

DRAFT

AGATE FOSSIL BEDS NATIONAL MONUMENT

FOSSIL MANAGEMENT PLAN  
and  
ENVIRONMENTAL ASSESSMENT

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TABLE OF CONTENTS

I. Cover Sheet..... 1

II. Table of Contents..... 2

III. Introduction

    A. Significance of the Resource..... 4

    B. Resource Description

        1. Historic Use..... 5

        2. Geology..... 5

        3. Paleontology..... 6

    C. Legislation and Policy..... 7

    D. National Historic Register..... 7

IV. Visitor Use

    A. Protection..... 8

    B. Interpretation..... 8

    C. Limitation of Visitor Use..... 8

V. Scientific Use

    A. Protection..... 9

    B. Permits..... 9

    C. Collection Management.....11

VI. Management Objectives.....12

VII. Proposed Action

    A. Description of Proposed Actions.....12

        1. Protect and preserve paleontological  
            resources.....12

        2. Prioritize existing research areas.....13

        3. Establish a fossil preparation area.....13

        4. Obtain a representative collection of  
            fossil specimens.....14

5. Establish park level review process for permit requests.....	14
6. Review eligibility for nomination of specific sites to the National Register.....	15
7. Establish criteria for removal/loan of specimens.....	16
8. Define procedure for closure of sensitive areas.....	17
9. Implement recommendations for mapping and assessment of current paleontological status within the Monument.....	17
10. Review eligibility for designation of area as a National Natural Landmark.....	18
11. Adopt specific actions for protection of Quarry 3 (Beardog Hill).....	18
B. Impacts.....	19
VIII. Action Matrix.....	20
IX. Alternatives to Proposed Actions	
A. No action alternative.....	23
B. Impacts.....	23
C. Summary.....	23
X. Alternative Assessment Matrix.....	24
XI. 10-238 Development/Study Package Proposals.....	25
XII. Persons and Agencies Consulted.....	26
XIII. Bibliography.....	27
APPENDIX	
A. Map of Agate Fossil Beds National Monument.....	28
B. Map of Agate Spring Quarries (1983).....	29

## FOSSIL MANAGEMENT PLAN

### III. INTRODUCTION

#### A. Significance of the Resource

Agate Fossil Beds National Monument is in Sioux County, north western Nebraska, T28; R55W, 6thPM. It includes portions of Sections 3 through 10 inclusive, plus a small portion of Section 12 (Stenomylus Quarry). (APPENDIX A).

This classic site was considered by the paleontologist, Henry Fairfield Osborn as "the most remarkable deposit of mammalian remains of the Tertiary Age that have ever been found in any part of the world." The fossil remains are not only extremely abundant and comprise a variety of different species, but they are remarkably well preserved with numerous, complete skeletons being a notable characteristic. Former Director George B. Hartzog Jr., in testifying before a House subcommittee on establishment of the monument, stated "they are nationally significant and represent an important chapter in the evolution of mammals, a chapter which is not now adequately represented in the National Park Service."

Buried in pond-laid sandstone and lime mud of Miocene age, the 19-20 million-year-old bone bed has produced thousands of bones of extinct herbivorous. The most outstanding examples of Miocene animal life are preserved at the monument. The remains of Menoceras, Moropus, Dinohyus, Stenomylus, and casts of burrows of the Palaeocaster, Daimonelix are found in abundance. In addition, fragments of the fossil remains of other animals such as Daphoenodon have also been discovered. The recent discovery of a bear-dog (Daphoenodon) at Carnegie Quarry 3 is significant not only as a discovery of these extinct Carnivora but as the oldest evidence of denning behavior in large mammalian carnivores.

The Master Plan (1966) identified the following objectives for Agate Fossil Beds National Monument.

To base conservation of Monument resources on the best possible plans and programs for their utilization and management, on sound research-based knowledge of resources.

It is this planning effort which is required not only to conserve the fossil beds but also allow legitimate scientific use of the quarries as directed by legislation. It is a major issue which is of "such magnitude or immediacy so as to require special attention in park planning and operational actions." (Statement for Management 1987).

Concern for this issue is also echoed in the Park's Resources Management Plan (1988), Paleontological Management AGFO-N3 which recommends the development of a plan and associated 10-238 Package #141 entitled Fossil Management Plan requesting \$3000 to provide on-site services of professionals in the field of Paleontology.

## B. Resource Description

### 1. Historic use

Since 1891, the early pioneers of scientific research and their followers in the West have centered many of their activities at Agate Fossil Beds. Scientists from the Carnegie Institute, the American Museum of Natural History, the Chicago Natural History Museum, the Smithsonian Institution, the Colorado Museum of Natural History, Amherst College, Universities of Nebraska, Yale, Princeton, Chicago, Michigan and Kansas, and many others have studied and worked at the site. The studies conducted here uncovered the remains of some species of Miocene life for the first time, and excavations have produced fossils for exhibit throughout the world. (Figure 1).

Excavation began with removal of approximately one ton of Daimonelix burrow casts in 1892. By 1904 much competition existed between the major universities and museums for the opportunity to excavate at key sites. An excellent discussion of excavations, fossil field lists and depositional character of the Agate area can be found in the Agate Hills (Robert M. Hunt, Jr. 1984 USDI contract PX 6000-2-0320).

By 1925 interest declined and major institutions such as Carnegie Museum of Pittsburgh, American Museum of Natural History in New York, University of Nebraska and Amherst College concluded their work. After 1930 only small parties worked to secure blocks of representative material for their institutions. Much of the work within the monument from the 1970's to the present has been conducted by Dr. Robert M. Hunt Jr. (Curator of Vertebrate Paleontology and Associate Professor of Geology, the University of Nebraska - Lincoln).

### 2. Geology

Today two principal remnants, Hartville and Cheyenne tableland, of a great wedge survive as topographically elevated table lands of the central Great Plains. The Agate quarries are located in Arikaree rocks of Early Miocene age that veneer the surface of the western Hartville table. The rocks were deposited largely as volcanic ash fall. The sediments gradually built up and were worked by low gradient ephemeral streams. Shallow ponds and lakes provided the only other source of water on these plains.

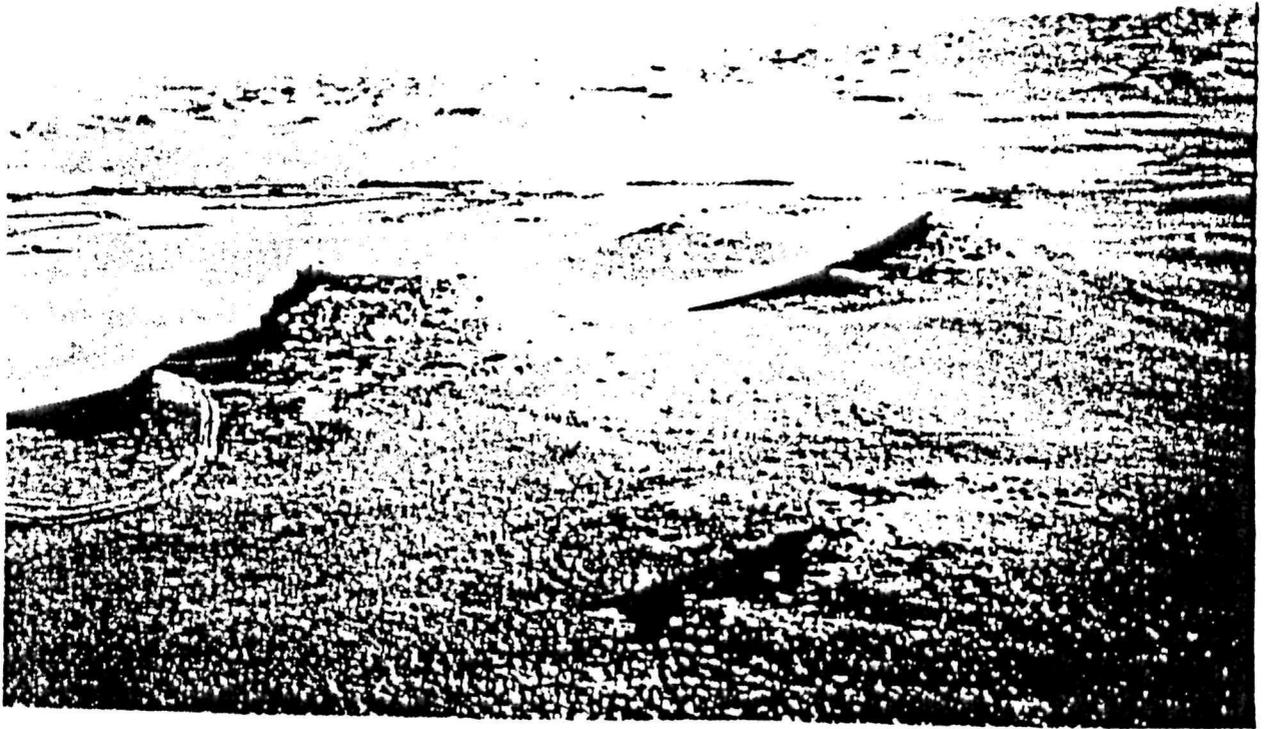


Figure No. 1

The Agate Fossil Beds

An aerial view of Amherst Point (foreground), Carnegie Hill (left), and University Hill (background, right).

