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REPORT OF THE REGIONAL HISTORICAL, STRATIGRAPHIC, AND PALEONTOLOGICAL FRAMEWORK OF THE LATE CRETACEOUS (CAMPANIAN-MAASTRICHTIAN) FOSSIL FOREST LOCALITY NEAR SPLIT LIP FLATS, SAN JUAN COUNTY, NEW MEXICO, WITH POSSIBLE MANAGEMENT OPTIONS AND A REVIEW OF PALEONTOLOGICAL MANAGEMENT GOALS FOR PUBLIC LANDS

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Surface collecting at a microvertebrate site, Fossil Forest, 1985 field season.

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ABSTRACT

This report provides a report of studies conducted in the Fossil Forest RNA over the last decade. The Fossil Forest occupies all or portions of secs. 13, 14, 22, 23, 24 and 26, T23N, R12W. In all, the area of greatest paleontologic interest includes approximately 1000 acres. The geology, stratigraphy, invertebrate paleontology, vertebrate paleontology and paleobotany of the area are discussed. Also treated, probably for the first time in an original way, are modern soils and flora of the area as well as mineralogy and depositional environments.

The Fossil Forest study area is perhaps the best studied and documented fossil locality in New Mexico. Literally tens of thousands of person hours have been expended in the area and in studies related to the area. The goal of the NMBM&MR studies has been to provide the most complete factual record of the area, a record which will assume some importance when consideration is given to its final disposition.

Our studies in the Fossil Forest have provided a number of interesting "firsts" or "bests" for New Mexico paleontology although the actual importance of these should not be overstated. The area has yielded the first evidence of Cretaceous insects, a new amiid fish species, many new Cretaceous mammal species, the first well documented Cretaceous fossil forest sequence, the first studies in New Mexico on fossil resins, the first pre-Holocene occurrence of the unusual

carbonate mineral, huntite, etc. We caution, however, that most of these accomplishments are not site dependent; in our view, similar results are available elsewhere in strata of the same age.

An extensive discussion of appropriate and inappropriate paleontological management goals is also included in light of the National Academy of Sciences study related to paleontology. The Fossil Forest study supports the view that if no action is taken, little if anything will change in the area. In addition, fossil collection should continue to be encouraged in the Fossil Forest. This study also supports the view that the most logical management goals, in terms of the scientific and economic value of the area, can be met by transferring the area to the Navajo Nation making certain that all legitimate prior claims on the coal resource are protected. Any available federal funds targeted for the Fossil Forest would best be transferred to the appropriate Navajo Nation authority, either directly or through the Bureau of Indian Affairs. Such funds could then be used for long range planning.

PREFACE

The Fossil Forest study area is located in portions of secs 14, 15, 23, 24 and 26 T23N R12W, north of Chaco Canyon and south of Farmington (Figures 1, 2). The area takes its name from the presence of numerous in situ fossil tree stumps that occur at five stratigraphic levels in the exposed strata and has been designated a Research Natural Area (RNA) by the U. S. Bureau of Land Management as part of the Wilderness Act of 1984. The badlands exposed in the Fossil Forest consist largely of Fruitland Formation coals, shales, mudstones and sandstones that represent the upper part of the Fruitland. Isolated and thin remnants of the overlying Kirtland Shale occur in the study area. Fossil leaf, invertebrate and vertebrate localities are restricted to the middle portions of the stratigraphic sequence in the Fossil Forest, above the highest coal and below the highest sandstone sequence.

A number of quarry sites occur throughout the Fossil Forest that predate the initiation of our studies in 1979; these can be historically grouped and the likely collectors identified once an understanding of the regional history, closely tied to the development of trading posts and early federal coal studies, is accomplished. This regional history is also of use to geologists and paleontologists working in the San Juan Basin, as well as historians and land use planners.

This report also discusses possible management options available for the final disposition of this area by Congress.

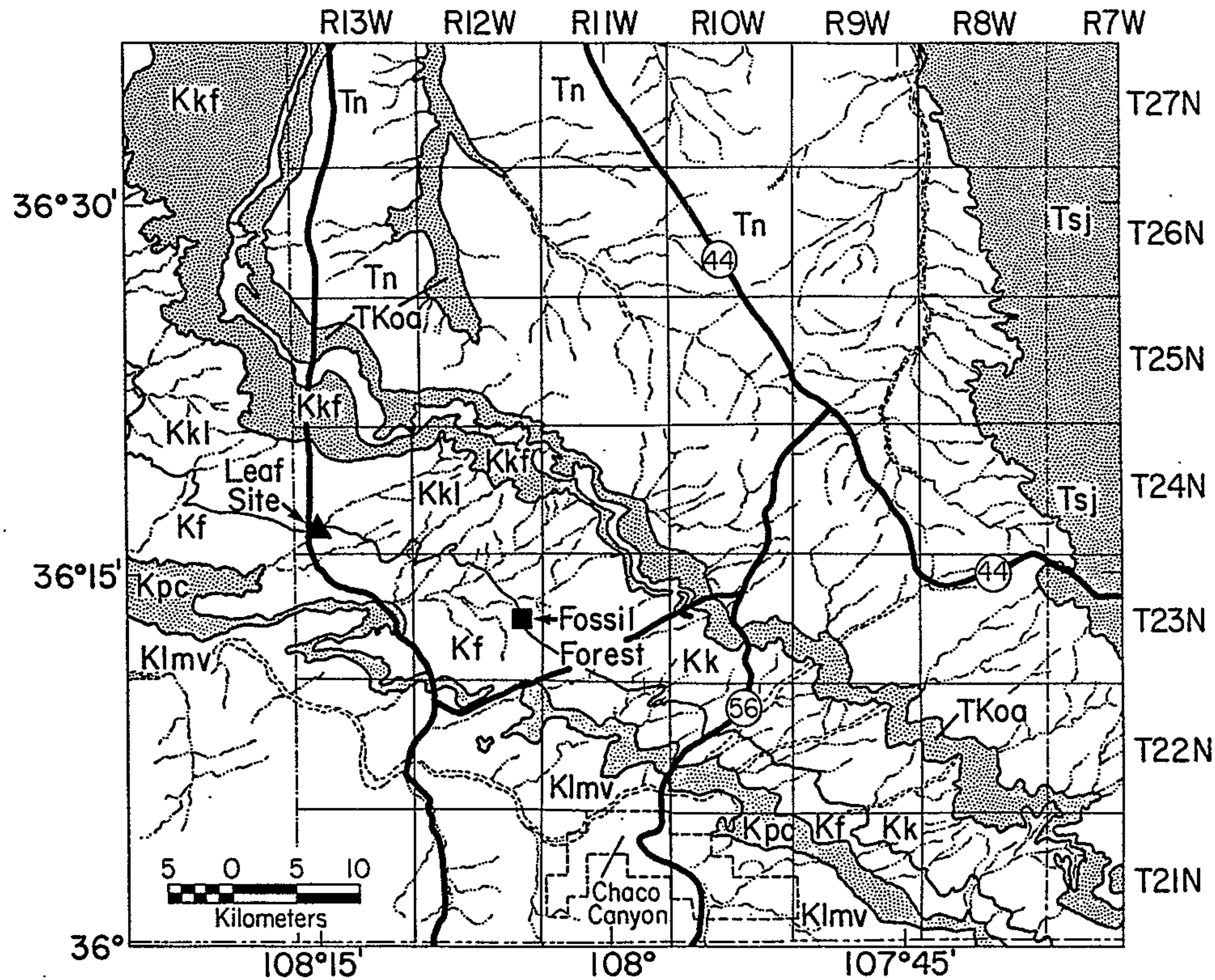


Figure 1 Location map of the Fossil Forest area

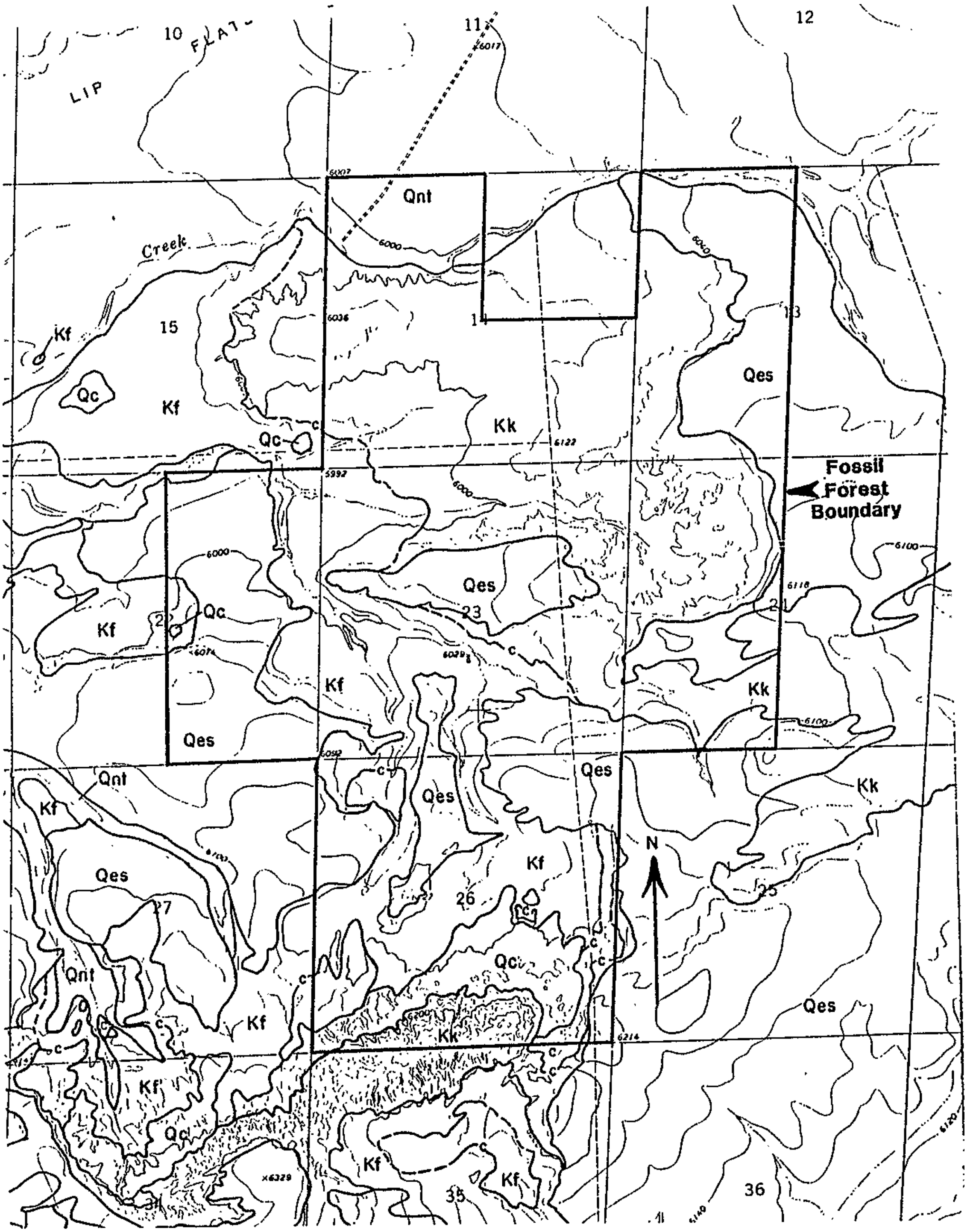


Figure 2 Boundary of the Fossil Forest RNA

It is the conclusion of this report that the changing circumstances of the coal mining industry in New Mexico make it unlikely that the Fossil Forest will soon be impacted in any way by coal development. There further seems to be little reason to restrict collection of fossils for scientific and/or educational purposes. There is also little justification for the Bureau of Land Management to continue to manage the Fossil Forest on a sustained basis. The State of New Mexico probably could do the job but has shown little interest in the prospect of a land trade with the federal government or in considering assuming responsibility for the area.

After due consideration of various options available, and discussion with various individuals, it is our view that the best and most appropriate management of the area lies in a well constructed long term management program by the Navajo Nation. Such a program would be carefully designed in cooperation with county and municipal government especially San Juan County and Farmington, and possibly McKinley County interests as well.

This report also discusses the role of Federal agencies in the management of fossils on public lands. The National Academy of Science recommendations are introduced as the best available guidelines for dealing with fossils on public lands. Portions of this report have been previously published (Wolberg, 1988) but are included here for completeness.

INTRODUCTION

The Fossil Forest has been designated a Research Natural

Area (RNA) by federal actions contained in the San Juan Basin Wilderness Protection Act of 1984; final rules were published in the Federal Register (50 FR 42122, Appendix A) and became effective November 17, 1985. The Fossil Forest RNA contains a total of 2770 acres and includes all or portions of secs 13, 14, 22, 23, 24 and 26 T23N R12W (Figure 2). A substantial portion of this area has little or no paleontologic interest but was included as a buffer around the fossil-bearing rocks. Those areas of the Fossil Forest RNA with fossils actually are encompassed within portions of secs 13, 14, 23 and 24 T23N R12W, including an area of slightly more than 1000 acres.

For purposes of this study, the area to the south, known as the "Big Badlands," was also considered. Information related to the paleontology and stratigraphy of the area, including portions of Sections 26, 27, 34 and 35 are included in this document.

The Fossil Forest study area is located north of Chaco Canyon and south of Farmington, in the west-central portion of the San Juan Basin (Figure 1). The Fossil Forest lies within the east-central portion of the Navajo Section of the Colorado Plateau (Hunt, 1956). It is included on the U.S. Geological Survey 1:24,000 Pretty Rock Quadrangle and consists largely of public lands managed by the U. S. Bureau of Land Management. The NE1/4 sec 14 is private land as is the N1/2 sec 13, while the S1/2 sec 13 is state land.

Travel to the area is possible via NM 44 and then west from Huerfano or via NM 370 and east on San Juan County 7500, providing access to Split Lip Flats.

The Fossil Forest lies at an altitude of between 5980 ft and 6100 ft and is drained by Coal Creek and its tributaries, eventually joining the De-na-zin drainage to the southwest. De-na-zin is a name derived from the Navajo term, deli naazini, referring to Navajo pictoglyphs found about 2 mi east of Tanner Lake (York, 1984). Historically, De-na-zin Wash was known to local residents and paleontologists as Coal Creek. A northeastern tributary of Coal Creek, was previously known as Barrel Springs Arroyo, a name that fell out of favor during the late 1920's except among paleontologists. The name De-na-zin replaced Coal Creek for the main Chaco tributary, and Coal Creek replaced Barrel Springs and is now used as the name of the main De-na-zin tributary.

Although climatological data in the area is poorly documented, 35 years of record at Chaco Canyon National Monument indicate a mean annual precipitation of slightly less than 9 inches, most of which falls between July and October (Gabin and Lesperance, 1977). Although infrequent, storms traversing the area may be intense.

Badlands development in the Chaco drainage basin is the result of Holocene climatic fluctuations and occurred rapidly in response to base-level lowering (Welles, 1983). However, the geomorphology of the landscape of the central basin Coal Creek area may have developed more in response to drainage-basin processes independent of lithology. Eolian mantling of the Fossil Forest hilltops and mesas show dune orientations that trend northeast-southwest and which parallel drainage orientations (Smith, 1983).

FOSSIL FOREST SOILS

The soils seen in the Fossil Forest is like that of 15% of San Juan County, Badland (BA) (Keetch, 1977; Himes, 1989). The Badland soil association is charactyerized by non-stony, barren shale uplands that are dissected by intermittent drainageways and gullies, some of which may be deep. Slopes vary from 5%-80% (Baltensperger and Maker, 1974).

The Badlands part of the association supports very little vegetation and has limited livestock use. The Badlands-Rock part of the association supports some native grass cover and brush with livestock and wildlife potential. Included in the Badlands-Rock association are Farb soils, shallow over shale, but with some deep loams of the Shiprock series. Maker and Keetch (1973) indicate that the Fossil Forest consists of 89% Badland-Rockland, 4% Shiprock-Shepard, 4% Doak-Shiprock and 3% Werlow-Fruitland-Turley associations.

Himes (1989) notes that the Shiprock-Shepard association consists of gently sloping to gently rolloing hills usually seen south of the San Juan River. Soils are sandy and underlain by sedimentary rock. The Doak-Shiprock association is usually found on the tops of gently sloping benches or mesas, where soils have formed by erosion. The Werlow-Fruitland-Turley association consists of deep, almost level soils of mixed origins. This association can be seen along drainages.

Himes (1989) also reviewed the lack of plant cover in the Fossil Forest area. His results are interesting. He found that substantial amounts of key nutrients such as nitrogen, phosphorous, and potassium are present. However, soil pH is very high; the range at six sampling stations covering all soil types, was from 8.22-9.34. Himes concluded that high pH and low moisture are the primary factors responsible for poor vegetative cover in the Fossil Forest. To this we would add very high rates of erosion.

MODERN FLORA

In 1987, 1988 and 1989, we undertook a study of the modern flora of the Fossil Forest area; this included the collection of as many extant plants as possible. The bulk of the work to date has been accomplished by our students Elvert Himes, David McKeever and Laura Howe. Howe will bring the final study to completion; she has received able assistance from Ken Heil, San Juan Community College. Table 1 represents a listing of extant plant taxa in the Fossil Forest and is the most complete listing available. More importantly, it based on collected material available for comparison with collections made elsewhere in the region.

THE FOSSIL FOREST STUDY

The Fossil Forest takes its name from the presence of numerous in situ fossilized tree stumps and isolated logs. The area is characterized by the presence of well-developed badlands exposures of the Fruitland Formation. In addition to fossilized tree stumps and logs, the Fossil Forest also contains leaf producing sites and invertebrate and vertebrate sites that have been actively studied by the NMBM&MR since 1979, first in cooperation with staff of the U. S. Bureau of Land Management (until 1981), then solely by the NMBM&MR. In 1987, an agreement was entered into between the NMBM&MR and the U. S. Bureau of Land Management by which the NMBM&MR would provide BLM with technical data describing the paleontology of the Fossil Forest required as part of a Congressional mandate related to the final disposition of the area.

Because of the Wilderness Act, access to public lands such as the De-na-zin, Ah-sli-sle-pah and Bisti has been seriously impeded for scientific collecting purposes. The importance of areas such as the Fossil Forest is thus artificially increased because it is among the ever shrinking areas characterized by an abundance of fossils, have historically been collected by paleontologists from many institutions, and which are still available for collecting. Land use issues in the San Juan Basin are certainly not a recent development and continue to impact paleontology, development of coal resources, wilderness and recreational use concerns, and Native American issues (see Wolberg and Kottlowski, 1980; Wolberg, 1982).

RECENT HISTORY OF THE IMMEDIATE VICINITY

As noted below, several old quarries are found in the

Fossil Forest study area. Some of these quarries are very large and large specimens, probably dinosaurs were collected. To date, we have no information other than circumstantial evidence to indicate who collected what, where or when in the study area. Because of this, a review of the recent history of the region is of some importance in order to develop a line of reasoning which may indicate the disposition of the previously collected material from the Fossil Forest. Similarly, this history may have utility for understanding potentially conflicting priority or ownership claims in the area.

In 1868, Navajos returned to the San Juan Basin after four years of internment at Bosque Redondo following the devastating campaign against them and the Apaches led by Kit Carson. At some time after the return, probably in the early 1870's, a Navajo band was camped on Split Lip Flats at the confluence of Coal Creek and De-na-zin Wash, near the Fossil Forest. They were attacked and massacred by a large force of Indians, possibly including Utes, Apaches, Jemez and Taos (Carroll, 1983). York (1984) spoke to two residents of Lake Valley, south of Coal Creek, who were relatives of survivors of the raid. These people told York that the Navajos had established a settlement at the Coal Creek-De-na-zin confluence and that the raiders were Beehai (Jicarilla Apaches). The raiders killed all the men and scalped many, and took women and children as captives, as well as horses and sheep. Some of the captives were sold as slaves.

At some time around 1878, the De-na-zin (Tiz-na-tzin) Trading Post was built on Coal Creek (Carroll, 1983). The trading post, "was first operated by Old Man Swires, of whom practically nothing is known," (McNitt, 1962, p.339). By 1895, it was incorporated into a chain of eight trading posts (Figure 3) operated by the Hyde Exploring Expedition, a project that developed between Richard Wetherill and Talbot and Frederick Hyde, and which financed archeological collection at Grand Gulch, Utah and Pueblo Bonito, in Chaco Canyon (Brugge, 1980). The Hydes inherited their wealth from their grandfather, Benjamin Babbitt and the Babbitt Soap Company (York, 1984). York (1984) places the De-na-zin Trading Post on De-na-zin Wash, proper, six miles west of Tanner Lake. Shortly after its incorporation into the Hyde trading post network, the store was abandoned before being rebuilt and operated for a time by Harvey Shawver, who had also rebuilt the Tsaya Trading Post, described below. After Shawver, the store was finally operated by Bert McJunkins (McNitt, 1962). Thus, by 1920, the De-na-zin Trading Post had changed hands several times and was finally deserted and in ruins, (Brugge, 1980; Bauer and Reeside, 1920).

Of some interest is the fact that a coal mine was developed at the De-na-Zin Trading Post, exploiting the surface and shallow coals present. Shaler (1906) called these coals Mesaverde, and this view is supported by Bauer and Reeside (1920, Plate XXXI). Shaler notes that the coal workings had been opened in 1901 and that a slope had been driven about 25 feet before being subsequently abandoned. The surface workings were apparently still ongoing as of 1906. There is a problem, however, if York's (1984) siting of the De-na-zin Trading Post is accurate; this area is mapped as Lewis Shale overlain by Pictured Cliffs Sandstone (O'Sullivan et al, 1986). Yet, we know that coal was mined at the trading post; Shaler (1906 describes a measured section, and Bauer and Reeside (1920) show the by then abandoned ruins at the site to lie within their Mesaverde outcrop belt and also describe a measured section of Mesaverde coal at the Tiznatzin mine, which must have been abandoned at the time. Bauer (1916) does show the area as lying on the Lewis-Mesaverde contact, as does Reeside (1924). The upper 30 ft of sand described by Shaler (1906) must then represent the Cliff House Sandstone and the most parsimonious explanation is that O'Sullivan, et al (1986) simply mapped the area incorrectly. The coal mined at the trading post must have been Menefee coal, using current terminology.

By 1898, Wetherill had established a trading post at Pueblo Bonito (Figure 3). Pueblo Bonito and the store assume some importance, as will be discussed below, because it was also the site of Putnam and the reference point for citations of fossil and other occurrences in the area (Foster, 1913).

Putnam was actually the name of the U. S. Post Office established at Pueblo Bonito, and was named for Dr. Frederick W. Putnam, an archeologist from the American Museum of Natural History (Brugge, 1980). The Pueblo Bonito or Putnam Trading

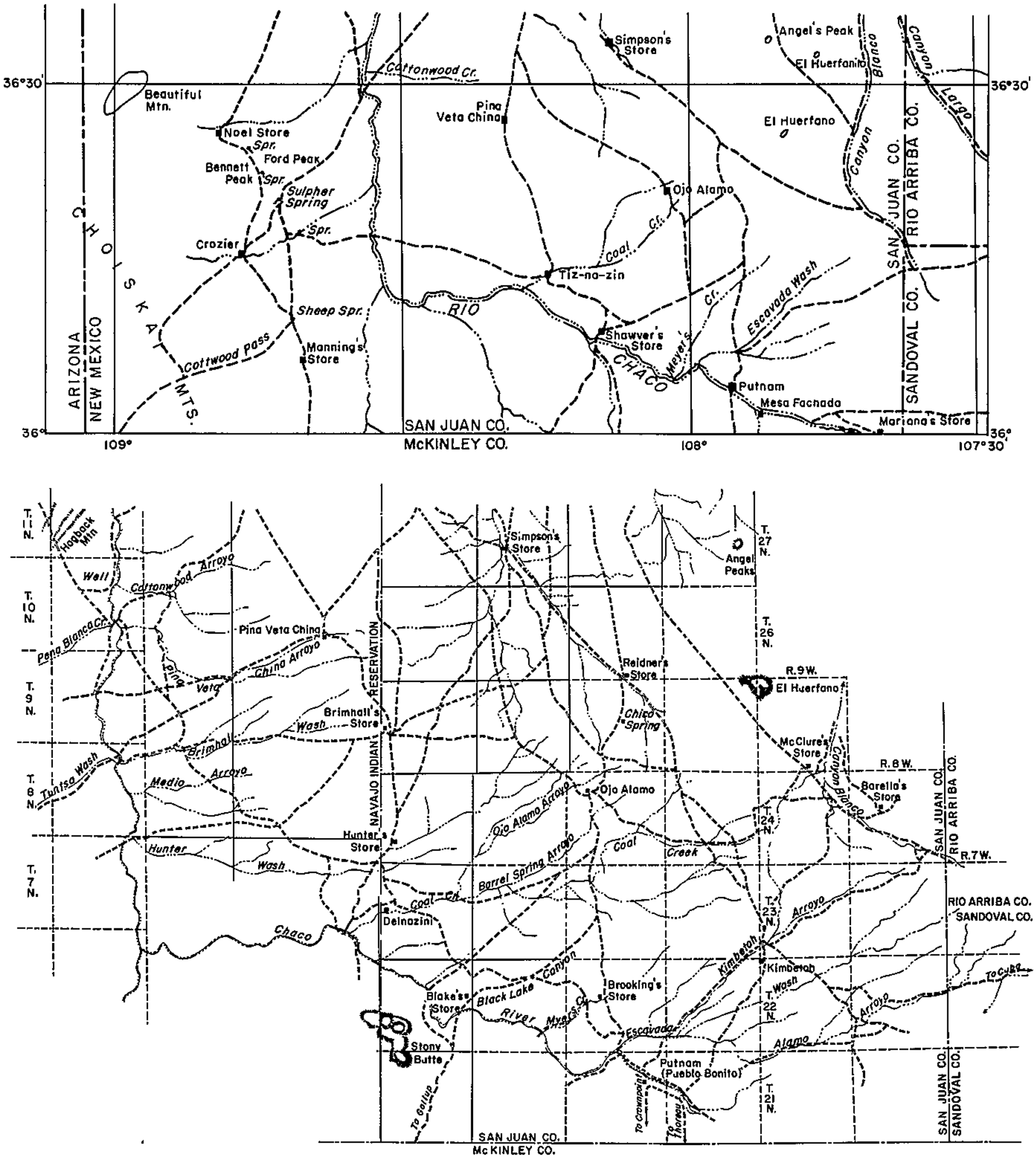


Figure 3—Trading posts in the San Juan Basin ca 1906 (upper) and 1920 (lower). 1906 map after Shaler; 1920 map after Bauer & Reeside.

Post functioned sporadically until the late 1950's or 1960's (York, 1984). However, Brugge (1980) notes that by 1915, the trading post at Putnam was closed. The name Putnam appears on Schrader's (1905) map and Shaler's (1906) map, not Pueblo Bonito. The name, "Pueblo Bonito (Putnam)" appears on Bauer and Reeside's (1920) map. Pierce (1965) notes that Putnam was a U. S. Post Office during the 1901-1911 period.

The Bisti Trading Post was sited on the north side of Hunter Wash, just east of a Navajo missionary center built rather late in the history of the trading store. Once on the main N-S unpaved county road, the area is now east of paved NM 371. The date of the establishment of the trading post is uncertain but has been suggested to be about 1900-1901 (McNitt, 1962; York, 1984) and by a man named Hunter. This early date for establishment of the trading post is probably in error. In point of fact, a man named D. H. Hunter operated a trading post west of Shiprock in 1918 (Brugge, 1980), while Billy Hunter built and operated a trading post at Beclabito, near the Carrizo Mountains at about the same time (McNitt, 1962). Apparently, the Hunter who built and first operated the trading post at Bisti also ran cattle in the area (York, 1984).

Importantly, however, Hunter's Store does not appear on Schrader's (1905) or Shaler's (1906) maps of the area, and it is very probable that the trading post at Bisti had not yet been established. Hunter's Store first appears on Bauer's (1916) map, and is shown again on maps by Bauer and Reeside

(1920) and Reeside (1924). Hunter's Store had a long list of owners until it was destroyed by fire in 1971; the ruins of the store were finally bulldozed in 1981. At one time, the store was part of the network of twenty trading posts owned or operated by the Foutz family as part of the Progressive Mercantile Company (McNitt, 1962). The store was also owned by the Ashcroft family of Kirtland and Tsaysa (York, 1984), a name that also emerges when considering the history of the Fossil Forest. The present trading post at Tsaysa is still operated by the Ashcroft family.

The Ojo Alamo Trading Post was located on a major N-S wagon road at the head of Alamo Wash opened in the 1890's, and by 1900 was incorporated into the chain of Hyde Exploring Expedition stores. A brother of Richard Wetherill, John, operated the store with his wife Louise but probably had abandoned it by 1906. The store was then reopened by 1909 by Joe Hatch and O. S. Thurston (Brugge, 1980). The store was deserted by 1921, a fact noted by Sternberg (1932), who collected in the area that year and only found an empty building.

Brugge (1980) and York (1984) note that Royal Davis operated the Ojo Alamo store as late as 1917. However, they probably confused the Ojo Alamo store with the Davis Store to the northwest of Ojo Alamo. The site of the Davis Store does not appear on any map until Reeside (1924). Brugge and York were dependent on Bauer and Reeside's map of 1920. Sternberg

(1932) makes a clear distinction between the old abandoned Ojo Alamo store and the Royal Davis Store, which he knew about and visited in 1921.

Tsaya Trading Post, named for Tsaya Canyon on current maps, has an interesting and important history as well. Originally, Tsaya Canyon was named Black Lake Canyon and takes its current name from the Navajo, Tsaya-chas-kesi, or, "Dark under the rock," which according to McNitt (1962) refers to a shaded spring near the old Tsaya Trading Post. However, as will be developed below, the Navajo term may actually refer to an unusual geologic deposit of uncertain composition and origin noted by Foster (1913), Bauer and Reeside (1920) and York (1984). This material has long been used for ritualistic and possibly medicinal purposes by the Navajo people.

The old Tsaya Trading Post situated at the southwestern mouth of Black Lake Canyon, and northeast of the Chaco, was among the oldest of the regions trading posts. The clearest clue to its origin can actually be found in an inscription carved in a cliff wall immediately north of Pueblo Bonito, an early form of advertisement, which indicates that the store was operated in 1887 by H. L. Haines. In 1895, Richard Wetherill led a family named Palmer to Pueblo Bonito, and the old Tsaya Trading Post was on their route; they found the store abandoned (Brugge, 1980) and in ruins, and what became of Haines is unknown.

In 1906, Harvey Shawver rebuilt the trading post and eventually took George Blake on as a partner. In 1910, Shawver sold his interest to George's brother, Albert (McNitt, 1962). The old Tsaya store operated until 1961 (York, 1984). Interestingly, Sternberg (1932) notes hiring a Navajo field assistant at Pueblo Bonito in 1921 named, "Ned Shouver." Shaler's map (1906) shows Shawver's Store, and by 1916, Bauer's map shows Blake's Store. In 1918, Roy Burnham purchased the store from the Blake brothers, in turn selling it to his brother-in-law, Corliss Stolworthy, in 1927 when he opened the Burnham Trading Post on Brimhall Wash, about 15 mi northwest of Hunter Wash (McNitt, 1962). By 1929, Stolworthy was in partnership at Tsaya with R.L. "Chunky" Tanner (York, 1984), who later constructed Tanner Lake in the Split Lip Flats area.

In 1939, Karl Ashcroft purchased the Tsaya Trading Post and ranched between there and De-na-zin (York, 1984). Ashcroft also ranched within the Fossil Forest area, as described below. The new Tsaya Trading Post was established in 1961 at a site southwest of the old store and south of Chaco Wash, on New Mexico Highway 371; this continues to operate to the present. Kaye Ashcroft still greets customers and his son shares in the operation of the store.

Tanner Lake (secs 17 and 18, T23N, R12W) and numerous associated ranch buildings and structures were constructed by R. L. Tanner, his family and hired workers during the 1935-1937 time period. The Tanners operated a ranch and trading post, the Tanner Lake Trading Post (York, 1984). One impressive series of masonary and adobe structures still present as a linear set of foundation ruins can be found in the NE1/4, SW1/4 sec 17, T23N R12W. These ruins consist of a series of 8 adjoining room-like structures that York (1984) suggests were used for storage of grain, feed and agricultural equipment and which were built for these purposes by the Tanners. These sorts of uses were certainly in effect as late as 1976 when the preparers of the EMRIA report on Bisti West (EMRIA, 1976) interviewed the then current Navajo lease holder of the ranch. York discounts the suggestion that this structure was built and used by a unit of Afro-American cavalry troops late in the 19th or early in the 20th century.

However, we would suggest that the structure appears much too substantial to be the remains of storage bins or tool sheds and at the very least, a great deal of effort went into their construction, much more than would be justified for such casual use as storage. The enclosures appear to be about the correct size for use as stables, or sleeping quarters for people. The uniformity of each enclosure would be in keeping with a military architectural plan. Finally, the Afro-American cavalry origin of the structure seems to be widely enough known to merit further attention. It is possible that records remain in Department of the Army archives and would be worthwhile reviewing.

The Tanners closed the trading post and sold the ranch to a Navajo man, Eli Smith, by 1960. Smith in turn sold the property to the Navajo Tribe in 1962; the Tribe periodically leased the ranch to Navajo ranchers as the Eli Smith Tribal Ranch (York, 1984). Access to the property has been restricted during the last several years by locked gates.

Several other trading posts existed in the region that are of importance in interpreting the history of early paleontological expeditions in this part of the San Juan Basin. For example, Brookings Store existed on Meyer's Creek (Ah-sli-sla-pah Wash) and was centrally located on a main N-S route between Pueblo Bonito and Ojo Alamo. This route also connected with a major E-W route in Black Lake Canyon. Brookings Store is shown on a map drawn in 1912 by S. F. Stacher, Superintendent of the Pueblo Bonito Indian Agency, but is not shown on Shaler's map of 1906, thus giving a likely date range for its establishment. The store appears on Bauer and Reeside's map (1920) and it appears on Reeside's 1924 map as well. Given the history of the region, it is likely that someone named Meyers operated a store at the site before Brookings, but we can find no additional information about Meyers or Brookings.

Kimbetoh was a major center of trading, Navajo and government operations quite early; by 1902, the Kimbetoh store was part of the network operated by the Hyde Expedition (Brugge, 1980). Sinclair and Granger (1914) show the Kimbetoh Store was operated by someone named Winters. Sternberg (1932) reports that he purchased supplies from the store, and that in 1921, it was operated by a Mr. Tyler. However, Sternberg may have actually be referring to John C. Tyler, a U. S. Government livestock superintendent in the region at the time (Brugge, 1980); Kimbetoh functioned as a regional livestock center.

In terms of paleontology, it is clear that the historic trading posts of the region were situated at or near most of the major fossil localities or sites that have assumed importance in the paleontological literature. The trading posts provided appropriate jumping off stations or base camps for the geologic and paleontologic exploration parties late in the last and early in the present century.

THE RECENT HISTORY OF THE FOSSIL FOREST

A great deal of federal funding and time, both contracted and BLM staff time, has been expended on the prehistoric archeology of the Fossil Forest. The results of these studies are probably available in the reports and maps documenting the prehistoric archeology of the Fossil Forest. We have not been able to obtain copies of any Fossil Forest archeology reports, but have seen copies of some of the BLM archeology site distribution maps.

Artifacts of some age perhaps, on the order of thousands of years, although still Holocene and certainly postglacial, have been documented within the badlands exposures of the Fossil Forest. It is likely to us that none of the material that occurs in badlands context can to be shown to be in situ or associated with a camping, tool-making, killing or habitation site. This is simply a reflection of the intensity of erosion in the region and the fact that stone material, artifact or natural, can be transported during storm events. The same can be said for almost all of the other documented archeological materials found within the badlands exposures. The badlands are as their name infers, not attractive for habitation. Almost all of the archeological materials seen in the Fossil Forest have been transported varying distances. Again, this is not unusual given the rapidity and intensity of erosion. Historic sites in the Fossil Forest are better documented.

York (1984) documents a Navajo campsite in the SE1/4, NE1/4, NW1/4 sec 14, T23N R12W periodically used by Mr. Many Horses and his family around 1900. Mr. Many Horses lived between 1847-1922. McNitt (1962) notes that Ganado Mucho ("Many Herds"), sub-chief of all western Navajos and head of the Big Water Clan, had a son, Many Horses, who saved Lorenzo Hubbell's life. Whether this is the same Many Horses who camped in the Fossil Forest is unknown. York's record does, however, provide important documentation of historic Navajo occupation of the area, certainly an actual occupation that predates any known non-Indian occupation.

The Bureau of Indian Affairs documents various allotments in the immediate Fossil Forest area; these were recorded by York (1984). In T23N R12W, allotments were made for the following: secs 10, 11, 14 and 15. These allotments were approved in 1908 and all have been subsequently relinquished.

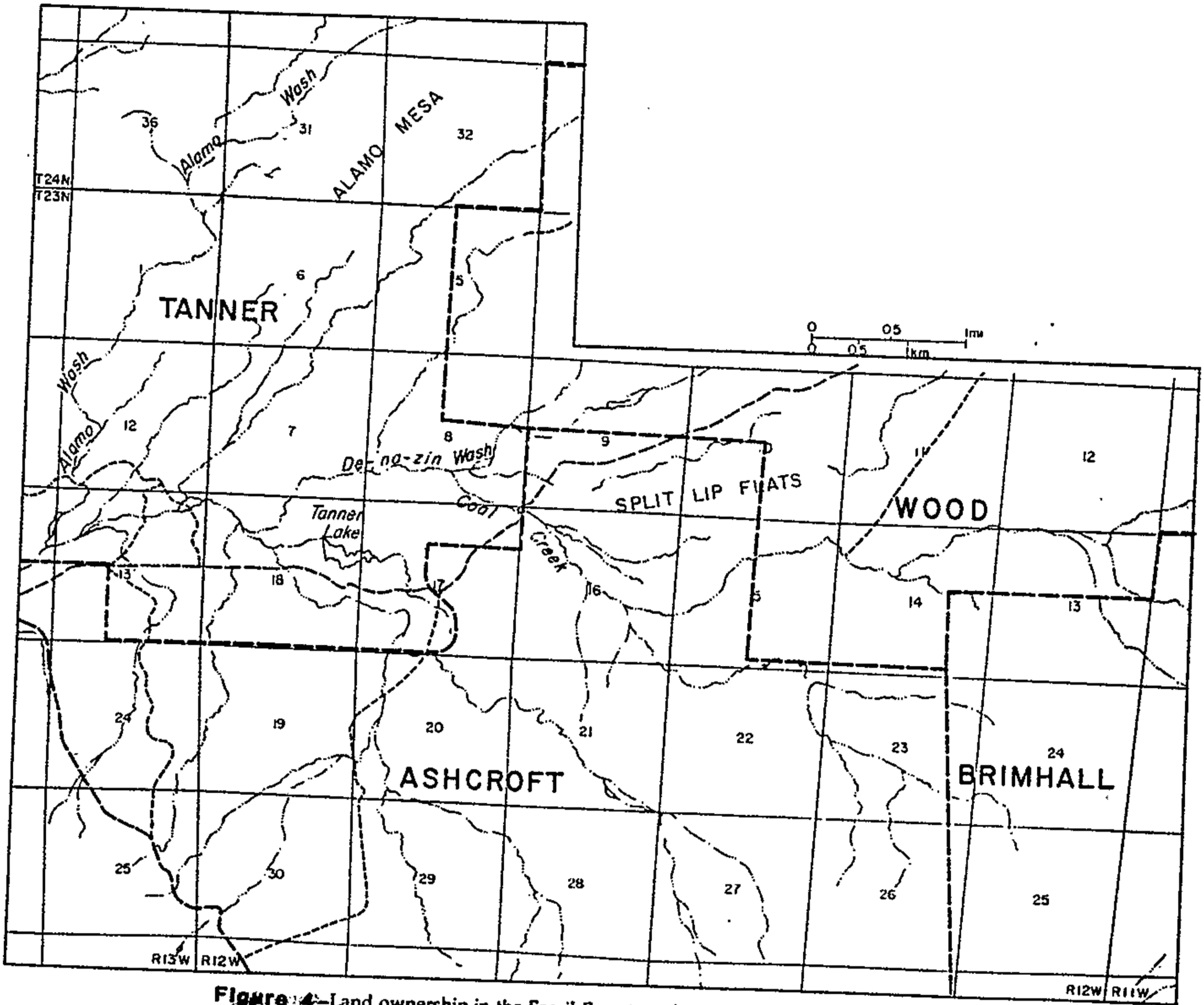


Figure 4—Land ownership in the Fossil Forest study area ca 1940 (after York, 1984).

