ga	551		I				Pollack Locality 65: USGS D5183	Canaan Creek		Ks	*Crassostrea* cf. *C. soleniscus*
Ga	552		I				Pollack Locality 66: USGS D5191	Canaan Creek		Ks	*Brachidontes, Corbula*
Ga	553		I				Pollack Locality 67: USGS D5189	Canaan Creek		Ks	*Ostrea coalvillensis*
Ga	554		I				Pollack Locality 68: USGS D5181	Canaan Creek		Ks	*Ostrea coalvillensis*
Ga	555		I				Pollack Locality 69: USGS D5467	Wide Hollow Reservoir		Ks	*Scaphites*
Ga	559		I				Pollack Locality 73: USGS D5190	Canaan Creek		Ks	*Brachidontes, Corbula, Melania?* (brackish-water species)
Ga	560				T		Pollack Locality 74: USGS D5192	Canaan Creek		Ks	burrows (probably wood bored by "shipworms" - suggests marine environment)
Ga	561		I				Pollack Locality 75: USGS D5187	Canaan Creek		Ks	*Phelopteria gastrodes, Ostrea Pycnodonte* (shallow-water marine assemblage)
Ga	562		I				Pollack Locality 76: USGS D5186	Canaan Creek		Ks	*Crassostrea soleniscus* (brackish-water oyster)

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	564		I				Pollack Locality 78: USGS D5428	Canaan Creek or Dave Canyon		Ks	*Inoceramus howelli*
Ga	582		I				Pollack Locality 96: USGS D5456	Carcass Canyon or Seep Flat		Ks	*Inoceramus, Pleuriocardia pauperculum, Cymbophora*
Ga	583		I				Pollack Locality 97: USGS D9628	Seep Flat		Ksj	*Inoceramus* (bored) *Crassostrea*
Ga	584		I				Pollack Locality 98: USGS D9629	Seep Flat		Ksj	*Inoceramus* (bored)
Ga	588		I				Pollack Locality 102: USGS D7285	Seep Flat		Ksj	*Baculites codyensis*
Ga	589		I				Pollack Locality 105: USGS D6056	Seep Flat		Ksj	*Inoceramus, Ostrea, Legumen* cf *L. ellipticum*
Ga	590		I				Pollack Locality 118: USGS D7307	Sunset Flat		Ksj	*Crassostrea soleniscus*
Ga	598	V	I				UCMP Locality V98098: Alvey Wash Lower Shark (in Sec 1, T36S and Sec 36, T35S, R2E)	Canaan Creek		Ksj	shells, shark teeth
Ga	601	V		I			UCMP Locality V98165: Alvey Wash Upper Shark W	Canaan Creek		Ksj	oysters
Ga	614		I	P			North side of Horse Creek	Canaan Peak	III	Ksj	leaf impressions, bivalves
Ga	616			P				Canaan Peak	III	Ksd	leaf and wood impressions, petrified wood fragments
Ka	048	V	I	P			near head, west branch Last Chance Creek			Ks; Kt	shark teeth, fossil plants and wood, invertebrates
Ka	049		I				Croton Creek Fork of Last Chance Creek	East of the Navajo		Ks	marine invertebrates
Ka	095	V		P			Type Section: Straight Cliffs, John Henry Member	Smoky Hollow and Tibbet Bench		Ksj	bones and logs

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	139		I				Section S12, Locality 67: Southern Kaiparowits region: Baldwin Hollow	Tibbet Bench	IV	Kst	*Inoceramus howelli*
Ka	140		I		T		Section S13, Locality 73: Southern Kaiparowits region (Ka140a)	Tibbet Bench	IV	Kst	*Ophiomorpha* trace fossils, *Crassostrea* and other bivalves
Ka	141		I				Section S14, Locality 69: Southern Kaiparowits region - Upper Warm Creek Canyon	Tibbet Bench	III	Kst	*Spathites, Inoceramus howelli, Crassostrea soleniscus, Cymbophora* sp,.
Ka	142		I				Section S16, Locality 72: Southern Kaiparowits region - Upper Warm Creek Canyon	Tibbet Bench	IV	Kst	*Inoceramus howelli*, other bivalves and gastropods
Ka	143		I				Kelly Grade: Section S18, Locality 123, Southern Kaiparowits region	Smoky Hollow		Kst	*Brachidontes* sp, *Crassostrea soleniscus*, bivalves, gastropods
Ka	144		I				Section S20: Southern Kaiparowits region			Kt/Kst	invertebrates
Ka	145		I				Section S22, Locality 139: Southern Kaiparowits region - East Burning Hills	Sit Down Bench	IV	Kst	*Inoceramus, Corbula*, gastropod fragments
Ka	146		I				Section S29: Southern Kaiparowits region			Kt/Kst	invertebrates
Ka	147		I				Section S30: Southern Kaiparowits region			Kt/Kst	invertebrates
Ka	148		I				Section S34: Southern Kaiparowits region			Kt/Kst	invertebrates
Ka	149		I				Section S6: Southern Kaiparowits region			Kt/Kst	invertebrates
Ka	150		I				Section T4: Southern Kaiparowits region			Kt/Kst	invertebrates
Ka	151		I		T		Section S5: Southern Kaiparowits region			Ksj	invertebrates
Ka	152		I				Section S6: Southern Kaiparowits region			Ksj	invertebrates