Photographer: William S. ("Bill") Keller  
Photographer, Yellowstone National Park  
June 1970

Source: "Bones of Agate"  
Administrative History of Agate Fossil Beds  
National Monument, Nebraska  
By Ron Cockrell

National Park Service  
1986

The Agate bone bed on Carnegie and University Hills occurs within rocks of the Arikaree-grain sandstone: includes feldspar, quartz and volcanic glass shards in about equal proportions. (Figure 2). The bone bed is found in the base of a 30-foot sequence of stream-deposited fine sands which overlies and incise a gray Arikaree sandstone below. Above these stream deposits is more Arikaree sandstone with soil features. The bonebed itself is a mixture of lime mud and fine sandstone.

Focusing on the Arikaree rocks that contains the Agate bone layer we find a series of depositional environments east of the Upper Harrison formation. A study of these outcroppings identified three depositional environments:

1. Streams, mainly ephemeral
2. Shallow, broad ephemeral ponds and lakes
3. Vast level interchannel plains

The geology at the Monument centers on this environment of Miocene Age. The present quarry sites are located in the lower portion of this Arikaree formation, which is composed of uniformly fine grained sand, mostly of volcanic origin. Evidence derived from these sediments, the discovery of pond limestones, and ancient soil horizons suggests a semi arid climate, without a prolonged cold winter and probably with a dry season interspersed with periods of intense rainfall. The sediments in both the Carnegie and University hills are nearly identical in vertical stratigraphic sequence. This supports the idea no major physical barrier separated the two hills and that they shared one common ephemeral stream system.

### 3. Paleontology

The major paleontological resources of Miocene fossil deposits in Agate are found in the three hills south of the river; Carnegie Hill; University Hill and Beardog Hill (Quarry 3). (APPENDIX B). Additional resources are contained within Quarry A and the Stenomylus Quarry. Carnegie Hill has large deposits of the two-horned rhinoceros, Menoceras, and other fossil mammals such as the unusual looking Moropus with its large claws, and the 7-foot tall pig, Dinohyus.

Excavations have been made on the north, west, and south sides of Carnegie Hill supporting evidence that the fossil concentrations run all the way through the hill. Backfill material was replaced over the exposed fossils to protect them for later excavation. Carnegie Quarry A, located on a small point of land north of the main Agate Hills, produces fauna dominated by the rhino, Diceratherium. The rediscovery in Carnegie Quarry 3 of bear-dogs (Carnivora) provide the only evidence known in the Tertiary fossil record for the occupation of a den by a succession of carnivore species. Four species of carnivores, represented by about eleven individuals, have been found in the three dens.



Figure No. 2

The Agate Fossil Beds

An aerial view of Carnegie Hill (foreground) and University Hill (background).

Photographer: William S. ("Bill") Keller  
Photographer, Yellowstone National Park  
June 1970

Source: "Bones of Agate"  
Administrative History of Agate Fossil Beds  
National Monument, Nebraska  
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1986

The detached Stenomylus Quarry contains many fossils of this small historic, gazelle-like camel. All available information indicates that sufficient material remains to provide an impressive in-place exhibit. Unlike those at Carnegie Hill, these fossil skeletons are distributed vertically through about ten feet of sediment.

Burrow casts of a prehistoric beaver, Paleocaster, are found in the bluffs north of the Niobrara River in the Northwest corner of the Monument. These casts are named Daimonelix, the "Devil's Corkscrews." (Figure 3).

### C. Legislation and Policy

Agate Fossil Beds National Monument was authorized by Public Law 89-33 signed June 5, 1965, "... to preserve for the benefit and enjoyment of present and future generations the outstanding paleontological sites known as Agate Springs Fossil Quarries and nearby related geological phenomena, to provide a center of continuing paleontological research and for the display and interpretation of the scientific specimens uncovered at such sites..."

The April 12, 1965, House of Representatives Report No. 232 of the 89th Congress, 1st Session, further clarified the primary mission found in the enabling legislation:

"Creation of the proposed national monument will allow further scientific work to be done there under proper controls (16 U.S.C. 423)..."

A 1981 Core Mission Declaration composed the following objectives:

"To preserve and protect the flora, fauna, geological and paleontological resources and scenic values of the Monument and thus allow nature to take its course."

Additionally, several Congressional acts defining the responsibilities of federal agencies, particularly the Department of Interior, in preservation of paleontological resources are relevant to Agate. These are Federal Antiquities Act (1906), Act to Established a National Park Service (1916), Historic Sites Act (1935), Historic Preservation Act (1966) and National Environmental Policy Act (1969).

### D. National Historic Register

Cultural resources, within Agate's boundaries include the Harold Cook Homestead, known as the "Bone Cabin," and at least 12 archeological sites. (Figure 4). The sites include tepee rings, rock cairns, campsites, and a possible burial mound as reported by Kay in "Archeological Surveys in Scotts Bluff and Agate Fossil Beds National Monuments, Nebraska" 1975. Currently only the

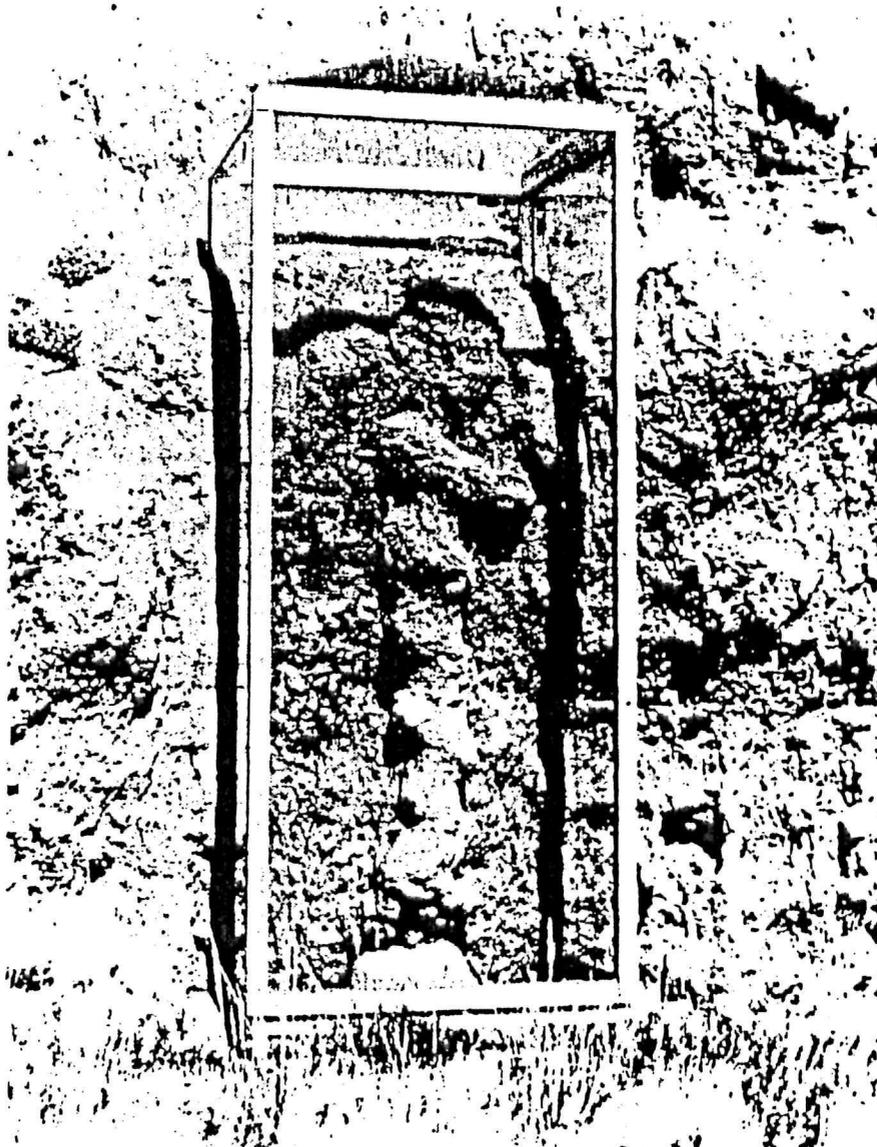


Figure No. 3

The Agate Fossil Beds

Daemonelix/Devil's Corkscrew

Photographer: Unknown  
Circa 1978

Source: "Bone of Agate"  
Administrative History of Agate Fossil Beds  
National Monument, Nebraska  
By Ron Cockrell