York (1984) has reconstructed the land holdings in the region of the Fossil Forest from BIA and BLM data. The following is extrapolated from his findings (Figure 4). By 1939, as noted above, Karl Ashcroft was ranching in the Fossil Forest area while also operating the Old Tsaya Trading Post. Ashcroft holdings included all or portions of secs 15, 22, and 23 in the immediate Fossil Forest area. Frank Wood's ranch included most of sec 14 and the eastern 1/2 sec 15. "Tabby" Brimhall's Black Lake Ranch included parts of secs 14 and 23 and all of 24. To the east, the Tanner holdings extended into sec 17.

By 1958, the land holdings had been consolidated (Figure 5). Karl Ashcroft died in 1953 or 1954 and his son, Kaye Ashcroft now ranched on most of secs 14, 15, 22 and 23. The Wood Ranch occupied the northern 1/4 of secs 13, 14 and 15 and was operated by Frank Wood's son, Dewey (York, 1984). The Wood Ranch headquarters is located on New Mexico Highway Department maps in the NW 1/4 sec 36 T24N R12W. Brimhall sold the Black Lake Ranch to M. Elkins and it now occupied most of sec 13 and all of 24. Brugge (1980) notes that Mark Elkins attended a stockman's meeting in Gallup on March 25, 1926 and that Elkins was a rancher from the public domain east of the Navajo Reservation. Mark Elkins eventually retired and moved to Utah (N. Elkins, pers. comm.)

Two prominent fencelines, trending just off N-S and E-W, are present in the Fossil Forest; we are now in a position to

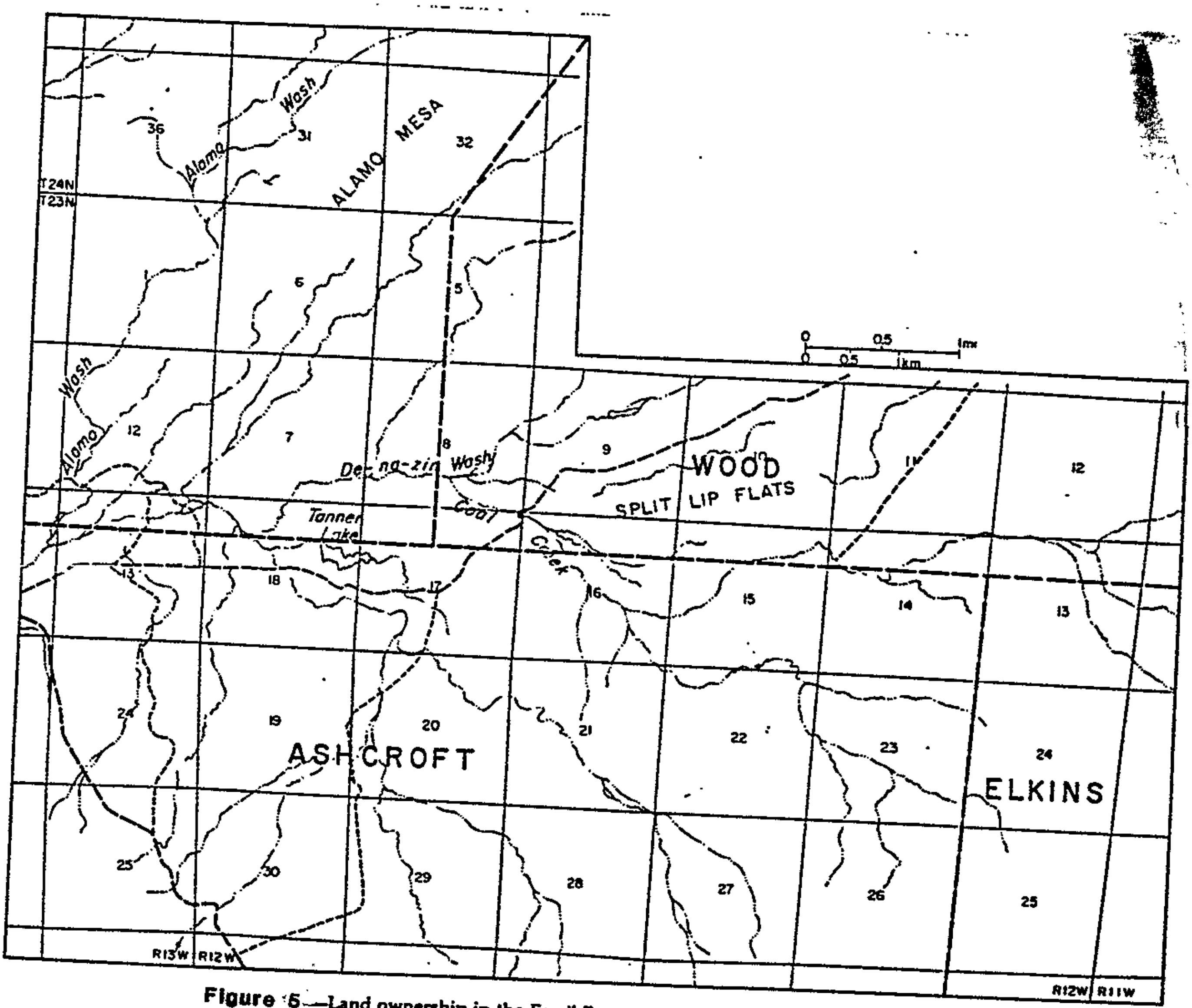


Figure 5—Land ownership in the Fossil Forest study area ca 1958 (after York, 1984).

determine their origin. The N-S fenceline is slightly west of north in the Fossil Forest area and originates from a section corner at the junction of secs 35 and 36 T23N R12W and secs 1 and 2 T22N R12W on the Tsaya Canyon (Black Lake Canyon) road. It is likely that when this fenceline was surveyed an effort was made to run the line N-S; it actually runs less than 3 degrees west of north. This fenceline separates "Tabby" Brimhall's Black Lake Ranch from Karl Ashcroft's ranch circa 1940. York (1984) notes that the Taylor Grazing Act was implemented in the area in 1939, and following that implementation, ranchers built fences.

The E-W fenceline was surveyed perpendicular to the N-S line, but actually trends slightly south of north because of the offset of the N-S line. This line separates the 1940 Ashcroft Ranch from the Wood Ranch to the northeast and the Tanner Ranch to the northwest. The fenceline are thus of relatively recent origin, certainly not older than 1939 (York suggests that they were built during World War II), and with the consolidation of the ranch holdings in the 1950's, the old fencelines became superfluous and more trouble to tear down or replace than to leave standing. It is possible that the N-S line was still used to separate the Ashcroft and Elkins holdings, however. Finally, all of the Fossil Forest holdings were incorporated into the Paragon Ranch (Wood, Black Lake and Ashcroft), owned by Public Service Company of New Mexico, or the Eli Smith Ranch (Tanner Ranch).

PREVIOUS STUDIES

Storrs (1902) described the Rocky Mountain coal fields including coal producing areas of the time throughout New Mexico. His Plate XXIX, a map of the coal fields in Utah, Colorado and New Mexico , is significant for what it does not show: no documented coal resources in the central portions of the San Juan Basin. This region, including the Fossil Forest area was still poorly known.

Schrader (1905) shows Coal Creek on his map, but is certainly referring to De-na-zin Wash. The crudeness of Schrader's map is in sharp contrast to Shaler's (1906) map, covering much the same area, but with a wealth of detail. The Laramie Formation constituted Shaler's coal-bearing Cretaceous rock unit and this was overlain by Puerco and Wasatch Tertiary-age rocks. Shaler shows the Tiz-Natzin store and its coal mine, and his Coal Creek is De-na-zin, but of particular interest are his descriptions of outcrops at localities 69, 70 and 71.

Shaler's Laramie included a basal sandstone, followed by coal-bearing strata that alternate with sandstones and shales. This is roughly the Pictured Cliffs-Fruitland-Kirtland sequence of current terminology. Closing the discussion of locality 68, Shaler notes that northeast of Shawver's Store (Tsaya or Black Lake trading post), Laramie coals appear at a number of places between the Chaco and Coal Creek (De-na-zin Wash). Shaler describes locality 69 as being 5 miles northeast of Shawver's store and, "... about 3 miles north of the wagon road leading northeastward from Shawver's store," (p.404). The wagon road referred to was the road in Black Lake Canyon that further east connected to a N-S wagon road connecting Putnam (Pueblo Bonito) and the Ojo Alamo Store, operated at the time that Shaler wrote (but soon to be abandoned) by John Wetherill.

Using Bauer and Reeside's Plates XXXIII and XXXIV, it is evident that the old Black Lake road was situated about a mile south of its present location in the area of secs 10 and 11, T22N R12W. A trail still exists in this position on current topographic maps of the area although the modern Tsaya Canyon road crosses through secs 2 and 3. Tracking approximately north from this point, Shaler would have seen coal approximately 2.5-3 miles from his turnoff somewhere in secs 34 or 35 T23N R12W, where thin coals are conspicuously exposed. This is the area of the "Big Badlands" just south of the Fossil Forest.

Shaler's locality 70 is, "two miles north of locality No. 69 and stratigraphically above the coal bed just described." Tracking approximately two miles north would have placed Shaler in sec 23 T23N R12W, in the Fossil Forest study area proper. Here too coals are present and formed the basis of Bauer and Reeside's (1920) coal sections at localities 511 and 510.

Shaler's locality 71 is approximately one mile further north of locality 70, "and on a branch of Coal Creek." This locality must represent the coal seen in sec 15, very near the sec 14 line, T23N R12W and in the vicinity of Bauer and

Reeside's (1920) localities 508 or 509. These localities are on the modern Coal Creek. The evidence indicates that Shaler was probably the first geologist to visit the Fossil Forest area.

THE SEEP LOCALITIES

Foster (1913) described a still poorly understood carbonaceous deposit found, "...about fifteen miles northwest of Putnam," (p.361), "...on a broad, flat wash having a drainage towards the northwest and into Chaco Canyon. This was between Coal Creek and Chaco Canyon," (p.362). Foster was actually referring to two separate localities, "...each distant from each other about four miles," (p.361). The deposit noted by Foster is at times caramel-like, or gelatinous, or greaselike and dries to a black powder. This material has not been sampled for analytical chemistry since Foster described it and the nature of the tests performed for Foster are inconclusive. Bauer and Reeside (1920) place the deposit in the vicinity of Black Lake and intermittent lakes or ponds in Black Lake Canyon. They suggest that the material, "...is a peat and may represent a period when these lakes were permanent throughout the year," (p.230).

However, it is our view that Foster (1913) was actually referring to at least two deposits, one in the Black Lake area and a second about 4 mi north of Black Lake. Foster notes that S. J. Holsinger actually visited the deposits. Brugge (1980) notes that J. S. Holsinger was a Special Agent of the U. S. General Land Office sent to New Mexico in 1901 to investigate the need for preservation of the archeology of the Chaco Canyon area. As part of his report to the Land Office, Holsinger proposed that the land included in T20-21N, R11-13W, and T22-24N R11-13W be made a new national park. In his report, he noted that the Navajos would not tamper with archeological materials or fossil remains.

In sec 9 T23N R12W, York (1984) documents a seep locality where a black, greasy fluid periodically naturally occurs and is known to the Navajos as "leejin." It is gathered by the Navajos for special ceremonial purposes. This locality is approximately 5 mi north of Black Lake.

In his correspondence with Holsinger, Foster cites Holsinger's description of vertebrate fossils 8-10 miles north of the deposit. but does not distinguish which deposit. Holsinger could have been referring to almost any of the badlands areas between the Fossil Forest and Hunter Wash. The area of one of the deposits is described as having extensive deposits of clinker; the Big Badlands to the south of the Fossil Forest have such deposits. Thus, although we cannot positively place Holsinger in the Fossil Forest proper, he was certainly familiar with the area, "between the Chaco and Coal Creek" and given his sensitivity to archeological and paleontological materials, it is very likely that he traversed the Fossil Forest study area.

Foster notes that he obtained the black material from a Mr. Barringer, who in turn obtained the samples from a Mr.

McCullough, "who made the expedition to secure the samples," (p.362). McCullough obviously new the region well and where to go to obtain the samples. Very importantly, in his correspondence with Barringer, McCullough notes that, "...there are many petrified trees lying on the surface," (Foster, 1913, p.362), and that, "fossil remains (heavy bones, etc.) are abundant in the near neighborhood in the shales," (Foster, 1913, p. 363). This information suggests that McCullough very likely traversed the Fossil Forest area.

We are still uncertain of the nature of the black material noted. In 1988, Wolberg and Bellis did locate one seep and obtained samples for analysis. At the known localities, the substance seems to lie beneath surficial deposits but above bedrock. It does not appear to be associated directly with coal deposits. The samples transported to the Chemistry Laboratory at the NMBM&MR, for some reason as yet undetermined, quickly oxidized. We question the results of the preliminary analyses and will have to obtain other samples. The Canyon occupied by Black Lake is, in our view, probably a structural feature. This view is shared by others (K. Fragelius, pers. comm.).

THE BAUER AND REESIDE PERIOD

By 1916, Bauer had named the Fruitland Formation and the Kirtland Shale, after settlements of the same names in the vicinity of exposures along the San Juan River. The Fruitland Formation overlies the Pictured Cliffs Sandstone and includes a sequence of interbedded coals, mudstones, poorly fissile shales and sandstones. The Fruitland Formation contains the preponderance of New Mexico's coal reserves, and these are concentrated in the lower part of the formation. The Pictured Cliffs Sandstone represents the last regression of the epeiric seaway from the region, and is actually the last of several regressive-transgressive episodes that characterize Upper Cretaceous sedimentation in the San Juan Basin (Figure 6).

Development of the San Juan Basin's coal resources has been cyclic and dependent on a variety of factors (Anderson and Wolberg, 1987).

The Kirtland Shale overlying the Fruitland Formation has been divided into three generally recognized members: an unnamed lower shale member, the Farmington Sandstone and an unnamed upper shale member. Various boundaries have been proposed to separate the Fruitland and Kirtland, and none are satisfactory (see Fassett and Hinds, 1971; Hunt, 1984). Eventually, it is likely that the Fruitland/Kirtland will be recognized as a single unit, perhaps of formational status, with member divisions.

Bauer and Reeside (1920), as part of their study of coal in the middle and eastern parts of the San Juan Basin, provide the first clearly documented report dealing with the Fossil Forest. They note the lack of adequate land surveys in the area included in T21N-T24N, R12W (among others), at the time of their field studies in the area. It is likely that they had access to Shaler's report, unpublished field notes and were

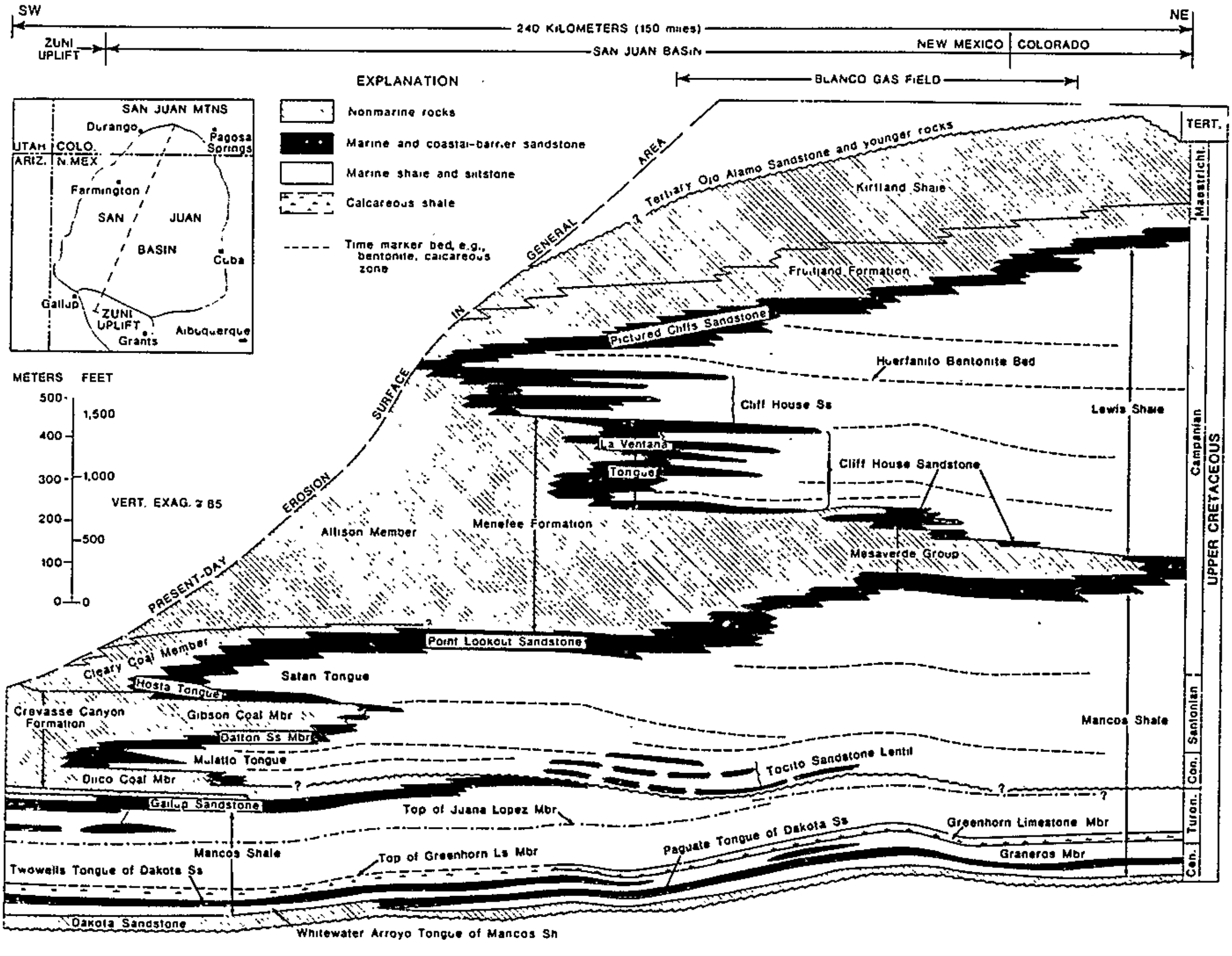


Figure 6 San Juan Basin Upper Cretaceous Stratigraphy

(after Molenaar, 1986)

thus encouraged to expand on Shaler's coal studies in the Fossil Forest. They could not locate any marked corners and details on official plats were grossly in error. They had to relocate points in the Fossil Forest area with local surveyors and Bureau of Indian Affairs personnel.

This lack of geographic certainty regarding the area is very evident in both earlier and later efforts in the region. Bauer and Reeside do not give any indication that fences existed in the area and as discussed above, it is likely that no fences existed until passage of the Taylor Grazing Act. The fences must have been set in place just before or during World War II, as noted above.

Bauer and Reeside (1920, Plate XXXIII) must have entered the Fossil Forest from the northwest and Split Lip Flats. Their coal sections are sequentially numbered NW-SE. There is a problem in matching their maps of adjoining areas (Plates XXXI and XXXIII); wagon roads shown on Plate XXXI terminate abruptly at the eastern edge and do not continue on Plate XXXIII. Reeside (1924) published a geologic map of part of the San Juan Basin which shows a road from Hunter's Store, south past the De-na-zin store (then abandoned), before turning east and traversing the northern part of T23N R12W through secs 18, 8, 9, 10, and 11 where it joins the Split Lip Flats road, finally terminating at the road juncture to the Ojo Alamo Store. Bauer and Reeside (1920, Plate XXXI) show this road terminating within sec 18, at the edge of the plate and is not continued within sec 18 on Plate XXXIII. A second road, south of the first road noted above is shown on Reeside's (1924) map and traverses T23N R12W in a SW-NE direction. It crosses secs 31, 30, 20, 16, 15, 11 where it merges with the northern road. Bauer and Reeside (1920, Plate XXXI) show this road terminating in sec 31, again at the edge of the plate, and not continuing on to Plate XXXIII. Interestingly, the Pretty Rock 1:24,000 topographic map, and the Alamo Mesa East quadrangle to the north of Pretty Rock show a trail extending northwestward from secs 11, 2 and 1 and then north to the old Ojo Alamo Store. There can be little doubt that this is basically the route of the old road shown on Reeside's 1924 map. Thus a rather significant road or wagon trail traversed the Fossil Forest study area; the modern Split Lip Flats road has shifted to the north and west. It is likely that Bauer and Reeside entered the area from this old road, an interpretation in keeping with their numbering of localities. They must have worked south and east through the area, intending to tie up with the Black Lake Canyon road to the south. Their numbering of coal sections indicates that they then worked towards the head of Meyer's Creek (Ah-sli-sla-pah Wash), following the then south fork of the Black Lake Canyon road which intersected a N-S trending road connecting the Ojo Alamo Trading Post and Pueblo Bonito via Brookings Store on Meyer's Creek. They were working downsection, although their description of coal exposures is organized upsection. It should also be stressed that they were less interested in discussing the fine details of the rocks they encountered than in providing a good appraisal of the coal resources over a very large area, of which the Fossil Forest, described by them as part of the area, "between Black Lake Canyon and Splitlip Flat," (Bauer and Reeside, 1920, p.230) was but a minor component.

We are certain that Bauer and Reeside actually entered and were familiar with the main part of the Fossil Forest RNA, in contrast to the earlier views of Hunt (1984) and restated in Rigby and Wolberg (1987). In actuality, the Fossil Forest occupied a central location between other areas of interest to them and they couldn't help but traverse the Fossil Forest with some frequency.

During the 1987 field season, we remeasured Bauer and Reeside sections 507, 508, 509 and 510. Additionally, we measured a section, A101, and a reference section for the "Big Badlands" area to the south. The locations of these sections are shown on Figure 7. Sufficient detail is present on Bauer and Reeside's Plate XXXIII and their section descriptions to reasonably relocate their sections on the modern USGS topographic map of the Pretty Rock Quadrangle. The results of this remeasurement are discussed below, but in general we were able to verify Bauer and Reeside's interpretations of the number of coal beds present in the area, and their location. We do not agree with their interpretation of the placement of the Fruitland-Kirtland boundary, however.

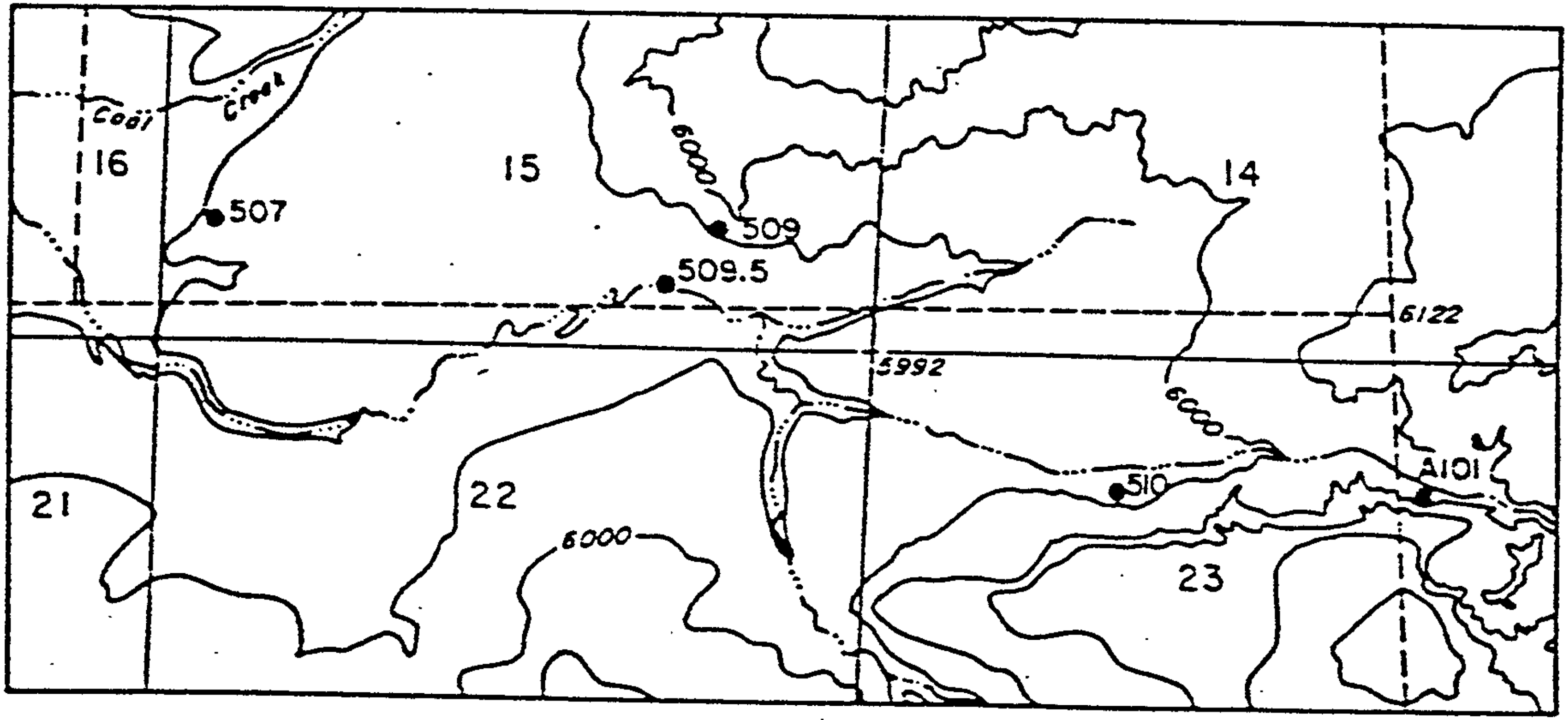


FIGURE 7—Location of measured sections.

Bauer and Reeside do not note the presence of the tree stumps in the area; in fact they do not mention fossils at all. Again, their main purpose was to map coals. The content and style of most USGS coal studies of the period generally restricted the inclusion of non-pertinent data, so the lack of paleontological content is really not so unusual. Although there is no substantive information to support the notion, it is possible that Bauer and Reeside may have intended to hold information of any significant fossil finds in the Fossil Forest area in confidence, intending to direct USGS or Smithsonian paleontologists to the area to collect material. The time period during which they worked in the San Juan Basin was a period of intense paleontological collecting by a variety of people, and some competition between institutions may have resulted.

ENTER STERNBERG

Of some interest is the fact that Sternberg (1932) describes meeting J. B. Reeside in 1921, possibly at the site of the Ojo Alamo Trading Post, and receiving from him information about, "...the type localities from which he had secured many fine turtles of the Cretaceous and Tertiary," (p. 207). Thus, despite the lack of paleontological data in Bauer and Reeside (1920), Reeside was certainly accumulating information and specimens as evidenced in much of the relevant literature of the period.

Sternberg's writing style is very straight-forward, but frequently disjointed in the sense that nonsequitors frequently occur. This style and the shifting of place names in current usage pose difficulties in trying to follow his collecting activities. Several passages are very suggestive of the Fossil Forest area, but almost always also contain a contradictory element as well. Very early in the NMBM&MR efforts in the Fossil Forest, these suggestive passages colored our interpretations of Sternberg's activities, and these views were forcefully stated in Hunt (1984) and Rigby and Wolberg (1987). For example, in a passage discussing the Kirtland shales (p. 210), Sternberg notes: "In one place I counted more than thirty large tree trunks to the acre." But then he says: "There are many different levels through the one hundred and more feet of this formation exposed on Meyers Creek." Is he really saying that the thirty tree trunks/acre are on Meyers Creek, or are they somewhere else and he is actually confusing two separate localities?

Later, (pp. 210-211) in discussing how this tree-laden terrain bode well for the discovery of vertebrates, he says: "Although it took many weary miles of travel, my best specimen, a Pentaceratops skull seven and one-half feet long, and the complete skeleton of a duckbilled dinosaur, were discovered in this formation. This is the only formation where the stumps of trees attached to their own roots stood erect among all the evidences of their past history around them." Were these specimens recovered from an area with in situ stumps?

Some confusion of what he did and saw in New Mexico must have entered his mind by 1932 because he places the coal-bearing Fruitland Formation above, not beneath the Kirtland Shale.

In July, 1921, "acting on information received from Mr. Reeside," (p.214) Sternberg was at Kimbeto and by July 26, 1921, was exploring the head of Escavada Wash. Then he was back at Kimbeto by July 28, 1921 having been forced to return because of poor weather. He then decided to explore the Kimbeto area and found the 7.5 foot long Pentaceratops skull, probably the same skull noted above. But, he does not mention in situ stumps. The Kimbeto skull is the skull that Sternberg sold to Wiman in Upsala, Sweden, and which was described as Pentaceratops fenestratus (Wiman, 1930), and which came from a locality 1 mile south of the Kimbeto Wash store, on the south branch of Meyers Creek (Wiman, 1930, p. 216).

A second skull, collected in 1922, was sold to the American Museum of Natural History and was described as Pentaceratops sternbergi by Osborn (1923). The locality for this skull was recorded as: "... nine miles northeast of Tsaya, New Mexico, in the Cretaceous formation described in 1916 by Bauer as the Fruitland Beds," (Osborn, 1923, p.1). Rowe, et al (1981) document two other Pentaceratops skulls collected in 1922 and 1923 from near Tsaya. George Sternberg colllected a portion of a P. sternbergi skull from the SW1/4 T24N R13W in 1929 (Gilmore, 1935).

In 1923, Sternberg collected fossil material described as

Parasaurolophus cyrtocristatus by Ostrom (1961, 1963), a crested hadrosaur. Ostrom (1961, p. 575; 1965, p. 146) identified the locality as:

> "Fruitland formation (Maestrichtian?) near Coal Creek, eight miles southeast of Tsaya, McKinley County, New Mexico. (This locality is not to be confused with a "Coal Creek" ten miles north of Tsaya in San Juan County.)"

There is difficulty with this locality data. The region so designated has no Coal Creek and the rock outcrops are simply wrong. Most importantly, Sternberg makes no mention of working the area. Available records at the Field Museum, Chicago, include a transcribed "box list" and correspondence from and to Sternberg. Specimen NO. 49 was listed as being found at a locality in, "San Juan Co., New Mexico, Coal Creek, 8 miles S. E. of Tsaya." A quarry diagram accompanied the list and marginal notations include the following: " Sternberg's scrawl is practically illegible." Thus, the specimen was found in San Juan County, not McKinley County (the change in counties is only needed if the direction from Tsaya is read as southeast) and a direction northeast, rather than southeast of Tsaya was intended by Sternberg. Sternberg's difficult handwriting could easily account for mistaking SE for NE. This would put the locality in the proper geographic and geologic contexts, in keeping with other documented fossil occurrences noted by Sternberg, in the Coal Creek (De-na-zin) area, eight or nine miles northeast of Tsaya.

Lull and Wright (1942) list a Kritosaurus? ischium and metapodial in the American Museum of Natural History collections as originating from a Sternberg'locality 9 miles northeast of Tsaya. They also list a U. S. National Museum trachodont locality noted by Gilmore (1916) as 30 miles south of Farmington and 4 miles east of the Navajo Reservation line. This locality would also be about 8 or 9 miles northeast of Tsaya. It is important to note that the Reservation boundary noted by Gilmore has since been adjusted westward, a fact not generally considered when trying to reconstruct locality information.

Sternberg initially seems to have relied heavily on the locality data given him by Reeside and Bauer's (1916) paper. He spent a great deal of time and effort journeying between Hunter Wash, Tsaya, Ojo Alamo and Kimbetoh, using the then wagon roads as his main routes. As he tells us in himself, he explored every wash and outcrop. There can be little doubt that this wonderfully energetic collector traversed the Fossil Forest area; as discussed above a rather significant wagon road crossed the area. It is likely that his son George literally followed in many of his father's footsteps a few years later. Yet, it is not possible to ascribe any particular specimen as having originated in the Fossil Forest, or any of the Fossil Forest quarries that predate our activities there to the collecting activities of the Sternbergs. At best, the localities eight or nine miles northeast of Tsaya are certainly suggestive and in any case would place Sternberg very close to the Fossil Forest.

It seems reasonable to suppose that the locality 8 or 9 miles northeast of Tsaya is a real locality designation, just as much so as Sternberg's localities in and around Hunter Wash, Kimbetoh or Ojo Alamo. The designations are real reference points. Again, although we are no longer as certain that Sternberg did in fact collect in the Fossil Forest as strongly as is conveyed in Hunt (1984) and restated in Rigby and Wolberg (1987), and there is good evidence that one or more additional episodes of collecting occurred in the area, it is at least probable that one or the other Sternbergs knew of the Fossil Forest and collected there. Those collections may be represented in part by the material from the "8 or nine miles northeast of Tsaya" locality. Recently, we have come to wonder whether the Sternberg's Goniopholis material may have originated in the Fossil Forest as well.

During various field seasons we have found actual evidence of quarrying tools and assorted detritus at various collecting sites. At one site we found the broken head of an old Marsh pick; at another a broken hand-wrought chisel and soldered cans and at a third, the remnants of a campsite and pieces of a broken wagon. As it develops, the wagon material was along the old wagon trail that traverses the area and should be dismissed. Finally, the several quarrying sites can be classed into three age groups based on the amount of erosion that has occurred and the extent to which they have been obscured. Not surprisingly, old, intermediate-age and relatively recent quarrying sites emerge from this analysis after factoring in such components as rock type involved or the location of the quarrying site.

It seems probable that the oldest quarries, involving at least three and possibly five quarrying sites, still evident, date from the period of intensive coal resource studies and the activities of the earliest collectors in the area of the Fossil Forest, 1915-1930. C. H. Sternberg and possibly his son George are the likeliest candidates for these activities. U. S. Geological Survey parties under Shaler, Bauer or Reeside would have left more of a documented imprint in terms of locality data attached to specimens that would most likely have been included in Gilmore's papers.

It is also possible that the Sternberg sold Fossil Forest material elsewhere, other than directly to museums. We know that some interesting New Mexico turtles were sold by Sternberg to Ward's Natural Science Company. These could have easily come from the Fossil Forest.

THE STOVALL PERIOD

A second group of perhaps two or three quarrying sites seems to postdate the earlier group but predate the most recent, non-NMBM&MR quarrying activities. Two of these sites still retain some traces of rotted burlap and plaster and some camping debris. The most likely group responsible for these quarries is the 1940-41 collecting expeditions of J. W. Stovall, University of Oklahoma. Two of Stovall's field assistants on his New Mexico collecting trips were Wann Langston and D. E. Savage. Langston (pers. comm. 1988) relates that he believes he did not accompany Stovall into the Fossil Forest area and that it probably was D. E. Savage, although Langston recalls the Wood Ranch. One of the Stovall localities, on file at the Oklahoma State Museum in Norman, Oklahoma, is described as being about 5 miles south of the Wood Ranch headquarters (Kenneth Carpenter, pers. comm.).

As described above, the Wood Ranch property included part of the Fossil Forest. The ranch headquarters were located in the SE 1/4 NW1/4 sec 36 T24N R12W, about 4 mi (in a straight line) almost due North from the corner between secs 13, 14, 23 and 24 T23N R12W as documented on the Bisti Trading Post Quadrangle (not to be confused with the U. S. Geological Survey Bisti topographic quadrangle) published by the New Mexico State Highway Department Planning Division. This map, Quadrangle 14, includes an inventory of roads completed in 1955, a time when the Wood holdings were still in operation. The material collected seems to have included at least ceratopsian remains (Kenneth Carpenter, pers. comm.) but may well have included additional vertebrate material. This ceratopsian material is different from the ceratopsian collection made in the vicinity of Ojo Alamo by the Stovall group. It appears that the entire collection still resides in the Stovall Museum in Norman, Oaklahoma.

THE "UNKNOWN" COLLECTORS

The third group of quarrying sites includes at least four quarries that are of much more recent origin; the cuts are still relatively fresh; evidence of rock debris thrown from the quarries still remains on the slopes and weathered burlap and plaster are relatively abundant. Uncollected bone fragments may be present in some abundance. These quarry sites are most interesting, and until our recent work, represented the largest quarries in the Fossil Forest. Many cubic yards of rock have been moved, largely in well-indurated sandstones. The time and resources committed to these efforts were substantive to say the least. At the most, these quarries probably date from the early to mid-1970's. No institution to our knowledge has let it be known that it holds documented collections from this group of quarries. We are certain that such collection exist, however.

During the course of a large-scale BLM funded paleontological survey (Kues et al., 1977), the Fossil Forest was noted as a significant paleontological area and recommended "200+ days" of federally funded salvage. This study also suggested that the area be, "preserved indefinitely from significant land use, as such use would destroy or disturb many of the in situ relationships of the biota," (p.208).

NMBM&MR studies in the Fossil Forest, as noted above, began in 1979 and continue to the present. During this span of time, a host of individuals have worked with us, and for the last five field seasons, work in the area has been carried out in part as a field school for secondary school teachers in the sciences. A number of papers have been presented and written dealing with various aspects of Fossil Forest paleontology, stratigraphy, fossil resins, clay and carbonate mineralogy and geochemistry. Studies continue at the NMBM&MR or in concert with specialists at other institutions.The reference section at the end of this report lists all the appropriate citations.