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	153		I				Section S12, Locality 66: Southern Kaiparowits region - Baldwin Hollow	Tibbet Bench	IV	Ksj	*Unio* sp.
Ka	154			P			Section S19: Southern Kaiparowits region			Ksj	invertebrates
Ka	155		I				Section S21: Southern Kaiparowits region			Ksj	invertebrates
Ka	156		I				Section S22, Locality 144: Southern Kaiparowits region - Last Chance Creek	Sit Down Bench	IV	Ksj	*Ostrea* sp.
Ka	157		I				Section S23: Southern Kaiparowits region			Ksj	invertebrates
Ka	158		I				Section S24: Southern Kaiparowits region			Ksj	invertebrates
Ka	159		I				Section S27: Southern Kaiparowits region			Ksj	invertebrates
Ka	160		I				Section S28: Southern Kaiparowits region			Ksj	invertebrates
Ka	161	V	I				Section S29: Southern Kaiparowits region			Ksj	invertebrates
Ka	162		I		T		Section S30: Southern Kaiparowits region			Ksj	invertebrates
Ka	163	V	I		T		Section S34: Southern Kaiparowits region			Ksj	invertebrates
Ka	164		I				Southern Kaiparowits region	Needle Eye Point		Ksj	invertebrates
Ka	165		I				Southern Kaiparowits region	Needle Eye Point		Ksj	invertebrates
Ka	166		I				The Scorpion	Nipple Butte	III	Ksj	bivalves incl *Cardium*-like and Chelicerate claws
Ka	168			P			Southern Kaiparowits region	Needle Eye Point		Ksj	plants
Ka	169		I				Southern Kaiparowits region	Sooner Bench		Ksj	invertebrates
Ka	170		I				Southern Kaiparowits region	Cummings Mesa 15'		Ksj	invertebrates

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	171	V	I	P			South Smoky Mountain: Section S18, Southern Kaiparowits region	Smoky Hollow	I	Ksd	dinosaur ribs, vertebrae, and teeth; plant stems
Ka	191			P			West Smoky Mt.	Smoky Hollow	IV	Ksj	plants
Ka	293				T		Christensen Dinosaur Track	Basin Canyon		Ksj	3-toed dinosaur track
Ka	301				T		Alden 6/9/98	Nipple Butte	II	Ksj	dinosaur tracks
Ka	304	V					Slickrock Bench 1	Canaan Peak		Kss	microvertebrates (mammals)
Ka	305	V	I				Slickrock Bench 2	Canaan Peak		Kss	microvertebrates (mammals)
Ka	306	V					Slickrock Bench 3	Canaan Peak		Kss	microvertebrates (mammals)
Ka	307	V					Slickrock Bench 4	Canaan Peak	I	Kss	microvertebrates (mammals)
Ka	308	V					Slickrock Bench 5	Canaan Peak		Kss	microvertebrates (mammals)
Ka	309	V	I				Slickrock Bench 6	Canaan Peak		Kss	microvertebrates (mammals)
Ka	310	V					Slickrock Bench 7	Canaan Peak		Kss	microvertebrates (mammals)
Ka	311	V	I				Slickrock Bench 8	Canaan Peak		Ksj	microvertebrates (mammals)
Ka	312	V					Slickrock Bench 9	Canaan Peak		Kss	microvertebrates (mammals)
Ka	315	V					Slickrock Bench 10	Canaan Peak		Kss	microvertebrates (mammals)
Ka	349	V		P			Conoco Smoky Mountain State 36-1 (Brooks Britt report)	Ship Mountain Point		Ks	dinosaur caudal vertebra, petrified wood
Ka	351		I				Alden 10-26-98	East of the Navajo	II	Ksj	*Volviceramus involutus*
Ka	514			P			Tibbet Canyon area of type section	Tibbet Bench	IV	Kst	wood, plant fragments in fluvial channel, upper part of Tibbet Canyon Member

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	515		I				The Scorpion	Nipple Butte	III	Kst	abundant bivalves, gastropods; *Prionocyclus hyatti* zone
Ka	516		I				Smoky Mtn East	Smoky Hollow	IV	Kst	*Ophiomorpha* traces
Ka	517		I				"The Gut"	Butler Valley	IV	Kst	*Inoceramus howelli, Cymbophora utahensis*
Ka	518				T		The Scorpion	Nipple Butte	II	Ksj	3-toed and 4-5 toed dinosaur tracks
Ka	519	V	I	P			Tibbet Canyon	Tibbet Bench	II	Ksj	worn saurian bone, fish scales, bivalves (*Ostrea*), wood and stems
Ka	520			P			Kelly Grade Summit - Peterson, 1969 PhD Sec S19, Locality 143	Smoky Hollow	IV	Ksj	plant stems
Ka	521		I	P			West Smoky Mountain	Smoky Hollow	III	Ksj	cardioid bivalves and plant stems
Ka	522			P			Smoky Mtn East	Smoky Hollow	V	Ks	plant stems, tree trunks
Ka	523	V					Smoky Mtn West	Smoky Hollow	IV	Ks	unidentifiable bone fragments
Ka	585			P			East Reese Canyon	Collet Top	IV	Ks	wood and leaf impressions
Ka	586			P			Upper Surprise Valley	Needle Eye Point	III	Ksj	angiosperm leaf and wood impressions
Ka	587		I	P	T		East of the Navajo	East of the Navajo	III	Ks	oysters, plant impressions, invertebrate burrows
Ka	588		I		T		Coyote Creek III	Lower Coyote Spring	III	Ks	clams, invertebrate trails
Ka	589	V			T		Coyote Creek II	Lower Coyote Spring	II	Ks	3 shark teeth, invertebrate trails
Ka	590			P			Coyote Creek I	Lower Coyote Spring	IV	Ks	petrified wood