National Park Service  
1986

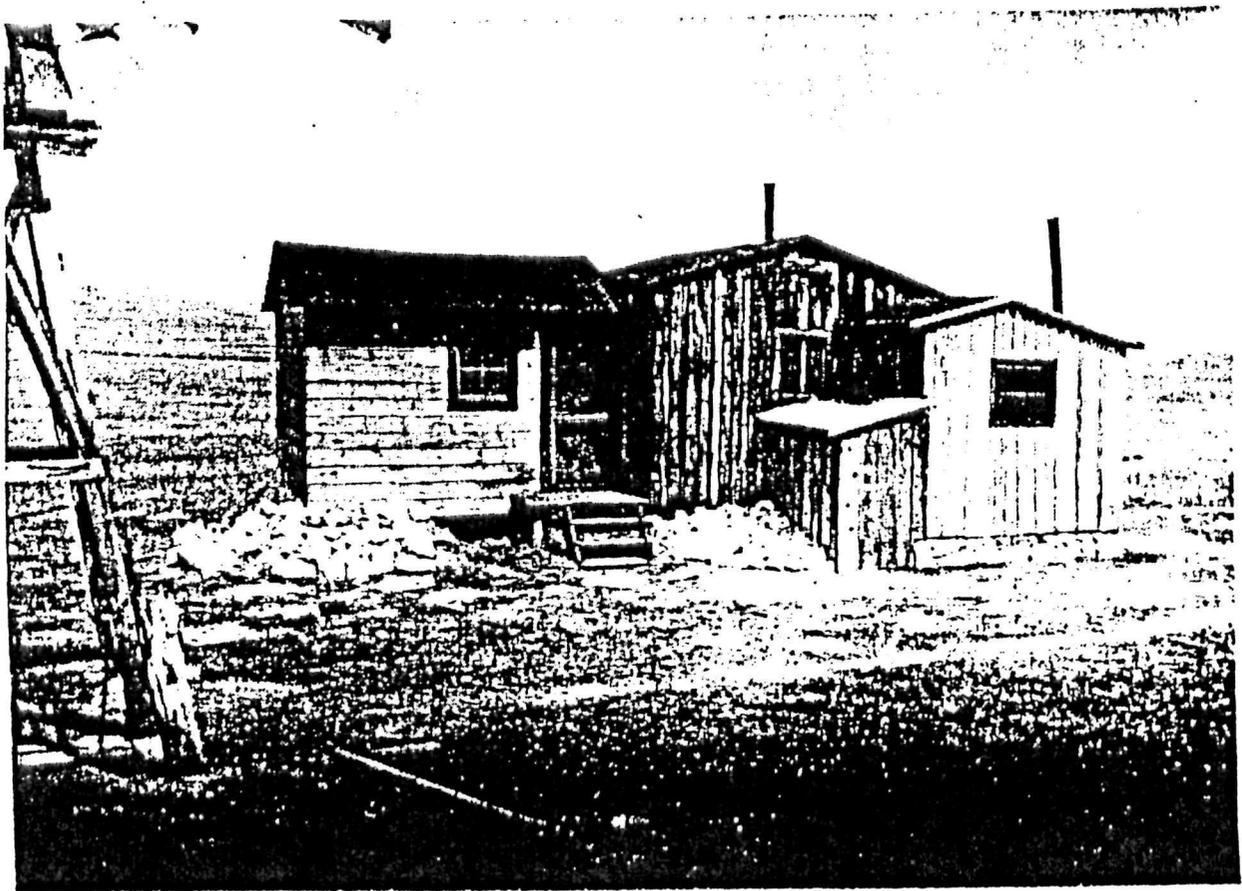


Figure No. 4

The Agate Fossil Beds

Harold J. Cook Homestead Cabin or "Bone Cabin"

Photographer: Unknown

Donated by Mrs. Margaret C. Cook  
Circa 1914

Source: "Bones of Agate"

Administrative History of Agate Fossil Beds  
National Monument, Nebraska  
By Ron Cockrell

National Park Service  
1986

"Harold Cook Homestead" is included in the National Register.

#### IV. VISITOR USE

##### A. Protection

Legal jurisdiction: The area is under concurrent jurisdiction and all applicable state and local ordinances apply.

##### B. Interpretation

Interpretation - The Master Plan (1966) provides a basis for interpretation: "To communicate as the major theme, the paleontology of the prehistoric Miocene "Golden Age of Mammals" represented in the Fossil Beds, and to interpret as secondary themes the geology and the early paleontological research and excavations carried on here." This theme is echoed in the Statement for Interpretation (1987), and Interpretive Prospectus.

Each Agate site has it's own contribution, ranging from geology to ecology, toward understanding the Agate story. The theme centers on Carnegie Hill with the dense concentrations of bone and the filled-in water hole to tell the story of the depositional environment. Exposure of an area of dense, relatively undisturbed skeletons would be ideal for an interpretive effort at this site. (Figure 5).

Geology as a theme would be best expressed in the area of University Hill with it's exposed verticle profile of the bonebed and then the site of the Southwest excavation at Carnegie Hill to complete the geological sequence.

The Beardog Hill and it's dens would best portray the ecological community and a counterpart to the herbivores found in the main hills. The Stenomylus Quarry and Quarry A record deaths in a stream environment of an older rock formation.

##### C. Limitation of Visitor Use

In order to provide an enjoyable park experience and to meet its mandate to preserve "the scenery and the natural and historic objects and the wildlife of the parks," the Service will, whenever necessary, regulate the amount and kind, and time and place, of visitor use in the parks. Such limitation will be fully explained to those affected and will be based upon adequate study and research. Guidelines for limiting visitor use will be determined using the Advisory Council on Historic Preservations "Criteria of Effect." This requires the Service to take a broad view of effect and associated range of causal agents, not only for those actions which might have a direct physical impact but also any undertakings adjacent to areas which may introduce elements that are out of character with the location or may alter its setting (Management Policies VII - I).



Figure No. 5

The Agate Fossil Beds

Fossils of Agate Fossil Beds located at Carnegie Hill.

Photographer: Unknown  
Circa 1978

Source: "Bones of Agate"  
Administrative History of Agate Fossil Beds  
National Monument, Nebraska  
By Ron Cockrell

National Park Service  
1986

Consistent with applicable legislation, Federal Administrative Policies and based upon a determination that such action is necessary for the protection of natural or cultural resources, aid to scientific research or implementation of management responsibility, the Superintendent may designate areas for specific use, impose conditions on use or activity, or close all or a portion of a park area to all public use (36 CFR section 1.5).

## V. SCIENTIFIC USE

### A. Protection

Law enforcement concerns or issues relating to protection of the paleontological resources are limited. Only occasional unauthorized removal of surface fossil fragments has been documented. The main bone layer within previously excavated sites is covered by overburden and therefore protected. Areas of exposed bone layer accessible to visitors are covered by display cases.

Possessing, destroying, injuring, defacing, removing, digging or disturbing fossilized paleontological specimens in the absence of a specific permit is prohibited in 36CFR section 2.1.

Management actions which would alter the Cook Homestead site are controlled in part by the 106 process of the National Historic Preservation Act of 1966. NPS-28 Chapter 4:2 states that 106 applies to the smallest construction project and at earliest possible stages it must be determined whether any properties listed or eligible for listing in the National Register will be affected by the undertaking. An impact area without listed or eligible properties requires no further procedural steps. The survey shall be documented in office files.

Other concerns are the presence of nonfederal subsurface mineral rights in portions of the Monument, and the potential for future impacts to fossil resources. (Land Protection Plan 1986).

### B. Permits

Collectors must comply with all applicable State and Federal laws regulating the collecting of fossils. NPS-53 contains guidelines for obtaining permits for scientific collecting activities. The collection of specimens for use in off-site educational programs and/or the development of general study collections will be prohibited.

Collecting for personal use or profit is prohibited (NPS-53).

Collecting by Service employees in the performance of their authorized duties such as interpretation, salvage/rescue etc., shall conform to all applicable rules governing collection of specimens and their disposition.

NPS-53 recognizes two general types of paleontological research:

1. Research that involves field work that includes survey (search) and the excavation of paleontological specimens.

2. Research that involves field work that includes only excavation of previously located paleontological specimens.

In either case since 1908, it has been the standing administrative policy of the Department of the Interior to require a permit for the investigation or collection of vertebrate paleontological resources and that permits are issued only to recognized scientific and educational institutions.

The Antiquities Act specifically states in Section 3 that the "examinations, excavations, and gatherings be undertaken for the benefit of (by) reputable museums, universities, colleges, or other recognized scientific or educational institutions, with a view to increasing the knowledge of such objects, and that the gatherings shall be made for permanent preservation in public museums. Individual persons are not authorized to conduct such activities unless they are affiliated with a reputable institution." Section 2 provides that these permits may be issued only to certain institutions for very limited purposes. This act definitely prohibits the commercial collection of fossils for sale.

As an institutional representative, an individual must complete and submit an application to the Park Superintendent which is then forwarded to the Regional Director for review. During this institutional and professional review by the region, the Smithsonian Institution is provided an opportunity to comment and make recommendations to the Service regarding the suitability of permit issuance. In addition, the application receives internal review by the region's Chief Scientist and may also be forwarded to other scholars who are familiar with the scope of the proposed research for peer review purposes. A term of a permit under this authority may not exceed three years. Permits under this authority are issued by the Regional Director (Secretarial Order No. 3104.)

Permits for invertebrate, paleobotanical and microfossil (non-vertebrate) paleontological resources may then be issued by the Superintendent at his or her discretion consistent with the preservation of natural resources and the park's Resources Management Plan.

### C. Collection Management

The Scope of Collections Statement (1985) defines the types of specimens to be retained in both Geological and Paleontological collections:

1. Geology and Paleontology: The following types of specimens will be retained by the Park in both of these categories:
  - a. Specimens which have been removed from quarries and other sites within the current boundaries of the Monument, after its establishment. (Most will be prepared, stored and maintained by scientific institutions, subject to 36 CFR 2.5).
  - b. Specimens which are important to the interpretation of the Agate Fossil Beds or that show the relationship of the Agate Beds to other localities or geologic time periods.
2. Records: All collectors' field and laboratory data will be held in accession files associated with specimens collected. Examples of field data include, but are not limited to, geological survey sheets, stratigraphic mapping, journal entries, photographs, and final reports.

Until such a time as a permanent visitor center is constructed at the Monument, the University of Nebraska State Museum has agreed, under a series of Antiquities Act permits, to house fossils resulting from their recent excavations. NPS-53 outlines the following guidelines for these collections stored or on loan to non-park repositories.

If the collection is to be stored in an outside university, museum or other institution, it is placed on loan to that institution and the collector has the responsibility to ensure that the collection is accessioned and cataloged into the National Park Service National Catalog unless the park agrees, in writing, to provide this service. The park will provide the collector with instructional materials and supplies as described in Chapter 4, Section E, Museum Handbook, Part II. All specimens and objects found within the park boundaries remain NPS property and must be cataloged into the NPS National Catalog.