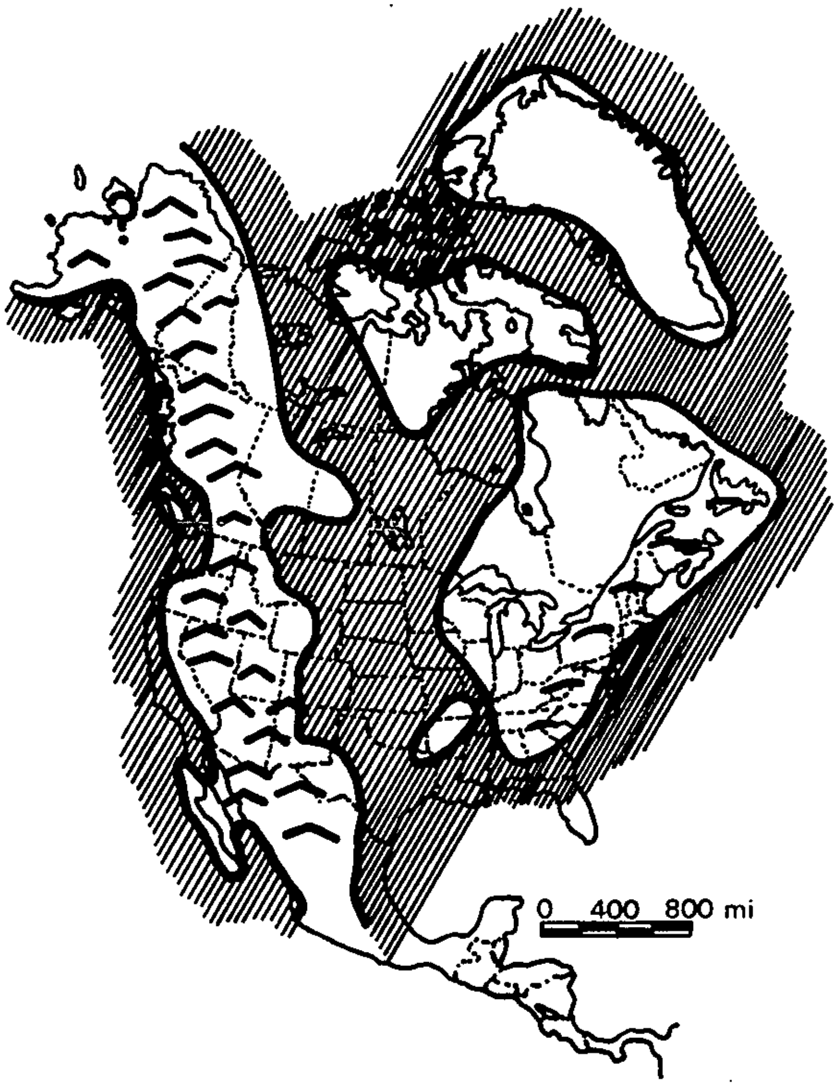
FOSSIL FOREST STRATIGRAPHY

As noted above, Upper Cretaceous rocks of the San Juan Basin reflect a history of marine transgressions and regressions and were deposited near the shoreline of an epeiric seaway. This seaway was relatively shallow (probably less than 600 ft deep), and extended north-south ,from the Arctic to the present Gulf of Mexico, and eastward to the midcontinent; the seaway was about 1500 miles wide. The Cretaceous seaway effectively divided North America into island continents (Figure 8).

The Fossil Forest is dominated by a sequence of interbedded coals, mudstones, poorly fissile shales that are frequently carbonaceous, and sandstones. The sandstones frequently contain a basal clay-pebble conglomerate. All sandstones except the highest occurring sandstone unit, present in the area only locally as an erosional remnant have calcitic

Figure 8

Early Maestrichtian Paleogeographic Map of North America



After William and Stelck, 1975

cement. The highest sandstone unit is characterized by siliceous cement. Sideritic concretions are common in the sandstones, generally at particular levels.

Two coal beds are exposed in the area and contain tonsteins. A single carbonaceous shale layer occurs throughout the area, not two carbonaceous shale layers as previously thought. Coal dominates the lower portion of a coarsening upward sequence. In general, beds dip 1-3 degrees to the NNE although locally dips as great as 12-18 degrees have been noted. Superficially the area is structurally simple but more detailed examination of exposures revealed substantial faulting and repetition of exposed section. These details and a failure to take into account the effects of even moderate dips might lead one to suggest for instance that two or more carbonaceous shales were present in the area.

Hunt (1984) measured a number of sections largely along and parallel to the main wash in the Fossil Forest in secs 23 and 24. Reviewing his measured sections and the stratigraphic relationships observed during the 1986 field season led to a number of questions that required additional work. To this end, we remeasured Bauer and Reeside (1920) sections 507, 508, 509 and 510. In addition, a section (A101) was measured and a reference section measured in the "Big Badlands" area to the south. The locations of these sections, as noted above, are shown in Figure 7 and descriptions of the sections can be found in Appendix 1.

Figure 9A shows the individual sections as measured by us. Figure 9B is our composite section. When considered together with the Big Badlands reference section (Figure 10), and Bauer and Reeside's sections in the area of the Big Badlands, extending Fossil Forest correlations to the south is possible.

Recently, Sunbelt Mining Company provided drilling data that has enabled us to more precisely determine the sequence of rocks, surface and subsurface, in the area (Appendix 2). Other Sunbelt data has allowed us to correlate units between the Fossil Forest and Hunter Wash. The available Sunbelt data is listed in a table at the end of this report. This very valuable data has allowed for excellent stratigraphic control throughout the study area.

Hunt (1984) completed a paleomagnetic section in the Fossil Forest. His section included a basal normal interval, followed by a thin and brief reversed interval, in turn succeeded by a longer normal. The magnetostratigraphic column figured in Rigby and Wolberg (1987), and which illustrates the position of Quarry I therians, is incorrect and does not correspond to Hunt's (1984) column. An additional reversal was introduced into this figure, above the longer of the two normals. This error vitiates the significance of the paleomagnetic/geochronologic discussion in Rigby and Wolberg (1984). Additionally, the magnetostratigraphy illustrated in Hunt (1984) as well as Rigby and Wolberg (1987) becomes moot because Hunt indicates the occurrence of more carbonaceous

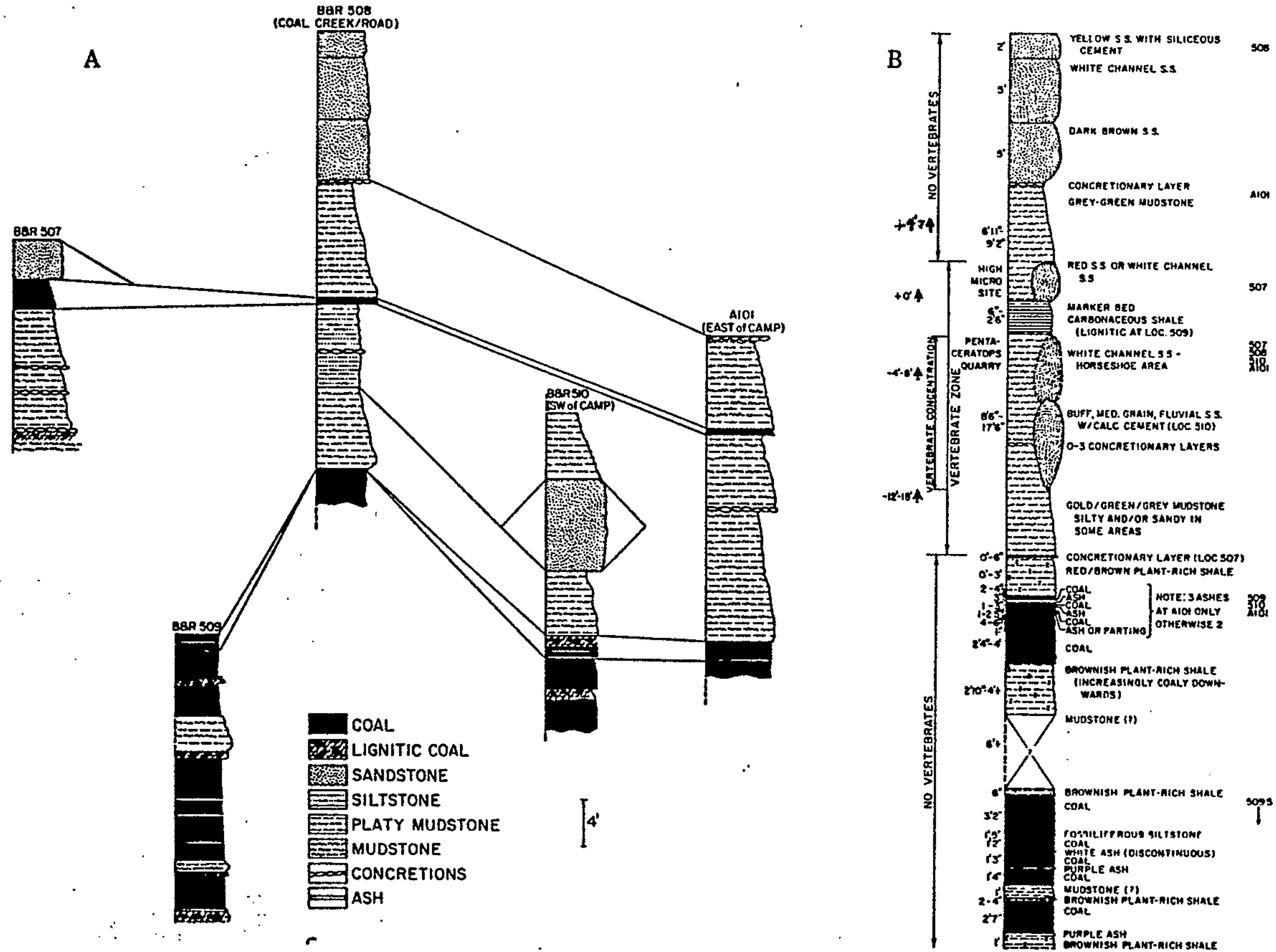


FIGURE 9.—Correlation of Fossil Forest measured sections (A) and composite section (B).

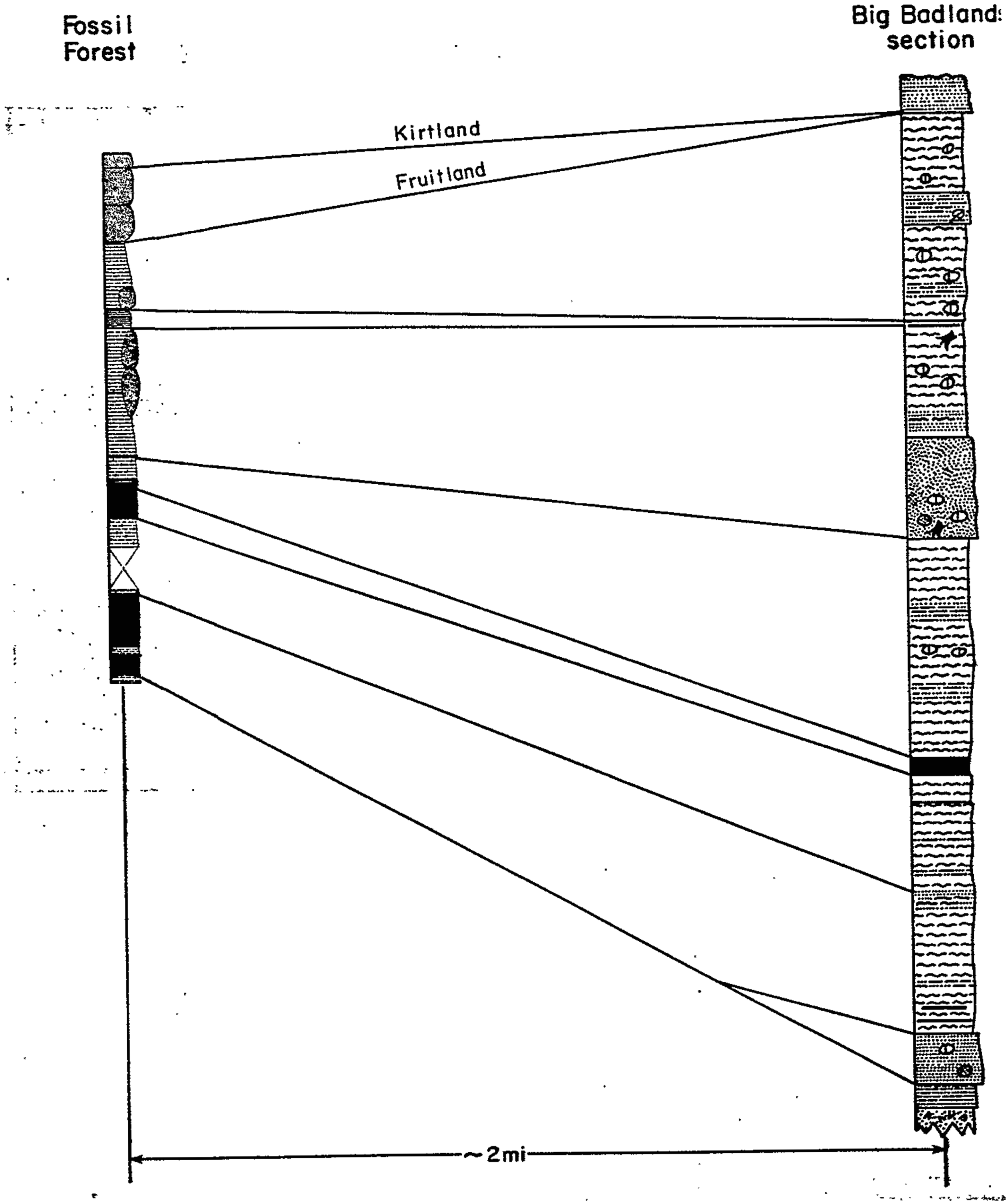


Figure 10 Composite Fossil Forest section correlated to the Big Badlands section

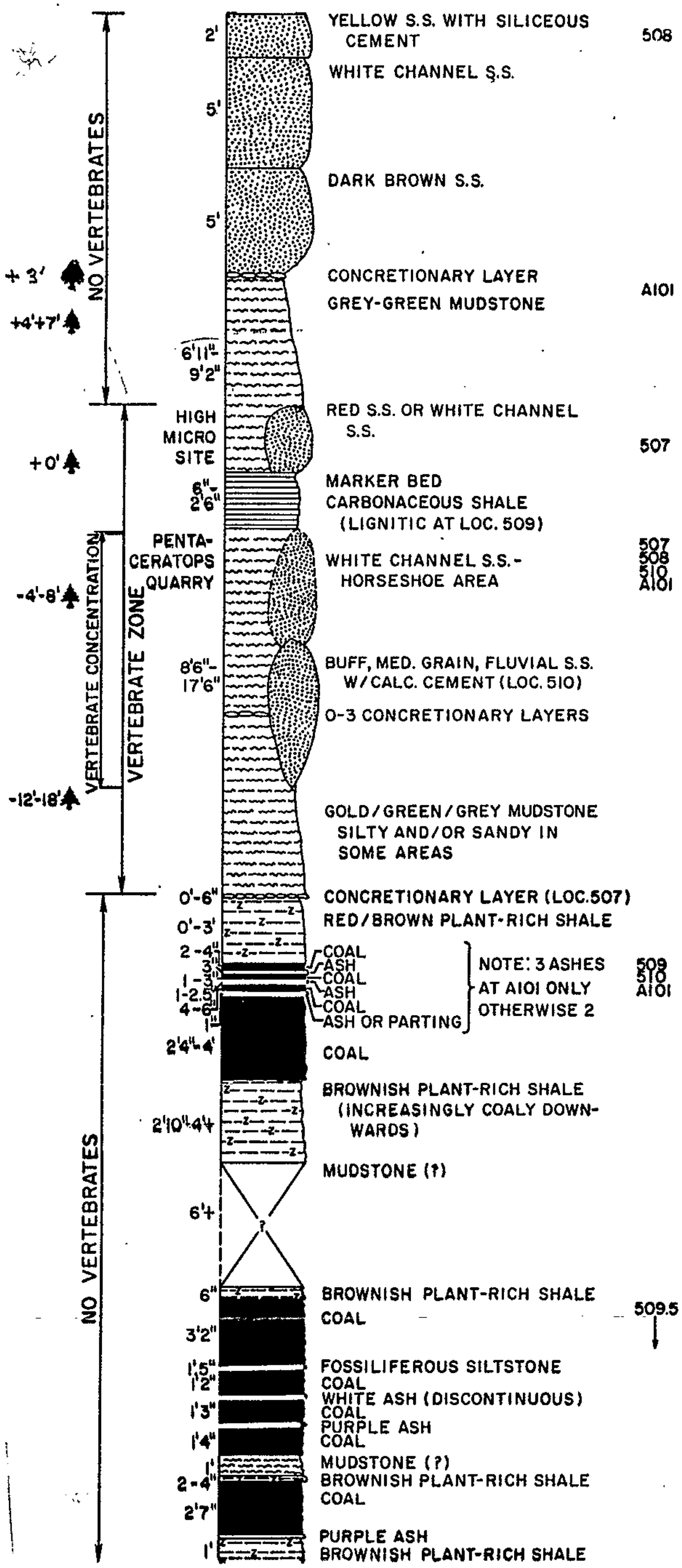
shale marker beds that are in fact present, and probably repeated the section. Thus the section should only contain a basal reversed zone followed by a normal interval. Such a constricted section is of very limited utility.

Finally, sampling of a section at Raton Park by Wolberg, D. Bobrow and N. Johnson, and magnetostratigraphic analysis by N. Johnson has raised questions regarding the techniques and analysis used by Hunt (1984). Additional work is indicated, and a more complete magnetostratigraphic section should be obtained from the Big Badlands. A Big Badlands section should be checked against the Fossil Forest section.

Figure 11 illustrates our composite section, based only on exposures, for the Fossil Forest and indicates a maximum thickness of about 73 ft, of which approximately 6 ft of the lower portion if the section are covered. Two main coal zones are present, separated by about a maximum of 22 ft. The higher of these coal zones are exposed at sections 508, 509 and 510. Our continuation of Bauer and Reeside section 509, our section 509 1/2, has a relatively thick coal section beginning about 20 ft 5 in below the higher coal. We correlate this coal to the coal in Bauer and Reeside sections 511 and 521, placed by them about 25 ft below the coal at 508, 509 and 510.

Bauer and Reeside (1920) note the presence of a thin (1 ft, 6 in) coal at their section 507, and correlate this with the coal in their sections 511 and 521, further to the south. We measured coal at 507 varying between 6 in and 2 ft, 6 in.

Figure 11 Fossil Forest composite stratigraphic section



However section 507 is actually downfaulted and is correlated to sections 508 and 509. The "coal" at 507 is the carbonaceous shale marker bed found higher in the section.

In 1988, a 300+ ft core was drilled in cooperation with the USGS and BLM. The importance of this core is inestimable. The core was drilled in the NE1/4, SE1/4 Sec 24 T. 23 N., R. 12 W. and penetrates the Pictured Cliffs Sandstone. We have described the lithology of this core, recorded at the end of this report, and intensively sampled the core for clay mineralogy, whole rock geochemistry (trace elements), palynology and amino acid analysis. We have also included a graphic representation of this core at the end of this report.

We have receoved excellent cooperation from coworkers at Exxon Production Research Company and Texaco Oil Company.` X-ray diffraction analyses have been conducted at the NMBM&MR X-ray Laboratory. Very significantly, our studies have disclosed the presence of the unusual magnesium carbonate mineral species, huntite, at nine sampling points in the core. This is the first documented pre-Holocene occurrence of the mineral and likely indicates a need to revise our interpretation of Fruitland paleoenvironments.

We have since confirmed the presence of huntite in an exposure and have learned of its discovery in a drill core east of the Fossil Forest. Thus, huntite has been found at two other sampling stations and strongly supports our conclusions as to its significance.

OVERVIEW OF NMBM&MR FOSSIL FOREST STUDIES

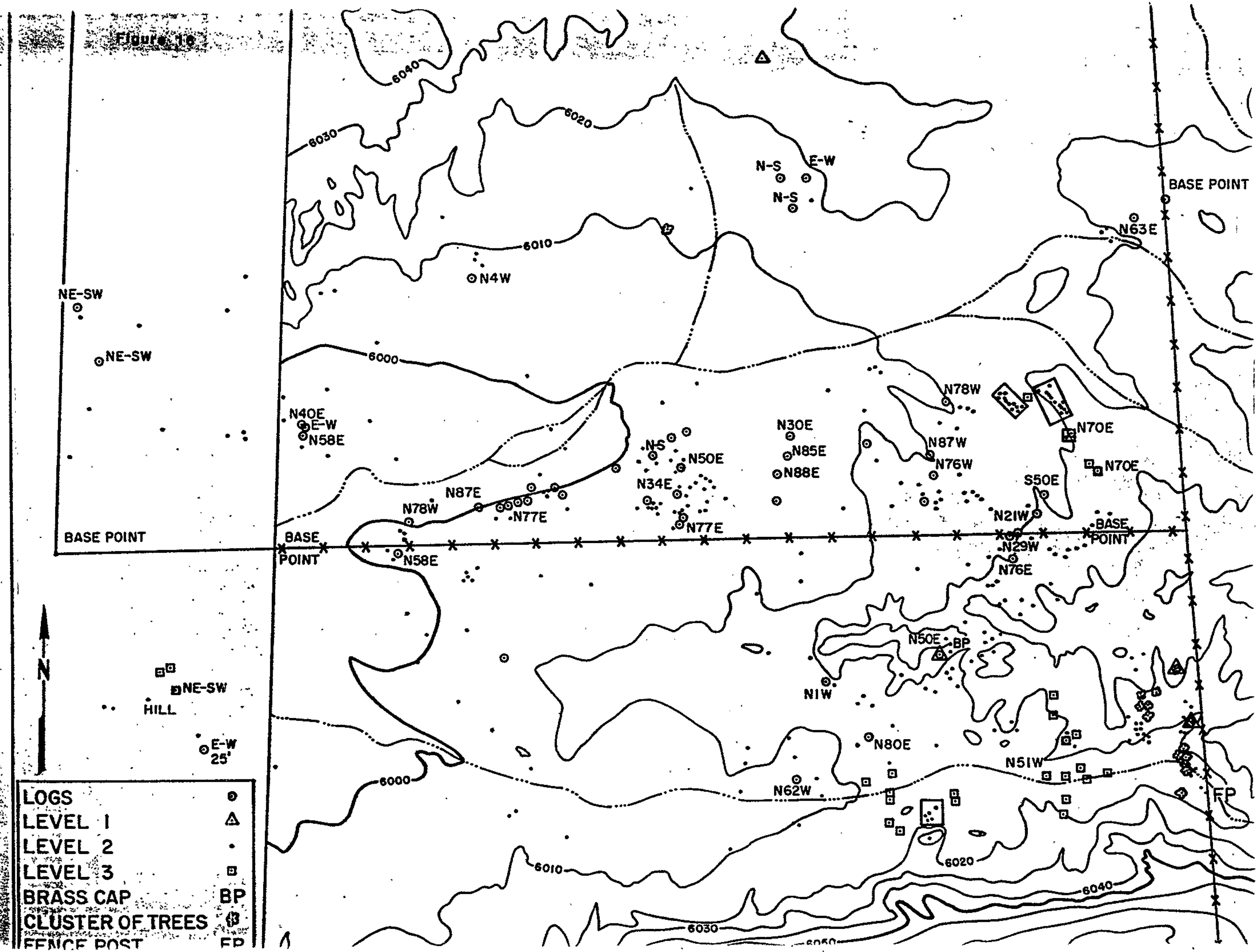
1978--

NMBM&MR reviews the claims made for the Fossil Forest by BLM staff and BLM-funded paleontological inventory. BLM-funded inventory proposes spending of massive amounts of federal money for fossils. Field trip organized by S. Hook, T. Siemers, S. Frost and D. Wolberg. Review of fossil-bearing sites, badlands and coal development in the Late Cretaceous of the San Juan Basin underway at NMBM&MR, not limited to state, federal or Indian lands. BLM program expansion plans initiated and almost at once in conflict with industry lease holders and parts of the scientific community.

1979--

NMBM&MR continues to review BLM-initiated debate on question of mining projections, BLM-funded studies, and broad claims of destruction of scientific material by industry, tourists, hobbyists, unpermitted scientists, etc. Some paleontologists competing for the contracts displeased by the process and complaints filed with Department of Interior on handling of contract awards. NMBM&MR organizes Fossil Forest field tour for A. T. Cross. Confrontation takes place in Cross's motel room between BLM staff person and Cross. Also present is a former Cross graduate student, now a BLM contractor. BLM staff suggests that Cross may be subject to arrest; Cross expresses doubt that the Fossil Forest is other than one of a number of fossil stump fields and that he

Figure 10


6040
6030
6020
6010
6000
6050
BASE POINT
BASE POINT
BASE POINT
N-S
E-W
N-S
N63E
N4W
NE-SW
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N40E
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N58E
N-S
N50E
N34E
N77E
N30E
N85E
N88E
N78W
N87W
N76W
N70E
N70E
S50E
N21W
N29W
N76E
N50E
BP
N1W
N80E
N62W
N51W
FP
NE-SW
HILL
E-W
25'
N
LOGS
LEVEL 1
LEVEL 2
LEVEL 3
BRASS CAP BP
CLUSTER OF TREES
FENCE POST FP

probably visited the locality in the 1950's. BLM contracts with the Paleontological Society's Committee on Collections and Collecting to review BLM-funded inventory report. The Committee returns a negative report and BLM abrogates the contract; in fact BLM never paid PS the fee (largely to cover costs) for the report. BLM claims that the report was made public before BLM accepted the report. In fact, BLM staff made the report public.

NMBM&MR and BLM begin to explore a way to "objectify" the Fossil Forest claims. First permit to NMBM&MR issued (by National Park Service) for paleontology. One NPS person in one Washington office hitherto able to deal with all requests for paleontological permits on virtually all federal land. NMBM&MR and BLM conduct joint and sequential collecting efforts of 1-3 days duration in the Fossil Forest. What the NMBM&MR collects goes back to NMBM&MR; what BLM collects, goes to Albuquerque. NMBM&MR files annual reports of collecting to BLM; BLM does not copy NMBM&MR on what it collects. Howverer, NMBM&MR has mangaged to obtain the permits needed and get into the field. BLM heavily involved in museum development program in Albuquerque.

Wolberg and Rigby excavate hadrosaur tail segment (Figure 12). Prepared and mounted specimen now in the NMBM&MR museum.

1980--

BLM paleontology effort expands; more vehicles and people; BLM is now collecting everywhere that contracted studies showed

Figure 12 D. Wolberg and J. K. Rigby, Jr. excavating hadrosaur tail, 1979

fossils to be present. Some BLM time dedicated to Fossil Forest but semi-independent of NMBM&MR work. Interactions of the staff more the product of godd natured field bonds rather than organized cooperation. NMBM&MR Fossil Forest work now gets down to basics: characterize the rocks, do the stratigraphy, collect samples for sedimentology, look at fossil occurrences, locate new sites, etc. Internal funding allows for research support for collections of invertebrates to be made, support of an M. S. thesis, fund a dinosaur specialist. First NMBM&MR quarries opened in "Boneyard" area. Pentaceratops quarry opened at the fenceline near the wash. First NMBM&MR clam quarries opened. First NMBM&MR/BLM mammal quarry opened. First NMBM&MR mammal/mollusk quarry opened. We begin to colect amber. NMBM&MR also looking at State lands in the San Juan for comparison. Some BLM staff cooperate with NMBM&MR on State lands. BLM conducts still additional surveys of fossil occurrences; rumblings are that BLM doing surveys is the excuse or program account used to get out in the field. First BLM initiative to promise transfer of federal funds on annual basis to the museum, if it gets going, "to maintain BLM fossils."

1981--

Work for NMBM&MR continues much as in 1980. We try to maximize our field time with getting specific goals accomplished. More stratigraphy, more mollusks, more mammal quarry material. More BLM staff added. Cooperation more difficult to attain; more competition between groups.

Additional quarries opened. We continue to collect amber. BLM initiates additional survey. Some excellent BLM staff out in field and a joy to work with. Farmington coal/paleontology meeting organized and well attended.

1982--

Field program is continuation of previous years. We are having greater difficulty getting to bigger quarries; limitations are mainly those of mechanical equipment and people. NMBM&MR funding tighter, reflecting economic conditions in the State. More Fossil Forest time spent in clumps of time during the year and more difficulty funding external specialists. At the same time, more projects in place elsewhere in the State. Work continues on a variety of Fossil Forest projects, however. No program cooperation with BLM although some NMBM&MR site specific projects are in cooperation with BLM staff on an ad hoc basis, e.g., first mapping of in situ logs and stumps undertaken by Wolberg, Robison and Hunt. More material collected at mammal quarry. Serendipitous discovery of edentulous hadrosaur jaw near trail to Fossil Forest.

NMBM&MR supports expansion of laboratory facilities made available to process sediments. Additional NMBM&MR support for student assistants and equipment.

1983--

The Fossil Forest work continues by NMBM&MR. We attempt to expand our understanding of the region and reinspect previously collected areas. We begin to open a number of smaller quarries in preparation for the next field season, the first of our large field party efforts through the New Mexico Tech summer program for Science Education. We begin to organize the logistical end of this large-scale effort; preparing for supporting 30-plus people for four weeks. Everything from drinking water to plaster will have to be carried in. Feeding these folks assumes major proportions. We put two undergraduates into the field with us for a brief time and work the "toadstool flats" west of the camp. This may have been an old Sternberg collecting area given the presence of a campsite with soldered cans and a handbeaten awl. We ponder who else collected here.

1984--1989

These are the annual field expedition years with our school teachers. In many ways, these years have proven to be the most productive for us despite the difficulties centered on supporting large numbers of people in the field for long periods of time, training those without any experience, and yet attempting to get real scientific results from the efforts. We believe these goals were accomplished in no small measure because of the fine, hardworking teachers who participated in our program. Some of the highlights of these years are listed below:

1984: Fenceline quarry worked; ceratopsian material recovered
Reopen _Pentaceratops_ quarry but no luck
Collect ankylosaur armor material at Ankylosaur Hill

Figure 13 The 1984 Fossil Forest crew

Figure 14 The 1985 Fossil Forest crew

Collect bulk material from Q-I and Q-II

Collect amber fragments

Big Badlands area prospected; poor pickings

The 1984 crew is shown in Figure 13.

1985: Salvage deteriorating log segment in Boneyard

Juvenile hadrosaur jaw discovered

High Quarry worked

Salvage vertebra from older Boneyard Quarry

Pentaceratops quarry worked for last time

Collect some bulk material from Q-I

Campsite loality discovered and salvaged

Work Hadrosaur Quarry in Boneyard

The 1985 crew is shown in Figure 14

1986: Toadstool leaf site discovered

Extreme north side of Coal Creek prospected

Fragmentary femurs salvaged from N. side site

High quarry worked

Carol's Quarry discovered

Review turtle concentrations in Turtle Heaven area

Collect amber material

Collect last material from Hadrosaur Quarry in Boneyard

XRD analyses begin

Amber infrared studies begin

Fluid inclusion studies begin

Look at Bigbadlands area again for fossils (sec. 26 and rest) but very little beyond scrap bone, wood fragments

Figure 15 The 1986 Fossil Forest crew

Major and minor trace elements

Dinosaur eggs discovered outside of Fossil Forest

Fluid inclusion studies continue

Pollen analyses continue

SEM studies continue

Gas chromatographic studies continue

Geology and prospecting Big Badlands

1989: Low Quarry at west end reopened and turtle salvaged

Leaf site near Low Quarry worked

Empty dinosaur nest with coprolite noted

Clam block recovered

Palm quarry opened in wash

Coconut discovered by palm root area near campsite

New fossil forest discovered to west

Carol's Quarry expanded

Look at Big Badlands

Review some inevntory data

Pollen analyses continue

XRD analyses continue

Major and minor trace elements continue

SEM studies continue

Gas chromatographic studies continue

THE 1988 FOSSIL SITE SURVEY

In 1988, a general inventory of all fossils in the Fossil Forest study area was carried out. Fossil occurrences were

recorded using a large scale (1:1000) map, the base of which was kindly provided by Western Coal Company, the company that predated Sunbelt Mining Company. A form was also developed to locate fossils and describe the material in as basic but useful fashion as possible and includes a code and series of descriptors that encompassed geography, geology, stratigraphy and fossil materials. The compiled data was later recorded and analysed using an 80286, 10 MHz computer and Lotus 1-2-3. It was most useful to locate all material stratigraphically position relative to the carbonaceous shale marker bed.
The results of this inventory are documented in the Fossil Forest Inventory Appendix. The Big Badlands area has always tempted us but repeated visits have yielded little evidence of fossil material; the geology and stratigraphy is interesting, however, as are the scenic views.

DISTRIBUTION OF FOSSIL TREES

The Fossil Forest takes its name from the presence of in situ fossilized stumps and some incomplete logs. Wolberg, Robison and Hunt mapped the distribution of approximately 40 of the best preserved stumps and 11 logs in the area known as the "main stump field," (portions of sections 14 and 23 parallel to the EW fenceline; this data was presented in Hunt (1984). It was our assumption at the time that a single forest floor was represented.

During the 1987 field season we became interested in the actual density of stump distribution and their stratigraphic distribution. A detailed, large scale mapping effort was undertaken to plot as many stumps as we could find. In some areas, although the actual stump no longer remains, fossilized root systems that radiate from where the stump should be can be discerned. The positions of several hundred stumps and more than forty logs were plotted using compass and pace or compass and tape. We know that in the "Main Stump Field Area" three forest levels are present: 1) the highest level is just above the carbonaceous shale; 2) an intermediate level is found 4-8 ft below the carbonaceous shale; 3) the third and lowest level occurs 12-18 ft below the carbonaceous shale.

Figures 9 and 11 show the position of the various forest levels. Figure 16 shows the density and distribution of the plotted stumps and logs in the main stump field. Compass bearings of the orientations of the long axes of the logs are also indicated in Figure 16. Most of the logs are associated with the intermediate level of stumps, those 4-8 ft below the carbonaceous shale. The long axes of the majority of these logs trend NE-SW. Logs with NW-SE bearings show high angles (>60 degrees west of north). Those comparatively few logs associated with the lowest and highest levels show a preferential NE-SW orientation of their long axes as well, although some exceptions are noted.

In addition, we have documented the occurrence of fourth and fifth fossil forest levels in the badlands exposures to the east. The fourth level is about 7-10 ft above the carbonaceous shale and is represented by several in situ stumps and one or two logs. The fifth level is an additional 3-5 feet higher still and appears to be represented by isolated logs and in situ stumps. This highest level has been the level most subjected to erosion.

It is important to note that some of the leaf localities discussed below obviously represent still additional forest levels.

C. Robison noted that almost all of the trees and logs are taxodiaceous in origin. We have observed isolated pieces and possibly one in situ stump of palm wood. Elsewhere, we have noted the presence of Sequoia. However, the stump field and logs are essentially monotypic and differ greatly from the much more varied flora known from leaf fossils found in the area. Preservation of the wood in the stumps and logs varies greatly. However, the best preserved wood is only moderately well-preserved. It is of some interest to note that tree rings are present in some but not all stumps, even those from the same stratigraphic level. Some stumps and logs evidence rotted cores, indicating different times of death from other trees in the area. Few, if any, logs can be associated with in situ stumps, indicating transport of virtually all logs, a conclusion reinforced by the preferential orientation of the log long axes.

FOSSIL LEAVES

Until the 1986 field season, productive fossil leaf sites were lacking in the area. Periodically, leaves were found as carbonaceous stains in various lithologies, but these were almost always poorly preserved or isolated occurrences. The first reasonably significant site was discovered in 1986 near the "toadstool" area just west of our permanent campsite. The leaves from this site occur as fair to poor carbonaceous, occasionally limonitic, compressions and impressions in a fine- to medium-grained sandstone. Leaves are present in some abundance.

In 1987, a second significant leaf locality was discovered in the drainage where stratigraphic section 509 1/2 was measured. The flora at this site is very abundant, preserved mainly as carbonaceous compressions, frequently with a good deal of morphological detail. The leaf floras noted above are currently being photographed and identified. Most of the leaves are angiosperm in origin. This is in contrast to the logs and stumps, which are gymnospermous.

During the 1989 field season, a rather significant new leaf site was discovered at about the level of the highest forest preserved. Preliminary analyses indicate that this site will probably be the best leaf site hitherto found.

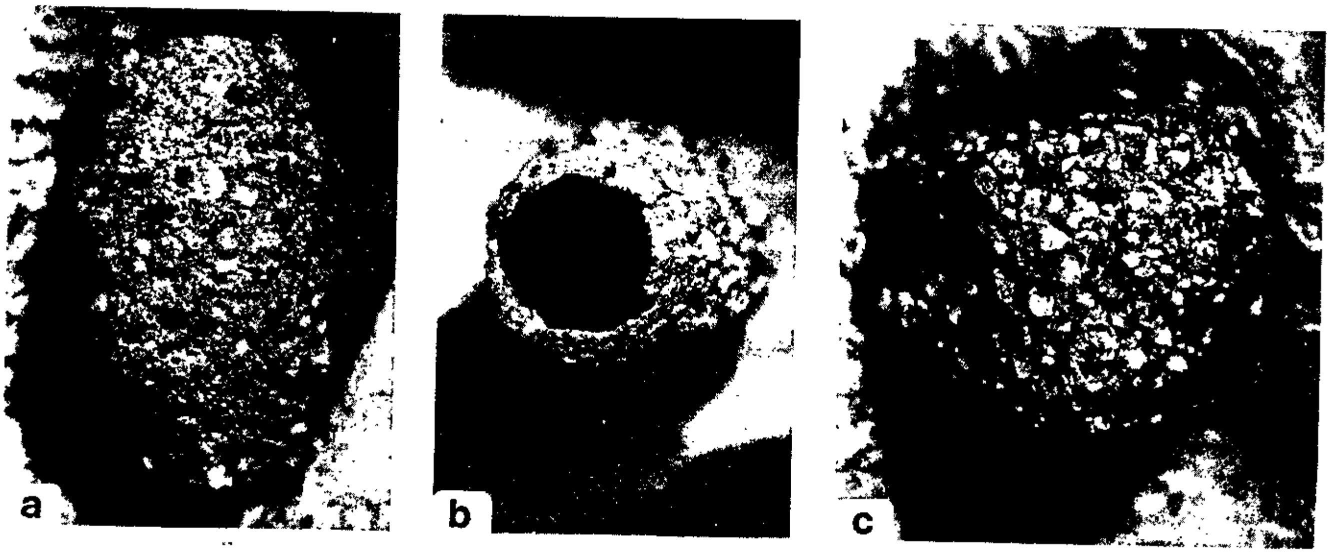
In all, leaves in abundance are now known from six sites. these are documented in the inventory data sheets. However, significant occurrences are known from only the three sites noted above. Table 2 represents our current estimation of the diversity of the leaf flora in the Fossil Forest and represents a great deal of effort by Laura Howe and Dean Hollick. Howe and Hollick are in the process of completing a dichotomous key for Fossil Forest leaves that should prove very useful.

Finally, in 1989, excellent palm material was recovered, including a coconuts and a possible fruit.

INVERTEBRATES

Invertebrates known from the area include fossil mollusks (bivalves and gastropods) and, discovered during the 1987 field season, insects (Figure 17) known from caddice fly cases (Wolberg and others, 1988). The bivalves are presently being studied by J. Hartman and include several unionid taxa. At least one new unionid species is present; its distribution is now known to include the Fossil Forest area, and Upper Fruitland localities at Bisti. This taxon will be described by Hartman. Of some importance is the fact that Hartman (1981) has discovered that the molluscan fauna of the Pictured Cliffs, Fruitland and lower Kirtland Shale has paleoenvironmental value. Brackish forms dominate the Pictured Cliffs-Lower Fruitland sequence, but beginning in the Lower Fruitland, freshwater forms become progressively more important and are dominant by the Upper Fruitland. Recent geochemical and palynological work may require some modification of this view, however.

