RESOURCES MANAGEMENT PLAN

FLORISSANT FOSSIL BEDS NATIONAL MONUMENT

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1/10/00
Date

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INTRODUCTION

The name Florissant may not be familiar even in its home state of Colorado, but it is well known among paleontologists, botanists, and entomologists of the world. The Florissant fossils provide a detailed reconstruction of a paleoecosystem. By no means a complete picture, the fossils provide a tantalizing glimpse into the evolution of life and the climate of this region 34 to 35 million years ago. The area is renowned for the variety, abundance, and detailed preservation of plant and insect fossils and giant petrified tree stumps. Although not as numerous, vertebrate fossil specimens have also been discovered. The volcanic and lacustrine shales, named the Florissant Formation, have been the subject of years of study and a large body of literature, since 1872.

To understand and appreciate the fossil resources within this 5,998 acre national monument, one must also understand the dynamic change between today's environment and the one 35 million years ago. It is also important to know the natural processes that were significant in bringing about the change.

The environment of the Eocene-Oligocene transition can be described as falling somewhere between that of the low, cool coastal valleys by Big Sur, California, and the drier highlands of northern Mexico. The area contained groves of sequoias, towering perhaps over 300 feet. The fossil record also indicates a lush undergrowth of vegetation, mixed hardwood and conifer forests, semi-arid highlands, mammals such as small horses and pig-like oreodonts, a wide variety of insects, meandering streams, and a lake containing aquatic life forms.

As a series of volcanic eruptions began a drastic change in the environment, which led to preservation of vast paleontological resources. The volcanic action caused mudflows and ash fall events that buried and fossilized the various forms of life.

The discovery of the fossil-bearing shales has been credited to Dr. A.C. Peale with the U.S. Geological Survey in 1873, although amateur naturalist Theodore Mead made the first scientific collection of fossils one year earlier. Since then, scientists from around the world have dug into the shales, identifying more than 1,100 species of insects (including almost all of the Oligocene butterflies of the New World,) over 140 plant species, and several species of fish, birds, and mammals.

Today, beneath the gently rolling meadows, an ancient fossil calligraphy is imprinted on the Eocene-Oligocene shales. Incredibly detailed fossils of insects and vegetation exist in such profusion that the Florissant Fossil Beds form one of the

better fossil assemblages in the world.

PARK PURPOSE AND SIGNIFICANCE

A Management Assessment Workshop held in December 1993 developed the following statements of Purpose, Significance, and Management Objectives.

Purpose

The purpose for which the Florissant Fossil Beds National Monument was set aside as part of the National Park system includes:

> To preserve and interpret for the benefit and enjoyment of present and future generations the excellently preserved insect and leaf fossils and related geologic sites and objects.
>
> To manage the national monument in accordance with the National Park Service 1916 Organic Act, "...to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."
>
> To promote the controlled scientific exploration and research and to advance our knowledge of fossils and other geologic resources.

The purpose for the establishment of Florissant Fossil Beds National Monument on August 20, 1969 (83 Stat.101) was derived from the Monument's enabling legislation, legislative history, and other legislation affecting the management of national park areas. Thus, the purpose of Florissant Fossil Beds National Monument, as well as mission of the National Park Service, encompasses themes of preservation, research, and education. Resource management plays a vital role in each.

Significance

The significance of Florissant Fossil Beds National Monument is summarized in the following statements which attempt to capture the essence of the resource and its importance to our nation's natural and cultural heritage.

> The park provides unparalleled paleo research opportunities by virtue of its high concentration of fossil plant and animal species that occurred 35 million years ago with opportunities to research, compare,and contrast ancient ecosystems with the present. Thereby providing an

opportunity to gain insights to our current ecological dilemmas.

The park's hidden treasures, delicate fossils of insects and plants buried under 15 feet of rock, preserve future research opportunities that through the maturation of paleontology may unlock the mystery of a bygone era.