The Collection Management Plan (1988) identifies about 800 paleontological specimens. These are research specimens resulting from investigations conducted by Professor Robert Hunt and are stored at the University of Nebraska but remain NPS property. The plan recommends a paleontological specialist be consulted to identify and evaluate the collections' interpretive potential.

## VI. MANAGEMENT OBJECTIVES

General objectives are identified in the Statement for Management (1987):

1. To identify, inventory, and monitor the condition of natural, cultural and scenic values of the Monument, and to provide appropriately for their preservation, protection and use.
2. To manage the unique paleontological resources of the area so as to provide for their scientific and educational use in a manner consistent with the purposes of the Monument.
3. To identify, provide for, and regulate appropriate uses of the Monument in a manner consistent with the protection of its resources and existing private rights, and to provide access and facilities to permit and manage such uses.

## VII. PROPOSED ACTION

### A. Description of proposed actions

Agate Fossil Beds National Monument will manage the paleontological resources, as identified in the Enabling Legislation, Statement for Management and NPS Policy by implementing the following actions. These actions will allow maximum preservation and protection of the fossil resource while encouraging paleontological research.

1. Protect and preserve, within the constraints of the Enabling Legislation, all elements of the paleontological resources effectively as possible.

Justification: Park management is mandated under the Enabling Legislation to implement actions which will reinforce the intent of Congress for management of the Monument.

#### Actions:

- establish an ad hoc review committee made up of the Site manager, Resources Management Specialist, Cultural Resources Technician, Regional Chief Scientist and a Paleontologist with field experience in Agate's specific depositional environment to advise the Superintendent on paleontological issues.
- protect significant fossil sites from vandalism, theft or increased visitor traffic by closure, interpretive activities and/or elevated law enforcement.

- salvage and conserve exposed scientifically significant fossil remains determined to be of exceptional value or impacted by illegal collecting.
- emphasize resource conservation in interpretive planning as outlined in the Statement for Interpretation. (1987).
- stabilize existing paleosites, such as the Daimonelix area, subject to weathering or other impacts which jeopardize their existence.
- retain fossil/sediment relationships undisturbed in some areas.
- removal of specimens only if;
  - a. They will add to additional knowledge of the miocene era and cannot be studied in-situ.
  - b. Material covers the more significant specimens beneath it.
  - c. they are needed for interpretive display in the planned Visitor Center and specimens are not available from other sources.

## 2. Prioritize existing research areas.

Justification: Certain areas within the Monument have been historically the site of intensive research efforts. Currently a need exists to evaluate all areas within the Monument for fossil resources.

### Actions:

- establish a prioritized list of research needs within the Monument based on evaluation by the academic community.
- an identification of areas which have potential for producing significant fossil materials (i.e. not yet excavated sites).

## 3. Establish a fossil preparation area.

Justification: To provide visitors opportunity to view fossil preparation, research and the display and interpretation of fossil specimens. Establishment of a visible full time paleontology laboratory may no longer be necessary according to the draft Collection Management Plan, "because few paleontologists now do laboratory work in the field". An alternative to the laboratory discussed in the 1978 Interpretive Prospectus maybe the construction of a working research station staffed by a seasonal paleontologist who would expose and interpret the fossil specimens during the summer season.

Actions:

- draft recommendations for the incorporation of a seasonally operated fossil preparation area within or adjacent to the planned Visitor Center.

4. Obtain a representative collection of fossil specimens for display and assess sites for interpretation of the "Golden Age of Mammals."

Justification: This action is necessary for successful interpretation of Agate's major theme, as outlined in an approved Master Plan for Agate Fossil Beds National Monument (1966).

Actions:

- establish interpretive shelter/exhibits at the following:

- a. Carnegie Hill
- b. Quarry #3
- c. Stenomylus Quarry
- d. Daimonelix area

- research the Cook Papers for the names of universities and museums who may have specimens from prior excavations and inquire about the availability of original specimens and/or casts.

- inventory these specimens as to status, condition, accessibility etc.

- investigate the potential for the use of in-situ exhibits at the fossil beds or disassociated sites to present major interpretive themes.

5. Establish a park level review process for permit requests.

Justification: The current standing Park Policy for issuing a permit for fossil invertebrate research excavations is in need of more input from the park level. The implementation of a park level preliminary review and comment procedure will provide additional information for the Regional Director's decision.

Action:

- establish a park-level review board for permit evaluations. This board will include the Superintendent, Site Manager, Resources Management Specialist, and outside Paleontologist.

- define criteria for permit review as outlined in NPS-53.  
Suggested permit guidelines may include;

- a. Can the work be accomplished outside the Park?
  - b. Does the work duplicate existing work?
  - c. Is the work focused and has a good chance for success?
  - d. Does it serve management needs?
  - e. Is researcher associated with a reputable institution?
  - f. Is the size of area requested for excavation limited to area which can be reasonably explored within the time limit of the permit?
  - g. Is an accurate proposal description included?
  - h. Time limit should be of no more than of three years.
  - i. The permittee should be advised that failure to begin work within 6 months of date of issue will result in revocation of the permit.
  - j. The land should be restored to the satisfaction of the Superintendent.
- a Restoration Plan should be a required part of the permit.

- submit preliminary recommendations for permit to Regional Director for final evaluation.

#### 6. Review eligibility for nomination of specific sites to the National Register.

Justification: Agate Fossil Beds National Monument was created in part for it's paleontological resource values which are, by law, nationally significant and, therefore, specific sites within the Monument may be eligible for the National Register.

#### Actions:

- utilize park-level review board to develop a preliminary list of eligible sites/structures.

To be eligible for listing on the National Register a property must meet certain criteria. (36CFR60). Suggested guidelines for assessing significance and integrity are as follows:

- a) Have the materials survived today as they were deposited on the site ?
- b) Does the site survive in a condition capable of yielding important information ?
- c) Does the site retain identity or character for which it is important ? It must be realized that paleontological sites have been effected by cultural and natural impacts, but that it retains enough original content and spacial relationship to be capable of yielding valuable data.

d) Does the site have the present capacity to convey it's identity and role in the theme of the "Golden Age of Mammals" ?

e) Is the site physically intact even though many features may be concealed at present ?

If the sites are found to possess integrity and meet the criteria of " have yielded or may be likely to yield, information important in prehistory" by the park board they may be considered for the nomination.

NPS - 28 Chapt. 2  
36 CFR 68  
36 CFR 1202  
National Historic  
Preservation Act 1966

#### 7. Establish criteria for loan of specimens.

Justification: The Monument can expect to entertain an increased number of requests for loan of fossil materials with the establishment of a permanent Visitor Center area with expanded interpretive display. Park policy should be established prior to the need to respond to these requests.

#### Actions:

- guidelines will be established at the park level utilizing NPS Policy , Guidelines and park-level review board.

Some requirements and restrictions are (but not limited to):

a) Objects will be loaned only to qualified scientific or educational institutions for exhibit or research. No loans are made to individuals.

c) Institutions must meet minimum NPS standards security and environmental control for NPS museum objects (Museum Handbook, Part I & II).

d) Sensitive materials may require additional stipulations and restrictions.

e) Expenses relating to the loan will be assumed by the borrower.

f) Any additional preparation on specimen must have written approval of the Superintendent.

g) All specimens are to be accessioned before they leave the park and will be placed on loan when they are taken from the Park.

h) If materials are accessioned and cataloged into the collections of other institutions, copies of accession and catalog data will be deposited at Agate. Such operations will not substitute for entry into the NPS system.

- provide for annual inventory of paleontological specimens.
- Loaned specimens will be photodocumented prior to removal.

#### 8. Define procedure for the closure of sensitive areas.

Justification: Areas shall be closed in accordance with 36 CFR 1.5, concurrent with the Superintendent's Order for the following reasons:

- 1) Site represents an important fossil resource which surface impact may destroy.
- 2) Protection of the fossil record "in situ", undisturbed, is critical to resource protection.
- 3) Area represents "one of a kind " resource within the Park.

In concert with this action and the Superintendent's Order to the file, the public will be notified of area closure by conspicuous signage and maps delineating the areas.

#### Actions:

- Carnegie Quarry #3 will be closed to visitor traffic during excavation, except during times which site manager determines to be adequate for an interpretative event.
- The closed areas will be adequately signed and designated.
- Visitors will be informed as to the location of closed areas by uniformed staff.
- Superintendent's Order will be written to the file for each event and will outline the reasons for the closure.

#### 9. Implement recommendations by Review Board regarding assessment and mapping of the current and potential paleontological status within the Monument.

Justification: At present, little centralized data exists on the status of paleontological resources in the Park. This baseline data is needed to develop management actions which will protect Agate's primary resource.

Actions:

- Prepare a geological map of Agate at a scale of 1:15,840 (1" = 1320') showing all important geological, cultural and paleontological features.
- As a subset of the above map, prepare a Paleontological Base Map, showing the locations of major and minor fossil producing sites.

10. Review eligibility of areas within Agate for designation as a National Natural Landmark which recognizes areas which best represent examples of fossil evidence of the development of life on earth.

Justification: Agate Fossil Beds National Monument was established to protect it's nationally significant paleontological. Agate contains one of the oldest occurrence of denning behavior of large mammalian carnivores.

Actions:

- Utilize a park-level review board to study fossil area within the Park and provide a scientific basis for NNL designation, using criteria for National Significance (36CFR 62.5).
- Provide documentation to the Division of Natural Landmarks for review and submission to the Director.