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	591		I	P	T		Tibbet Springs	Tibbet Bench	IV	Ks	gastropod casts, wood impressions, invertebrate traces
Ka	605				T		The Scorpion	Nipple Butte	II	Ksj	3-toed and 4/5-toed dinosaur tracks
Ka	608		I				"The Gut"	Butler Valley	II	Kst	*Prionocyclus hyatti* zone, *Spathites, Herrickiceras costatum, Gyrodes depressa*
Ka	627		I				Pollack Locality 35 (USGS D4629)	Nipple Butte		Ks	*Anomia?, Cymbophora?, Melania?*
Ka	633		I				Pollack Locality 55 (USGS D4366)	Tibbet Bench		Ks	*Prionocyclus hyatti* zone fauna
Ka	634		I				Pollack Locality 56 (USGS D8019)	Gunsight Butte		Kst	*Inoceramus hyatti (Prionocyclus hyatti* zone)
Ka	635		I				Pollack Locality 57 (USGS D7280)	Nipple Butte		Ksj	small gastropods and bivalves in baked clay
Ka	637		I				Pollack Locality 103 (USGS D9626)	Seep Flat		Ksj	*Inoceramus (Platyceramus) cycloides, Cardium, Placenticeras*
Ka	638		I				Pollack Locality 104 (USGS D9627)	Seep Flat		Ksj	*Plicatula, Chlamys?*
Ka	639		I				Pollack Locality 106 (USGS D7298)	Seep Flat		Ksj	*Cymbophora, Placenticeras*
Ka	640		I				Pollack Locality 107 (USGS D7299)	Seep Flat		Kst	*Inoceramus aff. I howelli*
Ka	641		I				Pollack Locality 108 (USGS D6057)	Seep Flat		Ksj	*Baculites codyensis, Protexanites bourgeoisianus, Placenticeras*
Ka	642		I				Pollack Locality 109 (USGS D7300)	Seep Flat		Ksj	*Inoceramus (Magadiceramus) stantoni, Tellina, Cymbophora* cf *C. emmonsi, Gyrodes depressa, Placenticeras* sp.

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	643		I				Pollack Locality 110 (USGS D13774)	Seep Flat		Kst	bivalves and gastropods presumably from *Prionocyclus hyatti* zone fauna
Ka	644		I				Pollack Locality 111 (USGS D6058) same locality as D6059	Collet Top		Ksj	calcareous worm tube *Inoceramus* cf *I. mesabiensis* "*Corbula*", *Stenomelania*?, *Pachychiloides?* ammonite fragment
Ka	645		I				Pollack Locality 112 (USGS D6059) same locality as D6058	Collet Top		Ksj	bryozoan, *Ostrea coalvillensis*, *Crassostrea soleniscis*, *Brachidontes*
Ka	646		I				Pollack Locality 113 (USGS D7297)	Seep Flat		Ksj	*Inoceramus* aff *I. koeneni*
Ka	647		I				Pollack Locality 114 (USGS D7295)	Seep Flat		Ksj	*Placenticeras*, ~20 species of bivalves and gastropods
Ka	648		I				Pollack Locality 115 (USGS D7296)	Seep Flat		Ksj	*Crassostrea*, *Protodonax oblongus*, *Pleuriocardia*, *Tellina*
Ka	649		I				Pollack Locality 116 (USGS D5296)	Seep Flat		Ks	*Inoceramus* sp.
Ka	650		I				Pollack Locality 117 (USGS D5308)	Seep Flat		Ks	inoceramids
Ka	651		I				Pollack Locality 119 (USGS D5692)	Basin Canyon		Ksj	*Sphenoceramus*, *Inoceramus* (*Endocostea*) cf *I. balticus*, *Crassostrea soleniscus*
Ka	652		I				Pollack Locality 120 (USGS D7305)	Basin Canyon		Ksj	*Placenticeras*
Ka	653		I				Pollack Locality 121 (USGS D7304)	Basin Canyon		Ksj	*Inoceramus*
Ka	654		I				Pollack Locality 122 (USGS D7306)	Basin Canyon		Ksj	*Inoceramus* (probably new species)
Ka	655		I				Pollack Locality 123 (USGS D5284)	East of the Navajo		Ks	*Placenticeras*

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	656		I				Pollack Locality 124 (USGS D8879)	Big Hollow Wash		Ksj	*Inoceramus*
Ka	657		I				Pollack Locality 125 (USGS D8880)	Big Hollow Wash		Ksj	Inoceramus cf *I. balticus Ostrea Tellina? Desmoscaphites*
Ka	658		I				Pollack Locality 126 (USGS D8881)	Big Hollow Wash		Kst	*Inoceramus howelli* (zone of *Prionocyclus hyatti*)
Ka	661		I				Pollack Locality 129 (USGS D7281)	Basin Canyon		Ksj	*Inoceramus (Magadiceramus) stantoni, Anomia*
Ka	662		I				Pollack Locality 130 (USGS D5283)	East of the Navajo		Ks	*Baculites asper*
Ka	664		I				Pollack Locality 132 (USGS D7905)	Blackburn Canyon		Ksj	*Inoceramus (Sphenoceramus patootensiformis)*
Ka	665		I				Pollack Locality 133 (USGS D8022)	Blackburn Canyon		Ksj	*Placenticeras*
Ka	667		I				Pollack Locality 135 (USGS D5286)	Sooner Bench		Ks	*Inoceramus, Ostrea, Baculites asper, Scaphites, Placenticeras*
Ka	668		I				Pollack Locality 136 (USGS D7283)	Sooner Bench		Ks	*Inoceramus (Magadiceramus) stantoni*
Ka	670		I				Pollack Locality 138 (USGS D5287)	Navajo Point		Ksj	*Baculites*
Ka	672	V					Conoco 2-D Seismic Line paleo locality - station 1498, line 15	East of the Navajo		Ks	dinosaur bone
Ka	675			P				Ship Mountain Point	III	Ksd	petrified log across road
Ka	677	V	I	P				Canaan Peak	III	Ksj	bone fragments, leaf impressions, petrified wood, bivalves
Ka	678		I					Canaan Peak	III	Ksj	bivalves
Ka	679		I	P				Canaan Peak	III	Ksj	petrified wood, bivalves