Florissant is a key element of a larger ecosystem that provides critical habitat for migrating and resident wildlife. The resources become more crucial as development within the region increases.

The park provides quiet, solitude, unassuming beauty with opportunities for contemplation, rejuvenation, perspective, and an appreciation for nature all within a short drive from an urban environment.

The park contains significant structures and sites from prehistory to western settlement and local history.

The Hornbek Homestead was the first homestead filed within the monument boundary. Adeline Hornbek exemplifies the role of women in the settlement of the west, and the role of western women in furthering the women's movement.

The monument was created entirely from private lands and modern man used and modified that land. As a result there exist a matrix of intertwined natural and cultural components which must be addressed in park planning and management.

Management Objectives for Resources Management

These statements describe a broad conceptual view of the kind of resource conditions and visitor experiences desired.

The region is recognized as a world class paleontology resource area from the delicate fossils of Florissant Fossil Beds to the massive dinosaurs of Garden Park fossil area in Canon City.

The park is managed in context of a larger ecosystem recognizing the needs of park, local communities, other agencies, and private landowners. Partnerships have been developed to jointly pursue mutual objectives and mandated missions.

The park has a world class collection management program which includes adequate facilities, staff, equipment,

strategies, and plans.

The park monitoring program allows for measurement of change, develops management actions, and understanding of how these changes affect resources over time. Restoration of Hornbek Homestead is complete.

The park has comprehensive research and resource management strategy that outlines specific goals to be achieved and projects to be carried out.

The park has identified and managed cultural and historic sites and stories of local, regional, and national significance.

The park has established a carrying capacity consistent with resource management and visitor experience objectives.

Partnerships are an integral part of park management in the areas of resource protection, science, history, community and economic cooperation, interpretation, tourism, and decision making.

The park has comprehensive inventory of baseline resource information and the ability to manage and utilize that information.

The park, surrounding communities and interests understand who the visitors are, where they are from, and their expectations and needs.

MANAGEMENT GOALS FOR PARK RESOURCES

The Resource Management Plan is a tool for achieving goals that affirm the park purpose and significance. Overall resource management goals were derived from the General Management Plan, Statement for Management, and Management Assessment.

1. To protect and manage the Monument facilities and resources with emphasis on preservation and interpretation of the paleontological and geological resources.

2. To identify and evaluate cultural and natural values in the park and manage them in a manner consistent with both the requirement of the law and administrative policies.

3. To acquire and manage sufficient baseline data to support preservation enhancement and interpretation in the management of the natural and cultural resources.

4. To encourage the scientific community to study those natural

resources which were significant in the establishment of the Monument.

5. To identify and monitor vegetation communities and cultural landscapes within the Monument, and to identify and resttore those communities that have been severely disturbed by past agricultural practices. 6. To retain the general characteristics of the existing landscape and to improve the quality of the visual environment along the pipelines, roads, and elsewhere, as desirable.

7. To encourage and promote the existence and return of native wildlife species within the Monument.

8. To cooperate with local governments, neighboring developments, and land management agencies to insure, to the greatest degree possible, that adjacent land use and development is compatible with long-term preservation of the area's natural, cultural, and scenic resources.

9. To support the professional management of park resources with a professional and well trained resource management staff.

PURPOSE OF THE RESOURCES MANAGEMENT PLAN

Congressional legislation, National Park Service policy, and management goals and philosophy have directed the development of the Resources Management Plan for Florissant Fossil Beds National Monument (RMP). The Monument recognizes a broad responsibility to preserve, protect, and convey to the public the meaning and significance of the natural and cultural resources for which the area was established. Whereas resource protection must be the primary responsibility, the RMP was developed to engage the Monument in an ongoing program of natural and cultural resource management, and research aimed at obtaining science based information to use in managing and protecting these resources.

The RMP is a working document containing information on the current status of natural and cultural resources and resource management activities in the Monument. A variety of research initiatives, baseline studies, and protective measures, complete with funding and staffing data, are integrated into a comprehensive resource management proposal.