11. Adopt specific action for protection of Quarry 3 (Beardog Hill)

Justification: This site may be considered the most fragile of the Agate sites. Uninformed excavation within this site could destroy subtle features of the geology and render portions of the overall context beyond recovery.

Actions:

- no further excavations should occur without access to maps of den areas and fossil locations.
- surface dirt used as a protective covering should be replaced annually due to loss by wind erosion.
- construct a permanent enclosure to provide protection from plant growth and the environment.

## B. Impacts of the Proposed Actions

The proposed management actions outlined in this plan serve to preserve and conserve the fossil resources at Agate. Protection and stabilization of fossils in-situ will result in mitigating the destruction of many specimens. The placement of a structure or modification over areas will have a minimal impact to surface and subsurface resources. Removal of fossils (salvage) will also impact surface and subsurface paleontological resources, but the closure of areas by the Superintendent will allow for additional protection to selected sites through reduced visitor contact.

VIII. Action Matrix                      FY89                      FY90                      FY91                      FY92

Action 1:				
Establish a Review Committee	X			
Protect significant sites	X	X	X	X
Salvage significant fossil remains	As needed	As needed	As needed	As needed
Emphasize conservation in interpretation	X	X	X	X
Stabilize existing paleosites	10-238			
Retain undisturbed fossil relationships	X	X	X	X
Remove specimens only under certain criteria	As needed	As needed	As needed	As needed
Action 2:				
Establish a list of research needs	10-238			
Identify locations of fossil potential	10-238			
Action 3:				
Construct fossil research area	Pgk.# 115			
Action 4:				
Establish interpretive shelter/exhibits	Pkg.#s 114,129 133,153			
Research Cook Papers for specimen locations	10-238			
Investigate areas for potential exhibits	10-238			

	FY89	FY90	FY91	FY92
Action 5:				
Establish board for permit review	X			
Define criteria for permits	X			
Require a Restoration Plan for excavation	X			
Submit recommendations for permit action to Regional Director	As needed	As needed	As needed	As needed
Action 6:				
Evaluate areas for National Register		X		
Action 7:				
Establish loan guidelines	X			
Inventory Paleontological specimens	X	X	X	X
Photodocument loaned specimens	As needed	As needed	As needed	As needed
Action 8:				
Close Carnegie Quarry #3	X			
Sign & designate closed areas	As needed	As needed	As needed	As needed
Draft Superintendents Order for closure	As needed	As needed	As needed	As needed
Action 9:				
Prepare geological map	10-238			
Prepare paleontological map	10-238			

	FY89	FY90	FY91	FY92
Action 10:				
Evaluate areas for National Register eligibility			X	
Action 11:				
Provide location maps for excavations	As needed	As needed	As needed	As needed
Replace surface cover annually	10-238			
Construct enclosure	Pkg.# 129			

## IX. Alternatives to Proposed Actions

### A. No Action Alternative

Under the No Action Alternative the monument would make no changes in its current fossil management policy. Lack of baseline data on the distribution of fossil resources will result in continued loss of Agate's primary resource through erosion, theft and vandalism. Actions, such as development of a Fossil Management Plan, would be ignored and no provision would be made to respond to paleontological issues except on an "as needed" basis (i.e. no proactive management). Under the alternative, Agate would fail to meet its mission as stated in PL89-33.

### B. Impacts of No Action Alternative

Fossils (Agate's primary resource) will be lost due to weathering, visitor impact or vandalism. With no provision for prioritizing research sites, adequate investigation of principal areas may not occur.

The current permit process will continue to be utilized, resulting in little input from the park and limited park information supplied at the Regional level for decision making. Fossil specimens may be on loan or stored which are inaccurately cataloged by researchers and displayed in substandard surroundings resulting in impacts to these resources. Inadequate areas for storage and preparation of specimens may lead to poor preservation and deterioration of fossil resources.

### C. Summary

The no action alternative is unacceptable to management. Any unplanned or unapproved development, erosion, theft and vandalism of the area will result in increased negative impacts to the paleontological resources. The lack of a plan to meet these threats will result in inadequate protection and preservation of these unique resources.

Management has determined that a higher level of action is necessary in addressing issues involving paleontological resources.

## X. Alternative Assessment Matrix

### RESOURCES AFFECTED

### NO ACTION

### FOSSIL MANAGEMENT PLAN

#### Fossil Resources

Impacts to existing exposed specimens may result due to lack of staff/money to respond in a timely fashion.

Park management can respond to issues in a timely manner with a planning effort based on protection and preservation of fossil resources

#### Paleonto- logical Sites

New excavations by researchers may result in needless impacts to sites due to inadequate information on resource base.

Research efforts can be directed toward high priority areas

#### Park Data

Data base will increase slowly regarding specimens/sites in need of preservation, areas of priority and status on materials on loan

Data base will increase in proportion to needs outlined in Fossil Management Plan

#### Scientific Community

Participation will be limited by the resource information available and permit approval based on Regional assessment.

Guidelines outlined in the Management Plan will insure the research will supply useful data on high priority areas. Authorizations of permits will more accurately reflect park needs.

#### Visitor Experience

Visitor experience will be limited to existing sites and displays without provision for the demonstration of active preparation of fossil specimens.

Visitor experience will be heightened due to more emphasis on the major interpretative theme and accurate portrayal of specimen preparation. More accurate information on park resources will be available for use in interpretive programs and exhibits.

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE

DEVELOPMENT/STUDY PACKAGE PROPOSAL

PACKAGE NO. 114  
REVISION NO.

ORG. NO. 6710	PARK (OR OTHER ORIGINATOR) Agate Fossil Beds NM	DEVELOPED AREA (NAME) Park General	DA CODE PG	REGION MWR
STATE Nebraska	STATE CODE NE	COUNTY(S) Sioux	CONGRESSIONAL DISTRICT 03	
PACKAGE TITLE CONSTRUCT INTERPRETIVE SHELTER AND TRAIL		STUDY PACKAGE NEW CONSTRUCTION <input checked="" type="checkbox"/> B REHABILITATION <input type="checkbox"/> A	NEW PACKAGE <input type="checkbox"/> REVISION <input checked="" type="checkbox"/> XX	
CRITERIA (INSERT X'S)	PARK PRIORITY 6		DATE 10-76	REG. N. PRIORITY DATE
PROGRAM THRUST, STATUS AND OTHER INFORMATION 190				

WILL ADDITIONAL OPERATING FUNDS AND POSITIONS BE NEEDED UPON COMPLETION OF THIS PACKAGE?  
(IF YES EXPLAIN NEEDS IN SECTION XI OUTLINE OF PLANNING AND MANAGEMENT REQUIREMENTS)

YES   
NO

FULL PACKAGE DESCRIPTION

Construct a 2,000 sq. ft. interpretive shelter over a relieved fossil layer case and an access trail of approximately one mile.

PACKAGE JUSTIFICATION/CONSEQUENCES:

The Agate Fossil Beds contain a variety of fossils of animals in beds of sedimentary rock. Many of these fossils are congregated in an area known as Carnegie Hill-University Hill. At the present time there is one small exhibit to show the fossils. The exposed fossils are covered by a glass case. This package calls for the construction of an interpretive shelter over the case. This will allow as many as 15 to 20 visitors to view the fossils, while being protected from the elements. Additional exhibits will allow more complete interpretation of the fossils and the general area where they are found. Failure to provide for this shelter will result in less than adequate interpretation of the major resource of the area.

PLANNING AND MANAGEMENT REQUIREMENTS (Follow instructions and outline provided in Program Formulation Guideline)

#2  
10-30-81

ORIGINATOR (Signature and Title) <i>Don Meyer</i> Supt.	DATE 10-15-76	CONCURRENCE (Signature of Superintendent or Equivalent Official) <i>Don Meyer</i> Supt.	DATE 10-15-76
APPROVAL (Signature of Regional Director or Equivalent Official) <i>Samuel A. ...</i>	U.S. GOVERNMENT PRINTING OFFICE: 1976-634-888/40		DATE 3-14-77

## PLANNING AND MANAGEMENT REQUIREMENTS

### I. Background and Status

The visitor hikes over an unimproved trail for one mile often in heat and sudden thunder showers. The shelter will satisfy three requirements: 1. Preservation of the resource. 2. Protection of the visitor. 3. Interpretation of the resource.

### II. Limitations and Influences

- A. Land acquisition - The necessary land has been acquired.
- B. Legislative development limitations - The legislative development limitation is \$1,842,000.
- C. Unusual geographical, climatological or other factors - The site is on a hill overlooking the valley. It is subject to temperature extremes that may be a maximum of +110<sup>o</sup>F. to a minimum of -45<sup>o</sup>F., with winds which may reach 85 miles per hour.
- D. Political and public interest factors - The Nebraska Congressional Delegation has taken a great deal of interest in seeing the area developed.
- E. Statement for Management - Approved 10/19/76
- F. Outline of Planning Requirements - Approved 10/19/76
- G. Concession Development Plans - Not recommended.
- H. List of Classified Structures - LCS prepared July, 1875. This project will affect an archeological site which is listed on the LCS.
- I. Other factors - None

### III. Planning, Design and Construction

- A. General Management Plans - Master Plan approved 2/18/66. Development Relocation Study approved 9/27/76

1. Resource Management Plan - This is under revision following Regional review.
  2. Visitor Use Plan - Not started
  3. General Development Plan - This is incorporated with the Master Plan.
- B. Interpretive Prospectus - Programmed.
- C. Development Concept Plan - This is a part of the Master Plan Package
- D. Buildings and facilities required - Design and construction of a small shelter for interpretation of the fossils, "In Situ" exhibit. (This may include ongoing excavation and relieving interpretation.) A minimum amount of space will be needed for storage of maintenance and protection equipment. Restrooms facilities may be incorporated. It is estimated that the shelter will not be utilized by more than 15 or 20 visitors at any time in the foreseeable future. The design of the shelter must blend in with the terrain.
- E. Utilities required - Comfort station facilities may be necessary and incorporated with the shelter facility. We presume this can be provided without bringing water, sewer, and electrical lines to the site. A reservoir/holding tank situation may be feasible.
- F. Roads and Trails required - An access trail approximately one mile in length from the Visitor Center to the Quarry site will need design and construction. The proposed construction will be four feet wide with a "black top" surface. The bridge across the Niobrara River will be adequate for continued use.
- G. Concessions Management Plans - None recommended
- H. Other Planning - None
- IV. Archeology - Dr. Kay, Department of Anthropology, University of Nebraska, conducted a survey in 1975. Further surveys and/or salvage may be necessary.
- V. Historic Architecture
- A. Historic Preservation - None
  - B. 106 clearance will be necessary.