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	682				T			Tibbet Bench	II	Ksj	3-toed dinosaur tracks
Ka	683			P				Tibbet Bench	III	Ksd	petrified wood
Ka	684				T			Tibbet Bench	III	Ksj	3-toed dinosaur tracks
Ka	685			P				Tibbet Bench	II	Ksd	petrified log
Ka	686				T			Tibbet Bench	II	Ksj	3-toed dinosaur tracks
Ka	691				T		Lower Trail Canyon along the Left Hand Collet Canyon Road	Collet Top	II	Ksj	3-toed dinosaur tracks

Wahweap Formation Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	227	V					USGS Locality D815	Death Ridge		Kw	dinosaur bone fragments
Ga	274	V					USGS Locality D596 (Denver catalog)	Dave Canyon		Kw	hadrosaur, croc, theropod
Ga	284	V					MNA Locality 455-1: Death Ridge (DR-1) approx 0.4 mile W of Death Ridge Reservoir	Death Ridge		Kw	*Symmetrodontoides* - microvertebrate (mammal)
Ga	308	V	I	P			MNA 456-1 and 456-2; OMNH V36 and V11; Field nos LS-1 and LS-2: Henrieville Creek	Henrieville		Kw	microvertebrates (mammals); turtle, wood, dinosaur, gastropods
Ga	383	V					Rock Spring N1 - UCMP V97087	Dave Canyon		Kw	vertebrates
Ga	384	V					Rock Spring N2 - UCMP V97088	Dave Canyon		Kw	vertebrates
Ga	385	V					Bernardo's Bluff	Canaan Creek		Kw	vertebrates
Ga	445	V						Death Ridge	IV	Kw	turtle
Ga	446	V						Death Ridge	IV	Kw	dinosaur
Ga	447	V	I	P				Death Ridge	I	Kw	dinosaur, fish, turtle, croc, *Unio*
Ga	448	V						Canaan Creek	III	Kw	dinosaur, turtle
Ga	449	V						Carcass Canyon		Kw	dinosaur, gar, turtle, croc
Ga	450	V						Carcass Canyon	II	Kw	dinosaur
Ga	451	V	I					Carcass Canyon	I	Kw	bivalves, gastropods, croc, turtle, dinosaur
Ga	452	V		P				Carcass Canyon	I	Kw	wood, dinosaur

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	453	V						Carcass Canyon	I	Kw	dinosaur, mammals
Ga	454	V						Carcass Canyon	II	Kw	crocodile
Ga	456	V						Canaan Creek	IV	Kw	indet. bone
Ga	457	V	I					Canaan Creek	II	Kw	fish, bivalves, indet. bone
Ga	458	V	I	P				Canaan Creek	I	Kw	fish, croc, dinosaur, wood, gastropods, bivalves
Ga	459	V		P				Canaan Creek	I	Kw	dinosaur, croc, turtle, fish, wood
Ga	460	V						Canaan Creek	I	Kw	turtle, croc, gar, dinosaur
Ga	501	V	I	P			Jorges Cliffs	Henrieville	II	Kw	croc, theropod tooth, indet. dinosaur, bivalves, gastropods, gar scales
Ga	505	V		P			Little Valley	Canaan Creek	III	Kw	chelonia, dinosaur, wood impressions, possible leaf
Ga	506	V	I	P			North Trap Canyon	Death Ridge	IV	Kw	petrified wood, indet. mollusc, indet. vertebrate
Ga	507	V	I	P			Little Valley View	Canaan Creek	III	Kw	gar, chelonia, gastropods, petrified wood
Ga	508	V					Little Valley Amphitheater	Canaan Creek	III	Kw	gar
Ga	615	V					Harry Barber dinosaur site	Canaan Peak	III	Kw	dinosaur bones
Ga	617	V						Canaan Peak	III	Kw	dinosaur bone
Ga	618		I	P				Canaan Peak	III	Kw	bivalves and wood impressions
Ga	624				T		Alden Hamblin 8-31-99	Carcass Canyon	II	Kw	dinosaur track casts

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	625				T		Alden Hamblin 9-1-99 (1)	Death Ridge	II	Kw	dinosaur track casts
Ga	626				T		Alden Hamblin 9-1-99 (2)	Death Ridge	II	Kw	dinosaur track casts
Ka	050	V					Escarpment SW of Last Chance Canyon	Needle Eye Point		Kw	fish bone
Ka	051	V	I					Petes Cove or Ship Mountain Point		Kw	croc or turtle bone
Ka	073	V	I				section near head of Nipple Creek	Nipple Butte		Kw	invertebrates, fish and reptile teeth, bone fragments
Ka	172	V	I	P			Section W1: Southern Kaiparowits region			Kw	invertebrates
Ka	173	V	I				Section W3: Southern Kaiparowits region			Kw	invertebrates
Ka	174	V	I	P			Section S3: Southern Kaiparowits region			Kw	invertebrates
Ka	262	V					Tibbet Canyon (MNA 1005-1)	Tibbet Bench	I	Kw	microvertebrates (mammals)
Ka	263	V					Tibbet Canyon (MNA1005-2)	Tibbet Bench	I	Kw	microvertebrates (mammals)
Ka	264	V		P			Tibbet Canyon (MNA1005-3): Tibbet Spring	Tibbet Bench		Kw	microvertebrates (mammals); plants - large stems
Ka	265	V					MNA 707-6; OMNH V19; Field #NB6	Tibbet Bench	I	Kw	microvertebrates (mammals)
Ka	286	V		P				Horse Flat		Kw	dinosaur bone, petrified wood, plant impressions
Ka	287	V		P				Horse Flat		Kw	dinosaur bone, petrified wood, plant impressions
Ka	524	V					Tibbet Spring	Tibbet Bench	II	Kw	saurian bone in 12-15 in ss-pebble cong on S side of road cut