Several of the molluscan sites are characterized by relatively well preserved material present in abundance. These have been collected by Hartman or Wolberg. In all, the 1988



Caddis fly larval cases from Fossil forest stump fillings

Figure 17—Lateral (a) and top (b) views of a complete larval case, ×8; (b) shows circular opening. c, Lateral view of a partial larval case, ×8.

inventory located 21 mollusc-producing sites. The following table shows the distribution of the mollusc sites by section.

TABLE 3

MOLLUSC SITES FOUND DURING THE 1988 SURVEY

SECT.	NO. OF SAMPLES
24	5
23	3
15	4
14	8
13	1

DISTRIBUTION OF VERTEBRATE FOSSILS

Vertebrate fossils are best represented from only the approximately middle one-third of the stratigraphic section exposed in the Fossil Forest (Figure 11). The lower portion of the section is dominated by coals, and it has been our experience in New Mexico that coal swamps did not provide a favorable environment for preserving vertebrates. The upper part of the section is dominated by sandstones that differ in character from the sands in the middle of the section, and again, conditions do not seem to have been favorable for preserving vertebrates.

Bone is not uncommon in the middle sands although the preponderance of vertebrate material consists of isolated elements. Articulated material occurs but generally consists of incomplete skeletons or portions of skeletons. Jaw elements are generally edentulous. Long bones found in these sands are generally uncrushed. Unfortunately, the sands are very well indurated, making collection difficult.

Sporadically occurring mudstones have yielded the most complete fossil material to date, an incomplete Pentaceratops skeleton. The mudstone facies is comparatively easy to work although the fossil material tends to be crushed. At the Pentaceratops quarry site, sediments begin as a silty sand and sand that fines upwards into muds.

Bone material, although most often occurring as isolated elements or fragments, is generally well preserved. Bone found in the channel sandstones is most often uncrushed, permineralized and dense with a moderate brown patina. The bone does not hold up well once exposed. We believe that bone quickly dehydrates upon exposure and exfoliation of the outer surface rapidly proceeds. An appropriate consolidant should be applied while excavating bone. Sandstones in the Fossil Forest tend to be highly indurated making quarrying difficult.

Bone found in muds is also well preserved but frequently showing crushing. Here too a consolidant should be applied to prevent dehydration and exfoliation. Muds are much more easily

Figure 18 Carol Horton soon after discovering Carol's Quarry

worked, however, and are preferred over sandstones for fossil excavation.

Additional information has become available as well. The discovery of Carol's Quarry by Carol Horton (Figure 18) has provided data not usually available. For example, this quarry has yielded portions of the skeleton of the second largest hadrosaur yet discovered in North America. It has also provided a log that contained well preserved bark as well as resin in the bark and from within the tree. Finally, this quarry has also yielded dinosaur integument (Figure 19). The size of this quarry has increased greatly during the past three field seasons, especially since the introduction of self-contained jack hammers (Figure 20).

We have experimented with various quarrying techniques largely the result of having to deal with very indurated sandstones (for us more similar to reinforced concrete than rock) in which bones occur. In addition to the difficulty of working the material, we had to devise means of transporting sometimes massive blocks varying distances (Figure21). The badlands topography limited access to vehicles.

Mammal sites discovered to date all occur in a facies dominated by clay pebbles supported by a silty sand matrix. Mammals are largely known from isolated teeth, although edentulous jaws and at least one postcranial element have been discovered. The mammals from Quarry I are reported in Rigby and Wolberg (1987). Lower vertebrates are also known from the

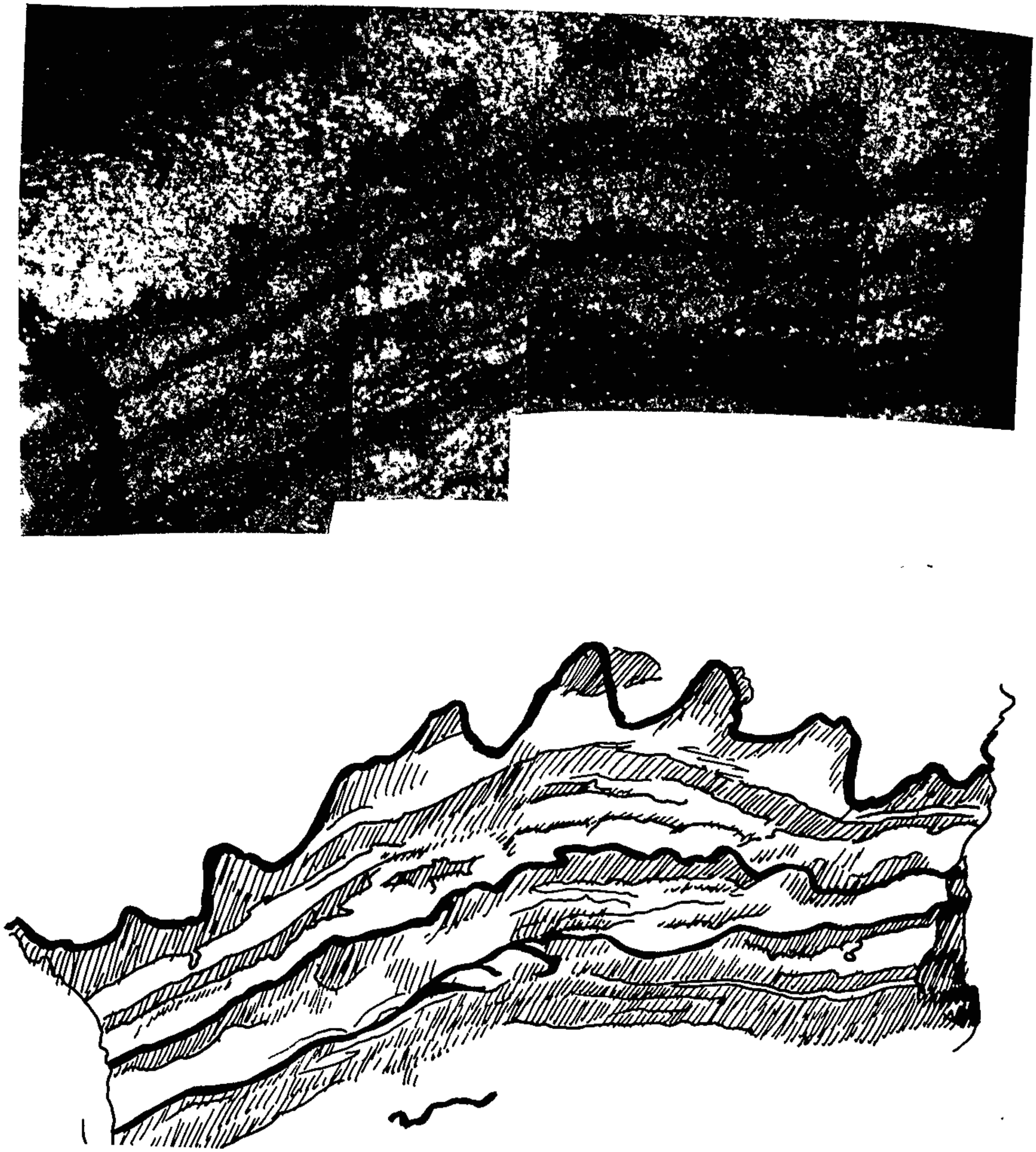


Figure 19 Dinosaur skin from the Fossil Forest

mammal sites and are reported in the table below. When they occur with mammals, the lower vertebrates are represented mainly by isolated teeth or postcranial elements. An incomplete and partially articulated new amiid has been found and described elsewhere Hall and Wolberg (1989).

The 1988 survey located 157 bone-producing sites. Not unexpectedly, most of these were found in Section 24. Table 4 lists the occurrences by section:

TABLE 4

BONE OCCURRENCES FOUND DURING 1988 SURVEY

SECT.	NO. OF SAMPLES
24	74
23	57
15	2
14	19
13	5

During the 1988 survey, articulated bone material was seen at only three localities. One of these was in Section 24; the other two were in Section 23. Table 5 lists our current estimation of the diversity of the vertebrate fauna.

SIGNIFICANCE AND ASSESSING THE VALUE OF THE FOSSIL FOREST

It is very difficult to establish criteria for objectively determining the significance or value of particular fossils or

Figure 20 James Baldwin and Susan McKinney at Carol's Quarry, Fossil Forest, 1986 field season.

fossil-producing areas. "One man's trash is another man's treasure" is, it seems to me, especially true when applied to fossils of any sort. It is also true that the perceived significance of a particular group of fossils or fossil-producing areas is frequently proportional to the level of one's involvement with those materials or areas; most of us like to feel that what we do has some importance. Similarly, it may be tempting to over-estimate the importance of a particular group of fossils or a fossil-producing area by the seemingly conflicting facts of too little information or too much. For example, a species or higher level group of organisms may be represented by a single or very few specimens and that limited sample may assume a very great significance because of rarity. Uniqueness is generally transitory, however. More specimens are certain to be discovered by continued collecting.

On the other hand, the importance of a group of organisms or fossil-producing area may assume great significance because a great deal of data is available. Thus, the Fossil Forest, where a very detailed surface and subsurface series of studies have been carried out for more than a decade, is clearly the best studied area of Fruitland Formation geology and paleontology and may well be the best studied area anywhere in the San Juan Basin.

Yet, there is no real reason to conclude that discoveries made in the Fossil Forest could not or would not result from equally intensive investigations elsewhere in the region. The

Fossil Forest tree stumps and logs are interesting because of their in situ nature (Figure 22) and the fact that they are present in som abundance. Fossil forests occur elsewhere in the San Juan Basin within and above or below the Fruitland Formation. It is very likely that some tree horizons correspond to horizons in the Fossil Forest study area. Additional studies should provide information relating tree horizons throughout the Fruitland outcrop belt. Indeed, just recently we have located another fossil forest, some miles away, with at least three and possibly four forest horizons apparent.

Cretaceous fossil forests are not unique to the San Juan Basin and known elsewhere in New Mexico from areas such as Elephant Butte and the southwestern part of the state. Cretaceous dinosaurs have been discovered elsewhere in New Mexico as well. In point of fact, a case can be made for the great importance to an understanding of the age and paleoenvironments of south-central New Mexico provided by studies of McRae Formation dinosaurs (Lozinsky and others, 1984; Wolberg, Lozinsky and Hunt, 1986; and Gillette, Wolberg and Hunt, 1986). The McRae discoveries can be interpreted as major breakthroughs, probably of greater significance in a scientific sense that most of the recent San Juan Basin work done (by ourselves and others).

Never before documented occurrences have resulted from our Fossil Forest studies and these have been cited above and are recapitulated here. For example, unusual as it may seem, the

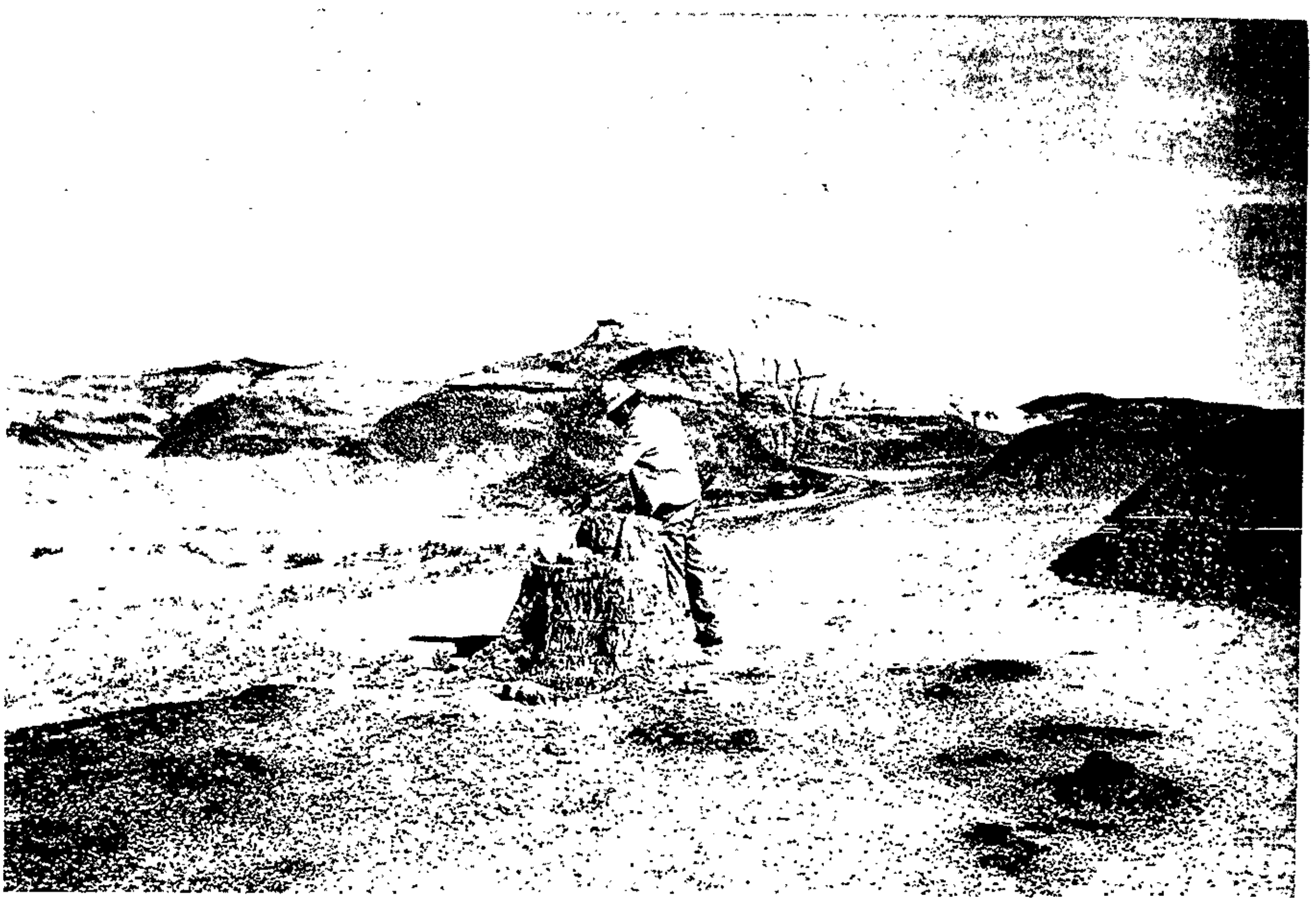


Figure 22 Fossil in-situ tree stump near campsite, Fossil Forest, 1985.

Fossil Forest is the first published occurrence of successive forest horizons in the Cretaceous of New Mexico. It is the only occurrence that includes distribution maps of the forests. In terms of animal fossils, a new amiid fish has been described from an incomplete skeleton found in the Fossil Forest by Hall and Wolberg (1989). The first Cretaceous insect has been found in the study area (Wolberg and others, 1988). The first hadrosaur juvenile, a lower jaw with teeth, was found in the Fossil Forest. The first detailed studies of Cretaceous amber have been carried out in the Fossil Forest. The first pre-Holocene occurrence of the unusual carbonate mineral huntite has been documented in the Fossil Forest (Wolberg, 1989; Bellis and Wolberg, 1989). This last discovery indicates the presence of alternating arid and humid climates during Fruitland time.

A number of our projects in the Fossil Forest await completion. For example, material remains in Carol's Quarry. The mammal localities require additional work. Our "high" Quarry (Figure 23) with the possibility of a contained partial dinosaur skeleton remains to be completed but will require different mechanical assistance.

MANAGEMENT OPTIONS

Four possible management options would seem to be available for the future of the Fossil Forest study area. These are:

1. no action
2. designate the area closed to mining but allowing

Figure 23 Barin Beard working the high Quarry, 1986

fossil collecting for scientific purposes to proceed

3. transfer the area to the State of New Mexico for scientific and educational purposes to be managed by the State

4. transfer the area to the Navajo Nation as part of the Navajo-Hopi exchange and allow the Navajo Nation to utilize the area as part of a broader economic development program being considered by the Dineh Power Authority, possibly as part of a cooperative management program by the Tribe, San Juan County and Farmington interests.

DISCUSSION OF MANAGEMENT OPTIONS

1. The no action option is the simplest option available. By this option, collection and study in the area would continue and legitimate interest in development of the coal resources would, we assume, occur if market conditions were favorable. In almost all instances, the only real protection for fossils is collection. If left uncollected, most fossils quickly erode and are forever lost (Figure 24).

In point of fact, there is little liklihood that coal development in the region would occur in the near future, the next 20 years. Market conditions are currently very poor indeed. Even if market conditions changed, it is not likely that coal would be stripped from the Fossil Forest area before the mid-or late-21st century. It is also likely that advances

Figure 24 Recently exposed, quickly disintegrating turtle shell in the Fruitland Formation; 1987.

in technology might make the resource more valuable for in situ gasification and processing rather than conventional stripping.

2. The second option is really unnecessary. To all intents and purposes, the area is certainly secure from mining pressure for the foreseeable future. In addition, in almost all cases in paleontology, and certainly in all cases in the Fossil Forest, the only adequate protection of fossils is collection.

3. For some time we favored the third option and indeed looked into the feasability of a possible exchange between New Mexico, BLM and Sunbelt Mining by which New Mexico would obtain ownership of the Fossil Forest area and maintain it as a research/educational park. We thought that it would be possible to develop some sort of visitor center and camping facility. This idea was discussed with a number of State, Federal and industry officials and tours of the area were arranged. The idea was deemed impractical. In actuality, with the pressure of economic development of the coal resource now gone, there is little need for any heroic protective measures in the area. The area is in fact currently available to other scientists and casual tourists within BLM management parameters at little or no cost to the taxpayer.

4. The fourth option is a recent development and perhaps the most interesting. If viable, it would be the only option allowing for both research and economic development within a reasonable time framework and not only limited to coal resource

development. If viable, it may be possible to foster the development of an active tourist/educational program that would be of economic benefit to the main constituencies in the region, the Navajo Tribe and the city of Farmington. We have received expressions of interest in this management option from Tribal officials as well as staff of the Dineh Power Authority. We have provided tours for a number of persons from these groups, just as we have provided tours for federal and state officials.

If this option is pursued, we would also strongly urge that those BLM funds projected for use in and about the Fossil Forest be transferred to the appropriate Tribal or cooperative authority coordinating the use of the Fossil Forest.

WHITHER PALEONTOLOGICAL REGULATION; THE NATIONAL ACADEMY OF SCIENCES REPORT

In 1987, members of the Society of Vertebrate Paleontology, the Paleontological Society, other professional organizations, members of Congress and even former President Reagan received copies of a National Academy of Sciences report, prepared by the Committee on Guidelines for Paleontological Collecting, dealing with collecting fossils on public lands. The Council of the Paleontological Society, meeting in Phoenix, in October, 1987 unanimously endorsed the NAS report. Members of the Society of Vertebrate Paleontology were polled and asked to vote on each of the ten recommendations of the NAS panel. That vote, tabulated in the February, 1989 SVP News Bulletin is discussed below.

The FY 1987-88 Federal legislation that addressed appropriations for the Department of Interior and BLM, Section 121 of the Appropriations Act for DOI, Fiscal Year 1987, required that the Secretary report to Congress within thirty days after issuance of the NAS study and how DOI was going to implement the recommendations of the NAS study. On September 29, 1987 Secretary of Interior Donald P. Hodel wrote to J. Bennett Johnston, Chairman of the Senate Committee on Energy and Natural Resources, with identical copies sent to Robert C. Byrd, Subcommittee on Interior and Related Agencies of the Committee on Appropriations of the Senate; Morris K. Udall, Committee on Interior and Insular Affairs of the House of Representatives; and Sidney R. Yates, Subcommittee on Interior and Related Agencies, Committee on Appropriations of the House of Representatives. In this letter, Secretary Hodell stated the following:

"The NAS report has now been completed and has concluded that fossils do not constitute a resource requiring the degree of management attention initially proposed by the Department. Conceptually, we accept the report's recommendations. We therefore plan to develop and publish new proposed rules, during Fiscal Year 1988, that will provide for the management and protection of paleontological resources consistent with the NAS recommendations. The proposed rulemaking will discuss the NAS report and contain specific details for carrying out the recommendations."

Secretary Hodel and the policy of the administration clearly supported the NAS study. Unfortunately, some BLM staff did not care for the NAS conclusions and apparently viewed the report and the Secretary's avowed intentions as sounding the death-knell of their plans for a very large and heavily funded geological/paleological program much like BLM archeology/cultural resources programs. Thus, everything possible was done to delay implementation of Secretary Hodel's and the administrations goals. In fact, those goals have not been implemented in FY 1989.

Recently, the new Secretary of Interior, Manuel Lujan, Jr., has restated DOI support for the NAS report. In a letter to Senator Larry Pressler dated September 25, 1989, Secretary Lujan states in part:

"The Department accepts the concepts embodied in the National Academy of Sciences (NAS) report."

In addition, the Director of the U. S. Bureau of Land Management has also expressed his acceptance of the NAS report. In a letter to the Secretary of Interior, through the Assistant Secretary-Land and Minerals Management, dated August 25, 1989, the Director, Bureau of Land Management states in part:

> "First, let us restate our position on the National Academy of Sciences (NAS) report. It is still the position of the BLM that we <u>conceptually</u> accept the recommendations in the report."

Later, this same letter states:

"We think it would be useful to clarify the roles and responsibilities of the GS and the BLM for paleontological resources. The GS will continue to provide the overall expertise needed by the Federal Government."

It seems clear that the NAS study should be incorporated into the management framework for the Fossil Forest study area. Given the BLM track record, however, there seems little indication that any initiative towards this goal will be forthcoming at the District level. Some consideration of the NAS statement would be useful at this juncture.

THE COMMITTEE RECOMMENDATIONS

The core of the NAS report can be found in the ten recommendations unanimously agreed upon by the Committee on Guidelines for Paleontological Collecting. These recommendations are remarkably straight forward and it is not supprising that most of them have found broad support throughout the paleontological community:

"Recommendation #1. A uniform national policy on paleontological collecting should be adopted by all federal agencies. Existing statutory authority is adequate for implementation of such a policy.

Recommendation #2. Each state should adopt a uniform paleontological policy for state-owned lands.

Recommendation #3. All public lands should be open to fossil collecting for scientific purposes. Except in cases involving quarrying or commercial collecting, collecting fossils on public lands should not be subject to permit requirements or other regulation.

Recommendation #4. Fossils of scientific significance should be deposited in institutions where there are established research and educational programs in paleontology. These repositories will ensure that specimens are accessioned, maintained, and remain available for study and education. There is no justification for requiring that fossils be deposited in an institution in the same state in which they are found; such requirements discourage paleontological research.

Recommendation #5. Commercial collecting of fossils from public lands should be regulated to minimize the risk of losing fossils and data of importance to paleontology. Permit applications must be subject to review by paleontologists qualified to assess the projects' potential impact on related research programs. Applications must receive the endorsement of a paleontologist who is willing to supply guidance to the commercial operation. Specimens deemed to be of special scientific interest must be deposited in a public institution, such as a museum, college, or university.

Recommendation #6. Private landowners should follow the guideline that commercial collecting of fossils be undertaken with thorough scientific oversight to ensure that the scientific usefulness of specimens is not impaired.

Recommendation #7. Blanket paleontological inventories, mitigation, or salvage activities should not be undertaken, funded or required by government agencies as a routine part of environmental assessment, impact analysis, permitting, land management, or similar programs.

Recommendation #8. Land managers or developers who require scientific guidance on perceived paleontological problems should initially seek advice from the U.S. Geological Survey, or appropriate state geological surveys, which in turn may wish to contact appropriate paleontological organizations.

Recommendation #9. The Department of Interior, in cooperation with the professional paleontological community, should identify and evaluate potential paleontological localities of national significance (both on public and private lands) for designation as National Natural Landmarks (NNLs), pursuant to the existing National Natural Landmarks Program administered by the National Park Service (36 CFR 62).

Recommendation #10. The paleontological societies of the nation should develop permanent and broadly based educational programs to inform landowners and commercial and amateur collectors of the research needs of professional paleontologists. "

As noted above, the Council of the Paleontological Society unanimously endorsed the NAS report in 1987. Every indication is that the PS membership, as gauged by contacts of a generally vocal membership through the Council, very strongly favors the report. Within the Society of Vertebrate Paleontology diverse views emerged and a decision was made to poll the membership on each of the NAS recommendations. The results of this poll finally appeared in the February, 1989 issue of the SVP News Bulletin although the results of the poll were given the President of SVP in June, 1988. SVP sent out 942 ballots and 322 were returned, a return of 34.2%. The poll results are very interesting; the SVP membership responding to the poll did so as follows:

Recommendation	Yea	Nay
Recommendation 1	304	18
Recommendation 2	11	11
Recommendation 3	255	66
Recommendation 4	306	15
Recommendation 5	185	33
Recommendation 6	294	25
Recommendation 7	131	189
Recommendation 8	278	41
Recommendation 9	292	26
Recommendation 10	310	8

It is likely that the overwhelmingly supportive vote of the SVP membership for the NAS study results greatly supprised many SVP members who have been very vocal about prohibiting commercial collection of fossils from public lands, for example. Most of those responding voted to allow collecting by permit. The response to NAS Recommendation 2 (11-11) is odd and indicates to me that this item was poorly worded and the SVP membership did not understand the intent of this recommendation.

CIRCUMSTANCES LEADING TO THE RECOMMENDATIONS

We will not attempt to describe all of the reasoning that went into the development of each of these recommendations by the Committee. The Committee report provides a good deal of documentation and we would urge all to read the report if they have not already done so. Each of the recommendations developed from difficulties and/or confusion encountered in the federal regulatory process as it treated or planned to treat the science of paleontology and subdisciplines or interests related to or dependent on paleontology. The history that led to the initiation of the NAS effort is long and complex, and involves a number of societies, professional organizations, industry, legislative and state interests that spill over beyond <u>just</u> paleontological concerns. In a very real sense, the regulatory process was becoming chaotic and confused to the point where the continuation of geologic field camps, various soft-rock field studies for both research and applied purposes, legitimate industry-based development activities, <u>and</u> paleontologic research were in some difficulty. Many paleontologists are aware of the difficulties that ensued in New Mexico as the result of an overly zealous, poorly conceived and misdirected attempt to institute a very confused paleontological regulatory effort. Those of you who aren't are welcome to look at our rather extensive files, or even the occaisionally rather amusing transcripts of a conference we organized in 1981. Over the last nine years, our files dealing with the regulatory miasma have grown substantially, and if their contents indicate anything, it is that the federal regulatory process is the last place one would look to for the enhancement of free and open scientific inquiry. That paleontologic research is best left as much alone as possible is recognized in the unifying philosophy of the NAS report and can be found in the following statement:

"In general, the science of paleontology is best served by unimpeded access to fossils and fossil-bearing rocks in the field. Paleontology's need for unimpeded access is in sharp contrast to the prevailing situation in archeology. In this report. 'access' is defined to include all collecting and removal of fossiliferous material for study and preservation. Generally, no scientific purpose is served by special systems of notification before collecting and reporting after collecting because these functions are performed well by existing mechanisms of scientific communication. From a scientific viewpoint, the role of the land manager should be to facilitate exploration for, and collecting of, paleontological materials."

The report recognizes the broad geologic significance of fossils and the need to integrate paleontological data into most geologic studies. In a sense, what is good for paleontology is good for all geoscience. One ancillary result of the report will be to reinforce the role of paleontology in the geological sciences.

DISCUSSION OF THE RECOMMENDATIONS

In our view, none of the recommendations offerred by the NAS Committee poses a any threat to the research interests of any paleontologist or for that matter, any geologist. In fact, we suggest that if implemented as formal policy by all federal land managing agencies, not only those agencies included in the Department of Interior--and as noted above, there are more than 60 federal agencies that manage lands--these recommendations will enhance research programs. It is certain that such implementation would simplify and rationalize procedures to gain access to public and other lands. However, we fully understand the concern some paleontologists might have with some of the recommendations, especially recommendations #5 and #7, the recommendations dealing with commercial fossil collecting and paleontological inventories, respectively.

The subjects dealt with in these recommendations were the most difficult areas confronted by the Committee. The Committee listened intently to the contrasting views presented by various interests on these matters, and members of the Committee brought to these discussions their own perspectives. The discussions were long and frequently difficult. But always the sense of dealing with paleontology as a single profession, of developing a consensus that would lead to obtainable results and which would have the most salutary affects on the profession of paleontology, guided the Committee.

Commercial collecting--

In our view, which has evolved over time, commercial collecting of fossils is a fact of life; most commercial collecting is rather positive or at the least neutral in that suppliers provide the brachiopods, crinoid columnals, rugose corals, etc., that are necesary for most introductory paleontology courses offerred in American universities and colleges. Commercial collectors also provide the specimens demanded by hobbyists. There are tens of thousands of paleontological hobbyists that range from casual to serious collectors and many of these are organized into regional and national societies. Many amateur collectors have, over the years, donated their "prized" collections to individual paleontologists and institutions. One wonders how many paleontologists began as hobbyists and purchased their first brachiopods or shark teeth from commercial suppliers. These individuals form a very solid core of supporters for science although scientists frequently have difficulty reaching them.

Commercial collecting of vertebrate fossils has certainly held a rather important place in the history of American paleontology. How paleontologists have viewed commercial collectors, however, has had a very interesting and almost cyclic history. Commercial collectors were at one time or another partners in research; suppliers of fossils that for various reasons could not have been gotten any other way and whose visits were always welcome; suppliers of fossils that for various reasons could not have been gotten any other way and so commercials collectors had to be tolerated but never loved; or as devastators who raid and pillage the paleontologic landscape.

In 1985, William Clemens, acting as Chairman of the Society of Vertebrate Paleontology Government Liaision

Committee, recognized the complex historical love-hate relationship between paleontologists and commercial fossil collectors as part of a poll of the SVP membership that he conducted. We suggest that the very forthright recognition by Clemens of the significant contributions to paleontology made by commercial collectors requires the profession to come to grips with the situation, and, again as Clemens has suggested, try to determine if there is a mechanism by which the commercial collectors can be better integrated into structured paleontology.

There seems to be little to be gained by ignoring the fact that most museums and many paleontologists purchase or otherwise receive very significant fossils from commercial collectors. There is nothing to be gained by denying the fact that there are those among us who have taken commercial collectors to task for being "up front" about <u>their</u> profession, the collection and sale of fossils, yet at the same time have their own commercial enterprises "on their own time" that do the very same thing, namely exchange paleontological services for money.

Of direct bearing on the Fossil Forest is the fact that the area was probably collected by a commercial collector, Charles Sternberg, and what collections he made were largely sold to museums. Interestingly enough, the fossils are preserved and available to the public and scientists.

Recommendation #5 of the NAS Committee is at least one practical way to address the situation. This recommendation will not stop the activities of unscrupulous commercial collectors, to be sure, but it does strengthen the hand of commercial collectors who genuinely consider themselves to be ethical and who have a real love of fossils.

Paleontological inventories--

Recommendation #7, dealing with blanket paleontological inventories is a bit more difficult to understand except, we suggest, when considered within the context of the regulatory process and procedures. On face value there would seem to be little to find fault with if governmental entities required an "inventory" of paleontological "resources" before, during or after any "major impacting action" were taken by government (at any level), industry, or the public. Further, since these "inventories" would be funded by taxes or industry contracts, and since paleontologists and paleontology graduate students would be the recipients of this largess, little harm could ensue. People would be paid and fossils might be collected and the fossils might even have some relationship to things that the paleontologist(s) involved really cared about. Finally, we are certain that paleontological inventories have found interesting fossils and/or fossil localities.

As used in most federal land managing agency documents, the glossary appended to the San Juan River Regional Coal Environmental Impact Statement, November, 1982, for example, the term "inventory" means:

"A descriptive listing and documentation, including photographs and maps, of cultural resources; included are the processes of locating, identifying, and recording sites, structures, buildings, objects, and districts through library area archival research, information from persons knowledgeable about cultural resources and varying levels of intensity of on-the-ground field surveys."

The social science bias of the usage of "inventory" as a term and as a process is demonstrated. With some substitution of words, application of the term to paleontology in its redefined form is certainly possible, but would have little or no meaning to the science of paleontology beyond the fact that some fossil localities in a particular area had already been documented in the literature, or were exposed at the time that someone went through a particular area. The idea that a body of rock can be "inventoried" is simply nonsense. The fact remains that fossils will be found in sedimentary rocks. We leave to each individual the choice of whether paleontologists choose to spend their time, or their students' time looking at those rocks with no research related rationale but only because a federal agency or company is prepared to pay to have a parcel of ground inspected.

It has been suggested by some paleontologists that paleontology and archeology are really very similar, or at least more similar than different. Such a view, I suggest is simply false and at best, misleading; I suggest that it is more likely that similarities would be pointed out by paleontologists than archeologists.

Archeology is the extension back through time of our understanding of the dynamic interplay of social and cultural phenomena gleaned through analyses of the things people made and/or used. Archeology is a social science that may use concepts and techniques derived from the biological or physical sciences, and may indeed derive more and more data from these sciences the older and\or more primitive the socio-cultural phenomenon studied becomes. In a sense to attempt to obscure the social science basis of archeology in an effort to highlight perceived similarities with paleontology is unfair to our archeologist friends. This effort ignores the very core of the supporting philosophical basis of archeology.

It has been suggested that the cost of conducting fossil inventory, clearance and salvage programs should be factored into industry's equations for the cost of doing business. If a corporation can't carry out these efforts and still earn a profit, perhaps they shouldn't be in business at all. This attitude, I suggest, is really not the point. By comparison to other regulatory demands placed on industries where fossils may be of some concern, paleontology is really a bargin; some companies spend hundreds of thousands of dollars for archeological mitigation work, for example. A consulting environmental assessment firm might charge a company hundreds of dollars per day per person to get the company through the regulatory process. As frequently happens, this firm may subcontract work to faculty at the local university or other speciality firms. Frequently, these speciality firms may be "paper companies" with little more than a P. O. Box.

We do not intend to imply that consulting is necessarily wrong or unethical. As long as very specific questions need to addressed for various purposes, it will make more sense to hire the very best on a task specific basis to address those needs than to attempt to maintain in-house expertise for all areas. As long as faculty pay scales remain depressed, universities and colleges and even museums, unable to adequately compensate staff, will permit and even encourage a certain level of consultation privileges.

However, it is very doubtful whether most paleontological mitigation and salvage work serves any useful scientific function. It would be interesting to determine how many published papers have resulted from these activities, and how many new paleontological insights have resulted. It would be very wrong for paleontologists to follow the lead of contract archeologists in these matters. We recall an incident where a State Archeologist refused to sign-off on a permit for a coal company to continue mining unless that company agreed to bear the costs of construction of additional storage space for archeological materials. I doubt if paleontologists want to get involved in this sort of thing.

A number of years ago, a paleontologist was commissioned by a coal company in New Mexico to "inventory" less than a section of land (640 acres) in the San Juan Basin. We are told that the company, not understanding the economics of paleontology, compensated the individual about $55,000 and a trip to the International Geological Congress in Paris.

During the conference that we organized in 1981, we were informed by the BLM that the agency budget for paleontology in New Mexico alone amounted to something like $500,000/year and had been maintained at that level for several years. True, this funding, which by the way no longer exists, included staff salaries, travel, supplies, etc., but also included the costs of a number of contracted studies that demonstrated that the Lewis Shale, Pictured Cliffs Sandstone, Fruitland Shale, Kirtland Formation, Nacimiento and San Jose Formations contained fossils and that the American Museum of Natural History, the University of Kansas and other institutions had documented fossil localities in the San Juan Basin. One rather interesting study attempted to document the person/specimen/hour cost to remove fossils under projected federal contracts.

Over the few years that New Mexico BLM was able to maintain this effort, several hundred thousand dollars were spent on such contracted studies. Some of the folks participating in those studies ended up in public jobs. Additionally, a good deal of materials were purchased by the BLM: such items as a rather expensive microscope, cameras, portable rock saw, such "important vertebrate-related" reference material as the <u>Treatise of Inveretebrate Paleontology</u>, specimen cabinets, thousands of vials and corks, rock hammers, chisels, plaster, burlap, etc., and best of all helicopter time to remove a jacketed specimen from a Wilderness

Study Area. All this so that BLM could adequately manage the fossil resource. We will not allude to the final disposition of the equipment here, beyond recording that it is our understanding that the rather expensive rock saw ended up on a surplus property list and was sold for $20 or $30 to a university agricultural department where it may still be used to cut frozen meat from carcasses. If it helps at all, we were informed at the same conference that BLM had been spending at least three times the amount on contract archeology that they were spending for contract paleontology.

We leave it to the reader to determine whether the science of paleontology was well served by these efforts. We leave it to the reader to determine whether our understanding of fossils was enhanced by these efforts. It is obviously our view that contract paleontology has little or no scientific validity. Terms such as inventory, clearance, significance, mitigation, salvage as presently applied to paleontology are based in the social sciences and/or are part of the land manager's and environmental consultant's jargon. In very limited circumstances they can have applicability to paleontology but will certainly mean something different to different paleontologists.

LAND MANAGEMENT AGENCY INTEREST IN FOSSILS

Federal land managing agency interest in paleontology largely grew out of various cultural resource programs. These programs centered on archeology and social/cultural anthropology and, of course, were directed by individuals with a background in the social sciences. The archeological foccus of regulatory efforts has a long and established history extending back to the Antiquity Act of 1906. It is the misapplication of the 1906 Act to fossils that led to the involvement of federal land managing agencies in paleontology. It is also the misapplication of the 1906 Antiquities Act that resulted in the awareness of the Society of Vertebrate Paleontology and the Paleontological Society to real and potential difficulties with the permitting/regulatory disaster as it began to unfold.

By the mid- and late 1970's, various federal agencies were in the process of major expansion; this expansion followed the passage of major environmentally based legislation. We suggest that cultural and scientific "resources" provided a fertile field for agencies to expand staffs, broaden their interpreted missions, and request ever increasing appropriations. In order to manage a "resource" you have to understand it, and in order to understand it, you have to do research. We suggest that these land managing agencies attempted to form what they considered to be internal research oriented groups and intentionally ignored the technical expertise available to them from other federal agencies, state agencies, universities and museums. Thus, the Bureau of Land Management, the Bureau of Indian Affairs, the Bureau of Reclamation, etc., needed paleontologists, geologists, archeologists, zoologists, botanists, etc. The battle for turf among these newly expanded agencies was on.

An incident that occurred at the coal/paleontology conference in Farmington, New Mexico in 1981 vividly highlights this fact. One of the USGS Paleontology and Stratigraphy Branch paleontologists was told by of the then BLM paleontologists that: what was his (BLM's) was his, but what was USGS' was negotiable. Similarly, some of those now protesting their inability to gain access to federal wilderness area to collect fossils were just those individuals who originally testified in favor of declaring those areas wilderness. In point of fact, they did not pay much attention to the language or intent of wilderness legislation and felt that they would be granted dispensations and allowed to dig holes and remove fossils. This conclusion becomes apparent when the published testimony of a hearing of the Senate Subcommittee on Public Lands, Reserved Water and Resource Conservation of the Committee on Energy and Natural Resources, held October 14, 1985 and published as S. Hrg. 99-463, is reviewed.