- VI. Museum exhibits and audio-visuals required
  - A. Museum exhibit - None
  - B. Wayside exhibits - The story of the fossils in correlation with the in situ exhibit and relieving must be interpreted.
  - C. Museum Services - Not applicable
  - D. Furnishings report - Not applicable
  - E. Furnishing acquisition - Not applicable
  - F. Audio-visuals - Not necessary for this interpretation
  
- VII. Natural Science Resource Problems - None
  
- VIII. Water resources - Not applicable
  
- IX. Environmental Documentation - Environmental Assessment or Impact Statement will be necessary.
  
- X. Other studies requested - None
  
- XI. Additional operating needs - Additional seasonal staffing will be necessary and has been requested by a previously submitted 10-237.

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE

DEVELOPMENT/STUDY PACKAGE PROPOSAL

PACKAGE NO. 114  
REVISION NO. 1

ORG NO 6710	PARK (OR OTHER ORIGINATOR) Agate Fossil Beds N. M.	DEVELOPED AREA (NAME) Park General	D.A. CODE PG	REGION MW
STATE Nebraska	STATE CODE NE	COUNTY(S) SIOUX	CONGRESSIONAL DISTRICT(S) 03	

PACKAGE TITLE	C	O	N	S	T	R	C	T	F	O	S	S	I	L	B	E	D	S	T	R	STUDY PACKAGE NEW CONSTRUCTION <input type="checkbox"/> B XX REHABILITATION <input type="checkbox"/> A	NEW PACKAGE <input type="checkbox"/> REVISION <input checked="" type="checkbox"/> XX
	A	I	L	I	N	T	E	R	R	E	T	I	V	E	S	H	E	L	T	E		

CRITERIA (INSERT X's)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	PARK PRIORITY #2	DATE 06-86	REG'N PRIORITY	DATE		
	X																															

PROGRAM THRUST, STATUS AND OTHER INFORMATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

WILL ADDITIONAL OPERATING FUNDS AND POSITIONS BE NEEDED UPON COMPLETION OF THIS PACKAGE?  
(IF 'YES' EXPLAIN NEEDS IN SECTION XI OUTLINE OF PLANNING AND MANAGEMENT REQUIREMENTS)

YES   
NO

FULL PACKAGE DESCRIPTION

Expose approximately 20 to 30 feet of the 2 foot thick fossil bed layer in Carnegie Hill next to the one mile Fossil Hills self guiding nature trail. Cover the exposed 20 million year old Miocene Mammal fossil bed layer with a protective case approximately 5 feet wide. Construct an interpretive shelter with wayside exhibit signs over the display case.

PACKAGE JUSTIFICATION/CONSEQUENCES

The interpretive shelter with protective case will provide visitors with some protection from adverse weather conditions and access to an on-site viewing area of a portion of the major paleontological resource of the Monument while providing protection and interpretation of the fossils. Without construction of the interpretive shelter, visitors are limited to viewing exposed fossils in two small temporary display cases. These are the primary resources to be interpreted to the public; and as yet, 20 years after authorization, even this primary exhibit has not been constructed.

PLANNING AND MANAGEMENT REQUIREMENTS: (Follow instructions and outline provided in Program Formulation Guidelines)

ORIGINATOR (Signature and Title)	DATE	CONCURRENCE (Signature of Superintendent or Equivalent Official)	DATE
		<i>Alford G. Lamb</i>	
APPROVAL (Signature of Regional Director or Equivalent Official)	DATE		DATE

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE

DEVELOPMENT/STUDY PACKAGE PROPOSAL

PACKAGE NO. 115  
REVISION NO. 3

ORG NO 6710	PARK (OR OTHER ORIGINATOR) Agate Fossil Beds N. M.	DEVELOPER AREA (NAME) Headquarters	D.A. CODE HQ	REGION MW	
STATE Nebraska	STATE CODE NE	COUNTY(S) Sioux	CONGRESSIONAL DISTRICT(S) 03		
PACKAGE TITLE CONSTRUCTION INTERPRETIVE CENTER ADMINISTRATION BUILDING		STUDY PACKAGE NEW CONSTRUCTION B <input checked="" type="checkbox"/> REHABILITATION A <input type="checkbox"/>	NEW PACKAGE <input type="checkbox"/> REVISION <input checked="" type="checkbox"/>		
CRITERIA (INSERT 'X's)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26	PARK PRIORITY	DATE	REG'N PRIORITY	DATE
	1 9 0	3.0	10-11-76		
PROGRAM THRUST, STATUS AND OTHER INFORMATION		1.0	10-30-81		
	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32	1.0	06-86		
		1.0	05-87		
WILL ADDITIONAL OPERATING FUNDS AND POSITIONS BE NEEDED UPON COMPLETION OF THIS PACKAGE?			YES <input checked="" type="checkbox"/>		
IF 'YES' EXPLAIN NEEDS IN SECTION XI OUTLINE OF PLANNING AND MANAGEMENT REQUIREMENTS:			NO <input type="checkbox"/>		

FULL PACKAGE DESCRIPTION:

Make minor changes to preliminary designs, prepare construction documents, and construct initial visitor use building to include exhibit areas, restroom facilities, multipurpose (AV) room, curatorial storage, library, museum lab, and office space for Park staff. Construct associated sidewalks and parking areas.

PACKAGE JUSTIFICATION/CONSEQUENCES

Agate Fossil Beds was established in 1965 and initial visitor use facilities have not yet been provided. Legislation establishing the Monument specifically provided for the exhibition of one of the Nation's major Sioux Indian collections. For lack of exhibit area, that collection remains in storage and the Park unable to fulfill its primary mission. A trailer which has served as a contact station and temporary exhibit area for the past 15 years has deteriorated and is in need of replacement. Due to trail access only to the fossil beds themselves, the facility is also necessary to provide alternative interpretation for visitors who cannot achieve the two-mile walk. The structure will provide administrative space and curatorial care for the many paleontological and cultural objects in the possession of the Park and presently in improper storage. If the facilities are not provided, interest groups will continue to publically question Federal acquisition of the area for which initial facilities have not been provided in 20 years.

PLANNING AND MANAGEMENT REQUIREMENTS (Follow instructions and outline provided in Program Formulation Guideline)

See Attached.

ORIGINATOR (Signature and Title)	DATE	CONCURRENCE (Signature of Superintendent or Equivalent Official)	DATE
		<i>Randall P. De</i> Supt.	08-03-84
TOVAL (Signature of Regional Director or Equivalent Official)	<i>Randall P. De</i>		DATE 10/24

## OUTLINE OF PLANNING AND MANAGEMENT REQUIREMENTS

### Section I. Significant Issues and Influences

A. Time Constraints - There are no time constraints which bear upon this package.

B. Land Acquisition - The land required for the completion of this project has been acquired in fee.

C. Legislative Development Ceiling - Public Law 95-675 dated November 10, 1978 authorized a development ceiling of \$2,012.00. This package can be constructed under the present ceiling.

D. Public Interest - There is renewed public interest in the project. The Western United Chambers of Commerce have recently identified the completion development as a major goal and has enlisted the aid of most members of the Nebraska Congressional Delegation and other public officials. The National Park Service has been the subject of severe local criticism for the 20-year delay in providing initial development in the Park.

E. Concession Interest - None.

F. Unusual Natural Conditions - There are no known unusual conditions affecting this proposal.

G. Operations and Maintenance - No unusual costs or problems have been identified.

H. Energy Conservation - The facility will be constructed to be energy efficient. The existing preliminary design should be reexamined to determine if the solar package is cost efficient and reflects current technology.

I. Compliance Required - An Environmental Assessment was completed for this project in 1976 and should suffice to meet NEPA requirements.

J. Other Factors - None.

### Section II. Status and Needs

A. Statement for Management - The Statement for Management approved in 1976 is currently under revision. The new revision retains as a primary objective the provision of these facilities.

B. Outline of Park Requirements - This project is the first priority on the Park's Outline.

C. Related 10-238's - None are directly related to the completion of this package.

D. General Management Plan - The 1966 Master Plan provides overall guidance for Park planning.

E. Related Implementing Plans - The Interpretive Prospectus completed in 1978 outlines the need for this structure and provides general guidance for exhibits.

### Section III. Related Studies

There are no known related studies which apply to this project.

### Section IV. Statutory and Executive Requirements

A. National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.) - An Environmental Assessment, Agate Fossil Beds National Monument Development was approved September 27, 1976 and includes this project.