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	525	V	I	P			MNA 707-5 - Tibbet Spring	Tibbet Bench	I	Kw	vertebrates, well preserved wood, bivalves (in calcite nodules)
Ka	526	V	I	P			MNA 707-1 - Tibbet Spring	Tibbet Bench	I	Kw	vertebrates, petrified wood, non-marine molluscs
Ka	527	V	I	P			SE of "The Gut"	Butler Valley	II	Kw	*Viviparus* sp, turtle, large dinosaur bone (14-15 in), large tree trunks (4-5 ft)
Ka	528	V						Butler Valley	III	Kw	dinosaur and reptile bone
Ka	529			P			SE of "The Gut"	Butler Valley	II	Kw	tree trunk pieces
Ka	531	V					Four Mile Bench	Formal Bench	II	Kw	turtle
Ka	536	V					Josh's Ceratopsian Skull, North Nipple Butte	Nipple Butte	I	Kw	ceratopsian skull
Ka	537	V						Horse Flat	IV	Kw	vertebrates, wood
Ka	538	V		P				Horse Flat		Kw	vertebrates, wood
Ka	543	V	I	P				Petes Cove	I	Kw	dinosaur, wood
Ka	544	V	I	P				Petes Cove	II	Kw	dinosaur, wood
Ka	545	V						Nipple Butte		Kw	dinosaur
Ka	546	V						Nipple Butte		Kw	dinosaur scrap
Ka	547	V						Nipple Butte		Kw	vertebrates
Ka	548	V		P	T			Five Mile Valley		Kw	dinosaur, wood - large logs
Ka	549	V	I	P				Five Mile Valley		Kw	dinosaur, wood, bivalves
Ka	550	V						Nipple Butte		Kw	turtle, dinosaur

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	551	V						Nipple Butte		Kw	turtle, dinosaur
Ka	552	V						Nipple Butte		Kw	dinosaur
Ka	592	V		P			8K0418	Butler Valley	IV	Kw	indet. vertebrate, ornithischian dinosaur?, petrified wood and logs
Ka	593			P			Upper Drip Tank	Ship Mtn Point	IV	Kw	petrified wood
Ka	611			P			SE of The Gut	Butler Valley	II	Kw	tree trunk pieces - large specimen in road cut w root ball intact
Ka	674	V		P			Conoco 6-1 well pad site	Ship Mountain Point	III	Kw	fossil leaves, petrified wood, bone fragments
Ka	680	V		P			Tibbet Spring Dinosaur	Tibbet Bench	I	Kw	dinosaur bone (?hadrosaur), fossil leaves
Ka	681	V					Martha's Microsite	Nipple Butte	II	Kw	turtle, gar scales
Ka	687				T			Nipple Butte	II	Kw	dinosaur tracks
Ka	688				T			Tibbet Bench	II	Kw	dinosaur track

Kaiparowits Formation Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	002	V					BYU *Parasaurolophus* locality: Henrieville Creek	Pine Lake	I	Kk	*Parasaurolophus* skull
Ga	088			P			The Blues Section: Units 1A - 1L	Pine Lake		Kk	pollen
Ga	089			P			The Blues Section: Units 1m-11: small hill inside Henrieville Creek Meander	Pine Lake		Kk	pollen
Ga	090			P			The Blues Section: Units 12-19: outside of upstream end of large meander	Pine Lake		Kk	pollen
Ga	091			P			The Blues Section: Units 20-22: drainage divide on S side of Henrieville tr	Upper Valley		Kk	pollen
Ga	092			P			The Blues Section: Units 23-37: along drainage divide	Upper Valley		Kk	pollen
Ga	093			P			The Blues Section: Units 38-44	Upper Valley (and Canaan Peak?)		Kk	pollen
Ga	094			P			The Blues Section: Units 45-53	Canaan Peak	I	Kk	pollen
Ga	095			P			The Blues Section: Units 53b-61: along Hwy 54 from .3mile E MP 26	Canaan Peak	I	Kk	pollen
Ga	096			P			The Blues Section: Units 62-64: N side Hwy 54 at E end of road cut	Canaan Peak	I	Kk	pollen
Ga	097	V	I	P			The Blues Section: Units 65-72: S side of low divide	Canaan Peak	I	Kk	pollen, gastropods, turtle, fish, eggshell fragments?, tooth
Ga	098	V	I	P			The Blues Section: Units 73-76: N side of valley	Canaan Peak	I	Kk	pollen, leaves, wood, bivalves, gastropods, croc. scutes