Paleontological resources--

The use of the term "resource" to either cultural or scientific materials, e.g., pottery, arrowheads, bones or rocks, is simply wrong. Land managing agencies are accustomed to dealing with economic "things" and this reflects the economic premises established by Congress by which these agencies conduct their daily business. They count, they assign economic value, they compare the cost of one action to another, all by way of determining value, in an economic sense, of the resource. They are generally good at doing these sorts of land managing things. They are not good at managing science.

No federal legislation has been enacted specifically for the protection of fossils, as noted in the NAS report. Public Law 87-13 regulates the collection of petrified wood on public lands, and the Archeological Resources Protection Act of 1979 regulates the collection of fossils found in an archeological context, but generally federal agencies have looked to the implied regulatory authority of portions of their enabling legislation that speak of "the physical environment" or "scientific values" to build agency-specific management programs in paleontology. There is obviously ample statutory authority for the protection and management of fossils by federal land managing agencies, a fact noted in the NAS report. When land managers have problems of genuine concern to paleontology, opportunities are in place for them to seek advice. Available resources for advice exist in the Paleontology and Stratigraphy Branch of the U. S. Geological Survey, state geologic surveys, universities, museums and of course, professional societies. The NAS report notes this.

CONCLUSIONS

It is imperative that paleontologists and law makers read the NAS report, and consider the recommendations of the report within the context of paleontology as a profession. As a close friend has noted elsewhere, it is difficult for paleontologists to reach a concensus; we are more accustomed to working alone than in a group. However, the recommendations addressing the issues considered in the NAS report do represent a consensus directed towards the benefit of the entire profession. Less regulation is better than more, especially when applied to areas of inquiry that require the greatest opportunities of freedom of action. Similarly, most impacts that result from geologic or paleontologic field work are minimal, quickly removed by erosion and miniscule when compared to the effects of a rainstorm or snowfall.

In our view, the NAS report is the culmination of a long road began literally decades ago by many very dedicated individuals in the Society of Vertebrate Paleontology and the Paleontological Society. In SVP, past members of the Government Liaision Committee toiled long and arduously in an effort to reach an accord with land managing agencies that would benefit the profession. Too often, we lost sight of the goal and became bogged down in details of little significance. We suggest that the NAS report is a timely and appropriate document that summarizes a beneficial program for the entire profession and, further, takes advantage of a "window of opportunity" to actually carry out long needed reforms. It is unlikely that such an opportunity will occur again soon.

Acknowledgements

Portions of this report have appeared elsewhere as earlier versions of our views on various aspects of the Fossil Forest. This is the first presentation of the document in its present form and content and reflects the thoughts of the two persons cited on the title page.

Since 1979, many people have worked with us in the Fossil Forest, too many to list them all. Substantive portions of this report are the direct result of collaboration with many folks. However, our sincere appreciation is extended to Dr. William X. Chavez, New Mexico Institute of Mining and Technology; Orin Anderson, New Mexico Bureau of Mines and Mineral Resources; April Gil, Farmington, New Mexico; and Robert Morrow, Albuquerque, New Mexico; and J. Hall, University of Kansas. These people worked long and hard with us in the field on the published Fossil Forest historic and stratigraphic paper (Wolberg, et al., 1988) as well as other projects. Our deep and lasting appreciation is extended to the many students of the MST Field Paleontology courses through the years, especially Jim Baldwin, Hal Brown, Baron Beard, Gloria Green, Kay Green, Kathy Arterburn, Carol Horton, Sue Laux, Brad Triplehorn, Mike De Young, Sue McKinney, Rheda Smallridge, Dean Hollock, Laura Howe and Sue Crumm. Special thanks to J. Hartman, C. Robison, J. Menack, N. Mateer, B. am Ende and especially A. Hunt for much assistance over the years. A very special debt of gratitude is owed J. Hartman and M. O'Neill.

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Numbered Figures

20. James Balwin and Susan McKinney at Carol's Quarry, 1986 field season.

21. Breaking a plaster jacket loose at the Big Hadrosaur Quarry, Fossil Forest, 1986 field season.

22. Fossil in-situ tree stump near campsite, Fossil Forest, 1985.

23. Barin Beard working the High Quarry, 1986.

24. Recently exposed, quickly disintegrating turtle shell in the Fruitland Formation, 1987.

TABLE I

MODERN FLORA OF THE FOSSIL FOREST

Cactaceae

Opuntia polyacantha Haw.

Caprifoliaceae

Arenaria fendleri Gray

Chenopodiaceae

Atriplex canescens (Pursh.)

Atriplex confertifolia (Torr. & Frem.)

Atriplex obovata

Atriplex saccana

Eurotia lanata (Pursh.)

Kochia vestita Wats

Salsola kali L.

Sarcobatus vermiculatus (Hook)

Suadea torreyana

Compositae

Artemesia filifolia Torr.

Artemisia tridentata Nutt.

Chrysothamnus nasuseosus Pursh,

Chrysothamnus viscidiflorus

Gutierrezia sarothrae (Pursh.)

Haplopappus tenuisectus (Green)

Helianthus annus L.

Lactuca pulchella (Pursh.)

Platyschkuhria integrifolia (Gray)

Stephanomeria pauciflora

Townsendia incana Hook

Xanthium strumarium L.

Cruciferae

Arabis sp.

Ephedraceae

Ephedra viridis Coville

Gramineae

Agropyron smithii Rydb.

Bouteloua gracilis (HBK)

Bromus tectorum L.

Hilaria jamesii (Torr.)

Hordeum jubatum

Muhlenbergia torreyi (Kunth.)

Oryzopsis hymenoides (Roem & Schult)

Sitanion hystrix (Nutt.)

Sporobolus airoides Torr.

Sporobolus giganteus R. Br.

Hydrophyllaceae

Phacelia integrifolia Torr.

Leguminosae

Astragalus ceramicus Sheld.

Lupinus pusillus Pursh.

Liliaceae

Allium macropetalum Rydb.

Yucca glauca Nutt.

Loasaceae

Mentzillia pumilia L.

Malvaceae

Sphaeralcea parviflora St. Hil.

Nyctaginaceae

Abronia fragans

Ongraceae

Oenothera pumila L.

Plantaginaceae

Plantago patagonica

Polygonaceae

Eriogonum leptocladon Torr.

Eriogonum rotundifolium Benth.

Eriogonum salsuginosum Hook

Rumex hymenosepalus L.

Salicaceae

Populus fremonti Wats.

Scrophulariaceae

Pentstemon angustufolius

Solanaceae

Lycium pallidum Miers

Tamaricaceae

Tamarix pendantra

Umbelliferae

Cymopterus fendleri Gray

TABLE 2

FOSSIL PLANTS IDENTIFIED

Filicophyta

- Polypodiaceae
  - *Dryopteris cledophleboides* Knowlton
- Equisetaceae
  - *Equisetum* sp.

Coniferophyta

- Araucariaceae
  - *Araucaria longifolia* (Lesquereux)
- Taxodiaceae
  - *Sequoia* sp.

Anthophyta

- Monocotyledonae
  - Najadaceae
    - *Potamogeton* sp.
  - Nymphaceae
    - *Cabomba inermis* (Newberry)
  - Palmae
    - *Sabalites* sp.
    - sp. et gen. indet.
- Dicotyledonae
  - Salicaceae
    - *Salix* sp.
    - *Populus* sp.
  - Fagaceae

Dryophyllum subfalcatum Lesquereux

Moraceae

Ficus planticostata Lesquereux

Polygonaceae

Polygonum sp.

Rumex sp.

Plantanaceae

Plantanus raynoldsii

Lauraceae

Laurophyllum sp.

Leguminosae

unidentified seed pod

Incertae sedis

Caprifoliaceae

Viburnum antiquum (Newberry)

Coniferales incertae sedis

Podozamites sp.

Testudines

Baenidae

Baena sp.

Dermatemydidae

Adocus sp.

Trionychidae

Aspiderites sp.

Trionyx sp.

Sauria

Teiidae

?*Chamops* sp.

Crocodilia

Goniopholidae

Goniopholis sp.

Crocodylidae

Brachychampsa sp.

Crocodylus sp.

Saurischia

Theropoda

Coeluridae

Genus indet.

Tyrannosauridae

Albertosaurus sp.

Sauropodomorpha

Sauropoda

Titanosauridae

New genus and species

Ornithischia

Ornithopoda

Hadrosauridae

Hadrosaurus navajovius

?genus indet.

Ankylosauria

Ankylosauridae

genus indet.

Ceratopsia

Ceratopsidae

Pentaceratops cf. P. fenestratus

Mammalia

Theria

Metatheria

Didelphidae

Didelphinae

Alphadon halleyi

A. parapraesaqus

A. cf. A. wilsoni

Ectocentrocristinae

Ectocentrocristus foxi

Pediomyidae

Pediomys fassetti

?Pediomyidae indet.

Aquiladelphis paraminor

Stagodontidae

cf. *Eodelphis*

Eutheria

Insectivora

Leptictoidea

Leptictidae

Gypsonictops clemensi

G. cf. G. lewisi

Palaeoryctoidea

Palaeoryctidea

Cimolestes lucasi

Erinaceoidea

Nyctitheriidae

Paranyctoides cf. P. sternbergi

Note: Appendix 2 lists specimens reposited at University of Kansas Museum Of natural History together with University of Kansas specimen numbers.

MEASURED SECTIONS

Section A101: section exposed along south side of Coal Creek tributary, east of N-S fenceline, in NE1/4, SW1/4, NE1/4, NE1/4, sec 23 T23N R12W

Fruitland Formation	Thickness (Ft., in.)
Concretions: concretionary layer of sideritic concretions, purple to black on freshly broken surfaces, weathering to reddish-brown.............	3"-6"
Mudstone: grey-green mudstone with disseminated carbonaceous plant material; poorly bedded slope-former......................................	6'11"
Shale: grey-black to black carbonaceous shale with disseminated plant material; gypsum and anhydrite concentrations on weathered surfaces..............	6"
Mudstone: "gold" mudstone; yellowish to yellowish-orange weathering; unbedded to poorly bedded..	5'8"
Concretions: concretionary layer of sideritic concretions......................................	3"-6"
Mudstone: "gold" mudstone.........................	4'6"-10'9"
Coal..	2"4"
Ash: greyish-white to white ashy bed; soft, greasy texture with micaceous and glassy phenocrysts.....	1/2"-3"
Coal..	2"
Greyish-white to white ash.......................	1 1/2"

Coal.. 6"

Ash: purplish-grey ash.......................... 1 1/2"

Coal.. 4' (+)

Bauer and Reeside (1920), Section 507: section exposed in wash on south side of Coal Creek in NE 1/4, SW 1/4, SW 1/4 sec 15 T24N R12W.

Sandstone: reddish weathering, well indurated, unbedded capping sandstone...................... 3'

Coal: weathered coal............................ 2'-2'6"

Mudstone: yellowish mudstone, unbedded to poorly bedded.. 4'6"

Concretions: concretionary layer................. 3"-6"

Mudstone: grey-green mudstone.................... 1'6"

Concretions: concretionary layer................. 3"-6"

Mudstone: yellowish mudstone..................... 2'6"

Concretionary layer..............................

Mudstone: reddish-gray weathering mudstone with abundant disseminated plant material............. 3+'

Bauer and Reeside (1920) Section 508: section exposed on Coal Creek near termination of old wagon road that traversed the area; in NW 1/4, NW 1/4, SW 1/4, NW 1/4 sec 14 T24N R12W.

Kirtland Formation

Sandstone: yellowish, well indurated, weakly bedded sandstone....................................... 2'

Fruitland Formation

Sandstone: white, well indurated, massive channel sandstone.. 5'

Sandstone: dark brown, well indurated sandstone... 5'

Concretions: concretionary layer................... 3"-6"

Mudstone: grey-green mudstone..................... 9'2"

Carbonaceous shale................................. 6"

Siltstone: yellowish to whitish sandy siltstone... 3'9"

Concretions: concretionary layer.................. 3"-6"

Mudstone: yellowish, silty mudstone............... 2'3"

Mudstone: grey-green mudstone..................... 6'6"

Coal.. 3'+

Bauer and Reeside Section 509: section exposed on north side of southern tributary of Coal Creek midway between NW and SW 1/4, NW 1/4, SE 1/4, SE 1/4 sec 15 T24N R12W and continued with our Section 509 1/2 in NE1/4, SE 1/4, SW 1/4, SE 1/4 sec 15 T24N R12W.

Coal... 6"

Ash: grey to grey-white ash....................... 1"

Coal... 6"

Ash: grey to grey-white ash....................... 1"

Coal... 2'4"

Coal: weathered coal/lignite grading downward into coal... 2'10"

Mudstone: grayish mudstone....................... 6"+

Covered interval.. 10'-12'

Section 509 1/2; 1987 plant locality and lower coal

Coal: weathered coal/lignite...................... 6"

Coal.. 3'2"

Siltstone: fossiliferous siltstone, abundant plant

material...................................... 1 1/2"

Coal.. 1'2"

Ash: discontinuous whitish ash.................... 1/2"

Coal.. 1'3"

Ash: purplish-grey to purplish-white ash.......... 1"

Coal.. 1'4"

Mudstone: grayish mudstone........................ 1'

Coal: weathered coal/lignite...................... 2"-4"

Coal.. 2'7"

Ash: purplish-grey to purplish-white ash.......... 1"-2"

Coal: weathered coal/lignite...................... 1'

Bauer and Reeside (1920) Section 510: section is exposed along south side of wash in NW 1/4, SE 1/4, NE 1/4, NW 1/4 sec 23 T24N R12W.

Holocene eolian deposits..........................

Mudstone: greyish-green mudstone; poorly indurated

with some disseminated carbonaceous plant material. 5'2"

Sandstone: medium-grained, buff-colored sandstone

with calcareous cement.............................7'2"

Mudstone: grey mudstone with abundant carbonaceous plant debris; micaceous and increasingly indurated downward; iron-stained where planty................ 5'2"

Coal: reddish-brown weathered coal/lignite......... 11"

Coal.. 1"-3"

Ash: greyish-white to whitish ash.................. 1"

Coal.. 4"-5"

Ash: highly altered, very clayey greyish ash....... 1"

Coal.. 2'4"

Coal/lignite: weathered, very planty............... 4'+

"Big Badlands" reference section to south of Fossil Forest in SE 1/4 SW 1/4 sec 26 T23N R12W; section begins on east side of small drainage at south edge of prominent clinker bed of fused sandstone and shale.

Kirtland Formation

Silty sandstone: very fine-grained, dark yellowish-orange and moderately well-sorted; faint cross-stratification; relatively resistent unit forming top of section locally............................ 6'

Fruitland Formation

Shale, mudstone and silty shale: light gray-brown and buff weathering; scattered ironstone concretions; a slope-former............................ 13'

Sandy siltstone; very fine-grained silty sandstone: buff-colored to pale yellowish-brown; plant fragments at base.................................... 5'

Mudstone and siltstone: buff and light gray; ironstone concretions; slope forming unit.............. 17'

Carbonaceous shale: badly weathered, gray-black-black.. 9"

Shale and sandy shale: buff-gray with very thin lenses and beds of well-indurated very fine-grained silty sandstone; ironstone concretions present that are moderate to dusky brown; upper part with scattered petrified wood fragments...... 17'1"

Sandstone: very fine-grained, weathers to light gray or light olive-gray; slightly fining upwards; ironstone and sandstone concretions present; petrified wood at base........................... 16'6"

Sandy shale and mudstone: light gray and buff weathering with thin, lenticular very fine-grained sandstone beds up to 1'6" thick. Zone of dark brown weathering ironstone concretions 18' above base; moderate slope-former....................... 37'8"

Coal: weathered, badly cracked with amber......... 2'3"

Mudstone: grey and light grey with limonitic staining; carbonaceous shale zone near middle..... 4'

Sandy shale and mudstone: slightly carbonaceous zones in lower part; partially baked and fused 3' reddish zone appears 22' above base........... 38'6"

Sandstone: light olive-grey and very pale orange

weathering to light grey and yellowish-grey; iron-
stone and sandstone concretions.................. 9'

Sandy claystone: partially fused and baked; terra cotta or moderate red.......................... 4'

Collapse ash: fine-grained, low density material; variegated black, orange, grey; section below covered.................................... 2'+

Hole drilled in NE1/4, SE1/4 Sec. 24, T 23 N, R 12 W; Elevation 6117. Core described by D. Wolberg and D. Bellis.

	THKNS(FT)
No recovery..	0'-20'
Carbonaceous mudstone, iron stained and earthy smell, light olive-grey, 5Y5/2....................	3.4'
Siltstone, bedded, vertical fractures, dusky yellow, 5Y6/4....................................	0.4'
Siltstone, very crossbedded, carbonaceous, light olive-grey, 5Y5/2................................	2.5'
Carbonaceous mudstone, earthy smell, iron-stained, light olive-grey, 5Y5/2..........................	5.5'
Carbonaceous siltstone, crossbedded, dusky yellow-light olive-grey, 5Y6/4-5Y5/2......................	2.1'
Fine grained, silty sandstone, well-sorted, yellow grey, 5Y7/2.....................................	0.9'
Carbonaceous siltstone, planty, grading into mud-stone, then carbonaceous shale, very mineralized,	

grayish-blue-light olive-grey, 5PB5/2-5Y5/2........ 3.0'

Coal (durain).. 0.3'

Mudstone, greasy; Mn, Fe in bedding planes,
oblique iron-stained fractures common.............. 3.7'

Carbonaceous shale with resinous blebs, light
grey, 5Y3/2.. 1.8'

Carbonaceous mudstone, grayish-olive, 10Y4/2....... 1.8'

Siltstone, oblique fractures, Fe-stained, light
olive-grey, 5Y5/2,................................. 1.8'

Mudstone, increasingly carbonaceous and more
fissile downward, Fe-stained, gypsum in fractures,
medium dark grey, N5............................... 3.0'

Carbonaceous shale, very resinous (yellow-orange),
sulfur on surfaces, medium dark grey to
gray-black, N5-N2.................................. 1.5'

Carbonaceous mudstone, medium dark grey, N5........ 1.2'

Siltstone, increasingly carbonaceous downward,
greenish-grey, 5GY6/1.............................. 2.0'

Carbonaceous shale, medium dark grey, N5........... 0.2'

Carbonaceous siltstone, greenish-grey, 5GY6/1...... 0.2'

Carbonaceous shale, medium, dark grey, N5.......... 0.3'

Carbonaceous siltstone, greenish-grey, 5GY6/1...... 1.0'

Mudstone, dark greenish-grey, 5GY4/1............... 6.1'

No recovery.. 2.5'

Carbonaceous siltstone, medium grey (N6), finely
laminated, grading to increasingly more

Carbonaceous mudstone, irregular bedding, dark greenish grey (5GY4/1)............................ 0.7'

Carbonaceous mudstone, bedded with oblique fractures and slickensides, disseminated coaly plant material, olive grey (5Y4/1) to dark grey (N3), increasingly sandy towards base............. 8.5'

Dolomitic nodules, dark yellowish-brown, 10YR6/2.. 2.6'

Fine grained, well-sorted sandstone............... 2.1'

Siltstone, dark yellowish-brown, 10YR6/2.......... 0.3'

Fine grained sandstone, yellowish-grey (5Y7/2), finely interbedded with carbonaceous mudstone, dark yellow brown in color (10YR4/2), and light olive-grey (5Y6/1) sandstone carbonate nodules and siltstone.. 3.4'

Siltstone, carbonaceous, light olive-grey (5Y6/1) to medium grey (N5).............................. 2.4'

Carbonaceous mudstone, mica and plant material on bedding planes, calcite in oblique fractures, greyish-black (N2) to olive-grey (5Y4/1), increasingly carbonaceous downwards................ 3.8'

Coal (clarain), well cleated, sulfur on contact, calcite in cleats, with two .05' tonsteins, resin and pyrite present.............................. 7.9'

Carbonaceous shale parting low, carbonaceous siltstone at base................................ 0.3'

Medium grained sandstone, light olive-grey (5Y6/1), coarsening downward, very clean and punctuated with coaly beds, crossbedded and secondary gypsum.. 8.9'

Thin carbonaceous/coaly bed........................ 0.3'

Fine grained sandstone with carbonaceous and coaly clasts.. 1.2'

Coal (well-cleated clarain), dark grey (N3) carbonaceous shale; poorly bedded, olive-grey (5Y4/1) to brownish-black (5YR2/1) carbonaceous mudstone; carbonaceous mudstone with clay balls at base... 3.8'

Carbonaceous shale with 0.8' coal (clarain), and carbonaceous shale at bottom, some resin, light olive grey (5Y6/1) to olive-grey (5Y4/1)........... 3.3'

Finely bedded carbonaceous shale, olive-black (5Y2/1), light brown (5YR6/4) towards base with very light grey (N8), medium grained sandstone at base.. 8.9'

Carbonaceous shale with clay clasts, olive-green, 5Y4/1.. 1.1'

Claystone with cross-bedded sandstone, olive-green, 5Y4/1.. 0.9'

Coal (vitrain), black, N1......................... 0.1'

Carbonaceous mudstone, poorly bedded with carbonaceous shale at base, dark grey (N3) to olive-grey (5Y4/1)................................ 4.0'

Coal (clarain and durain), dark red resin in clarain and yellow resin in durain, sandstone partings in coal.. 2.8'

Mudstone, poorly bedded with oblique fractures, dark greenish grey (5GY4/1 to dark grey (N3)....... 4.4'

Carbonaceous shale, brownish-black, 5YR2/1......... 0.5'

Coal (durain) with some resin and siltstone parting 1.1'

Carbonaceous shale and mudstone, brownish-black (5YR2/1) to olive-grey (5YR4/1).................... 1.3'

Mudstone, greasy, oblique fractures, carbonaceous partings with plant material........................ 2.4'

Siltstone with sandstone interbeds................. 1.8'

Carbonaceous mudstone, olive-grey (5Y4/1), with oblique fractures and slick'n sides grading into very light grey (N8) medium grained sandstone at base.. 7.7'

Sandstone, coarse grained, with mudstone interbeds, very light grey (N8),............................. 0.4'

Siltstone, poorly sorted, salt and pepper color.... 1.6'

Mudstone, olive-grey, 5Y4/1, with carbonaceous parting midway down.............................. 7.2'

Coal (clarain), grey-black, N2..................... 0.3'

Mudstone, olive-grey, 5Y4/1....................... 3.9'

Siltstone, moderately well-bedded, dark greenish-grey (5GY4/1) to olive-grey 5Y4/1................. 6.5'

Sandstone, medium grained, welll-sorted with lenses of clay clasts that are lenticular and flattened, very light grey (N8)................................ 12.0'

Coal (clarain), erosional contact with sulfur,

good cleats with resin in cleats, durain at bottom. 5.2'

Mudstone, olive-grey (5Y4/1)......................... 13.6'

Carbonaceous mudstone, brownish-black (5YR/2),

alternating with olive-grey (5Y4/1) siltstone...... 6.9'

Sandstone, medium grained, moderately well sorted,

very light grey (N8)................................ 6.5'

Carbonaceous shale, grey-black (N2)................ 1.0'

Coal (clarain) becoming siltier towards base, black

(N1).. 5.5'

Sandstone, medium grained and well sorted with

carbonaceous partings, white (N9).................. 7.2'

Sandstone, medium grained and white (N9) to light

grey (N8) with clay lenses at 273'................. >38'

Total depth... >303'

APPENDIX 1

LISTING OF PROPRIETARY DRILL HOLE LOGS AVAILABLE TO NMBM&MR

IN THE FOSSIL FOREST STUDY AREA

Section 13, T. 23 N., R. 12 W.

Drill Hole ID	Driller's Log	Lith Log	Geophys Log
P-351	x	-	x
P-352	x	-	x
P-353	x	-	x
P-354	x	-	x
P355	x	x	x
P-356	x	-	x
P-357	x	-	x
P-358	x	-	x
P-359	x	-	x
P-360	x	-	x
P-361	x	-	x
P-362	x	-	x
P-363	x	x	x
P-364	x	-	x
P-365	x	-	x
P-366	x	-	x
P-367	x	-	x
P-368	x	-	x
309	x	-	x

Section 14, T. 23 N., R. 12 W.

RB-14A	x	–	–
P-261	x	–	x
P-262	x	–	x
P-263	x	x	x
P-264	x	–	x
P-265	x	–	x
P-266	x	–	x
P-267	x	–	x
P-268	x	x	x
P-269	x	–	x
P-270	x	–	x
P-272	x	–	x
P-273	x	x	x
P-276	x	–	x
P-278	x	–	x
P-280	x	–	x
P-282	x	–	x
307	x	–	x
308	x	–	x
P-315	x	–	x
P-316	x	–	x
P-317	x	–	x
P-318	x	–	x
P-319	x	–	x

P-320	x	-	x
P-321	x	x	x
P-322	x	-	x

Section 22. T. 23 N., R. 12 W.

RB-14	x	-	-
P-218	x	-	x
P-220	x	-	x
P-222	x	-	x
P-224	x	-	x
P-226	x	-	x
P-228	x	-	x
P-230	x	-	x
P-232	x	-	x
P-234	x	-	x
P-283	x	-	x
P-285	x	x	x
P-287	x	-	x
P-289	x	-	x
P-291	x	-	x
P-293	x	x	x
P-295	x	-	-
P-297	x	-	x
P-299	x	-	x
318	x	-	x

Section 23, T. 23 N., R. 12 W.

RB-15	x	-	-
P-284	x	-	x
P-286	x	-	x
P-288	x	-	x
P-290	x	-	x
P-292	x	-	x
P-294	x	-	x
P-296	x	-	x
P-298	x	-	x
P-300	x	-	x
320	x	-	x
321	x	-	x
P-323	x	-	x
P-324	x	-	x
P-325	x	-	x
P-326	x	-	x
P-327	x	-	x
P-328	x	-	x
P-329	x	-	x
P-330	x	-	x
P-331	x	x	x
P-332	x	-	x
P-333	x	-	x
P-334	x	-	x

P-335	x	-	x
P-336	x	-	x
P-337	x	x	x
P-339	x	-	x
P-369	x	x	x
P-371	x	-	x
P-372	x	-	x

Section 24, T. 23 N., R. 12 W.

28-D	x	-	x
30-B	x	-	x
30-D	x	-	x
32-B	x	-	x
34-B	x	-	x
32-D	x	-	x
34-D	x	-	x
36-B	x	-	x
36-D	x	-	x
108	x	-	x
205	x	-	x
206	x	-	x

Section 26, T. 23 N., R. 12 W.

RB-8	x	-	-
P-302	x	-	x
P-304	x	-	x
P-306	x	-	x
P-308	x	-	x
P-309	x	x	x
P-310	x	-	x
P-311	x	-	x
P-312	x	-	x
P-313	x	-	x
P-314	x	-	x
324	x	-	x
P-341	x	-	x
P-342	x	-	x
P-343	x	x	x
P-344	x	-	x
P-345	x	-	x
P-346	x	-	x
P-347	x	x	x
P-348	x	-	x
P-349	x	-	x

APPENDIX 2

LISTING OF FOSSIL FOREST SPECIMENS REPOSITED AT THE UNIVERSITY OF KANSAS MUSEUM OF NATURAL HISTORY

Specimen Name	Spec.#	Spec. ID	Locality
Amia	88378		300' NW of fenceline junction, SE of quarry I
Reptile	96184	Eggshell fragments	Quarry I
Ceratopsian	96717	sacrum, jaw limb bones	from main wash fenceline quarry FF-K-81-04 (a-g)
Tyrannosaur	96846	femur	from north central edge of flats, @ upland quarry site @ Seismic Road FF-K-85-03
Turtle	96847		from Hunter Wash, Bisti, lower Kirtland shale, sec 32 loc. BH-K-79-05
Hadrosaur	96848	radius	campsite What's it? FF-K-86-06
Hadrosaur	96849	femur	nr. Quarry I in concretion FF-K-81-05
Ceratopsian	96850	femur	from sec. 22 FF-K-82-07
Hadrosaur	96851	tibia	Sarah's loc. in boneyard nr. channel sandstone quarry FF-K-84-08
Hadrosaur Carnosaur(?)	96852		nr. ankylosaur hill in channel sand FF-K-84-09
Turtle	96853	carapace	from FFVP-10 FFV-47
Ceratopsian	96854	limb frg.	from FFVP-10 FFV-45
Hadrosaur	96855	pes	from FFVP-7 FFV-29
Dinosaur	96856	femur	big ss quarry FF-K-85-10
Hadrosaur(?)	96857	lg. femur	FF-K-85-30
Ceratopsian(?)	96858	vertebra	FF-K-86-14
Dinosaur	96859	partial limb	FFV-48
?	96860	sacrum	
Carnosaur	96861	astragalus	Toadstool Flats loc. FF-K-84-13

Dinosaur	96862	vertebra	FF-K-84-34
Dinosaur	96863	vertebra	FF-K-84-86
?	96864	bone frg.	FF-K-84-39
?	96865	vert.in block	Coca-Cola Q
Dinosaur	96866	vertebra	FF-K-85-24
?	96867		FF-K-84-37
?	96868		FF-K-84-35
?	96869	jaw ramus	FFV-65
?	96870	jaw	FFV-47
?	96871	humerus	Coal Ck.Toadstool flts. FF-K-84-18
?	96872	rib(?)	FFV-52
?	96873	vertebra	Coal Ck. Toadstool Flats FF-K-84-19
?	96874	ilium(?)	FFV-19
Dinosaur	96875	vertebra	FF-K-87-22
Hadrosaur	96876	juvenile rib	FF-K-85-41
Turtle	96877		from fenceline Q
Carnosaur	96878	tooth	
?	96879	rib	FF-K-82-40
?	96880	bone	from brownish mudstone
Dinosaur	96881	bone frg.	FFV-1
Ceratopsian	96882	humerus	loc. FFVP-10 FFV-44
?	96883		mudstone Q just S. of camp FF-K-87-11
Ceratopsian	96884	jaw & limb bone	FFV-64-a & b
Hadrosaur	96885	dentary	FFV-65
	96886	dentary	road into FF(DLW,CR& AH) FFV32

Tyrannosaur	96888	jaw	Coal Ck. Toadstool Flats FF-K-84-17
Hadrosaur	96890	jaw (juv.)	
Hadrosaur	96892	phalanx	FFV-50
Crocodile	96893	vertebra	FF-K-85-33
Ceratopsian	96894	occipital condyle	Coal Ck. Toadstool Flats FF-K-84-20
Hadrosaur	96895	vertebra	low q. @ extreme S. end of FF (Mike's Q.) FF-K-85-31
?	96896	coprolite	FFV-3
?	96896	coprolite	FFV-2
Hadrosaur	96897	tooth	FFV-10
Crocodile	96898	vertebra	Coal Ck. TS Flats FF-K-85-27
?	96899	gastralia	Low Q, W. end of FF (Mike's Q) FF-K-85-12
?	96900	femur	FFV-42
Hadrosaur	96901	dentary	FFV-63
Hadrosaur	96911	tibia	
Fish Indet	96912	isolated teeth & bone frg.	Quarry 2
Pycnodont	96913		Quarry 2
Aspidorhynchid	96914	tooth	Q2
Paleolabrus Montanensis	96915	tooth	
Gar	96916	teeth & scales	Q2
Amia	96917	teeth	Q2
Paralbula	96918	teeth	Q2
Amphibia Indet.	96919	ass't jaw frg.	Q2
Crocodilia Indet.	96920	isolated teeth	Q2

TREE INVENTORY

FOSSIL FOREST INVENTORY
JUNE 1988
TREES AND AMBER

SITE	SECT	CARB	LITH	LOCATION
III-NE113	24	35	MDST	
III-NE111	24	23	MDST	
III-NE-5	24	21	MDST	
I-SE-2H	24	15	MDST	E OF HAWK'S NEST
I-SE-2X	24	10	SLST	SW OF FENCE,BELOW DUNES
III-NE-15	24	10	MDST	ON HILLSIDE
III-NE-13	24	10	MDST	ON HILL
III-NE-16	24	10	MDST	ON HILLSIDE
III-NE-19	24	10	MDST	HILLSIDE
III-NE-14	24	10	MDST	ON HILLSIDE
III-NE122	24	10	MDST	
I-SE-M	24	8	MDST	
I-SE-2E	24	8	SLST	
III-NE-22	24	7	MDST	
III-NE-17	24	7	MDST	HILLSIDE
III-NE-21	24	7	MDST	
III-NE117	24	6	MDST	
III-NE120	24	6	MDST	
III-NE-3	24	6	MDST	
III-NE-12	24	6	MDST	UP ON HILLSIDE
I-SE-2K	24	5	MDST	
III-NE-18	24	4	MDST	
I-SE-G(R)	24	4	SLST	
III-NE-10	24	3	MDST	
III-NE106	24	2		ATOP RIDGE, III-NE-2
III-NE-24	24	2	MDST	IN WASH
III-NE-1	24	2	MDST	
III-NE-4	24	2		
III-NE102	24	2	MDST	
III-NE108	24	2		
III-NE104	24	2	MDST	500 YDS. E OF SAND D.
III-NE-2	24	2	MDST	90' NW OF III-NE-1
I-SE-2Y	24	2	MDST	S OF MAIN HOO-DOOS
III-NE-27	24	2	MDST	
III-NE-28	24	2	COAL	
III-NE-25	24	2	MDST	
III-NE110	24	2	MDST	
III-NE109	24	1	MDST	
III-NE105	24	1	MDST	ATOP NOLL ABOVE COAL
III-NE103	24	1	MDST	
III-NE-7	24	1	MDST	
III-NE-6	24	1	MDST	
III-NE123	24	1	MDST	
I-SE-2M	24	0	COAL	E OF SITE I-SE-2M
I-SE-3E	24	0	COAL	N OF I-SE-3D

TREE INVENTORY

FOSSIL FOREST INVENTORY
JUNE 1988
TREES AND AMBER

SITE	SECT	CARB	LITH	LOCATION
I-SE-D	24	0	COAL	
III-NE-11	24	-1	MDST	IN HILL
I-SE-2D	24	-1	SLST	
III-NE-29	24	-1	MDST	JUST BELOW CARB SHALE
I-SE-3D	24	-1	SLST	N OF WASH
III-NE208	24	-1	SS	
III-NE223	24	-1	SS	FLAT AREA, TOP OF HILL
III-NE101	24	-2	MDST	PART OF III-NE208A
III-NE-26	24	-2		IN WASH AREA
I-SE-2P	24	-2	MDST	
III-NE-9	24	-2		LOG FRAGS IN WASH
I-SE-X	24	-2	SLST	
I-SE-C	24	-2	SLST	E OF I-SE-D
III-NE118	24	-2	MDST	
III-NE121	24	-3	MDST	
I-SE-2W	24	-3	MDST	
III-NE112	24	-3	MDST	
I-SE-2C	24	-4	MDST	
I-SE-2R	24	-4	SLST	
I-SE-2Q	24	-4	SS	
III-NE222	24	-4	SS	20' FROM "MUD SCULPTURE"
III-NE202	24	-5	SS	
I-SE-Y	24	-5	MDST	JUST OFF MAIN WASH
III-NE217	24	-5	SS	
III-NE215	24	-5	SS	FRAGS
III-NE112	24	-5	SS	ABOVE ARROYO
I-SE-2L	24	-5	MDST	
III-NE211	24	-6	SS	ABOVE ARROYO
I-SE-2G	24	-6	MDST	50 YDS. W OF SEH
III-NE119	24	-6		MOVING W FROM III-NE208A
III-NE204	24	-8	SS	
I-SE-P	24	-10	SS	
I-SE-E(R)	24	-10	SS	BY I-SE-H(R)
I-SE-N(R)	24	-10	SLST	
I-SE-H(R)	24	-10	SS	
I-SE-3K	24	-10	SLST	MAIN WASH IN HILL TO S
I-SE-Z	24	-12	MDST	
III-NE206	24	-12	SS	
III-NE207	24	-12	SS	
III-NE-44	24	-15	MDST	
I-SE-I	24	-15	SLST	
I-SE-2I	24			
I-SE-2J	24			
I-SW-50	23	25	MDST	
III-NE-70	23	10		
I-SE-16	23	8	MDST	S OF H.Q.
I-SW-59	23	6	MDST	

TREE INVENTORY

FOSSIL FOREST INVENTORY
JUNE 1988
TREES AND AMBER

SITE	SECT	CARB	LITH	LOCATION
I-SE-3B	23	-15	MDST	150 YDS. W OF FENCE
I-SE-14	23	-15	SS	
I-SW-39	23	-20	MDST	
I-SW-30	23	-20	MDST	
I-SE-3G	23	-20	MDST	50 YDS. E OF FENCE
I-SW-41	23	-20	MDST	
I-SW-34	23	-20	MDST	ACROSS FROM CAMP
I-SW-47	23	-20	SS	
I-SW-33	23	-25	MDST	
I-SW-31	23	-25	MDST	
I-SW-51	23	-25	MDST	MAIN WASH
I-SW-40	23	-30	MDST	
I-SW-38	23	-30	MDST	
I-SW-36	23	-35	MDST	
I-SE-28	23		COAL	IN CARB SHALE
III-NE219	23			
I-SW-44	23		COAL	
I-SW-56	23		COAL	
I-SW-52	23			
I-SW-55	23		COAL	
III-NWB22	15	6	MDST	300' W OF III-NWB21
III-NWB21	15	6	MDST	300' S OF III-NWB20
III-NWB26	15	4	MDST	400' SW OF III-NWB25
III-NW-C3	15	4	MDST	800' SW OF III-NWB14
III-NWA20	15	4	MDST	500' NW OF III-NWB25
III-NWB25	15	2	MDST	200' W OF III-NWB24
III-NWB13	15	0	MDST	200' W OF III-NWB10
III-NWB12	15	0	MDST	40' NW OF III-NWB10
III-NWB17	15	-2	MDST	150' NW OF III-NWB16
III-NWB20	15	-2	MDST	500' W OF III-NWB18
III-NW-C2	15	-2	MDST	100' NW OF III-NW-C1
III-NWA18	15	-2	MDST	400' NW OF III-NWB19
III-NWB27	15	-2	MDST	600' NW OF III-NWB26
III-NWA19	15	-2	MDST	HOO-DOO, NW SIDE OF HILL
III-NWB15	15	-2	MDST	100' NE OF III-NW-C3
III-NWB19	15	-2	MDST	500' NW OF III-NWB18
III-NWB24	15	-2	MDST	300' S OF III-NWB22
III-NWA17	15	-2	MDST	500' SW OF III-NWA16
III-NWA12	15	-4	MDST	150' W OF III-NWA11
III-NWA10	15	-4	MDST	1000' NW OF III-NWB10
III-NWA16	15	-4	MDST	230' NW OF III-NWB17
III-NWA11	15	-4	MDST	800' NW OF III-NWB10
III-NWA13	15	-4	MDST	250' NW OF III-NWA12
III-NWA14	15	-4	MDST	250' NW OF III-NWA13
III-NWB23	15	-6	MDST	375' NW OF III-NWB22
III-NWA15	15	-6	MDST	1000' NW OF III-NW-C3
III-NWB28	15			W-ROAD, 800' SW III-NWB26