B. 106 Clearance may be required.

C. Issue not affected by this proposal.

D. Issue not affected by this proposal.

E. Issue not affected by this proposal.

F. Issue not affected by this proposal.

G. Issue not affected by this proposal.

H. Issue not affected by this proposal.

I. E.O. 11593 - An Archeological Survey was completed in 1975.

J. E.O. 11988, Floodplain Management - Floodplain determination may be required.

K. Issue not affected by this proposal.

L. Issue not affected by this proposal.

M. Issue not affected by this proposal.

N. Issue not affected by this proposal.

## Section V. Water Resources

Not applicable or required.

## Section VI. Archeology

Archeological factors were considered in the Environmental Assessment. Some site surveillance may be required in the initial stages of construction.

## Section VII. Historic Architecture

No historic architecture involved.

## Section VIII. Museum Exhibit and Audiovisual Needs

The project will require planning and preparation of exhibits in two separate areas. A collection of over 500 Sioux objects is to be displayed in association with exhibits on James and Harold Cook, historic figures in early Indian relationships and preservation of the fossil beds. Major exhibits also are needed interpreting the paleontological story of the Park. A new audio visual program will be prepared. Considerable curatorial involvement will be required in preparing Sioux objects for display.

## Section IX. Design and Construction

A. Buildings and Related Facilities Work Required - Preliminary design drawing 165/40006 (Rev. November 1981) provides for the basic requirements of this facility, but will require minor modification of interior design prior to the preparation of construction documents. The energy package will also have to be reevaluated for cost effectiveness in light of present technology.

The facility will require approximately 6,000 feet of floor space to include exhibit areas for two primary themes, office space for a minimum of four persons, library, small paleontological lab or preparation area, information and sales area, multipurpose (with audio visual capacity) room to contain seats for up to 50 persons, restrooms, first aid facilities, and administrative storage.

The building will also require 1,500 feet of museum storage for additional Cook Collection and paleontological specimens.

The facility must be equipped with fire detection, suppression, and intrusion alarm systems.

B. Utilities Required - All utilities are on or near the site. The package will require modifications. The existing overhead 7.2KV line will be undergrounded for a distance of at least 1,000 feet as will existing telephone service.

200 feet of 6" sanitary sewer and a new absorption field will be required.

Approximately 300 feet of water line will have to be installed from the present stub to the building site.

C. Roads and Trails Required - Parking for 50 vehicles. side walks and a 300 foot access drive, paved 24 feet wide are needed.

Section X. Public Participation

The Environmental Assessment process has been completed. No additional formal public participation is required.

Section XI. Additional Operating Needs

Upon completion of this project the Park will require additional needs as follows:

Park Technician/Aid	.75 FTE	\$15,000
Laborer	.3 FTE	\$ 6,000
Additional maintenance, operational, and supply costs		\$10,000
	TOTAL	<u>\$31,000</u>

Section XII. Other Needs

Not applicable.

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE

DEVELOPMENT/STUDY PACKAGE PROPOSAL

PACKAGE NO. #129  
REVISION NO.

ORG NO 6710	PARK (OR OTHER ORIGINATOR) Agate Fossil Beds N. M.	DEVELOPED AREA (NAME) Park General	DA CODE PG	REGION MW
STATE Nebraska	STATE CODE NE	COUNTY(S) Sioux	CONGRESSIONAL DISTRICT(S) 03	
PACKAGE TITLE	C O N S T R U C T B E A R D O G D E N S I N T E R P R E T I V E S H E L T E R	STUDY PACKAGE NEW CONSTRUCTION <input checked="" type="checkbox"/> B REHABILITATION <input type="checkbox"/> A	NEW PACKAGE <input checked="" type="checkbox"/> X REVISION <input type="checkbox"/> O	
CRITERIA (INSERT X's)	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 1 9 d	PARK PRIORITY #5	DATE 08-86	REG'N PRIORITY DATE
PROGRAM THRUST, STATUS AND OTHER INFORMATION				
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32				

WILL ADDITIONAL OPERATING FUNDS AND POSITIONS BE NEEDED UPON COMPLETION OF THIS PACKAGE? YES   
(IF YES EXPLAIN NEEDS IN SECTION XI OUTLINE OF PLANNING AND MANAGEMENT REQUIREMENTS) NO

FULL PACKAGE DESCRIPTION

Cover the approximately 15x30 foot exposed area of 20 million year old fossil Bear Dog dens with a protective case. Construct an interpretive shelter with wayside exhibit interpretive signs over the display area at Bear Dog Hill near the one mile Fossil Hills self guiding nature trail.

PACKAGE JUSTIFICATION/CONSEQUENCES

The interpretive shelter with protective case will provide visitors an on-site viewing area of the oldest known large carnivore den system in the world while providing protection and interpretation of the fossils. It will also provide visitors with some protection from adverse weather conditions. Without the construction of the interpretive shelter, visitors will be unable to view the oldest known large carnivore dens. Temporary measures of covering up the fossil dens with plastic sheets and dirt do not afford the protection a permanent display case could provide. Resources may be lost.

PLANNING AND MANAGEMENT REQUIREMENTS. (Follow instructions and outline provided in Program Formulation Guideline)

ORIGINATOR (Signature and Title)	DATE	CONCURRENCE (Signature of Superintendent or Equivalent Official)	DATE
APPROVAL (Signature of Regional Director or Equivalent Official)		<i>Clifford J. Brant</i>	DATE

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE

DEVELOPMENT/STUDY PACKAGE PROPOSAL

PACKAGE NO. #133  
REVISION NO.

ORG. NO. 6710	PARK (OR OTHER ORIGINATOR) Agate Fossil Beds N. M.	DEVELOPED AREA (NAME) Stenomylus Quarry	D.A. CODE QU	REGION MW
STATE Nebraska	STATE CODE NE	COUNTY(S) Sioux	CONGRESSIONAL DISTRICT(S) 03	

PACKAGE TITLE	D	E	V	E	L	P	S	T	E	N	O	M	Y	L	U	S	Q	U	A	R	-	STUDY PACKAGE <input type="checkbox"/>	NEW PACKAGE XX
	R	Y	A	N	D	O	P	E	N	T	O	V	I	S	I	T	O	R	S	NEW CONSTRUCTION B <input checked="" type="checkbox"/>	REVISION <input type="checkbox"/>		
																							REHABILITATION A <input type="checkbox"/>

CRITERIA (INSERT X's)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	PARK PRIORITY	DATE	REG'N PRIORITY	DATE																																																													
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WILL ADDITIONAL OPERATING FUNDS AND POSITIONS BE NEEDED UPON COMPLETION OF THIS PACKAGE? YES   
(IF 'YES' EXPLAIN NEEDS IN SECTION XI OUTLINE OF PLANNING AND MANAGEMENT REQUIREMENTS) NO

FULL PACKAGE DESCRIPTION:

This package will provide for the excavation of a small exhibit area, construction of an interpretive shelter and exhibits, and construction of a 1.5 mile foot trail to the site.

PACKAGE JUSTIFICATION/CONSEQUENCES:

The Stenomylus Quarry, a fossil area composed of the remains of a very small gazelle-like camel, is a 60 acre tract separated from the main portion of Agate Fossil Beds National Monument. Park planning calls for the excavation of a small area of fossils and construction of exhibits at the site. Sufficient right-of-way has been purchased to allow access to the site, but no trail presently exists. The park cannot complete its interpretive mission without these facilities. The long delay between acquisition of the site and development is causing friction with local individuals and groups.

PLANNING AND MANAGEMENT REQUIREMENTS: (Follow instructions and outline provided in Program Formulation Guideline)

ORIGINATOR (Signature and Title)	DATE	CONCURRENCE (Signature of Superintendent or Equivalent Official)	DATE
APPROVAL (Signature of Regional Director or Equivalent Official)			DATE

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE

DEVELOPMENT/STUDY PACKAGE PROPOSAL

PACKAGE NO. 153  
REVISION NO.

ORG ID# 6710	PARK (OR OTHER ORIGINATOR) Fossil Beds National Monument	Agate	DEVELOPED AREA (NAME) Park General	DA CODE PG	REVISION MWR
STATE Nebraska	STATE CODE NE		COUNTY Sioux	CONGRESSIONAL DISTRICT(S) 03	
PACKAGE TITLE CONSTRUCT SHELTER AT DAI MONELIX WAYSIDE EXHIBIT		STUDY PACKAGE NEW CONSTRUCTION B X REHABILITATION A 11		NEW PACKAGE X REVISION 11	
CRITERIA (USE BOXES) 1 9 0		PARK PRIORITY		DATE	REG PRIORITY
PROGRAM PURPOSE, STATUS AND OTHER INFORMATION				DATE	DATE
WILL ADDITIONAL OPERATING FUNDS AND PERSONNEL BE NEEDED UPON COMPLETION OF THIS PACKAGE? YES 11 NO X1					

FULL PACKAGE DESCRIPTION

Construct sun screen shelter (15' x 30' and 8 1/2' high) with pitched roof and 4 corner beams, at the Daimonelix wayside exhibit turnout.

PACKAGE JUSTIFICATION/CONSEQUENCES

The construction of a sun screen shelter will provide shade and shelter from rain for visitors and the wayside exhibit signs. The shelter should also encourage much greater visitor use of the 3 new wayside exhibit signs at the Daimonelix turnout.