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	099	V		P			The Blues Section: Units 77-78: upstream spur of Henrieville Creek meander	Canaan Peak	I	Kk	pollen, turtle, dinosaur
Ga	100			P			The Blues Section: Unit 79: small gully	Canaan Peak	I	Kk	pollen
Ga	101			P			The Blues Section: Units 80-82	Upper Valley or Canaan Peak		Kk	pollen
Ga	102			P			The Blues Section: Unit 83	Upper Valley		Kk	pollen
Ga	104			P			The Blues Section: Units 88-90	Upper Valley		Kk	pollen
Ga	105			P			The Blues Section: Units 91-95	Upper Valley		Kk	pollen
Ga	106			P			The Blues Section: Unit 96 (and base of 97)	Upper Valley		Kk	pollen
Ga	107			P			The Blues Section: Unit 97 (2190-2350 ft)	Upper Valley		Kk	pollen
Ga	108			P			The Blues Section: Unit 97 (2350-2580 ft)	Upper Valley		Kk	pollen
Ga	109			P			The Blues Section: top of Unit 97 (2850-2756 ft)	Upper Valley		Kk	pollen
Ga	148	V	I	P			Death Ridge Paleo Locality, Northern Geophysical Survey Project	Death Ridge		Kk	dinosaur bone, clams, petrified wood
Ga	262	V	I	P			"The Blues" - a Kaiparowits badlands in the Paria River Amphitheater	Upper Valley		Kk	*Ornithomimus velox*
Ga	292	V					First Kaiparowits: Univ of Colorado Museum (UCM) Locality 83237	Canaan Peak	II	Kk	turtle and dinosaur bone
Ga	293	V					Second Kaiparowits: UCM Locality 83238	Upper Valley	I	Kk	croc., turtle, lizard, dinosaur bone
Ga	310	V					MNA 453-2; OMNH V14; field no TB2	Upper Valley		Kk	microvertebrates (mammals)

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	312	V					MNA Locality 1235: Henrieville Creek	Canaan Peak	I	Kk	turtle
Ga	320	V	I	P				Upper Valley / Canaan Peak	II	Kk	petrified wood, turtle, gastropods
Ga	378	V					OMNH V61	Upper Valley		Kk	microvertebrates (mammals)
Ga	386	V					Paria Hollow S	Upper Valley		Kk	vertebrates
Ga	387	V					The Blues 30	Upper Valley		Kk	vertebrates
Ga	388	V					The Blues 31	Upper Valley		Kk	vertebrates
Ga	389	V					The Blues 32	Upper Valley		Kk	vertebrates
Ga	390	V					The Blues 33	Upper Valley		Kk	vertebrates
Ga	391	V					The Blues 34	Upper Valley		Kk	vertebrates
Ga	395	V					Dinosaur Rib	Death Ridge		Kk	dinosaur
Ga	405	V						Upper Valley	III	Kk	turtle shell fragments with possible ilium or coracoid
Ga	434	V	I					Upper Valley	II	Kk	gar, turtle, croc., dinosaur, invertebrates - gastropods
Ga	435	V	I	P				Upper Valley	II	Kk	dinosaur, wood, gastropods
Ga	436	V		P				Upper Valley	II	Kk	dinosaur, wood
Ga	437	V	I	P				Upper Valley	II	Kk	croc., turtle, dinosaur, wood
Ga	438	V	I	P				Upper Valley	II	Kk	croc., turtle, dinosaur, wood, gastropods, bivalves
Ga	439			P				Upper Valley	II	Kk	wood

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	440	V	I	P				Upper Valley		Kk	dinosaur, gastropods, wood
Ga	441	V	I					Upper Valley	II	Kk	dinosaur, croc., turtle, bivalves
Ga	442	V					Croc graveyard	Upper Valley		Kk	crocodilian
Ga	509	V		P			8G0315	Upper Valley	IV	Kk	wood, dinosaur
Ga	510		I				8G0314	Canaan Peak	IV	Kk	bivalves
Ga	511	V					8G0313	Canaan Peak	IV	Kk	indet. vertebrate
Ga	512	V					Elmore James	Upper Valley	III	Kk	chelonia, dinosaur, ceratopsidae
Ga	513	V					Junior Wells	Upper Valley	IV	Kk	chelonia; indet. dinosaur
Ga	516	V	I				Raymond M Alf Museum Locality: Section 20 Site #1: V98007	Canaan Peak		Kk	snails, clams, dinosaur caudal vertebra fragments, turtle shell fragments
Ga	517	V					Raymond M Alf Museum Locality: Section 20 Site #2: Enders Site, V98008	Canaan Peak		Kk	dinosaur bone, incl. caudal vertebrae, partial theropod? foot
Ga	518	V					Raymond M Alf Museum Locality: Section 20 Site #3: V98009	Canaan Peak		Kk	ceratopsian dinosaur tooth fragment, turtle shell fragments, unidentifiable bone fragment
Ga	519	V					Raymond M Alf Museum Locality: Section 20 Site #4: V98010	Canaan Peak		Kk	centrum of dinosaur caudal vertebra
Ga	520						Raymond M Alf Museum Locality: V97040	Canaan Peak		Kk	dinosaur
Ga	535			P			Henrieville Creek	Canaan Peak	I	Kk	pollen, gastropods, turtle, fish, eggshell fragments?, tooth
Ga	538	V		P			Upper Henrieville Creek	Upper Valley	II	Kk	turtle, dinosaur, wood

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	539		I				Upper Henrieville Creek	Upper Valley	II	Kk	gastropods, bivalves
Ga	591	V					University of California Museum of Paleontology (UCMP) Locality V98050: JGE 8653	Upper Valley		Kk	turtle fragments
Ga	592	V	I				UCMP Locality V98051: JGE 8660	Canaan Peak		Kk	turtle fragments
Ga	593	V					UCMP Locality V98052: JGE 8659	Canaan Peak		Kk	turtle fragments
Ga	594	V					UCMP Locality V98053: Little's Neurankylus	Canaan Peak		Kk	*Neurankylus* shell
Ga	595	V					UCMP Locality V98053: Hwy 12 Overlook Micro	Canaan Peak		Kk	turtle fragments, gastropods, clams
Ga	596	V					UCMP Locality V98053: Still the Blues	Upper Valley		Kk	turtle fragments
Ga	597	V					UCMP Locality V98097: Lofgren Baenid	Upper Valley		Kk	baenid turtle
Ga	599	V					UCMP Locality V98156: BM 7004 NW 1	Canaan Peak		Kk	turtle fragments
Ga	600	V	I				UCMP Locality V98157: BM 7004 NW 2	Canaan Peak		Kk	turtle fragments, gastropods
Ga	603	V					UCMP Locality V98176: Baenid Belly Up	Death Ridge		Kk	baenid shell
Ga	604	V					UCMP Locality V98177: Right Hand Collet Canyon South Arm	Death Ridge		Kk	turtle fragments
Ga	619		I				Hamblin locality 8/20/99	Canaan Peak	III	Kk	bivalves and gastropods
Ga	620		I				Hamblin locality 8/20/99	Canaan Peak	IV	Kk	bivalves
Ga	621				T		Hamblin locality 8/20/99	Henrieville	II	Kk	3-toed dinosaur track (1st reported Kk dinosaur track in GSENM)