TREE INVENTORY

FOSSIL FOREST INVENTORY
JUNE 1988
TREES AND AMBER

SITE	SECT	CARB	LITH	LOCATION
I-SE-1	23	6	SLST	
I-SW-55	23	6	MDST	
I-SE-3F	23	5	SLST	N OF I-SE-3E
III-NE218	23	4		3/4 WAY UP RIDGE
III-NE-56	23	4	MDST	
III-NE125	23	3		
III-NE221	23	2	SS	
III-NE-54	23	2	MDST	
I-SW-53	23	0	COAL	
III-NE-50	23	0	COAL	
I-SW-56	23	0	COAL	
I-SW-45	23	0	COAL	
I-SE-3C	23	0	COAL	
I-SW-57	23	0	SS	
III-NE128	23	-1	MDST	
I-SE-19	23	-2	MDST	AT HEAD OF DRAINAGE
I-SE-4	23	-2	SS	
III-NE-55	23	-4	MDST	
III-NE220	23	-4	SS	
I-SE-3A	23	-4	SLST	75 YDS. W OF FENCE,S DUNE
I-SW-29	23	-4	MDST	
I-SE-25	23	-5	SS	ABOVE DRAINAGE
I-SE-7	23	-5	MDST	
III-NE-51	23	-6	MDST	
I-SE-15	23	-6	SS	E UP WASH FROM DRAIN-H.Q.
III-NE-46	23	-6	MDST	
III-NE-48	23	-8	MDST	
III-NE126	23	-8		
I-SW-42	23	-8	MDST	
III-NE-48	23	-8	MDST	
I-SE-3	23	-8	SS	
I-SE-19	23	-8	SS	
III-NE124	23	-10	MDST	
III-NE-71	23	-10	MDST	
III-NE-72	23	-10	MDST	
I-SE-20	23	-10	MDST	
III-NE-49	23	-10		
III-NE225	23	-10	SS	
I-SW-35	23	-10	MDST	
I-SE-8	23	-12	SS	
I-SE-3H	23	-12	MDST	
I-SE-12	23	-12	MDST	OFF MAIN WASH
I-SE-21	23	-14	MDST	
III-NE127	23	-15	MDST	
I-SE-26	23	-15	SLST	
I-SE-22	23	-15	SS	NW OF OLD DIG
I-SW-58	23	-15	MDST	

TREE INVENTORY

FOSSIL FOREST INVENTORY
JUNE 1988
TREES AND AMBER

SITE	SECT	CARB	LITH	LOCATION
III-NWB14	15			150' S OF ALL III-NWA,B,C
III-NE144	14	10	MDST	
III-NE-69	14	10	MDST	
III-NE-40	14	6	MDST	
III-NE174	14	6	MDST	
III-NE179	14	6	MDST	
III-NW-B5	14	6	MDST	400' NW OF III-NW-B4
III-NE147	14	4	MDST	
III-NW-A2	14	4	MDST	200' NW OF III-NW-A1
III-NW-A5	14	4	MDST	500' N OF III-NW-B4
III-NE149	14	4	MDST	
III-NW-B3	14	4	MDST	85' SW OF III-NW-B2
III-NE148	14	4	MDST	
III-NW-B2	14	4	MDST	200' W OF III-NW-B1
III-NW-B1	14	4	MDST	800 SW III-NW-A2
III-NE164	14	4	MDST	
III-NW-A1	14	4	MDST	N SIDE OF S COAL CR.
III-NE145	14	4	MDST	
III-NE175	14	4	MDST	
III-NE178	14	4	MDST	
III-NE173	14	4	MDST	
III-NE-A4	14	4	MDST	200' NW OF III-NW-A3
III-NE171	14	4	MDST	
III-NW-A3	14	4	MDST	200' NW OF III-NW-B2
III-NE131	14	2	MDST	
III-NE176	14	2	MDST	
III-NW-B9	14	2	MDST	100' W OF III-NW-B8
III-NE165	14	2	MDST	
III-NE167	14	2	MDST	
III-NE169	14	2	MDST	
III-NW-A6	14	2	MDST	400' N OF III-NW-B5
III-NE172	14	2	MDST	
III-NW-B6	14	2	MDST	600' W OF III-NW-B5
III-NE168	14	2	MDST	
III-NE166	14	2	MDST	
III-NE170	14	2	MDST	
III-NE233	14	1	MDST	NEAR 14/13 MARKER
III-NE140	14	1		
III-NE141	14	1	MDST	
III-NE229	14	0	MDST	
III-NE226	14	0	MDST	
III-NE238	14	0	MDST	
III-NW-A9	14	0	MDST	400' N OF III-NW-B9
III-NWB11	14	0	MDST	40' N OF III-NWB11
III-NE139	14	0	COAL	
III-NE227	14	0	MDST	
III-NE231	14	0	MDST	

TREE INVENTORY

FOSSIL FOREST INVENTORY
JUNE 1983
TREES AND AMBER

SITE	SECT	CARB	LITH	LOCATION
III-NE232	14	0	MDST	
III-NE132	14	0	COAL	
III-NE135	14	-1	MDST	
III-NE142	14	-1	MDST	
III-NE134	14	-2	MDST	
III-NE-41	14	-2	MDST	
III-NE-62	14	-2		
III-NWB10	14	-2	MDST	500' W OF III-NW-B8
III-NE138	14	-2		
III-NE234	14	-3	MDST	
III-NE-52	14	-4	MDST	
III-NE133	14	-4	MDST	
III-NE-53	14	-4		
III-NE230	14	-5	MDST	
III-NE235	14	-5	MDST	
III-NE236	14	-5	MDST	
III-NE145	14	-6	MDST	
III-NE143	14	-6	MDST	
III-NE-63	14	-8	MDST	
III-NE237	14	-10		
III-NE-59	14	-10	MDST	
III-NE-65	14	-10	MDST	
III-NE-67	14	-10	MDST	
III-NE-60	14	-10	MDST	
III-NE136	14	-10	MDST	
III-NE-57	14	-10	MDST	
III-NE-61	14	-10	MDST	
III-NE-64	14	-10	MDST	
III-NE-66	14	-10	SS	
II-NW-14	14			50'-SECT. 13, 200'-EW F.
III-NE-93	13	20		
III-NE-94	13	20	MDST	
III-NE163	13	10	MDST	
III-NE155	13	10	SS	
III-NE162	13	10	MDST	
III-NE161	13	10	MDST	
III-NE188	13	10	SS	
III-NE153	13	10	MDST	
III-NE-88	13	8	MDST	
III-NE-33	13	7	MDST	HILLSIDE
III-NE-30	13	7		ON HILLSIDE
III-NE182	13	6	MDST	
III-NE156	13	6	MDST	
III-NE-38	13	6	MDST	
III-NE154	13	6	MDST	
III-NE-99	13	6	MDST	
III-NE-97	13	6	MDST	

TREE INVENTORY

SITE	SECT	CARB	LITH	LOCATION
III-NE183	13	6	MDST	
III-NE-98	13	6	MDST	
III-NE181	13	6	MDST	
III-NE-77	13	6		
III-NE-35	13	6	MDST	
III-NE-36	13	6	MDST	
III-NE151	13	6	MDST	
III-NE-86	13	6		
III-NE187	13	6	MDST	
III-NE184	13	6	MDST	
III-NE-39	13	6	MDST	
III-N3185	13	6	MDST	
III-NE-85	13	6	MDST	
III-NE-37	13	6	MDST	
III-NE-95	13	6	MDST	
III-NE-87	13	6	MDST	
III-NE186	13	4	MDST	
III-NE-83	13	4		
III-NE-90	13	4	SS	
III-NE-78	13	4		
III-NE-91	13	4	SS	
III-NE150	13	4	MDST	
III-NE-89	13	4	SS	
III-NE100	13	4	MDST	
III-NE-81	13	4	MDST	
III-NE-34	13	4	MDST	
III-NE-80	13	4	MDST	
III-NE-79	13	4	MDST	
III-NE-82	13	4	MDST	
III-NE-92	13	4	MDST	
III-NE-84	13	4	MDST	
III-NE-96	13	4	MDST	
III-NE159	13	2	MDST	
III-NE157	13	2	MDST	
III-NE158	13	2	MDST	
III-NE180	13	2	MDST	
III-NE160	13	2	MDST	
III-NE-74	13	0	MDST	
III-NE-75	13	0	MDST	
III-NE-76	13	0	MDST	
III-NE152	13	0	MDST	
III-NE-45	13	-2	MDST	
III-NE-32	13	-2	MDST	
III-NE-42	13	-4	MDST	
III-NE-43	13	-10	MDST	

SS = SANDSTONE
SLST = SILTSTONE
MDST = MUDSTONE
HQ = HADROSAUR (CAROL'S) QUARRY

FOSSIL FOREST INVENTORY
[redacted]UNE 1988
[redacted]ONES

[redacted]TE	CODE	FAUNA	SECT	CARB	LITH	LOCATION
III-NE111	4	F	24	23	MDST	
[redacted]I-NE111	4	T	24	23	MDST	
[redacted]-SE-2H	4	D	24	15	MDST	E OF HAWK'S NEST
[redacted]-SE-20	4	T	24	15	SLST	S HILLSIDE BEFORE FLATS
I-SE-Q	4	T	24	15	MDST	
[redacted]I-NE-23	4	D	24	10	MDST	HILL TOP
[redacted]I-NE-20	4	D	24	10	MDST	HILLSIDE
I-SE-2F	4	D	24	10	SLST	
[redacted]SE-Z	4	D	24	10	SS	
[redacted]SE-2F	4	T	24	10	SLST	
III-NE-17	4	T	24	7	MDST	HILLSIDE
I-SE-L(R)	4	T	24	5	SLST	S OF HAWK'S NEST
[redacted]SE-2N	4	D	24	2	MDST	S OF LARGE HILL
[redacted]I-NE110	4	D	24	2	MDST	
III-NE106	4	D	24	2		ATOP RIDGE, III-NE-2
[redacted]SE-2Y	4	D	24	2	MDST	S OF MAIN HOO-DOOS
[redacted]SE-2N	4	T	24	2	MDST	S OF LARGE HILL
III-NE110	4	T	24	2	MDST	
[redacted]I-NE-25	4	T	24	2	MDST	
[redacted]I-NE107	4	T	24	2	MDST	
III-NE104	4	T	24	2	MDST	500 YDS. E OF SAND D.
III-NE-4	4	T	24	2		
[redacted]I-NE108	4	T	24	2		
[redacted]I-NE102	4	T	24	2	MDST	
III-NE115	4	U	24	2	MDST	
[redacted]SE-2W	4	U	24	2	MDST	
[redacted]I-NE109	4	D	24	1	MDST	
III-NE105	4	T	24	1	MDST	ATOP NOLL ABOVE COAL
[redacted]I-NE-9	4	T	24	1		
[redacted]I-NE-7	4	T	24	1	MDST	
III-NE-8	4	T	24	1	MDST	
III-NE103	4	T	24	1	MDST	
[redacted]I-NE201	4	T	24	-1	MDST	E SIDE OF BISTI AREA
[redacted]I-NE101	4	D	24	-2	MDST	PART OF III-NE208A
I-SE-N	4	D	24	-2	MDST	
[redacted]I-NE114	4	D	24	-2	MDST	
[redacted]I-NE101	4	T	24	-2	MDST	PART OF III-NE208A
III-NE209	4	D	24	-3	MDST	
III-NE112	4	T	24	-3	MDST	
[redacted]I-NE209	4	T	24	-3	MDST	
[redacted]SE-F(R)	4	U	24	-4	SLST	
III-NE202	4	D	24	-5	SS	
[redacted]-NE202	4	T	24	-5	SS	
[redacted]-NE116	4	D	24	-6		
III-NE206	4	D	24	-6		BETWEEN III-NE208A & 209A
[redacted]-NE119	4	D	24	-6		MOVING W FROM III-NE208A

[redacted]

BONES

[redacted]ITE	CODE	FAUNA	SECT	CARB	LITH	LOCATION
I-SE-I(R)	4	T	24	-6	SLST	
[redacted]II-NE203	4	T	24	-6	SS	
[redacted]II-NE210	4	T	24	-6	SS	
III-NE211	4	T	24	-6	SS	IN CONCRETION
[redacted]-SE-2M	4	T	24	-6	MDST	S OF WASH OPP. HILL
[redacted]II-NE213	4	U	24	-6	MDST	S SIDE OF DRAINAGE
I-SE-3K	4	D	24	-10	SLST	MAIN WASH IN HILL TO S
I-SE-X	4	D	24	-10	SS	
[redacted]-SE-F	4	D	24	-10	SLST	
[redacted]-SE-U	4	T	24	-10	SLST	
I-SE-X	4	T	24	-10	SS	
[redacted]-SE-P	4	T	24	-10	SS	
[redacted]II-NE214	4	T	24	-10	SS	N SIDE OF INLET
I-SE-M(R)	4	T	24	-10	SS	
[redacted]-SE-S	4	T	24	-10	SLST	SMALL MOUND
[redacted]II-NE224	4	U	24	-10	SS	
[redacted]-SE-2Z	4	D	24	-12	MDST	
I-SE-W	4	D	24	-12	SLST	SOUTH WASH E.
[redacted]II-NE216	4	T	24	-12		19 SHELL FRAGS
[redacted]-SE-W	4	T	24	-12	SLST	SOUTH WASH E.
I-SE-E	4	U	24	-12	SLST	
[redacted]-SE-J	4	D	24	-15	SLST	
[redacted]-SE-2J	4		24			
III-NE205	4	D	24		SS	TOP OF RIDGE
I-SE-3N	4	D	24			50-60 YDS. SE OF QUARRY
[redacted]-SE-2S	4	F	24		COAL	
[redacted]-SE-3M	4	F	24		MDST	S OF ROAD, E OF FENCE
I-SE-3M	4	T	24		MDST	S OF ROAD, E OF FENCE
[redacted]-SW-49	4	D	23	25	SS	
[redacted]-SW-48	4	T	23	20	MDST	W OF "HOO-DOO" PLACE
II-NW-19	4	C	23	15		150'S-EWF
[redacted]I-NW-20	4	U	23	15		10'W OF II-19
[redacted]-SE-5	4	T	23	6	MDST	
I-SE-13	4	T	23	6	MDST	
I-SE-A	4	T	23	-4	SLST	
[redacted]-SE-B	4	T	23	-4	SLST	
[redacted]-SE-7	4	C	23	-5	MDST	
I-SE-28	4	C	23	-5	MDST	
[redacted]-SE-7	4	D	23	-5	MDST	
[redacted]-SE-25	4	D	23	-5	SS	ABOVE DRAINAGE
I-SE-6	4	D	23	-5	SS	
[redacted]-SE-7	4	F	23	-5	MDST	
[redacted]SE-7	4	T	23	-5	MDST	
[redacted]-SE-25	4	T	23	-5	SS	ABOVE DRAINAGE
I-SE-2	4	T	23	-6	SLST	
[redacted]SE-4	4	T	23	-7	SS	
[redacted]SE-20	4	D	23	-8	MDST	N OF I-SE-19
I-SE-3	4	D	23	-8	SS	
[redacted]SE-20	4	T	23	-8	MDST	

[redacted]

BONES

[redacted]ITE	CODE	FAUNA	SECT	CARB	LITH	LOCATION
I-SE-3L	4	D	23	-10	MDST	MID FLATS, E OF FENCE
[redacted]-SE-8	4	C	23	-12	SS	
[redacted]-SE-8	4	D	23	-12	SS	
I-SE-27	4	D	23	-12	SS	NEAR OLD DIG
[redacted]-SE-27	4	F	23	-12	SS	NEAR OLD DIG
[redacted]-SE-8	4	T	23	-12	SS	
[redacted]-SE-12	4	T	23	-12	MDST	OFF MAIN WASH
I-SE-14	4	D	23	-15	SS	
[redacted]-SE-24	4	D	23	-15	SS	SW OF I-SE-23
[redacted]-SE-23	4	D	23	-15	SS	W OF OLD DIG
II-NW-17	4	U	23	-15		150' S OF EW F.
[redacted]-SW-30	4	D	23	-20	MDST	
[redacted]-SE-8	4	F	23	-20	SS	DOWN DRAIN FROM I-SE-7
I-SW-30	4	T	23	-20	MDST	
I-SE-11	4	T	23	-20	MDST	
[redacted]-SW-41	4	T	23	-20	MDST	
[redacted]-SE-11	4	T	23	-20	MDST	
I-SW-51	4	D	23	-25	MDST	MAIN WASH
[redacted]-SW-32	4	U	23	-25	MDST	
[redacted]-SW-38	4	D	23	-30	MDST	
I-SW-38	4	T	23	-30	MDST	
[redacted]-SW-37	4	T	23	-30	MDST	
[redacted]-SW-43	4	C	23		COAL	
I-SW-45	4	C	23		COAL	
I-SW-57	4	D	23		SS	
[redacted]-SW-46	4	D	23		SS	
[redacted]-SW-60	4	D	23		SS	SW OF PIPE
I-SW-43	4	F	23		COAL	
[redacted]-SW-45	4	F	23		COAL	
[redacted]-SW-45	4	T	23		COAL	
I-SW-43	4	T	23		COAL	
[redacted]-SE-0	4	T	23		MDST	EDGE OF DUNE TO SE
[redacted]-SW-60	4	T	23		SS	SW OF PIPE
I-SW-46	4	T	23		SS	
I-SW-57	4	T	23		SS	
[redacted]-SW-44	4	T	23		COAL	
[redacted]I-NW-C1	4	T	15	2	MDST	600' SW OF III-NWB10
III-NW-C4	4	T	15	-1	MDST	30' E OF III-NW-C1
[redacted]-NW-5	4	T	14	15		W FENCE,200 YDS.-GATE
[redacted]-NW-4	4	D	14	10		50' N OF EW FENCE
II-NW-1	4	T	14	10		NEAR CORNER, SE OF 14 MK.
II-NW-2	4	T	14	10		W OF SE CORNER
[redacted]-NW-6	4	D	14	6		HILLS N OF EW FENCE
[redacted]I-NE177	4	T	14	4	MDST	
III-NE178	4	T	14	4	MDST	
[redacted]I-NW-B4	4	D	14	2	MDST	200' SW OF III-NW-B3
[redacted]I-NE-68	4		14	-10	SS	
III-NE-66	4	D	14	-10	SS	
[redacted]I-NE-58	4	D	14	-10	SS	

ONES

SITE	CODE	FAUNA	SECT	CARB	LITH	LOCATION
II-NE137	4	T	14	-12	MDST	
II-NW-7	4	C	14	-15		200'-EW FENCE.300'-NW F.
II-NW-8	4	C	14	-15		2 DRAINS CONVERGE
I-NW-20	4	T	14			BY EW F., 100' FROM NS F.
I-NW-21	4	C	14			SE CORNER
III-NE229	4	T	14		MDST	
II-NE228	4	T	14		SS	NEAR WASH BED
II-NE-93	4	T	13	20		
III-NE-31	4	T	13	7	MDST	
II-NE-35	4	T	13	6	MDST	
II-NE-36	4	T	13	6	MDST	
II-NE-38	4	D	13	6	MDST	
III-NE114	5		24	-2	SS	
-SE-3L	5		23	-10	MDST	MID FLATS, E OF FENCE
-SE-14	5		23	-15	SS	

FOSSIL FOREST INVENTORY
JUNE 1988
MOLLUSKS

SITE	SECT	CARB	LITH	LOCATION	REMARKS
III-NE111	24	23	MDST		EDGE OF OYSTER BED
I-SE-2F	24	10	SLST		MOLLUSK BED
I-SE-L(E)	24	5	SLST	S OF HAWK'S NEST	CLAM SHELL BED
III-NE-27	24	2	MDST		CONCRETION, FRAGS IN A 60' RAD.
I-SE-28	24		COAL		CLAM SHELLS
III-NE129	23	1	MDST		CLAM SHELL BED IN DRAINAGE
III-NE130	23	-2	MDST		LONG CLAM BED
II-NW-9	23		COAL	AT EW F., W OF NS F.	SHELL FRAGS, NEAR OLD QUARRY, MAYBE SECT 14
III-NWB18	15	6	MDST	600' S OF III-NWA17	SECT. 14 ???
III-NW-C1	15	2	MDST	600' SW OF III-NWB10	SECT. 14 ???, COAL; GASTROPODS & SNAILS 1/2" DIA.
III-NW-C5	15	1	MDST	600' NE OF III-NWB24	SECT. 14 ???, CONCRETION LAYER
III-NWB16	15		MDST	200' NW OF III-NWB15	SECT. 14 ???, CONCRETION LAYER, MANY SHELL FRAGS
II-NW-3	14	10		SE CORNER AT FENCE	SPREAD OUT THRU DRAIN
III-NE177	14	4	MDST		LARGE CLAM SHELLS
III-NW-A7	14	2	MDST	250'N OF III-NW-B6	CLAM SHELLS IN CONCRETION LAYERS
III-NW-A8	14	2	MDST	200' NW OF III-NW-B7	CONCRETION LAYER LOADED WITH SHELL FRAGS
III-NW-B8	14	2	MDST	200' NW OF III-NW-B7	CONCRETION LAYER LOADED WITH SHELL FRAGS
III-NW-B7	14	2	MDST	250' N OF III-NW-B6	CLAM SHELLS IN CONCRETION LAYER
III-NE140	14	1			CLAM SHELLS
III-NE239	14	1	MDST		HOODOOS WITH CLAM SHELL BED
III-NE-73	13	-10	MDST		MANY SHELLS IN CONCRETION, OLD QUARRY

FOSSIL FOREST INVENTORY
JUNE 1988
LEAVES

SITE	SECT	CARB	LITH	LOCATION	REMARKS
II-NW-18	23	10		100'-WASH	(SITES 15 & 16 ON MAP BUT NO PAPER WORK)
I-SE-14	23	-15	SS		THIS IS CAROL'S QUARRY
I-SW-57	23		SS		PLANTS IN LAYERS OF SS
I-SW-47	23		COAL		PLANT QUARRY, '86
I-SW-54	23		COAL	UNDER TIP OF SANDDUNE	SMALL OUTCROPPING

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Appendix 4

Fossil "Inventory" Site Data Sheets

Viola, Vivian, Bea

CODE 4 T or C

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 1

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION near corner SE of 14

CARB SHALE (+ - in feet) 10 ft.

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS In the wash area of sand & mud - surface - 3 pieces
nice texture

Date of Mapping June 15

CODE 4 T

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 2

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION just a bit west of SE corner of 14 on down slope

CARB SHALE (+ - in feet) 10

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS washed down fragments coming out of hill

Date of Mapping June 15-88

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 3

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION SE corner of 14 at fence along E W boundary - in small drainage

CARB SHALE (+ - in feet) 10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Spread out throughout drainage - nice shell fragments

Date of Mapping June 15 - 88

CODE 4 D

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 4

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 50 ft North of E-W fence line about 1/3 way from corner of fence

CARB SHALE (+ - in feet) 10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Big Many chunks of bones - 6" x 6" cubes - spread over 12 ft. diameter area. - broad open wash area in drainage basin

Date of Mapping June 15 - 88

CODE 4 T

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 5

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION along western fence line about 200 yds from E W fence & gate

CARB SHALE (+ - in feet) 15

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS One very amber, clear colored piece of shell-(turtle) textured on both sides - no boney portion

Date of Mapping June 15-88

CODE 4 D

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 6

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION high hills north of E W fence about 1/2 way from new western fence

CARB SHALE (+ - in feet) 6 - Can't see it

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Pile of bones - looks as if they were placed in small circle 5 Chunks about 3 x 4 in, & sm. pieces

Date of Mapping June 15-88

CODE 4 C

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 7

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION

CARB SHALE (+ - in feet) 15 below

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS 200ft from E W fence - 300ft from N W fence - darkish skin-like fragment

Date of Mapping 6-15-88

CODE C

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 8

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION where two drainages converge

CARB SHALE (+ - in feet) 15' below

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Red brown skin type fossil - several pieces in group

Date of Mapping 6-15-88

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 9

FAUNA ______

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION along the E W fence just West of N S fence - near old quarry at fence line

CARB SHALE (+ - in feet) same level

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS 2 sides of small hill covered with small shells

Date of Mapping June 16 '88

CODE ______

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE ______

FAUNA ______

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) ______

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS ______

Date of Mapping ______

CODE Skin

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 13

FAUNA C
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 200 ft from fence [illegible] 51/555

CARB SHALE (+ - in feet) - 15

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS 25 ft long by 30 ft light color colored patterned shale

Date of Mapping 6-15-88

Delete

CODE ______

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE ______

FAUNA ______
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) ______

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS ______

Date of Mapping ______

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 14

FAUNA u

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 50 ft from site 13, 200 ft from W/E fence

CARB SHALE (+ - in feet) ______

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Question of whether it is same as palm tree stumps oval shaped found in sample

Date of Mapping 6-15-88

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 15

FAUNA F

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 300 ft from W/E Fence along wash

CARB SHALE (+ - in feet) +10'

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Flat area drainage

Date of Mapping ______

Calcite

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 16

FAUNA C

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ~~[illegible]~~ 14

LOCATION 300 ft from fence w/3 Calista

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS flat area just above wash

Date of Mapping 6-15-88

Delete

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 17

FAUNA u

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ~~14~~ 22

LOCATION 150 ft South w/e Fm

CARB SHALE (+ - in feet) 75'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS small mound near road by gate

Date of Mapping 6-16-88

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 20

FAUNA u

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION 10 ft west of 19 hoth facing north of w/e fence

CARB SHALE (+ - in feet) +15'

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS 12 chunks/inch squares, Top of same hill as 19

Date of Mapping 6-16-88

CODE ______

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE ______

FAUNA ______

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) ______

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS ______

Date of Mapping ______

CODE ______ 1-Log or stump 2-Leaves 3-Mollusks 4-Bone fragments 5-Articulated bones A-Amber

SITE 21

FAUNA ______ D=dinosaur T=turtle C=crocodile M=mammal F=fish/shark U=unknown

SECTION # 23

LOCATION West side of section 23 approx 200 ft from camp

CARB SHALE (+ - in feet) 2 ft

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS next to slope of a small hill

Date of Mapping June 16, 88 Thur

CODE ______ 1-Log or stump 2-Leaves 3-Mollusks 4-Bone fragments 5-Articulated bones A-Amber

SITE ______

FAUNA ______ D=dinosaur T=turtle C=crocodile M=mammal F=fish/shark U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) ______

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS ______

Date of Mapping ______

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 21

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +7

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Large log mostly covered [illegible]

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 22

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +7

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 4-1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 9

FAUNA T
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION Down in wash (Log parts) ~~[illegible]~~

CARB SHALE (+ - in feet) +1, -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Turtle fragments above carb. shale S.E. of Log 30'
Large Log fragments, small log fragments 30' S.W. and 90' S.W., 60' N, 60' W
— Unusual looking fragment 20'
— Large turtle shell fragment S.W. 60' ... N.E. 60' from Log ... Log parts
(Large flat belly bone ...)

Date of Mapping

CODE 1 (fragments)

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 10

FAUNA
Large flat belly bone exp.
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) + 3'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion layer

Date of Mapping

CODE 4, 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 7

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ________

CARB SHALE (+ - in feet) +1'

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS many fragments, 20' N of turtle [illegible] are
the root fragments

Date of Mapping ________

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 8

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ________

CARB SHALE (+ - in feet) +1'

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS ________

Date of Mapping ________

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A16

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 230' N.W. of B17

CARB SHALE (+ - in feet) -4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A17

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 500' W,S.W. of A16

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B12

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 40' N.W. of B10

CARB SHALE (+ - in feet) +0

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B13

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 200' Due west of B10

CARB SHALE (+ - in feet) +0

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B8

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 200' N.W of B7

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion layer — whole layer loaded with shell fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A8

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 90' N of B8

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible] - 3[illegible]

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION 50 YARDS EAST OF FENCE 50 YARDS SOUTH OF ROAD

CARB SHALE (+ - in feet) -20

LITHOLOGY MUDSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS 2-3 STUMPS IN A 40 FT AREA

Date of Mapping 6/17/77

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible]E - 3H

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION [illegible] SOUTH

CARB SHALE (+ - in feet) -[illegible]

LITHOLOGY MUDSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS LARGE [illegible] WEATHERING OUT OF HILLSIDE
3-4 FT EXPOSED

Date of Mapping 6/17/[illegible]

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-3E

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION [illegible] OF SE-3D in [illegible] SIDE

CARB SHALE (+ - in feet) ~~top OF CARB~~ SH [illegible]

LITHOLOGY Siltstone (Sandstone, mudstone, siltstone, coal)

REMARKS Large Log weathering OF [illegible] HILLSIDE
5 ft [illegible]

Date of Mapping 6/7'88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-3F

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION JUST below the HOODOO to [illegible] SE-3E

CARB SHALE (+ - in feet) [illegible]

LITHOLOGY SILTSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS FRAGMENTED STUMP OR log

Date of Mapping 6/[illegible]

CODE 3-4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 5G-25

FAUNA F

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION

CARB SHALE (+ - in feet) 10 [illegible]

LITHOLOGY SILT STONE (Sandstone, mudstone, siltstone, coal)

REMARKS Lots of [illegible] snails fish scales [illegible]
Also [illegible]

Date of Mapping

CODE

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-2N

FAUNA T AND D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION SOUTH OF [illegible] HILL

CARB SHALE (+ - in feet) +2

LITHOLOGY MUDSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS LOTS OF BONE WEATHERING OF SMALL MOUND

Date of Mapping ______

CODE ______

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE ______

FAUNA ______

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) ______

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS ______

Date of Mapping ______

CODE /

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-25

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 2-1

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE / AND 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-25

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE -26

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION 50 YARDS WEST OF SH both SIDES OF [illegible]

CARB SHALE (+ - in feet) -6

LITHOLOGY MUDSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS LARGE [illegible] [illegible] 2 OR 3 50 ft [illegible]
[illegible] PIECES [illegible] [illegible] [illegible]

Date of Mapping 6 [illegible]

CODE 1 AND [illegible]

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-an

FAUNA D.

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]

LOCATION EAST OF [illegible] WEST WEST OF [illegible]

CARB SHALE (+ - in feet) + [illegible]

LITHOLOGY MUDSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] [illegible] [illegible] [illegible] bone
[illegible] [illegible] [illegible] [illegible]

Date of Mapping [illegible]

CODE ______

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible] 2E

FAUNA ______
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION ______

CARB SHALE (+ - in feet) +?

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] MOST

Date of Mapping 6/16/[illegible]

CODE 3-4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible]

FAUNA D-T
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION ______

CARB SHALE (+ - in feet) +0

LITHOLOGY SILTSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS MOLLUSK BED MOSTLY FRAGMENTED SHELLS
A FEW BONE FRAGMENTS POSSIBLY TURTLE

Date of Mapping [illegible]

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible]

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 21

LOCATION

CARB SHALE (+ - in feet) -10

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] b[illegible]

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible]

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]

LOCATION

CARB SHALE (+ - in feet) [illegible]

LITHOLOGY SLT ST (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping

SEO

1

Same as site

[illegible] - 14 [illegible]

[illegible]

25

CODE ______

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible] I

FAUNA ______

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 27

LOCATION ______

CARB SHALE (+ - in feet) -1[illegible]

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS FOSSILIZED STUMP [illegible]

Date of Mapping ______

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 56 J

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION ______

CARB SHALE (+ - in feet) -[illegible]

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping ______

CODE 1, A*

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 5(1)55

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 6+

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS 3 upright cypress stems
* amber in coal

Date of Mapping 6/2/91

CODE 1, A

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 5(1)55

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY C (Sandstone, mudstone, siltstone, coal)

REMARKS palm f... ... ... agamia
c tree mapped

Date of Mapping 6/2/91

CODE 4, 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 41

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 20 -

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS sm frags

Date of Mapping 6/16/98

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 42

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 2?

LOCATION

CARB SHALE (+ - in feet) 15 - ?

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping 6/16/98

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE S. 27

FAUNA F

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION near old dig

CARB SHALE (+ - in feet) 10 - 15

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS Gar scales washing out (by old dig site)

(2 places bone frag. app 20'-25' east of gar scales 6/21/88)

Date of Mapping 6/11/88

CODE A

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SF 28

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION In c. s.

CARB SHALE (+ - in feet)

LITHOLOGY C. (Sandstone, mudstone, siltstone, coal)

REMARKS small amount visible

(croc. skeleton, armour, skoots, 10'-20' W of orig. site, 6/20/88)

Date of Mapping 6/16/88

CODE 1, 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE 25

FAUNA D? T?

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION above drainage

CARB SHALE (+ - in feet) 5 -

LITHOLOGY ON SS (Sandstone, mudstone, siltstone, coal)

REMARKS sm [illegible] on bench & below in [illegible] > (gar scales + turtle 15'W across drain (-5 to -10) 6/21/88

(15ft N - bone [illegible])

Date of Mapping 6/[illegible]/88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE 26

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 2[illegible]

LOCATION

CARB SHALE (+ - in feet) [illegible]

LITHOLOGY m/slt ? (Sandstone, mudstone, siltstone, coal)

REMARKS 3 [illegible] frags of stump / (20 ft from dune) Sm[illegible] stump in drain

Date of Mapping 6/16/88

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible] 11

FAUNA T U

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 2[illegible]

LOCATION

CARB SHALE (+ - in feet) 20[illegible]

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] [illegible] [illegible] [illegible] to [illegible] [illegible] [illegible] [illegible]
[illegible] on [illegible] of Channel

Date of Mapping 6/15/[illegible]

[illegible] as [illegible] "Y"

CODE 1, 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible]

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION [illegible]

CARB SHALE (+ - in feet) -12

LITHOLOGY Mud (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping 6/15/[illegible]

Stumps & [illegible] at the [illegible] then [illegible]

See SEOR + SEY

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE9

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 22

LOCATION

CARB SHALE (+ - in feet) 12 -

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS ½' thick

Date of Mapping 6/15

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE10

FAUNA D, T, C

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 22

LOCATION

CARB SHALE (+ - in feet) 6 -

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS many frags, 160' W from SED' hollow [illegible]

Date of Mapping 6/15/88

CODE 1, 4, 4* 1-Log or stump 2-Leaves 3-Mollusks 4-Bone fragments 5-Articulated bones A-Amber

SITE SF 7

FAUNA T, D, F, C (gar)
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 5-

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] flowing N, [illegible] west of palm

Date of Mapping 6/15/88

*2 [illegible] lg bone frags/ron 10' wash sw stake at top of wash

CODE 4, 1 1-Log or stump 2-Leaves 3-Mollusks 4-Bone fragments 5-Articulated bones A-Amber

SITE SE 8

FAUNA F (gar) C, D
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 22

LOCATION [illegible] drain from stump

CARB SHALE (+ - in feet) 20 - (gar) 12 - (Log & gar bone)

LITHOLOGY SS (Sandstone, mudstone, siltstone, coal)

REMARKS gar [illegible], fibrous wood concretion over coal mineralized, gar ? bone, lots of coprolite

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE#1

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) [illegible]

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping [illegible]

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SES

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 33

LOCATION

CARB SHALE (+ - in feet) -6

LITHOLOGY SLTST (Sandstone, mudstone, siltstone, coal)

REMARKS SMALL FRAGS - SCATTERED

Date of Mapping 6/15 88

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE 0

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # -

LOCATION SE

CARB SHALE (+ - in feet) ?

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

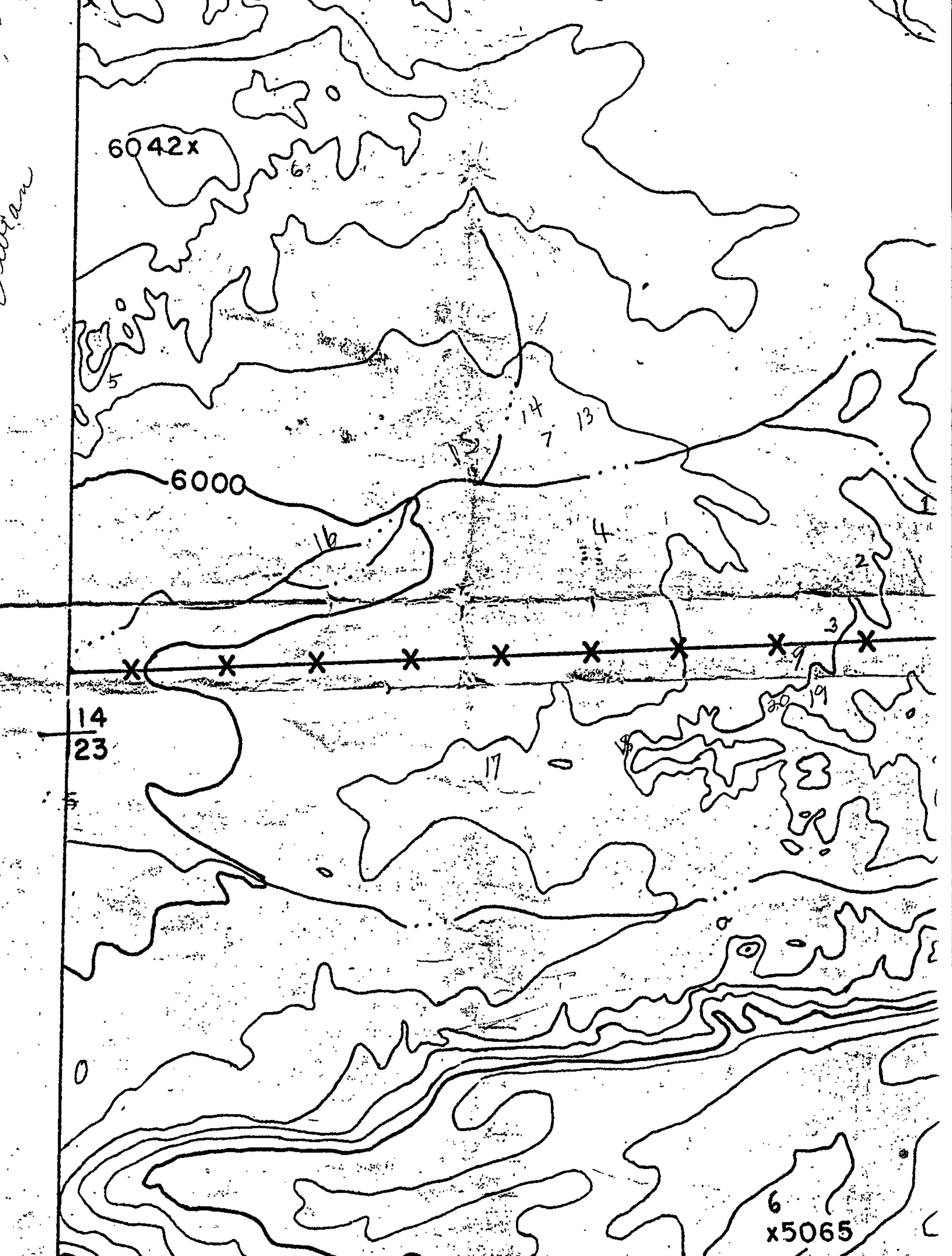
LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping



6042x
6
5
14
13
7
6000
16
4
1
2
3
9
20
19
17
14
23
6
x5065

CODE 4 T

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 20

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION by E/W fence 100 ft and 200 ft from N S fence on a small mound SF

CARB SHALE (+ - in feet)

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS close to aroyo

Date of Mapping Wed June 15, 88

CODE 4C

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 21

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION SF corner small mound by arroyo

CARB SHALE (+ - in feet)

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS slightly south of No. 20.