PLANNING AND MANAGEMENT REQUIREMENTS (Follow instructions and outline provided in Program Formulation Guideline)

AUTHORITY (Signature and Title)  Unit Manager	DATE 03-09-88	APPROVED BY (Signature of Supervisor or Equivalent Official)  Supt.	DATE 3-8-88
APPROVAL (Signature of Regional Director or Equivalent Official)			DATE

## XII. Persons and Agencies Consulted

Dan Chure  
Paleontologist  
National Park Service  
Dinosaur National Monument

Florissant Fossil Beds National  
Monument

Fossil Butte National Monument

Dr. Robert Hunt  
Associate Professor of Geology  
University of Nebraska  
Lincoln

Charles Mc Kinney  
National Park Service  
WASO

Janice Meldrum  
Resource Management Specialist  
Apostle Island National  
Lakeshore

Jim Morris  
Chief Ranger  
John Day Fossil Beds National  
Monument

Dennis Umshler  
Paleontological Coordinator  
BLM  
Albuquerque District

Gary Willson  
Regional Ecologist  
National Park Service  
Midwest Region  
Omaha, Ne.

Jan Wobbenhorst  
Resources Management Specialist  
Indiana Dunes National  
Lakeshore

### XIII. Bibliography

Cockrell, Ron, 1986, Bones of Agate, An Administrative History of Agate Fossil Beds National Monument

Kay, Marvin, 1975, Archeological Surveys in Scotts Bluff and Agate Fossil beds National Monument, Nebraska. National Park Service PX 6115-4-0139

Hunt, Robert M., Jr., 1984, The Agate Hills, History of Paleontological Excavations 1904-1925. National Park Service PX 6000-2-0-320

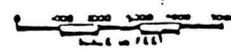
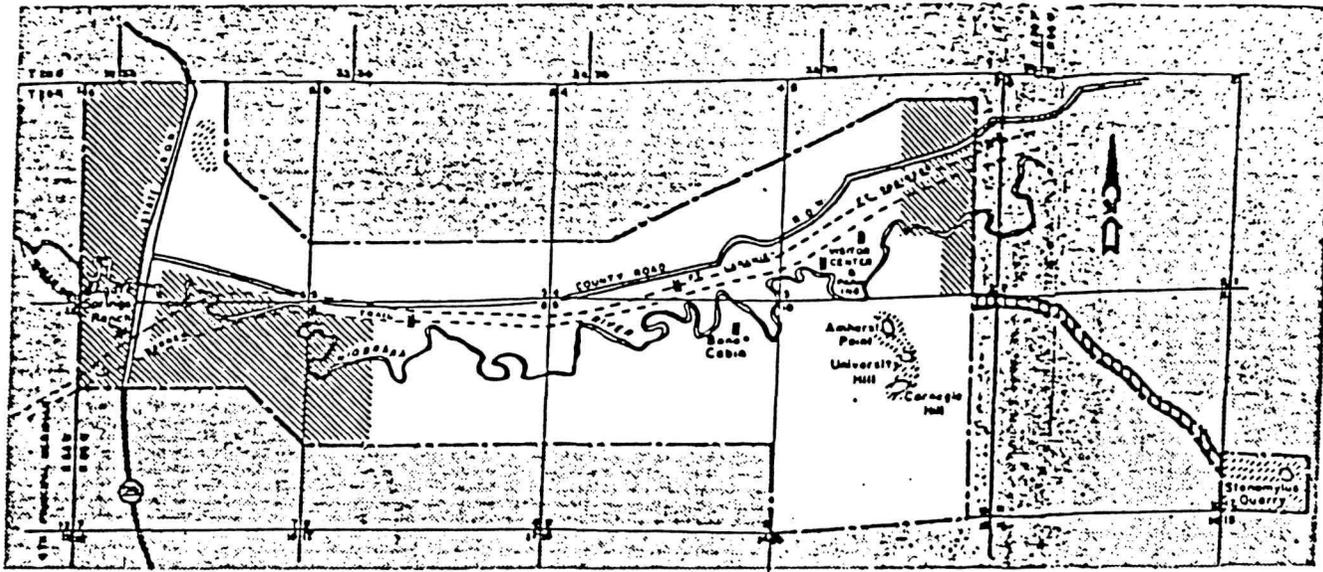
Hunt, Robert M., Jr., 1987 Report on the Geology and Paleontology of Agate Fossil Beds National Monument Sioux County, Nebraska.

Resources Management Plan, 1988, Agate Fossil Beds National Monument

Scope of Collections Statement, 1985, Agate Fossil Beds National Monument

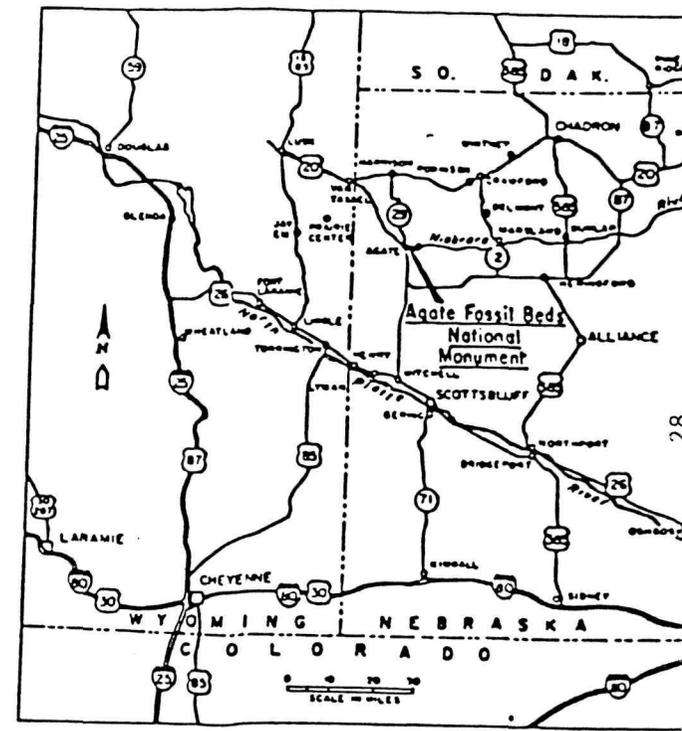
Statement for Management, 1987, Agate Fossil Beds National Monument

Collection Management Plan, 1988, Agate Fossil Beds National Monument



- Outstanding Natural Feature (Subzone of NATURAL ZONE)
- Private Residential/Ranching (Subzone of SPECIAL USE ZONE)
- HISTORIC ZONE
- DEVELOPMENT ZONE
- Access/Circulation (Right of Way)
- NATURAL ZONE

STATEMENT FOR MANAGEMENT  
EXISTING MANAGEMENT ZONING and BOUNDARY MAP

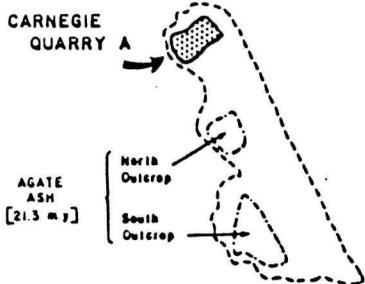


VICINITY MAP

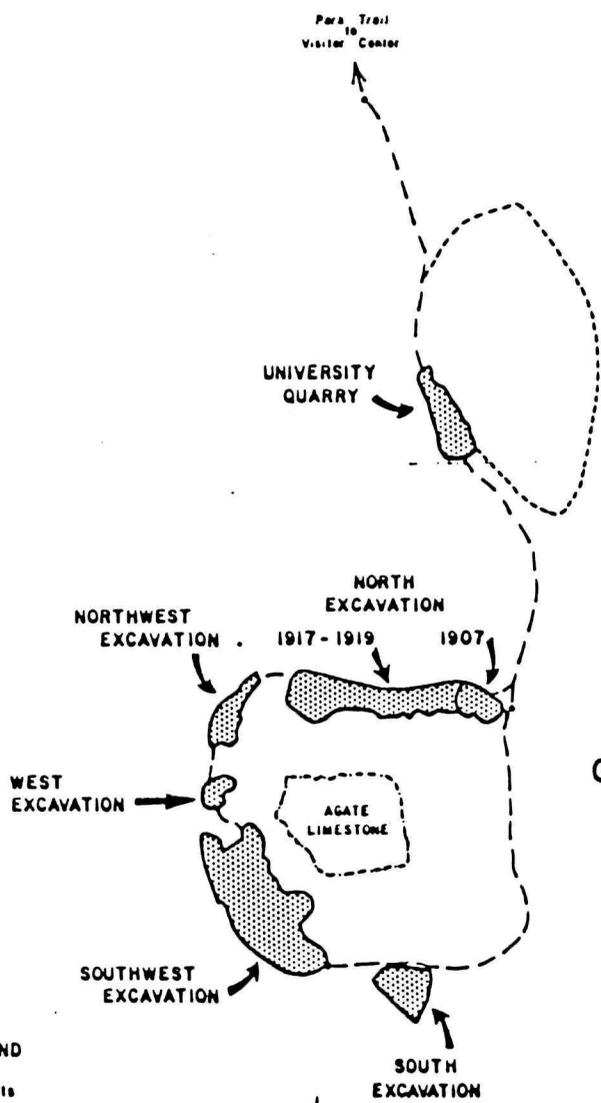
Agate Fossil Beds National Monument  
SIOUX COUNTY NEBRASKA

# MAP OF THE AGATE SPRING QUARRIES, SECTION 10, T. 28 N, R. 55 W, SIOUX COUNTY, NEBRASKA

SURVEYED BY  
R. M. HUNT, JR & M. E. REBONE  
JULY, 1983



NORTH RIDGE



- LEGEND
- Quarry Limits
  - - - - Outcrop Boundaries of Agate Ash and Agate Limestone
  - - - - Hill Perimeters
  - - - - National Park Service Trail
  - National Park Service Trail Post