The RMP is a tool for the development of an effective strategy to achieve management goals, objectives, and address resource problems and needs. An ecosystem approach has been proposed as a resource management strategy. Ecosystem management is an evolving concept which has potential for achieving the integrated goals and desired future conditions described in this plan.

II. PRESENT RESOURCE STATUS

This section summarizes information on the Monument's natural and cultural resources, baseline data, and what is known about their current condition or threats to those resources. An assessment of baseline information and condition of resources is essential for restoring or maintaining natural processes; preventing irreparable degradation; and documenting unique resources. Program needs and individual project statements are addressed in another section.

NATURAL RESOURCES BASELINE INFORMATION & CONDITION OF NATURAL RESOURCES

This section describes and evaluates baseline information for natural resources within the Monument. The National Park Service Inventory and Monitoring Guideline, NPS-75, identifies the minimum baseline information needed for a viable resource management program, and sets criteria for evaluating current status. A table, Summary of Natural Resource Baseline Information, is provided in the appendix.

1. HISTORICAL DATABASE

Historical scientific material, including research reports, field notes, wildlife observations, maps and photos are in the park library, archives, and Automated National Catalog System (ANCS) data base. Retrieval of information from ANCS is automated, however there is no overall index of all reference documents. Each of the resource databases described below are up to date and accessible for research. A comprehensive indexing system would be desirable to facilitate retrieval and use of reference material.

F. Martin Brown Archives:
This unpublished work consists of scientific and field notes, photos and drawings, references and inventories of fossil insects collected from the Florissant fossil beds now in various museum collections worldwide. The original papers and archival copy (about 10 lineal feet) are stored in acid free folders in four file drawers of a fire resistant safe in the museum store room. The physical condition of the papers is good and they are stored under relatively constant temperature and humidity. A working copy (about six lineal feet) is available to researchers in the park library. Specimen data from the collection is cataloged by taxa on ANCS, and a manual subject/author index has been made. Retrieval of information could be improved by a comprehensive automated index.

Monument Library:
Approximately 1100 titles are housed in the visitor center.

Resource management related titles have not been estimated. Items are catalogued by the Dewey decimal system and are recorded on author/title/subject cards. There is no automated or backup record. With the exception of a few rare books stored in a fire resistant safe, books are stored on open shelves. New items are added weekly. Recent research reports and surveys, completed since 1990, are catalogued into the library. Original copies are stored in a fire resistant safe or the Superintendent's office, and working copies are available in the library.

Wildlife Observations:
Handwritten records of sightings made by staff and visitors are encouraged. Information includes species, location (not usually georeferenced,) behavior, date, time, and weather at time of observation. Observation cards are stored in the library. Information was entered into a d-Base inventory (BIS) in 1992. There are no other copies of this information.

Biological Inventory Survey (BIS):
An inventory of species occurring within the Monument was compiled in 1991 using a d-Base program. The BIS was compiled from wildlife observation records, literature survey, Colorado Native Plant Society inventory, and Audubon bird list.

Other Paleontological Databases:
A current "Bibliography of Paleontological Research" comes from research files at the Monument, and the US Geological Survey "Silver Platter" geological computer index.

A wealth of new information pertaining to the monument's paleontological and geological resources was presented during the Rocky Mountain regional meeting of the Geological Society of America (GSA) in May 1994. Publication of a GSA Special Paper on the Florissant symposium is planned. Individual studies included: 1) the Precambrian basement of the Florissant area (Wobus); 2) stratigraphy and depositional setting of the Florissant Formation (Murphy and others); 3) palynology of the Florissant Formation (three separate contributions by Leopold and Clay-Poole, Nichols and Wingate, and Cross and Taggart); 4) update on the fossil megaflora (Manchester); 5) tree ring analysis of fossil Sequoia stumps (Gregory); 6) paleoelevation of the Florissant flora (Meyer); 7) identification of fossil dicotyledonous woods (Wheeler); 8) paleoecology of fossil insects (Drummond); 9) fossil birds (Chandler); 10) fossil mammalian faunas (Kron and deToledo); 11) the nature of the late Eocene erosion surface in the Florissant vicinity (Evanoff and Chapin); and 12) studies of volcanic stratigraphy (two different contributions by Mertzman and others and Campbell).