Date of Mapping Wed June 15, 88

14

CODE 2

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 18

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION Top of hill 200ft. 100 ft [illegible] [illegible]

CARB SHALE (+ - in feet) +10'

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS ____

Date of Mapping 6-16-88

CODE S[illegible]

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 19

FAUNA F[illegible]

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION 150' south [illegible] fence To [illegible] [illegible] [illegible] hill [illegible]

CARB SHALE (+ - in feet) +15'

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS looks like snake's skin only fossils [illegible] small fossils [illegible] [illegible]

Date of Mapping 6-16-88

CODE 4 T

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 20

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION by E/W fence 100 ft and 300 ft from NS fence on a small mound SE

CARB SHALE (+ - in feet) ______

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS close to aroyo

Date of Mapping wed June 15, 88

CODE 4C

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 21

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION SE corner small mound by arroyo.

CARB SHALE (+ - in feet) ______

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS slightly south of No. 20.

Date of Mapping Wed June 15, 88

CODE 2

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 18

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION Top of hill 100 ft from wash

CARB SHALE (+ - in feet) +10'

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping 6-16-88

CODE Skin

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 19

FAUNA F/or C/U

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION 150' south of site fence To of one of the
hidden h.115

CARB SHALE (+ - in feet) +15'

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS looks like snake's skin only fossile, other small fossils in shale

Date of Mapping 6-16-88

Appendix 3

Annotated Register of Survey Sites

Lizard indet.	96921	teeth, jaws scutes	Q2
Gar	96922	teeth & scales	Q2
Amia	96923	teeth	Q1
Paralbula	96924	teeth	Q1
Fish Indet.	96925	teeth	Q1
Aspidorhynchid	96926	pectoral spines	Q1
Amphibia	96927	jaw frg., vertebra	Q1
Lizards	96928	jaw frg.	Q1
Crocodilian	96929	teeth	Q1
Ceratopsian	96930	tooth	Q1
Hadrosaur	96931	teeth	Q1
Troodon formosus	96932	ant. dentary tooth	Q1
Theropod Indet.	96933	isolated teeth	Q1
Turtle	97045	plastron frg.	32-10-11
Plastromenus	97046	plastral frg.	32-64 Z-8
Plastromenus	97047	plastral frg.	Hunter's Wash
Turtle	97048	femur	Hunter's Wash

carbonaceous mudstone, olive grey (NY4/1 to NY6/1), to more greasey and lighter gray (N7) mudstone. Planty and siltier at bottom, also medium dark grey (N4).. 7.4'

Coal (durain), shaley partings downward, grayish-black, N2................................ 1.4'

Siltstone, becoming more carbonaceous and finely bedded downward, with leaf imprints, dark greenish-grey, 5GY4/1...................................... 4.1'

Carbonaceous mudstone, coaly with coaly leaves and wood fragments, medium dark grey, N4.......... 4.8'

Very fine grained to lithographic carbonate, calcite in fractures, pale to dark yellowish-brown (10YR6/2).. 0.7'

Carbonaceous mudstone, medium dark grey (N4), fossiliferous (bivalves) at lower contact......... 1.0'

Carbonaceous siltstone, light olive grey (5Y6/1), grading into weakly bedded carbonaceous mudstone, olive grey (5Y4/1) to dark greenish grey (5GY4/1), to greenish grey (5GY6/1)........................ 12.9'

Carbonaceous shale with iron-staining around material, dark grey (N3)........................ 1.7'

Coal (vitrain), grayish black to black (N2-N1).... 0.6'

Mudstone, poorly bedded, olive grey, 5Y4/1........ 1.4'

Coal (clarain), some resin, becoming shaley, olive grey, 5Y4/1...................................... 0.6'

TABLE 5

PRELIMINARY FOSSIL FOREST VERTEBRATE FAUNAL LIST

Chondrichthyes

Selachii

Hybodontidae

Lissodus sp.

Batoidea

Dasyatidae

Myledaphus bipartitus

Rajiformes

Sclerorhynchidae

Ischyrhiza avonicola

Ptychotrygon sp.

Osteichthyes

Amiiformes

Amiidae

New genus and species (Hall and Wolberg)

Lepisosteiformes

Lepisosteidae

Lepisosteus sp.

Elopiformes

Phyllodontidae

Paralbula casei

Amphibia

Urodela

Genus indet.

Reptilia

from the Fruitland Formation (Campanian-Maastrichtian) of the Fossil Forest, San Juan Basin, San Juan County, New Mexico; in Wolberg, D. L., (ed.), Contributions to Late Cretaceous paleontology and stratigraphy of New Mexico, Part III: New Mexico Bureau of Mines and Mineral Resources, Bulletin 122, pp. 29-31.

York, F. F., 1984, Historic cultural resources in the Arch joint venture project area along the De-na-zin Wash: University of New Mexico, Office of Contract Archeology, Project No. 185-147A, 113 p.

and some plant material in clinker available

The 1986 crew is shown in Figure 15

1987: Carol's Quarry expanded with new discoveries

Work High Quarry

Stumps and logs in main stump field mapped

Forest levels reviewed and clarified

Four forest levels recognized

Lowest coal discovered

New Amiia discovered and excavated SE of Q-I

Collect amber material

XRD analyses continue

Major and minor elements begun

Pollen analyses begun

SEM studies begin

Fluid inclusion/ spectroscopic studies begin

Amber infrared studies begin

Gas chromatographic studies begin

Dinosaur footprints discovered near Bisti

1988: Analyses of deep core begins

Amber collection continues

Continue to work Carol's Quarry

Work lower coal plant sites

Inventory of entire area completed

Computerization of inventory data begun

Characterization of trees begun

XRD on clays continues

Viola, Vivian, Ben

17-20 Sect 23
The rest Sect 14

NW

CODE 4 T or C

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 1

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION near corner SE of 14

CARB SHALE (+ - in feet) 18 ft.

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS In the [illegible] area of sand [illegible] [illegible] - 3 pieces
In the wash area of sand [illegible]

Date of Mapping June 15

CODE 4 T

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 2

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION W of SE corner of 14
just a bit [illegible] of SE corner of 14 on [illegible] slope

CARB SHALE (+ - in feet) 10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS washed from [illegible] [illegible] [illegible]
washed down [illegible]

Date of Mapping June 15-87

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 3

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION SE corner of 14 at fence along E W boundary - in small drainage

CARB SHALE (+ - in feet) 10

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS Spread out throughout drainage - nice shell fragments

Date of Mapping June 15 '88

CODE 4 D

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 4

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 50 ft North of E-W fence line about ½ way from corner of fence

CARB SHALE (+ - in feet) 10

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS Many Big chunks of bone - 6"x6" cubes - spread over 12 ft. diameter area - broad open wash area in drainage basin

Date of Mapping June 15-88

CODE 4 T

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 5

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION along western fence line about 200 yds from E W fence & gate

CARB SHALE (+ - in feet) 15

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS One very amber, clear colored piece of shell - (turtle) textured on both sides - no boney portion

Date of Mapping June 15 - 88

CODE 4 D

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 6

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION high hills north of E W fence about 1/2 way from new western fence

CARB SHALE (+ - in feet) 6 - Can't see it

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS Pile of bones - look as if they were placed in small circle 5 chunks about 3x4 in. 4 sm. pieces

Date of Mapping June 15 - 88

CODE 4 C

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 7

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION

CARB SHALE (+ - in feet) 15 below

LITHOLOGY ✓ (Sandstone, mudstone, siltstone, coal)

REMARKS 200 ft from E W fence - 300 ft from N W fence - darkish skin-like fragment

Date of Mapping 6-15-88

CODE C

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 8

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION where two drainages converge

CARB SHALE (+ - in feet) 15' below

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Red brown skin type fossil - several pieces in group

Date of Mapping 6-15-88

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 9

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION along the E W fence just West of N S fence - near old quarry at fence line

CARB SHALE (+ - in feet) same level

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS? Side of small hill covered with small shells

Date of Mapping June 16 '88

CODE

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE Skin

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 13

FAUNA C

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 200 ft Sym fence

CARB SHALE (+ - in feet) -15

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS 25 ft long by 30 ft light wide dark patterned shale

Date of Mapping 6-15-98

CODE ____

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE ____

FAUNA ____

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ____

LOCATION ____

CARB SHALE (+ - in feet) ____

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS ____

Date of Mapping ____

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 14

FAUNA u

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 50 ft from site 13, 200 ft from W/E fence

CARB SHALE (+ - in feet) ____________

LITHOLOGY ____________ (Sandstone, mudstone, siltstone, coal)

REMARKS question of whether it is wood or palm tree stump? oval shaped found in sample

Date of Mapping 6-15-88

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 15

FAUNA F

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

Calcite

LOCATION 300 ft from W/E Fence along wash

CARB SHALE (+ - in feet) -10'

LITHOLOGY ____________ (Sandstone, mudstone, siltstone, coal)

REMARKS Flat area drainage

Date of Mapping ____________

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 16

FAUNA C
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ~~[illegible]~~ 14

LOCATION [illegible] Caliche

CARB SHALE (+ - in feet) ______

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] wash

Date of Mapping 6-15-88

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 17

FAUNA u
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ~~14~~ S of EW

LOCATION 150 ft South w/e fence

CARB SHALE (+ - in feet) -15'

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS small mound near road by gate

Date of Mapping 6-16-88

CODE ____________ 1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 21

FAUNA ____________
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION West side of section #3 approx 200 ft from camp

CARB SHALE (+ - in feet) 2 ft.

LITHOLOGY ____________ (Sandstone, mudstone, siltstone, coal)

REMARKS next to slope of a small hill

Date of Mapping June 16, 88
Thur

CODE ____________ 1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE ____________

FAUNA ____________
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ____________

LOCATION ____________

CARB SHALE (+ - in feet) ____________

LITHOLOGY ____________ (Sandstone, mudstone, siltstone, coal)

REMARKS ____________

Date of Mapping ____________

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 20

FAUNA u

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION 10 ft west of 19 both facing north of w/c fence

CARB SHALE (+ - in feet) +15'.

LITHOLOGY ____________ (Sandstone, mudstone, siltstone, coal)

REMARKS 12 chunks 1 inch squares, Top of same hill as 19

Date of Mapping 6-16-88

CODE ____________

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE ____________

FAUNA ____________

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ____________

LOCATION ____________

CARB SHALE (+ - in feet) ____________

LITHOLOGY ____________ (Sandstone, mudstone, siltstone, coal)

REMARKS ____________

Date of Mapping ____________

CODE 4,

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE 3

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 7-

LITHOLOGY ss (Sandstone, mudstone, siltstone, coal)

REMARKS a few small frags of large bone

Date of Mapping 6/15/88

CODE 4, 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE 4

FAUNA T ?

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 7-, 2-

LITHOLOGY SS (Sandstone, mudstone, siltstone, coal)

REMARKS many sm frags (also see [illegible])
strange preservation of log appears to have manganese
5', Dark brown, purple, may not be in place.

Date of Mapping 6/15/88

20' SW of Log over saddle = T

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE½

FAUNA ?

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 10 ±

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping 6/15/88

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE½

FAUNA D ?

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 5 -

LITHOLOGY M/ss? (Sandstone, mudstone, siltstone, coal)

REMARKS sm frags

Date of Mapping 6/15/88

Cro- bone sm 23D

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE 15

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION up wash to E from drain leading H.Q.

CARB SHALE (+ - in feet) 6 -

LITHOLOGY M/SS (Sandstone, mudstone, siltstone, coal)

REMARKS small flattened log, c̄ carbon interior (small amount)
lies across wash

Date of Mapping 6/16/88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE 16

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 22

LOCATION S of H Q

CARB SHALE (+ - in feet) 8 +

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS scattered frags of cyprus

Date of Mapping 6/16/88

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE 13

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 6+

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS scattered frags; on top of beginning of [illegible] Hill.

Date of Mapping 6/16/88

CODE 4, 1, 5, 2

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE 14

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping

CODE 4, 1*

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE 17

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS scattered frags
* at rear of [illegible]

(17b - big bone (-10ft) on surface at [illegible] of [illegible] 6/21/88 D)

Date of Mapping 6/16/88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE 19

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 10+

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS 8 cyprus trees (1 tree c̄ in 12'+- of dune)
hard to locate because of previous sites (SE 5, 6, 7)

Date of Mapping 6/16/88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 19

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION at head of drainage coming from sand dune

CARB SHALE (+ - in feet) 2', 8'

LITHOLOGY M, SS (Sandstone, mudstone, siltstone, coal)

REMARKS 2 large pieces stump, + smaller frags
(site in same -SE 6,5)

Date of Mapping 6/16/88

CODE 4, 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 20

FAUNA D?, T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION N of previous site

CARB SHALE (+ - in feet) 8-11'

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS 1 single lg bn, few small frags; turtle shell; ±15'
Not imbedded
(imbedded bone; log app 20' nw site 21 6/21/88)

Date of Mapping 6/16/88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE 21

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 14 -

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS sitting in drain (1s) 2 at mouth, on M, many sm frags on [illegible] old dig at mouth on NW corner

Date of Mapping 6/16/88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE 22

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION n of old dig, ON west

CARB SHALE (+ - in feet) 15 -

LITHOLOGY SS (Sandstone, mudstone, siltstone, coal)

REMARKS 3 concretionous sm logs, purple (manganese) also old specimen bag to N, ebh

Date of Mapping 6/16/88

also see 2 small logs of same type on floor of wash

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 23

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION W of old dig / across from another old dig 5-CS

CARB SHALE (+ - in feet) 15 -.

LITHOLOGY washed out of ss (Sandstone, mudstone, siltstone, coal)

REMARKS (1) 6"-7" long & 3"-4" diameter, in frag
also see ~~frags~~ 8' away, also spoundy bag
& also 28 ft from (1) small bn. frags on ss

Date of Mapping 6/16

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 24

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION SW of [illegible] site

CARB SHALE (+ - in feet) 15 -

LITHOLOGY SS (Sandstone, mudstone, siltstone, coal)

REMARKS 1 lg c sm frags

Small frags -5
on hill above 1st site
6/21/88

Date of Mapping 6/16/88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 29

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 3-4⁻

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS sm frags

Date of Mapping 6/16/88

CODE 1, 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW30

FAUNA D?; T?

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 20⁻

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS fragmented log
Cypress, bn frag on float

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW31

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 25'

LITHOLOGY m (Sandstone, mudstone, siltstone, coal)

REMARKS 3 [illegible] pieces of stumps

Date of Mapping [illegible]

CODE 4?

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW32

FAUNA U

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) [illegible]

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping 6-10-86

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible]

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]

LOCATION

CARB SHALE (+ - in feet) 25-

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS 3 groups of tree [illegible]

Date of Mapping 6/16/79

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 5032[illegible]

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]

LOCATION [illegible]

CARB SHALE (+ - in feet) 15-, 25-

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS 3 cypress stumps,

Date of Mapping 6/16/88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible]

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 10

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] Tmp, [illegible]

Date of Mapping 6/[illegible]

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW36

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 22

LOCATION

CARB SHALE (+ - in feet) 25 ±

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS 12 ± small [illegible] frags, 1 lg. Cypress stump
continued [illegible] west (35)

Date of Mapping 6/16/96

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible]

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]

LOCATION

CARB SHALE (+ - in feet) 30 -

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] ; (also bone [illegible] in area could be [illegible])

Date of Mapping [illegible]/16/[illegible]

CODE 1, 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible] 38

FAUNA T, D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 2[illegible]

LOCATION

CARB SHALE (+ - in feet) 30 -

LITHOLOGY [illegible]

(Sandstone, mudstone, siltstone, coal)

REMARKS tree , bn frags lg D. bn. frags.

Date of Mapping [illegible]/[illegible]/87

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 2[illegible]

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 22

LOCATION

CARB SHALE (+ - in feet) 20'

LITHOLOGY m (Sandstone, mudstone, siltstone, coal)

REMARKS slm sl-, part silty [illegible]

Date of Mapping 6/16/88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 40

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 30'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] c rings, many frags

Date of Mapping 6/16/88

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 43

FAUNA T, F, C

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) ?40-

LITHOLOGY C.S. (Sandstone, mudstone, siltstone, coal)

REMARKS gar scale, 3 clidae

Date of Mapping

CODE 4, A

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 44

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) ?

LITHOLOGY C.S. (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1, 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 4[illegible]

FAUNA T, F
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) ? –

LITHOLOGY CS (Sandstone, mudstone, siltstone, coal)

REMARKS lg log, f[illegible], [illegible]

Date of Mapping 6/[illegible]/[illegible]

CODE 4, T

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 46

FAUNA T D,
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY SS (Sandstone, mudstone, siltstone, coal)

REMARKS bn. frags

Date of Mapping 6/17/92

CODE 2 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 47

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 20'

LITHOLOGY SS / C (Sandstone, mudstone, siltstone, coal)

REMARKS several logs (bone frag - T 6/21/88)

Date of Mapping 6/2/86

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 47

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 20

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS (D or T frag. (6/21/88))

Date of Mapping 6/12/86

In the wash; lots of frag.

by far west "Hoo Doo" place; by 86 plant quarry

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 49

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 25

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping [illegible]

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 50

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 22

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping 6/17/85

CODE 1, *2, 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW52

FAUNA D T*

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION [illegible] wash

CARB SHALE (+ - in feet) —

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS 1st c quartz
* Locat[illegible] of stump [illegible] (beautiful piece
* [illegible] rooted [illegible] of stump — small wood
w/ quartz crystals)

Date of Mapping 6/17/98

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW52

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) ?

LITHOLOGY [illegible] M (Sandstone, mudstone, siltstone, coal)

REMARKS disintegrating log

Date of Mapping 6/10/98

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW5?

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]

LOCATION

CARB SHALE (+ - in feet) 20+ [illegible]

LITHOLOGY C (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping 6/17/98

CODE 2

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW54

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION [illegible]

CARB SHALE (+ - in feet) ?

[illegible]

LITHOLOGY SC (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] out [illegible]

Date of Mapping 6/17/98

(didn't [illegible] site)

CODE 2, 1, 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 50

FAUNA D, T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 2

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] / frags / [illegible] / shell
[illegible] plants in layers

Date of Mapping [illegible]

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 51

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]

LOCATION

CARB SHALE (+ - in feet) 15

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS Compressed log / cyprus

Date of Mapping 6/17/99

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 5?

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION

CARB SHALE (+ - in feet) 6 T.

LITHOLOGY M (Sandstone, mudstone, siltstone, coal)

REMARKS stump [illegible]
[illegible] stump are tree [illegible] / 1 palm

Date of Mapping 4/[illegible]

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SW 60

FAUNA D T.

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION SW [illegible]

CARB SHALE (+ - in feet)

LITHOLOGY S (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]
See [illegible] to [illegible]

Date of Mapping 6/9[illegible]

CODE /

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible] C

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION OTHER SIDE OF HILL [illegible] EAST OF SE[illegible]D

CARB SHALE (+ - in feet) -2

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]
[illegible] ABOUT 1 Ft [illegible] DIAMETER

Date of Mapping [illegible]

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 3E - E

FAUNA U

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]4

LOCATION

CARB SHALE (+ - in feet) -12

LITHOLOGY SILTSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS FEW bone FRAGMENTS, A FEW ALMOST
HAND SIZED

Date of Mapping 6/15/88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible]

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]

LOCATION [illegible] - [illegible] SAND[illegible]

CARB SHALE (+ - in feet) [illegible]

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] ON OTHER SIDE OF
[illegible] WEST

Date of Mapping [illegible]

CODE

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible] F

FAUNA [illegible]

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION

CARB SHALE (+ - in feet) -10

LITHOLOGY SILTSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS SEVERAL BONE FRAGMENTS MOST [illegible] SMALL

Date of Mapping 6/15/94

CODE

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE /

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 2-1

LOCATION

CARB SHALE (+ - in feet) ~2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

Locations — up against sanddune

CODE ____ 1-Log or stump SITE ____
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

FAUNA ____
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ____

LOCATION ____

CARB SHALE (+ - in feet) ____

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS ____

Date of Mapping ____

CODE ____ 1-Log or stump SITE ____
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

FAUNA ____
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ____

LOCATION ____

CARB SHALE (+ - in feet) ____

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS ____

Date of Mapping ____

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible]-5

FAUNA T
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]

LOCATION [illegible]

CARB SHALE (+ - in feet) [illegible]

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping [illegible]

CODE [illegible] 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible]

FAUNA T
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping [illegible]

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SEA

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # SL(23

LOCATION

CARB SHALE (+ - in feet) 4 -

LITHOLOGY SL[illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping 6/15/88

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SEB

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible](23

LOCATION

CARB SHALE (+ - in feet) 4 -

LITHOLOGY SLST (Sandstone, mudstone, siltstone, coal)

REMARKS frag complete shell (I can't find this; wh did it go??? 6/23/88)

Date of Mapping 6/15/88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SEE

FAUNA u

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]

LOCATION [illegible] (?) (??

CARB SHALE (+ - in feet) -10 ft.

LITHOLOGY SDST (Sandstone, mudstone, siltstone, coal)

REMARKS fragment stump in wash

Date of Mapping 6/15/88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SEH

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION

CARB SHALE (+ - in feet) 10 -

LITHOLOGY Sdst. (Sandstone, mudstone, siltstone, coal)

REMARKS Nice log fragments [illegible]
In wash now of "red" hoo-doos

Date of Mapping 6/15/88

CODE [illegible]

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE F

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION

CARB SHALE (+ - in feet) -4

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping 6/[illegible]/88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE G

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION

CARB SHALE (+ - in feet) + 4

LITHOLOGY [illegible] L ST (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] Stump

Date of Mapping 6/15/88

CODE ______

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE I R

FAUNA T
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION ______

CARB SHALE (+ - in feet) -6 ft.

LITHOLOGY SLT ST (Sandstone, mudstone, siltstone, coal)

REMARKS 2 in. + smaller turtles - well

Date of Mapping 6/15/88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE J R

FAUNA ______
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION ______

CARB SHALE (+ - in feet) -2 ft

LITHOLOGY SLT ST [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS Log fragments [illegible]; Same as Bill's X site.

Date of Mapping 6/15/88

Turtle Shell (6/23/88)

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE S[illegible]

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]

LOCATION Possibly the same as Bill's 2G site.

CARB SHALE (+ - in feet) -6-8.

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] (6'88 [illegible]

Date of Mapping 6/15/88

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SF L 1+2

FAUNA T ?

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION South of hawk's nest; SE→150 yd [illegible] side [illegible] - 100

CARB SHALE (+ - in feet) [illegible]

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Clam [illegible] + Large Turtle [illegible]
Gar scales, bone fra.

Date of Mapping [illegible]/15/88

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 5E - W

FAUNA T [illegible] D
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION SOUTH [illegible] EASTSIDE

CARB SHALE (+ - in feet) ~12

LITHOLOGY SILTSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] FRAGMENTS AND LARGE BONE
[illegible]

Date of Mapping [illegible]

CODE 1 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible]

FAUNA [illegible] D
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]

LOCATION

CARB SHALE (+ - in feet) [illegible]

LITHOLOGY [illegible] SILTSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]
[illegible]

Date of Mapping [illegible]/88

CODE ____________

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE ____________

FAUNA ____________
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ____________

LOCATION ... OFF ...

CARB SHALE (+ - in feet) ____________

LITHOLOGY MUDSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS ____________

Date of Mapping ____________

CODE 1 AND 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-2

FAUNA ____________
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ____________

LOCATION ____________

CARB SHALE (+ - in feet) ____________

LITHOLOGY ... MUDSTONE (Sandstone, mudstone, siltstone, coal)
Bone ...

REMARKS ... ELEMENTS
... OUT OF ...

Date of Mapping ____________

CODE ___/___

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE ___SE-2[illegible]___

FAUNA ______
- D=dinosaur
- T=turtle
- C=crocodile
- M=mammal
- F=fish/shark
- U=unknown

SECTION # ___24___

LOCATION ______

CARB SHALE (+ - in feet) ___-4Ft___

LITHOLOGY ___MUDSTONE___ (Sandstone, mudstone, siltstone, coal)

REMARKS ___FRAGMENTED STUMP (2 in. [illegible]) MO[illegible] SMALL [illegible] 4 [illegible] [illegible] FT AREA___

Date of Mapping ___[illegible]___

CODE ___[illegible]___

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE ___SE-2D___

FAUNA ______
- D=dinosaur
- T=turtle
- C=crocodile
- M=mammal
- F=fish/shark
- U=unknown

SECTION # ___[illegible]___

LOCATION ______

CARB SHALE (+ - in feet) ___-1___

LITHOLOGY ___SILTSTONE___ (Sandstone, mudstone, siltstone, coal)

REMARKS ___TREE STUMP - FRAGMENTED 5 FT AREA___

Date of Mapping ______

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-24

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION

CARB SHALE (+ - in feet) +5

LITHOLOGY MUDSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS Log on N. the Top 3-4 ft in length Lots of small fragments

Date of Mapping [illegible]

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-24

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION

CARB SHALE (+ - in feet) -5

LITHOLOGY MUDSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS LARGE LOG EXPOSED APPROX 15' - WEATHERING OUT SE HILLSIDE

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-2M

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION JUST [illegible]

CARB SHALE (+ - in feet) -6

LITHOLOGY MUDSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS CHUNKS OF LOGS ON SURFACE 1-2 FEET in length
and several [illegible]

Date of Mapping [illegible]

Also

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-2M

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION EAST OF LOG 25 YARDS

CARB SHALE (+ - in feet) in [illegible]

LITHOLOGY SILTSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS AN [illegible] AMOUNT OF [illegible]
[illegible] shell [illegible] [illegible]

Date of Mapping 6/16/88

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-20

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]

LOCATION SOUTH SIDE OF HILLSIDE BEFORE FLATS

CARB SHALE (+ - in feet) 6.5

LITHOLOGY SILTSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS A FEW TURTLE SHELL FRAGMENTS [illegible]
[illegible]

Date of Mapping [illegible]

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-21

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION

CARB SHALE (+ - in feet) -2

LITHOLOGY MUDSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS STUMP 3 LARGE PIECES MOSTLY FRAGMENTED

Date of Mapping 6/2/[illegible]

CODE /

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-22

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION

CARB SHALE (+ - in feet) -4

LITHOLOGY SANDSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS 3 STUMPS HIGHLY FRAGMENTED IN 40 FT AREA

Date of Mapping 6/[illegible]

CODE

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-22

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -4

LITHOLOGY SILTSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS 3 STUMPS EACH about 300 ft APART MOSTLY FRAGMENTED

Date of Mapping

CODE 1 and [illegible]

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-2[illegible]

FAUNA U
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION 25 YARDS D[illegible] NORTH OF SE-2[illegible] [illegible]

CARB SHALE (+ - in feet) +2 and -3

LITHOLOGY mudstone (Sandstone, mudstone, siltstone, coal)

REMARKS SEVERAL SMALL [illegible] OF WOOD [illegible] ALSO [illegible]

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-2[illegible]

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]

LOCATION [illegible] JUST [illegible]

CARB SHALE (+ - in feet) +10

LITHOLOGY [illegible]

(Sandstone, mudstone, siltstone, coal)

REMARKS SINGLE STUMP [illegible]

Date of Mapping 6/[illegible]

CODE [illegible]

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-24

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION Just [illegible] of [illegible] of HooDoos

CARB SHALE (+ - in feet) +2

LITHOLOGY MUDSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] fragment [illegible] bone weather out of [illegible]

Date of Mapping [illegible]

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-27

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION [illegible] west of SE-24

CARB SHALE (+ - in feet) -12

LITHOLOGY MUD-STONE (Sandstone, mudstone, siltstone, coal)

REMARKS Large amount of bone weathering out on Hill top seem to be coming out of large [illegible] AREA

Date of Mapping 6/17/88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-3A

FAUNA ______
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION 75 YDS WEST OF FENCE JUST [illegible] OF [illegible]

CARB SHALE (+ - in feet) -4

LITHOLOGY SILTSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS SINGLE LARGE STUMP

Date of Mapping [illegible]

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-3B

FAUNA ______
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION 150 YARDS WEST OF FENCE 30 YDS [illegible] OF [illegible]

CARB SHALE (+ - in feet) -15

LITHOLOGY MUDSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS SINGLE STUMP IN SITU

Date of Mapping 6/17/89

CODE 1 — 1-Log or stump; 2-Leaves; 3-Mollusks; 4-Bone fragments; 5-Articulated bones; A-Amber

SITE SE-3C

FAUNA ______
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION JUST SOUTH OF SE [illegible]

CARB SHALE (+ - in feet) IN CARBSHALE

LITHOLOGY SILTSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping 6/17/[illegible]

CODE 1 — 1-Log or stump; 2-Leaves; 3-Mollusks; 4-Bone fragments; 5-Articulated bones; A-Amber

SITE SE-3D

FAUNA ______
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION NORTH OF [illegible]

CARB SHALE (+ - in feet) -1

LITHOLOGY SILTSTONE (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] WEATHERED OUT [illegible]

Date of Mapping [illegible]/82

CODE ____________ 1-Log or stump SITE [illegible]

2-Leaves

3-Mollusks FAUNA D

4-Bone fragments D=dinosaur

5-Articulated bones T=turtle

A-Amber C=crocodile

M=mammal

F=fish/shark

U=unknown

SECTION # [illegible]

LOCATION [illegible]

CARB SHALE (+ - in feet) [illegible]

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] bone as well [illegible]

Date of Mapping ____________

CODE ____________ 1-Log or stump SITE ____________

2-Leaves

3-Mollusks FAUNA ____________

4-Bone fragments D=dinosaur

5-Articulated bones T=turtle

A-Amber C=crocodile

M=mammal

F=fish/shark

U=unknown

SECTION # ____________

LOCATION ____________

CARB SHALE (+ - in feet) ____________

LITHOLOGY ____________ (Sandstone, mudstone, siltstone, coal)

REMARKS ____________

Date of Mapping ____________

CODE 4 ? ?

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE 3L

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 23

LOCATION MIDDLE OF FLATS EAST OF FENCE

CARB SHALE (+ - in feet) -10

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] OF BONE FRAGMENTS [illegible]

[illegible]

Date of Mapping [illegible]

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE SE-3M

FAUNA T F

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # [illegible]

LOCATION [illegible] EAST OF FENCE

CARB SHALE (+ - in feet)

LITHOLOGY [illegible] (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] TEETH AND [illegible] WEATHERING [illegible]

[illegible] MOUND

Date of Mapping [illegible]

CODE ____________

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE ____________

FAUNA ____________

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ____________

CARB SHALE (+ - in feet) ________

LITHOLOGY ____________ (Sandstone, mudstone, siltstone, coal)

REMARKS ____________

Date of Mapping ________

CODE ____________

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE ____________

FAUNA ____________

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ____________

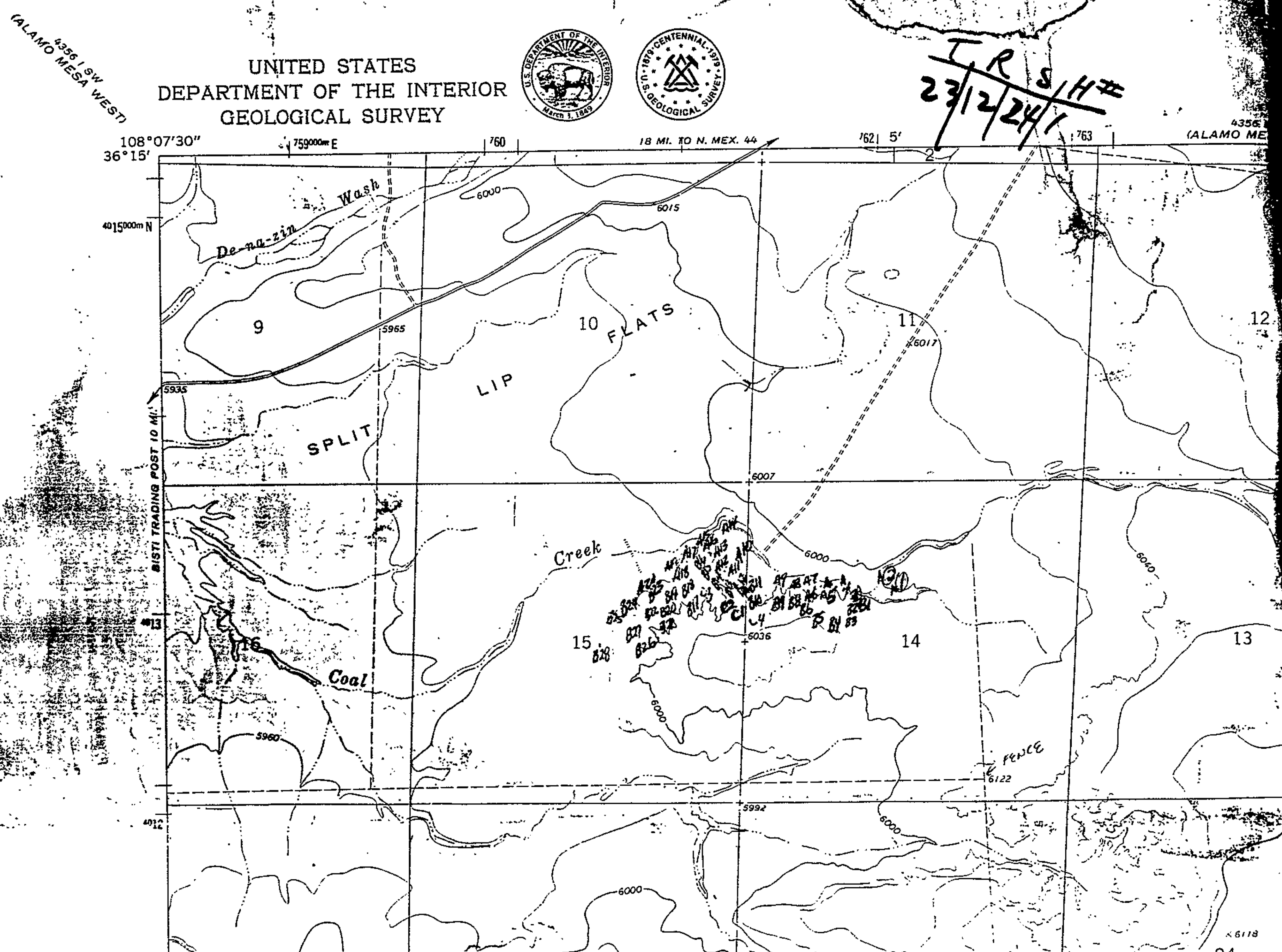
CARB SHALE (+ - in feet) ________

LITHOLOGY ____________ (Sandstone, mudstone, siltstone, coal)

REMARKS ____________

Date of Mapping ________

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B9

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 100' West of B8

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion layer; mollusk shells 2 ft South

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A9

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 400' North of B9

CARB SHALE (+ - in feet) +0

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B10

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 500' W of B8

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Nice Stump

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B11

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 40' North of B11

CARB SHALE (+ - in feet) +0

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A10

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 1000' N.W. of B10

CARB SHALE (+ - in feet) -4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 4,3

+ GastroPods
Snails 1/2" in dia

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE C1

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 600' S.W. of B10

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A11

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 800' W, N.W of B10

CARB SHALE (+ - in feet) -4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A12

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 150' Due west of A 11

CARB SHALE (+ - in feet) -4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A13

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 250' N of A 12

CARB SHALE (+ - in feet) -4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A14

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 250' N.W of A 13

CARB SHALE (+ - in feet) -4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS long log

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE C2

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 100' N.W of C1

CARB SHALE (+ - in feet) -2.

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE R-14

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 150' South of A11

CARB SHALE (+ - in feet) +0

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS roots

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE C3

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 800' S.W. of B14

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B15

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 200' N.E. of C

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B15

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 100' N.E. of C3

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A15

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 1000' N., NW of C3

CARB SHALE (+ - in feet) -6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Enormous Log

Date of Mapping

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B16

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 200' N.W. of B15

CARB SHALE (+ - in feet) +0

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion layer - many shells fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B17

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 150' W, N.W. of B16

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B1

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 800' W,SW of A2

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments in Concretion layer

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B2

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 200' due west of B1

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion layer.

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B3

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 85' S.W. of B2

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS concretion layer.

Date of Mapping

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B4

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 200 W., S.W of B3

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Some Larger Bone frags.

Date of Mapping

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B18

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 600' South of A17

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B19

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 500' N.W. of B18

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B20

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 500' W of B 18

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A18

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 400' N.W of B 19

CARB SHALE (+ - in feet) — 2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS 2 parallel logs

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B-21

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 300' S of B20

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B22

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 300' West of B21

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B23

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 375' N.W. of B22

CARB SHALE (+ - in feet) -6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE C4

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 30' east of C1

CARB SHALE (+ - in feet) 0 -1

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B24

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 300' South of B22

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE C5

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 600' N.E. of B24

CARB SHALE (+ - in feet) +1

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion layer.

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B25

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 900' West of B24

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A20

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 300' N.W. of B25

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B26

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 400' S.W. of B25

CARB SHALE (+ - in feet) +4.