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ga	622				T		Hamblin locality 8-31-99	Henrieville	II	Kk	3-toed dinosaur track
Ga	623			P			Hamblin locality 8-31-99	Henrieville	III	Kk	petrified log
Ka	052		I					Butler Valley		Kk	invertebrates
Ka	053		I					Horse Mountain		Kk	invertebrates
Ka	211		I				USGS Locality D6061	Death Ridge		Kk	invertebrates
Ka	235	V					Carnisaur bone bed	Horse Mountain	I	Kk	dinosaur, turtle, croc., mammal teeth
Ka	236	V					First Kaiparowits Mammal	Horse Mountain	I	Kk	dinosaur, turtle, croc., mammals
Ka	237	V	I				Dull Green	Horse Mountain	II	Kk	croc., dinosaur (hadrosaur), invertebrates
Ka	238	V					NE of Dull Green	Horse Mountain	I	Kk	bone and teeth (lower verts)
Ka	239	V					Gar	Horse Mountain	I	Kk	croc. and dinosaur teeth, gar scales
Ka	240	V					West Gar	Horse Mountain	II	Kk	croc., dinosaur, turtle, gar
Ka	241	V	I	P			Invert Conglomerate - UCM Locality 83248	Horse Mountain		Kk	bone fragments, wood, gastropods, bivalves
Ka	242	V					Turtle Horizon	Horse Mountain	II	Kk	turtle
Ka	243	V					West Turtle Horizon	Horse Mountain	III	Kk	turtle
Ka	244	V		P			Turtle Horizon Amphitheater	Horse Mountain	I	Kk	turtle, croc., dinosaur teeth, wood
Ka	245	V					Nice Small Bone	Horse Mountain	I	Kk	bone fragments
Ka	246	V					Foot in Hole	Death Ridge	II	Kk	turtle, croc., dinosaur teeth, gastropods, bivalves

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	247	V					Whole Turtle	Death Ridge	I	Kk	whole turtle
Ka	248	V					Whole Croc	Death Ridge	I	Kk	whole croc., edentulous mammal jaw
Ka	249	V					String of Vertebrae	Horse Mountain	I	Kk	croc., dinosaur
Ka	250	V	I				Invert Horizon	Butler Valley	II	Kk	turtle, gastropods, bivalves
Ka	251	V	I	P			Blue Wash Mammals (upper Blue Wash)	Butler Valley	I	Kk	croc., dinosaur, turtle, mammal teeth, unioid bivalves, wood, stems
Ka	252	V					Small Knob	Butler Valley	II	Kk	croc., dinosaur, turtle
Ka	253	V					Base of Cliffs	Butler Valley	II	Kk	lizard scutes, croc. and dinosaur teeth
Ka	254	V	I				Towards Paradise (upper Blue Wash)	Horse Mountain	III	Kk	lizard scutes, bone fragments, gastropods
Ka	255	V					Barb's Turtle	Butler Valley	II	Kk	turtle
Ka	256	V	I				North Blue Wash	Butler Valley	I	Kk	lizard scutes, mammal, croc. and dinosaur teeth, invertebrates
Ka	257	V					Lost Lantzch	Butler Valley	I	Kk	large dinosaur bones, lower vertebrates
Ka	258	V		P			Blue Wash (MNA 704-2)	Butler Valley	I	Kk	microvertebrates (mammals) dinosaur vertebrae, ribs, scapula, plant stems
Ka	259	V		P			Blue Wash (MNA 704-3)	Butler Valley	I	Kk	microvertebrates (mammals) plant stems
Ka	260	V					Horse Mountain (MNA 454-4; OMNH V33)	Horse Mountain	II	Kk	microvertebrates (mammals), turtle, ?lungfish burrows

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	261	V	I		T		Horse Mountain (MNA 454-6; OMNH V9)	Horse Mountain	I	Kk	microvertebrates (mammals) fish, turtle, dinosaur (?hadrosaur), fish scales
Ka	294	V	I				Near headquarters cabin site	Butler Valley	II	Kk	bivalves; bone; claw
Ka	295	V		P				Horse Mountain	III	Kk	bone; wood
Ka	296	V						Butler Valley	II	Kk	bone - dinosaur
Ka	302			P			Alden 6/12/98	Formal Bench	III	Kk	petrified wood
Ka	303	V	I	P			Alden 6/12/98	Formal Bench	II	Kk	bone, unionid bivalves, petrified wood, plant impressions
Ka	334	V					Lower Sandstone	Death Ridge		Kk	microvertebrates (mammals)
Ka	335	V					Middle Sandstone	Death Ridge		Kk	microvertebrates (mammals)
Ka	336	V					Black Bone	Death Ridge		Kk	microvertebrates (mammals)
Ka	337	V					Top of Fossil Ridge	Death Ridge		Kk	microvertebrates (mammals)
Ka	338	V					Below Camp	Death Ridge		Kk	microvertebrates (mammals)
Ka	339	V					East of Camp	Death Ridge		Kk	microvertebrates (mammals)
Ka	340	V					Knob	Death Ridge		Kk	microvertebrates (mammals)
Ka	341	V					In Blue Wash	Death Ridge		Kk	microvertebrates (mammals)
Ka	342	V					Howard's By the Road	Death Ridge		Kk	microvertebrates (mammals)
Ka	345	V		P				Butler Valley		Kk	bones of 2+ animals; large petrified tree 50 ft NE
Ka	346	V	I				Dog Flat	Horse Mountain	III	Kk	dinosaur, bivalves