A bibliography of approximately 500 references to Florissant Fossil Beds paleontological research has been compiled, and

copies of relevant articles obtained from the USGS and nearby universities as available. These are kept as a separate collection in the Paleontology Office where they are accessible to researchers upon request. A continuing effort is being made to locate more of the references and obtain copies to complete this collection. It is at present organized by author, but a subject index would also be helpful.

Numerous fossils and associated information, collected prior to the designation of the national monument, are located in several museums and universities, worldwide. Information on these collections needs to be centrally organized to facilitate research efforts. The research and information compiled by the late F. Martin Brown, "The Brown Archives," attempted to accomplish this for the fossil insects. Similar data are needed for the fossil plants and other organisms. A more complete inventory of fossil specimens, including specimen and locality numbers, at other institutions is needed. Photographic documentation of type specimens, and other rare or significant specimens is also needed.

2. SPECIES INFORMATION

Vegetation

The Monument lies within the eastern slope of the Rocky Mountains at an elevation of 8,200 feet to 8,900 feet in the Montane Life Zone. The Monument is characterized by mountain meadows interspersed with open forests of ponderosa pine. Dense forest stands of Douglas fir and blue spruce can also be found on the hilltops and north facing slopes. Aspen trees are restricted to moist drainages throughout the area. Meadows occupy most of the area that falls within the boundaries of the prehistoric Florissant lakebed. The basin is visually dominated by 14,110 foot Pikes Peak, approximately 18 miles east of the Monument.

Vascular Plants:
The Colorado Native Plant Society has collected and identified 443 species of plants from 88 families and 308 genera. Specimens are in the Monument's herbarium, which is stored in metal cabinets in the A-Frame curatorial area. These specimens have been accessioned and cataloged into the ANCS. In 1990, they published Plants of the Florissant Fossil Beds National Monument, by Mary Edwards and William Weber.

Several exotic species of vegetation exist because of the intensive grazing and agricultural activities that occurred before 1969. Primary aliens include Canada thistle and yellow toadflax. In 1999, seven significant alien species were mapped and prioritized for control efforts and a draft weed management plan prepared.

Plant communities at Florissant have been greatly affected by human activity, including:

farming and grazing up to 1984
erosion due to overgrazing
construction of soil conservation features
logging since the 1860s
various utility rights of way
continued fire suppression

Non-vascular Plants:
There is no baseline data or inventory of non-vascular plants.

Wildlife

Biological Inventory Survey (BIS) was completed in 1991. Data in the survey came primarily from wildlife observations recorded by Monument staff and visitors. The following major groups are listed in the BIS:

2 species amphibians
2 species reptiles
105 species birds
25 species mammals

253 species insects

There are no records for other invertebrates, or the vertebrate class Pisces (fish.)

Mammals:
The Colorado Mammal Distribution Latilong Study, undertaken by the Colorado Division of Wildlife in 1982, is referenced as the baseline inventory for species in the Monument. From this study, 26 species were identified.

Large mammal species commonly found in the Monument are elk, deer, antelope, bobcats, and coyotes. During summer, sightings of black bears within the Monument and on surrounding private lands have become an almost daily occurrence. Mountain lion and human interactions are increasing within the general region. Small animals include beavers, porcupines, badgers, rabbits, weasels, bats, and mice. There was one observation of a "masked weasel", possibly a Black-footed ferret, by a park employee in 1994. Populations of arboreal and ground squirrels, prairie dogs, and chipmunks fluctuate in visitor use and picnic areas.