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS 48' Long log Concretion layer

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B27

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 600' N.W. of B26

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B28

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION Just west of Road 800' W, S.W of B26

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A-19

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION Lihoo dog area N.W. Side of hill

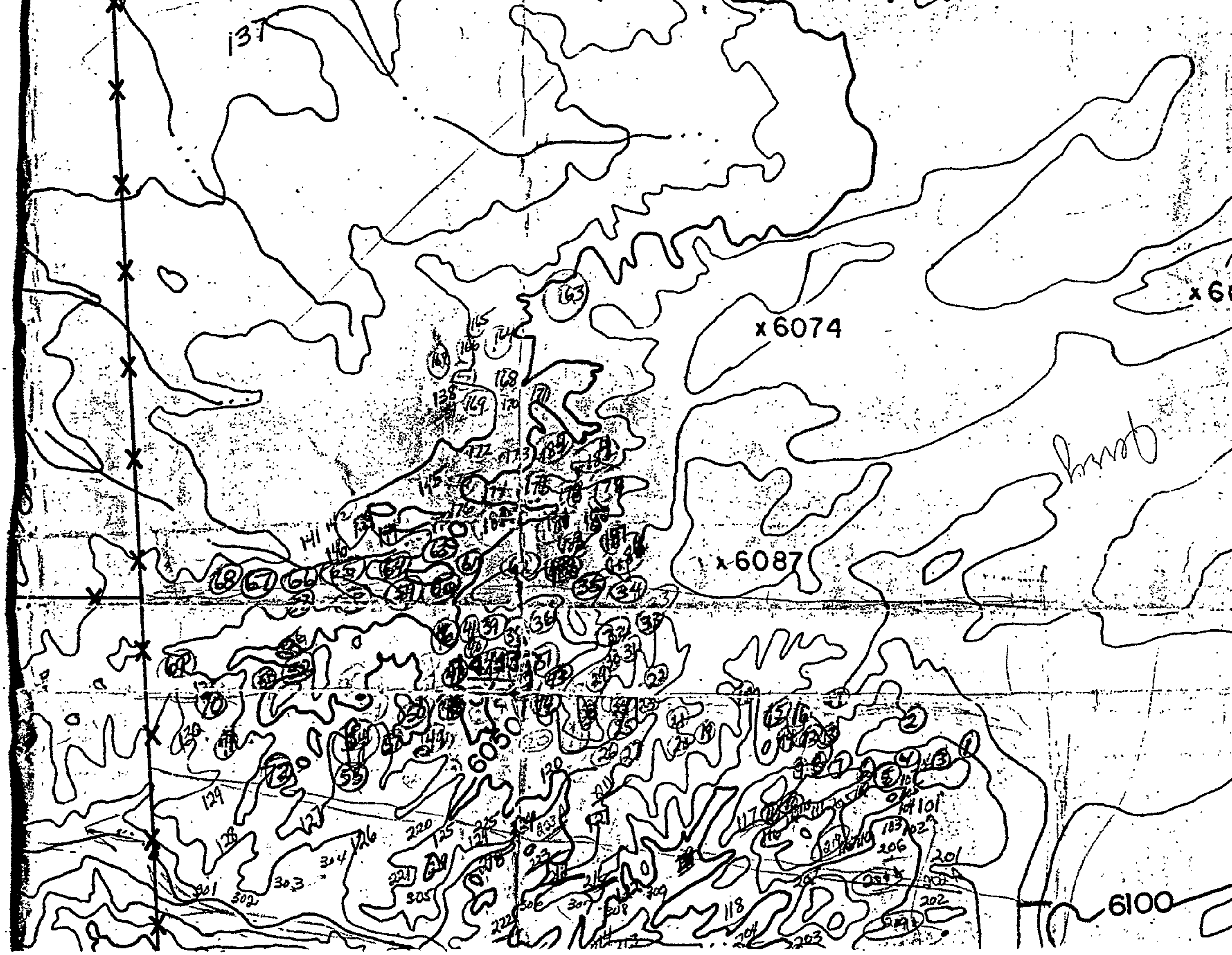
CARB SHALE (+ - in feet) - 2

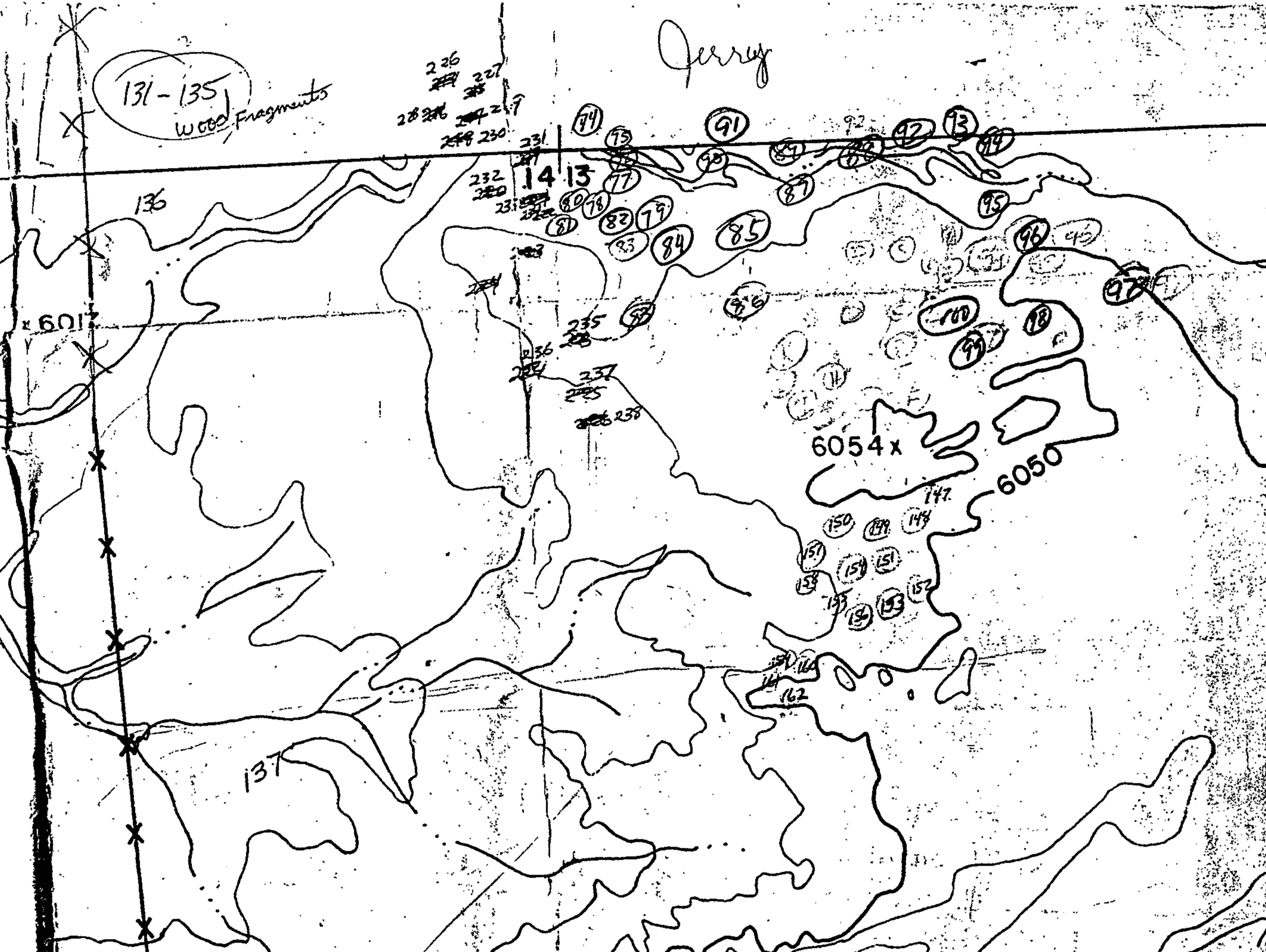
LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping


x 6074
x 607
x 6087
6100
6050


137
x 6074
x 6087
6100



Jerry
131 - 135
wood Fragments
136
137
14
13
6017 x
6054 x
6050

General Data Sheet. { Jerry
Linda
Sharon

Total overall sites = 275

Day 1 6-15-88

Section $\frac{14/13}{23/24}$

Area covered = North of ~~East~~ Dry wash east of Camp
East of North South Fence
South of East west Fence.

#'s used in area.
1-73, 101-130, 201-225

Total Sites = 128

Day 2. 6-16-88

Section 14/13

Area Covered = NORth of East-West Fence line
South of Dry wash just south of Coal Creek.
East of North-South Fence.

#'s used
74-100, 147-188, 131-146,
214-226

Total sites = 94

Day 3 6-17-88

Section 15/14

Area Covered North of middle of ridge to Coal Creek
West to just beyond road

#'s use = A1-A20, B1-B28, C1-C5

Total Sites = 53

DATA for Sections 19/13
23/24 North of Dry Wash and East of North - South Fench. to Wash Just South of Coal Creek -

CODE 1 1-Log or stump SITE 1
2-Leaves
3-Mollusks FAUNA
4-Bone fragments D=dinosaur
5-Articulated bones T=turtle
A-Amber C=crocodile
M=mammal
SECTION # F=fish/shark
U=unknown
LOCATION

CARB SHALE (+ - in feet) +2'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Stump

Date of Mapping 6-15-88

CODE 1 1-Log or stump SITE 2
2-Leaves
3-Mollusks FAUNA
4-Bone fragments D=dinosaur
5-Articulated bones T=turtle
A-Amber C=crocodile
M=mammal
SECTION # F=fish/shark
U=unknown
LOCATION 20' NW of Site 1

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 3

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1, 4

Parts

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 4

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +2'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments in a 20' radius

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 5

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) + 2'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS In 'concretions' - Log still has soft fibrous material

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 6

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) + 1'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 11

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION in hill

CARB SHALE (+ - in feet) −1'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Long log out of hill – 15' long

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 12

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION up on hillside

CARB SHALE (+ - in feet) +6'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 13

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION on hill

CARB SHALE (+ - in feet) +10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion logs

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 14

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION on hill side

CARB SHALE (+ - in feet) +10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion logs

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 15

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION On hillside

CARB SHALE (+ - in feet) +10'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 16

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION on hill side

CARB SHALE (+ - in feet) +10'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Large [illegible]

Date of Mapping

CODE 4, 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 17

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION hill side

CARB SHALE (+ - in feet) +7'

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Stump [illegible] 12' [illegible]

Date of Mapping ______

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 18

FAUNA ______

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) +4'

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS ______

Date of Mapping ______

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 19

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION hill side

CARB SHALE (+ - in feet) + 10.

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] layer

Date of Mapping

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 20

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION hill side

CARB SHALE (+ - in feet) + 10'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 23

FAUNA D
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION hill Top

CARB SHALE (+ - in feet) +10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion layer

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 24

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION in wash

CARB SHALE (+ - in feet) +2'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS 70' radius - wood fragments

Date of Mapping

CODE 1 — 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 25

FAUNA T
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ________

CARB SHALE (+ - in feet) -12'

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS ________

Date of Mapping ________

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 26

FAUNA ________
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION in ~~too~~ wash area

CARB SHALE (+ - in feet) ~2

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS fragments

Date of Mapping ________

CODE 1,3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 27

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +2'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]
[illegible] 60' [illegible]

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 28

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION Carb shale layer

CARB SHALE (+ - in feet) +2' Carb shale layer

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 29

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION Just below carb shale

CARB SHALE (+ - in feet) -1

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 30

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION on hill side

CARB SHALE (+ - in feet) +7'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments in a 30' radius
2 logs cypress [illegible] ridge 30' N.W.

Date of Mapping

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 31

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) +7'

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS ______

Date of Mapping ______

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 32

FAUNA ______

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) -2

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS ______

Date of Mapping ______

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 33

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION Hill Side

CARB SHALE (+ - in feet) +7

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS 5-6 pieces of log and fragments to N.W. 30'

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 34

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Nice stump

Date of Mapping

CODE 1, 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 35

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ____

LOCATION ____

CARB SHALE (+ - in feet) +6'

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS Stumps and fragments in a 60' radius
Turtle fragments 40' west. Also 65' west.

Date of Mapping ____

CODE 4, 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 36

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ____

LOCATION ____

CARB SHALE (+ - in feet) +0'

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS Large Stump area fragments in 30' Radius
Turtle remains 35' North (1 very large.

Date of Mapping ____

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 37

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS log fragments [illegible]

Date of Mapping

CODE 1,4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 37

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] [illegible] 50' North. (Large [illegible] Skull) [illegible]

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 39

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Stump fragments, 100' N Log fragment

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 40

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS one long log

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 41

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6, -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Stump? fragments 2 ft below carb shale 100' West.

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 42

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Log, stump? fragments 100' north

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 43

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 44

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -15

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 45

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 46

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] logs, Fragments

Date of Mapping

CODE /

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 47

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -8

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping

CODE /

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 48

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -8

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 49

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -10.

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion [illegible], Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 50

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +0

LITHOLOGY (Sandstone, mudstone, siltstone, coal) Carb shale

REMARKS Long log, stump maybe 2 logs
Lots of fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE S1

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragment Just NW 100' of Baldy

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE S2

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -4'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Log, Stump Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 53

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -4'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Log Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 54

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Root fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 55

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) -4'

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Log Fragments 150' S.W. of Baldy

Date of Mapping ______

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 56

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) +-4'

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS ______

Date of Mapping ______

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 57

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) –10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Log fragments

Date of Mapping

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 58

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) –10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Black stained bone fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 59

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 60

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -10'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 61

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -10'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments 40' radius

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 62

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -2'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Large Fragments on small hill

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 63

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -8'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 64

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -10'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Log fragment 20' radius

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 65

FAUNA ______
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) -10'

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Log fragments

Date of Mapping ______

CODE 1 & 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 66

FAUNA D
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) -10'

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Bone fragments with wood fragments

Date of Mapping ______

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 67

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -10'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 68

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Bone Fragments Stained Black

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 69

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +0

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 70

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +0

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 71

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -10'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fou? Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 72

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -10'

LITHOLOGY ? (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 73

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -10'

LITHOLOGY Many shells (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] in core [illegible] layers [illegible]
— [illegible] (OLD Quarry)

Date of Mapping

74 – 188 are in Section 13, South of Coal Creek
North of East west Fence line.

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 74

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping 6-16-88

CODE / 1-Log or stump SITE 75
2-Leaves
3-Mollusks FAUNA
4-Bone fragments D=dinosaur
5-Articulated bones T=turtle
A-Amber C=crocodile
M=mammal
SECTION # F=fish/shark
U=unknown

LOCATION

CARB SHALE (+ - in feet) +

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Stump Fragments 30' Radius

Date of Mapping

CODE / 1-Log or stump SITE 76
2-Leaves
3-Mollusks FAUNA
4-Bone fragments D=dinosaur
5-Articulated bones T=turtle
A-Amber C=crocodile
M=mammal
SECTION # F=fish/shark
U=unknown

LOCATION

CARB SHALE (+ - in feet) +

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS stumps several in a 30' radius

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 77

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Large log Parts and Stump Parts

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 78

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 79

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4.

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Log Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 80

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 81

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 82

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14/13

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Small Stump

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 83

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Log fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 84

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Stump

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 85

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Big Stump

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 86

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Log Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 87

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ________

CARB SHALE (+ - in feet) +6

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS ________

Date of Mapping ________

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 88

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ________

CARB SHALE (+ - in feet) +8

LITHOLOGY ________ (Sandstone, mudstone siltstone, coal)

REMARKS ________

Date of Mapping ________

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 89

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Many Log fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 90

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Huge stump Fragments

Date of Mapping

CODE /

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 91

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Large Stump + Log fragments

Date of Mapping

CODE /

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 92

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Small Long log - 25'

Date of Mapping

CODE 1,4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 93

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ________

CARB SHALE (+ - in feet) +20

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS Top of East-west trending hill (lobe)

Date of Mapping ________

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 94

FAUNA ________

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ________

CARB SHALE (+ - in feet) +20

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS ________

Date of Mapping ________

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 95

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 96

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Log Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 97

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Large Stump fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 98

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 99

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 100

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 4-1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 101

FAUNA D-T
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 13

LOCATION [illegible] location [illegible]

CARB SHALE (+ - in feet) -2'

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

Date of Mapping [illegible]

Large Bone in place, Turt Shell, Log frag, 50' rad.

CODE 1-4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 10[illegible]

FAUNA T
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 13

LOCATION

CARB SHALE (+ - in feet) [illegible]

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS 30-33 ft [illegible]

Date of Mapping

30-33ft log w/ Tur Sh on N side

[illegible] 30'-30' [illegible] of Site 105

CODE 1 | 1-Log or stump | SITE 103
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

FAUNA T
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) +1'

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] 30' - [illegible] turtle fr[illegible] 20-30 rad.

Date of Mapping ______

log in place, 20'
T Sh frag, 20'-30' rad.

CODE 1 | 1-Log or stump | SITE 101
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

FAUNA T
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION approx 500 yds [illegible] dunes CN/Finger

CARB SHALE (+ - in feet) +3

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS few wood frag. w/ T frag nearby in drain going [illegible]

Date of Mapping 6-15

few wood frag
T frag

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 105

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION atop noll above carb shell

CARB SHALE (+ - in feet) +1

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] - wood frags [illegible] go N - 20 ft + more wood frag w/ turtle

In conc., wd frag + TSh going N

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 106

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION atop ridge to N.E. of 2

CARB SHALE (+ - in feet) +3'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Wood frg + stump - articulating toe bones to N E of 208-1A atop hill [illegible]

Date of Mapping

CODE ______ 1-Log or stump 2-Leaves 3-Mollusks 4-Bone fragments 5-Articulated bones A-Amber

SITE 10'1

FAUNA U-7

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) -12

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Whole shell material in place - in [illegible] bed - [illegible] frag. [illegible] [illegible] N-2031 in [illegible] [illegible]

Date of Mapping ______

CODE 1 1-Log or stump 2-Leaves 3-Mollusks 4-Bone fragments 5-Articulated bones A-Amber

SITE 108

FAUNA 7

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) 7.3

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] - 10-5 [illegible]
[illegible]

Date of Mapping ______

Wood frag
T Sh

CODE 1. 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 109

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) [illegible]

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]
Smaller bone [illegible] [illegible] lg. wood frg

Date of Mapping ______

wood frag
bone frag
TSh frag

CODE 1. 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 110

FAUNA T [illegible]

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) [illegible]

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Wood frag + turtle along hillside facing SE
buried log above drain + along wall

Date of Mapping ______

CODE 3-4-1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE

FAUNA T-F
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -23'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS looks like edge of oyster Bed [illegible] [illegible] [illegible] some Bone frag [illegible] fish scales

turtle pts, w frag

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 113

FAUNA 7

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -3'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] wood [illegible] [illegible] below wood [illegible]

Date of Mapping

CODE 1 | 1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber | SITE [illegible]
FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ________

CARB SHALE (+ - in feet) -135.4

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS wood chips

Date of Mapping ________

CODE 4-5 | 1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber | SITE [illegible]
FAUNA D
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ________

CARB SHALE (+ - in feet) -2'

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS In Stream bed

Date of Mapping ________

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 115

FAUNA U

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -12'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] small round b frag

Date of Mapping

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 116

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS lg Bone - Rd - frag in drainage

Date of Mapping

CODE 1 | 1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber | SITE 1187

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] 50' [illegible]

Date of Mapping

frag along ridge -50', large chunks 5

CODE 1 | 1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber | SITE

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible] hill
30 - [illegible]

Date of Mapping

Conc. layer, wood chip

CODE 1 1-Log or stump SITE 119
2-Leaves
3-Mollusks FAUNA D
4-Bone fragments D=dinosaur
5-Articulated bones T=turtle
A-Amber C=crocodile
M=mammal
SECTION # F=fish/shark
U=unknown

Moving W from 708A

LOCATION [illegible] moving W [illegible] from 208A - 20 yds [illegible]

CARB SHALE (+ - in feet) -6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS lg wood pieces w/ lichen - [illegible]
[illegible] - wood [illegible] up on hill - [illegible]
[illegible] - E about 50' - T+D - on [illegible] log [illegible]
Wood

Date of Mapping

CODE 1 1-Log or stump SITE 120
2-Leaves
3-Mollusks FAUNA
4-Bone fragments D=dinosaur
5-Articulated bones T=turtle
A-Amber C=crocodile
M=mammal
SECTION # F=fish/shark
U=unknown

LOCATION

CARB SHALE (+ - in feet) 6'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS in Concretion layer [illegible]
[illegible]

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 121

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -35'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS 75 ft apart [illegible]

[illegible]

Date of Mapping

75 ft apart - lg wood frag

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 12[illegible]

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +110'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS [illegible]

[illegible]

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 123

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +1

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Lg wood frag

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 124

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -10'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Wood Frag

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 125

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +3'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Stump + frags. from N [illegible] 150' [illegible]

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 126

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -8'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Lg. frag. w/ smaller frags

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 12

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -1-2'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Wood frag scattered -- 100 ft [illegible]

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible]

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -1'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Wood frag - 50' W. [illegible] Fm

Date of Mapping

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 129

FAUNA Clams

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +1

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Non-shell Bed - in drainage below shell frag

Date of Mapping

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 130

FAUNA [illegible]

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) - [illegible]

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Long Clam Bed

Date of Mapping

Area of Section 14/13 Just South of Coal Creek and north of East West Fence line and East of North-South Fence line

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 131

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) 1'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Wood frags - 15' rad.

Date of Mapping 6-16-88 for 131-146

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 132

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) 0

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS stump - log in 50' of each other - [illegible] [illegible] - wood frag scattered 100' radius [illegible] N

Date of Mapping 8/16/88

follow [illegible] wood pieces

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 133

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -4'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS log in place w/ [illegible] 50 [illegible]
[illegible] E-5 [illegible]

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 134

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS several log stumps w/ [illegible] around -20' rad.
50' [illegible]

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 135

FAUNA ______
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) -1

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS 4 stumps [illegible]

Date of Mapping ______

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 136

FAUNA ______
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) -10

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Cluster of small wood chips

Date of Mapping ______

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 137

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -13

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Lots of turtle shell on mounds next to [illegible] concretion

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 137

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -2 ft

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Wood frags

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 139

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) 0

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS wood pieces

Date of Mapping

CODE 3-1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) 1

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Clam shells & wood frag

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 141

FAUNA ____
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ____

LOCATION ____

CARB SHALE (+ - in feet) +1

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS Wood frag

Date of Mapping ____

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 142

FAUNA ____
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ____

LOCATION ____

CARB SHALE (+ - in feet) -1

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS several pieces of wood scattered just below carb shale - .25' apart -

Date of Mapping ____

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 143

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) ~6'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Wood frag in 5' radius

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 144

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +14'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Some large pieces w/ sm frag - lg pieces scattered all up/down drainage for 100' [illegible]

Date of Mapping

all over concretion layer below sandst

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE [illegible]

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -6'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS 2 [illegible] wood frag in 3' area

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 146

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS 2 lg wood stump w/ frags 25' apart just in front of some hoo-doos [illegible]

Date of Mapping

[illegible] more wood limb frag [illegible]

CODE 1

1-Log or stump
2-~~Leaves~~
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 147

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 148

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 149

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 150

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 151

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion layer

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 152

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1 1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 153

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) +10

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS ______

Date of Mapping ~~+1~~

CODE 1 1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 154

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) +6

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping ______

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 154

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Large Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 156

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE ______ 1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 1 157

FAUNA ______
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) +2

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping ______

1

CODE 1 1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 1 158

FAUNA ______
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) +2

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS ______

Date of Mapping ______

CODE 1

1-Log or stump
2-~~Leaves~~
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 159

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-~~Leaves~~
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 160

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 161

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 162

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 163

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS roots

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 164

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 165

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 166

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 167

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 168

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Nice stump

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 169

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 170

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 171

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragment

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 172

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 173

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ________

CARB SHALE (+ - in feet) +4

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping ________

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 174

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ________

CARB SHALE (+ - in feet) +6

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping ________

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 175

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ________

CARB SHALE (+ - in feet) +4

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS ________

Date of Mapping ________

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 176

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ________

CARB SHALE (+ - in feet) +2

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS ________

Date of Mapping ________

CODE 3,4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 177

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) +4

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Complete Turtle Shell, Large Clam Shells

Date of Mapping ______

CODE 1,4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 178

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) +4

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS Lots of turtle shell fragment

Date of Mapping ______

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 179

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Large Stump sections on hill

Date of Mapping

CODE 1

1-Log or stump
2-~~Leaves~~
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 180

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1 | 1-Log or stump | SITE 181
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1 | 1-Log or stump | SITE 182
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 183

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 1 - 184

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

390

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 185

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 186

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1 | 1-Log or stump | SITE 187
2-Leaves
3-Mollusks | FAUNA
4-Bone fragments | D=dinosaur
5-Articulated bones | T=turtle
A-Amber | C=crocodile
M=mammal
SECTION # | F=fish/shark
U=unknown

LOCATION

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1 | 1-Log or stump | SITE 188
2-Leaves
3-Mollusks | FAUNA
4-Bone fragments | D=dinosaur
5-Articulated bones | T=turtle
A-Amber | C=crocodile
M=mammal
SECTION # | F=fish/shark
U=unknown

LOCATION

CARB SHALE (+ - in feet) +10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

Map # ↓ Actual Count #

CODE 4 | 1-Log or stump, 2-Leaves, 3-Mollusks, 4-Bone fragments, 5-Articulated bones, A-Amber

SITE 201 (189)

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

X SECTION # 24

LOCATION East side of Bisti area, North of wash feet

CARB SHALE (+ - in feet) -1½ ft

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS (one) Curved (rib bone?) 1-2 in size)

Date of Mapping 6-15

CODE 4 | 1-Log or stump, 2-Leaves, 3-Mollusks, 4-Bone fragments, 5-Articulated bones, A-Amber

SITE 305 (190) Sorry

FAUNA ______

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 24

LOCATION Top of ridge

CARB SHALE (+ - in feet) atop ridge

LITHOLOGY ______ ? (Sandstone, mudstone, siltstone, coal)

REMARKS scattered pieces of shell/bone ← fragments ranging in size (. ¾ in 3 inches)

Date of Mapping ______

CODE 1 - 4 | 1-Log or stump | SITE 202 (191)
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

FAUNA T D
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ________

CARB SHALE (+ - in feet) - 5.

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS few scattered bone fragments ranging from 1-2 1/2 in. in drain - below sand dunes - T frag - drainage N more T frag

Date of Mapping 6-15

CODE 1 | 1-Log or stump | SITE 206 (192)
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

FAUNA ________
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ________

CARB SHALE (+ - in feet) -12 ft

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS Tree branch - 7 in diameter, petrified

Date of Mapping 6-15-86

206 A : 4-1
Din. bone
-6 below shale
located in drain between
205A + 209A - over
hill + in ravine

CODE ____________ 1-Log or stump SITE ____ (193)
2-Leaves
3-Mollusks ?
4-Bone fragments
5-Articulated bones
A-Amber

FAUNA ____________
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 3

LOCATION ____________

CARB SHALE (+ - in feet) -6

LITHOLOGY ____________ (Sandstone, mudstone, siltstone, coal)

REMARKS Either turtle shell, possibly shell formations 3 sm (3/4 in) pieces

Date of Mapping 6-15

CODE 1 1-Log or stump SITE [illegible] (194)
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

FAUNA ____________
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ____________

LOCATION ____________

CARB SHALE (+ - in feet) -8 [illegible]

LITHOLOGY ____________ (Sandstone, mudstone, siltstone, coal)

REMARKS 2 lg (4½ in w [illegible]) tree roots - petrified buried in siltstone bed. Smaller pieces within 4-20 ft. above + below lg pieces. larger stumps on each side, Ex[illegible] debris.

Date of Mapping 6-15

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 207 (195)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -12

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS gnarled petrified tree branch (8X12) scalloped pieces within 15ft. claw in cretion (?)

Date of Mapping 6-15

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 208 (196)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -1

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS 4 lg. sections of tree (lgst: ? x 30 in) - multiple debris within 25 ft.

Date of Mapping 6-15

CODE 4 T

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 209 (197)

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -3 ft.

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Extensive small turtle fragments from pebble size to 1x2 in pieces scattered within 8ft. of other site mini ridge (2½ ft h)

Date of Mapping 6-15

CODE 4T

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 210 (198)

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS More chunks resembling site #209

Date of Mapping

CODE 4-1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 211 (199)

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION in concretion layer - 1 foot down S side of hill - [illegible]

CARB SHALE (+ - in feet) -6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS multiple turtle fragments 1-3½ in. small + [illegible] alongside tree [illegible] (ranging [illegible] long) [illegible] 25"

Date of Mapping 6-15

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 212 (200)

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

✓LOCATION above arroyo - ~~[illegible]~~ S side [illegible] right turn @ [illegible]

CARB SHALE (+ - in feet) -5

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS splintered tree segments averaging 8½ x 18 in. SE - 50 yds - 3 lg [illegible] - w/ 2 lg pieces [illegible] w/ small frag. in 5 ft. radius - 10 yds - S more lg. wood pieces

Date of Mapping 6-15

(212A) Moving due E - lg piece of wood w/ red lichen on it - on hoodoo - 2 logs (W) 6 ft away - 125 yds - N - more wood frgs - also 50 yds S a lg group of wood frag in 15 ft radius

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 213 (201)

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION S side of drainage 50 yds from 215 [illegible]

CARB SHALE (+ - in feet) -6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS small (1½ in rectangle) bone segment along drainage line. Some [illegible] nearby. Also white porus rocks thin & angular (lg. cluster

Date of Mapping 6-15

CODE T ?

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 214 (202)

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION on N side of inlet

CARB SHALE (+ - in feet) -10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS scattered bone fragments with black crust which has eroded

Date of Mapping 6-15

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 215 (203)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ____

LOCATION ~~lo~~ bank of arroyo — N side

CARB SHALE (+ - in feet) -5

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS Several pieces of petrified wood coal ... around next bend (5, [illegible])

Date of Mapping 6-15

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 216 (204)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ____

LOCATION above & behind (flat area) arroyo in lot

CARB SHALE (+ - in feet) -12

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS 19 turtle shell fragments

Date of Mapping 6-15

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 217 (205)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -5

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS isolated 11 x 2½ in wood splinter - smaller spec. nearby

Date of Mapping 6-15

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 218 (206)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION ¾ way up ridge to left of 5th fork

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS long (13 in) but thin wood splinters scattered about 5 ft. diameter

Date of Mapping 6-15

CODE "Mystery Fingers"

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 219 (207)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS 5 painted lines atop plateau (10-15 in bag) 5 ft between 1st & 2nd (Crocodile Fingers) Another set on top of summit North of orig. one

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 220 (208)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS scattered wood splinters below "fingers"

Date of Mapping 6-15

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 221 (209)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS lg. tree stump - hollow center (34 in diameter)

Date of Mapping 6-15

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 220 (210)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION 20 ft from "mud sculpture"

CARB SHALE (+ - in feet) -4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS lg. long splinters from tree - bigger pieces base of carb shale - 20 ft away + along "mud sculpture" - just below same Top carb shale Debris along hillside. (Artistic balance)

Date of Mapping 6-15

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 223 (211)

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION flat area - top of hill - W side - E side of hill is lg log w/ scattered wood frag

CARB SHALE (+ - in feet) -1

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS few scattered pieces of petrified wood - float down hill 40' - 50' (under - ~~on E side~~) - on hill due E - on S side are scattered wood frags.

Date of Mapping 6-15

CODE U (T): 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 224 (212)

FAUNA U - (T) ?
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS a few chips that resemble pottery with black eroded surface

Date of Mapping 6-15

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 225 (213)

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Small splinter of wood in [illegible]

Date of Mapping 6-15

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 223A

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION E + S of wood frag - of 222 - lg log in 7 lg pieces

CARB SHALE (+ - in feet) -5'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS - log is about 8 ft long - several lg pieces w/ wood chips in 30 ft float NW

Date of Mapping

#'s 214 - 226

This data applies to Section 13/14 south of Coal creek to East west Fence line and East of North South Fence line.

CODE |

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE ~~226~~ 226 (214)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) Surface level (flat land, scattered carb. [illegible]

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS One lg log segment (13x15in) surrounded by 2-4 in [illegible] with 4 in [illegible]

Date of Mapping 6-16

CODE |

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE ~~[illegible]~~ 227 (215)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ______

LOCATION ______

CARB SHALE (+ - in feet) ______

LITHOLOGY ______ (Sandstone, mudstone, siltstone, coal)

REMARKS intact stump ([illegible]) with multiple fragments within 5 ft. & associated pieces scattered within 25 ft.

Date of Mapping 6-15

CODE 4 - 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 208 (216)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION [illegible] wash bed (due [illegible])

CARB SHALE (+ - in feet) ________

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS Turtle fragments ranging [illegible] pebble size to 2 in length scattered within [illegible]

Date of Mapping ________

CODE 1-4, T or C

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 229 (217)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ________

LOCATION ________

CARB SHALE (+ - in feet) flat with scattered, sparse carb [illegible]

LITHOLOGY ________ (Sandstone, mudstone, siltstone, coal)

REMARKS 2 clusters of tree stumps between 5-9 in diameter with scattered chunks within 100 yds
Sm. Fragments of clam shell scattered/25 ft radius. Turtle fragments, Small (lg. 15")

Date of Mapping 6 - 15

Extensive cluster of turtle pieces within 100 ft of stump (+ scattered [illegible]
Directly N. of sandstone mound
Poss[illegible]y C.

CODE ____

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 230 (218)

FAUNA ____
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ____

LOCATION ____

CARB SHALE (+ - in feet) -5

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS Scattered tree chunks below shale peak. [illegible] 2-6 in [illegible]

Date of Mapping 6-16

[illegible] # 226 - 227 = N [illegible]

CODE 1 roots

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 231 (219) [illegible]

FAUNA ____
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # ____

LOCATION ____

CARB SHALE (+ - in feet) ____

LITHOLOGY ____ (Sandstone, mudstone, siltstone, coal)

REMARKS 2-3 lg tree chunks with surround. stumps + wood chips within 100 ft radius [illegible] 2-3" diameter

Date of Mapping 6-16

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 232 (220)

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS 3 wood stumps (directly E of 14/13 marker between 6 & 13 ft. Diag.) Scattered chips towards drain to W

Date of Mapping 6-16

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 233 (221)

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION beneath whitish S.E. of 14/15 marker

CARB SHALE (+ - in feet) -11

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS 2 dark bone fragments - or wood - about 4 in long others scattered around which don't look more like wood. More & larger pieces directly E 25 ft. along drain. Also, some shell fragments (tiny)

Date of Mapping 6-16

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 234[4] (222)

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -3.

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS "Apparent" orig. stump is 20 ft #232 to E with debris scattered between pts. mostly fragmented, other stumps in surrounding area bad @ ground level

Date of Mapping 6-16

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 235[5] (223)

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -5

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS scattered stump pieces & splinters following 30 ft along with

Date of Mapping 6-16

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 236 (224)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -5

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Very large root at carb shale 8 ft. long
[illegible] along drain,
5m stump in position atop peak, Another stump in [illegible] (w) with scattered debris [illegible]
nearby carb shale peaks (both [illegible]

Date of Mapping 6-16

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 237 (225)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) -10

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Scattered wood chips along drains from shale peaks

Date of Mapping 6-16

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 238[8] (226)

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) [illegible]

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Scattered chunks (2-4 in) of tree stumps [illegible] (cypress)

Date of Mapping [illegible]

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE 231

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION #

LOCATION

CARB SHALE (+ - in feet) +1

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Hoodoos w/ clam shell bed - 2 ft below sandstone

Date of Mapping 6/21/88

going North to Coal Creek

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A1

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION North side of South Branch Coal Creek, 300' East

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion layer

Date of Mapping 6-17-88 for A1 - A20
B1 - B28
C1 - C5

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A2

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 200' N.W of A1

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A3

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 200' N.W. of B2

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone siltstone, coal)

REMARKS Concretion layer

Date of Mapping 16-17-88

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A4

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 200' N.W. of A3

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion layer

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A11

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 800' W, N.W of B10

CARB SHALE (+ - in feet) -4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A12

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 150' Due west of A 11

CARB SHALE (+ - in feet) -4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A13

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 250' N of A 12

CARB SHALE (+ - in feet) -4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A14

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 250' N.W of A 13

CARB SHALE (+ - in feet) -4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS long log

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A16

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 230' N.W. of B17

CARB SHALE (+ - in feet) -4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A17

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 500' W,S.W. of A16

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B1

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 800' W,SW of A2

CARB SHALE (+ - in feet) +4.

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments in Concretion layer.

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B2

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 200' due west of B1

CARB SHALE (+ - in feet) +4'

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion layer.

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B3

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 85' S.W. of B2

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS concretion layer.

Date of Mapping

CODE 4

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B4

FAUNA D

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 200 W., S.W. of B3

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Some Larger Bone frags.

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A5

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 500 N. of B4

CARB SHALE (+ - in feet) +4.

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B5

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 400 N.W. of B4

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments in concretion layer

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A6

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 400 due N of B5

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B6

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 600' due West of B5

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B7

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 250' N of B6

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Clams Shells in Concretion Strata

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A7

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 100' N of B7

CARB SHALE (+ - in feet) + 2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B8

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 200' N.W of B7

CARB SHALE (+ - in feet) -12

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS concretion layer - whole layer loaded with shell fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A8

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 90' N of B8

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B9

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 100' West of B8

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion layer; mollusk shells 2 ft south

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A9

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 400' North of B9

CARB SHALE (+ - in feet) +0

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B10

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 500' W of B8

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Nice Stump

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B11

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 14

LOCATION 40' North of B11

CARB SHALE (+ - in feet) +0

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B12

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 40' N.W. of B10

CARB SHALE (+ - in feet) +0

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B13

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 200' Due west of B10

CARB SHALE (+ - in feet) +0

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B15

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 100' N.E. of C3

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A15

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 1000' N, NW of C3

CARB SHALE (+ - in feet) -6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Enormous Log

Date of Mapping

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B16

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 200' N.W. of B15

CARB SHALE (+ - in feet) +0

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion layer - many shells fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B17

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 150' W, N.W. of B16

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B18

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 600' South of A17

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B19

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 500' N.W. of B18

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B20

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 500' w of B 18

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A18

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 400' N.W. of B 19

CARB SHALE (+ - in feet) — 2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS 2 parallel logs

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B-21

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 300' S of B20

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B22

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 300' West of B21

CARB SHALE (+ - in feet) +6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B25

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 200' West of B24

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A20

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 300' N.W. of B25

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B26

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 400' S.W. of B25

CARB SHALE (+ - in feet) +4.

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS 48' Long log Concretion layer

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B27

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 600' N.W. of B26

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B28

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION Just west of Road 800' W, S.W of B26

CARB SHALE (+ - in feet)

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A-19

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION Who do area N.W. side of hill

CARB SHALE (+ - in feet) - 2

LITHOLOGY (Sandstone, mudstone siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE A10

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 1000' N.W. of B10

CARB SHALE (+ - in feet) -4

LITHOLOGY (Sandstone mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 4,3
+ Gastropods
Snails 1/2" in dia

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE C1

FAUNA T

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 600' S.W. of B10

CARB SHALE (+ - in feet) +2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE C2

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 100' N.W of C1

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE R-14

FAUNA

D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 150' South of A11

CARB SHALE (+ - in feet) +0

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Coats

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE C3

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 800' S.W. of B14

CARB SHALE (+ - in feet) +4

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B15

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 200' N.E. of C

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 1 1-Log or stump SITE B23
2-Leaves
3-Mollusks FAUNA
4-Bone fragments D=dinosaur
5-Articulated bones T=turtle
A-Amber C=crocodile
M=mammal
SECTION # 15 F=fish/shark
U=unknown
LOCATION 375' N.W. of B22

CARB SHALE (+ - in feet) -6

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 4 1-Log or stump SITE C4
2-Leaves
3-Mollusks FAUNA T
4-Bone fragments D=dinosaur
5-Articulated bones T=turtle
A-Amber C=crocodile
M=mammal
SECTION # 15 F=fish/shark
U=unknown
LOCATION 30' east of C1

CARB SHALE (+ - in feet) -1

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS

Date of Mapping

CODE 1

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE B24

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 300' South of B22

CARB SHALE (+ - in feet) -2

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Fragments

Date of Mapping

CODE 3

1-Log or stump
2-Leaves
3-Mollusks
4-Bone fragments
5-Articulated bones
A-Amber

SITE C5

FAUNA
D=dinosaur
T=turtle
C=crocodile
M=mammal
F=fish/shark
U=unknown

SECTION # 15

LOCATION 600' N.E. of B24

CARB SHALE (+ - in feet) +1

LITHOLOGY (Sandstone, mudstone, siltstone, coal)

REMARKS Concretion layer.

Date of Mapping