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	352	V		P			Upper Long Flat	Butler Valley	I	Kk	dinosaur (articulated), turtle, petrified wood
Ka	353	V					Spur west of K80214	Horse Mountain	I	Kk	whole soft-shelled turtle, dinosaur
Ka	354	V					End of Spur	Horse Mountain	I	Kk	partially articulated dinosaur and turtle 5-6 m down section
Ka	358	V		P			East of the Gut	Butler Valley	II	Kk	petrified wood (logs); abundant turtles; dinosaur bone
Ka	359	V	I				Upper Long Flat	Butler Valley	II	Kk	turtle bone, unioid bivalves
Ka	360	V	I				Upper Blue Wash	Butler Valley	III	Kk	unioid bivalves, turtle
Ka	361	V					Spur NE of 8K0222	Horse Mountain	II	Kk	dinosaur bone
Ka	362		I				Clam site	Horse Mountain	II	Kk	bivalves
Ka	363			P			new locality - fossil wood site	Horse Mountain	III	Kk	petrified wood
Ka	364	V	I	P	M		Horse Mountain, north end	Horse Mountain	I	Kk	bivalves, plants, microfossils, ?dinosaur bone
Ka	365	V					Paradise Canyon	Death Ridge	I	Kk	microvertebrates (mammals)
Ka	366	V					Paradise Canyon	Death Ridge	I	Kk	microvertebrates (mammals)
Ka	367	V		P			Lower Sandstone	Death Ridge	I	Kk	turtle; wood
Ka	368	V		P			Top of Fossil Ridge	Death Ridge	I	Kk	dinosaur; plant
Ka	369	V	I	P			Black Bone	Death Ridge	I	Kk	dinosaur, turtle, gastropods, bivalves
Ka	370	V		P			In Blue Wash	Death Ridge	I	Kk	dinosaur, turtle, wood
Ka	371	V		P			Knob	Death Ridge	I	Kk	dinosaur, wood, bivalves

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	372	V		P			Middle Sandstone	Death Ridge	I	Kk	dinosaurs, turtles, wood
Ka	530			P			4 Mile Bench	Formal Bench	III	Kk	petrified logs
Ka	532	V		P				Formal Bench	IV	Kk	wood, dinosaur bone
Ka	533	V	I	P				Formal Bench	III	Kk	dinosaur, wood, bivalves
Ka	534	V	I	P				Horse Mountain	II	Kk	dinosaur, wood, bivalves
Ka	539	V						Horse Flat	III	Kk	dinosaur, turtle, wood
Ka	540	V	I	P				Butler Valley	III	Kk	dinosaur, turtle, wood, bivalves
Ka	541	V	I	P				Butler Valley	III	Kk	dinosaur, turtle, wood, bivalves
Ka	542	V	I	P				Butler Valley	III	Kk	dinosaur, turtle, wood, bivalves
Ka	594	V	I				North Squaw Bench 2	Horse Mountain	II	Kk	chelonia, clams, gastropods
Ka	595			P			North Squaw Bench	Horse Mountain	II	Kk	wood - large intact log
Ka	596	V		P			Tommy Water IV	Horse Mountain	IV	Kk	turtle, wood
Ka	597	V					Tommy Water III	Horse Mountain	IV	Kk	indet. reptile
Ka	598				T		Tommy Water II	Horse Mountain	IV	Kk	invertebrate traces
Ka	599	V					Tommy Water I	Horse Mountain	IV	Kk	indet. reptile - bone fragments
Ka	600	V	I				Dog Flat	Horse Mountain	III	Kk	bivalves, indet. vertebrate
Ka	601		I				58-46	Horse Mountain	III	Kk	large bivalves abundant in conglomeratic sandstone
Ka	602	V					Long Flat Hill 3	Butler Valley	IV	Kk	indet. dinosaur

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	603	V					Long Flat Hill 2	Butler Valley	III	Kk	crocodylia, chelonia, indet. dinosaur
Ka	604		I	P			Long Flat Hill 1	Butler Valley	III	Kk	bivalves, wood impressions
Ka	612	V	I	P			West of Upper Wahweap	Butler Valley	I	Kk	dinosaur, turtle, croc., unioid bivalves, wood stems
Ka	614	V					Alden Hamblin 12/21/98 dinosaur	Horse Mountain	I	Kk	articulated bones and fragments of a dinosaur
Ka	616	V	I	P			Alden Hamblin 1/4/99 dinosaur	Horse Mountain	I	Kk	dinosaur vertebrae, gastropods, bivalves, petrified wood
Ka	617			P			Alden Hamblin 1/4/99 petrified wood	Horse Mountain	II	Kk	petrified wood
Ka	618	V					Alden Hamblin 1/4/99 dinosaur	Horse Mountain	II	Kk	dinosaur bone fragments

Claron Formation Paleontological Localities in the Grand Staircase-Escalante National Monument

Co.	No.	V	I	P	T	M	Locality Name	Map Name	Class	Map symbol	Preserved Taxa
Ka	610		I				Butler Valley North	Butler Valley	IV	Tc	non-marine gastropods - *Viviparus*?