The Monument plays an important part in the seasonal migration patterns of elk as they move through the Pikes Peak region. The substantial growth in elk herd populations are causing greater year-round utilization of the Monument. In 1997, a joint study between the Monument and the Colorado Division of Wildlife documented the movement and use patterns of the elk herds in the area.

Birds:
A bird list of 95 species was compiled by the Audubon Society, starting in the 1970's. A team from the Colorado Bird Atlas in 1990-1991 confirmed 34 breeding species, including a 10 year record of nesting golden eagles. Bald eagles and peregrine falcons have been sighted during summer months. The bird list includes favored habitat and seasonal occurrence, and is considered complete.

Fish:
Non-native trout species have been identified by Colorado Division of Wildlife as occurring within the Monument. There has been no field inventory to confirm a species list. Fishing is permitted with possession of a state license, however this is an infrequent activity. Requests by the State Division of Wildlife to stock ponds for fishing purposes were denied by the Monument. The impact of the construction of a campground with stocked fishing ponds on private property adjacent to the southeast boundary is unknown.

Reptiles and Amphibians:
There are at least two species of amphibians, Tiger salamander (Ambystoma tigrinum), and a frog (species unknown); and two species of reptiles, Bullsnake (Pituophis melanoleucus) and Western garter snake (Thamnophis elegans) based on observations made by staff or visitors. Field inventories of amphibians and reptiles are needed to confirm a species list. While habitat within the Monument is relatively undisturbed, subdivision development and agriculture outside the boundaries may affect the quality of these areas within the Monument.

Insects:
A collection of 630 specimens of modern insects, taken within the Monument, was made by F. Martin Brown and colleagues from 1976 to 1983. About 253 species have been identified in this collection, which is considered essentially complete. Specimen data, including collection parameters, is entered in ANCS and can be retrieved by genus and species.

3. THREATENED AND ENDANGERED SPECIES

There has been no formal survey to list or monitor populations of animals that would assist us in detecting the presence of endangered, threatened, or rare species. Golden eagles have been observed nesting in the area since 1976. Bald eagles are infrequent visitors, as are peregrine falcons.

With the help of the Colorado Native Plant Society (CoNPS), vascular plant species "of special concern," as listed in

Colorado Natural Heritage Inventory, have been identified. The rarest species on the Monument, the white upland aster (Unamia alba,) belongs to a relict prairie-woodland group. So far, three thriving populations have been found (Edwards and Weber, 1990.) A number of other sensitive or unusual plants are being studied by the CoNPS.

4. DIGITAL MAPS/GEOGRAPHIC INFORMATION SYSTEM (GIS)

The Monument participates in a GIS program with three other NPS areas, referred to as the South Central Colorado Group (SCCG.) Curecanti National Recreation Area serves as the node park providing GIS support for Black Canyon of the Gunnison, Great Sand Dunes, as well as Florissant Fossil Beds. The SCCG program at Curecanti consists of an ArcInfo work station, and full-time GIS position.

Base data layers for the following themes are available:

VEGETATION/LAND COVER	0% complete
WETLANDS	0% complete
POLITICAL BOUNDARIES	100% complete
T&E SPECIES	no data
HYDROLOGY	100% complete
TRANSPORTATION	100% complete
LAND OWNERSHIP	100% complete
GEOLOGY	100% complete
SOILS	100% complete
PALEONTOLOGIC	100% for known sites
ELEVATION/SLOPE/ASPECT	100% complete

Digital Vegetation Maps:
Accurate vegetation mapping does not exist for the Monument. Aerial photographs have been acquired for the purpose of preparing a vegetation map.

Land Use Baseline:
Political boundaries and transportation data layers are complete. Data base includes TIGER census data for Teller and Fremont counties. Data on private land ownership for properties adjacent to Monument boundaries has been acquired from the Teller County GIS office.

Digital Soil Map:
The map for the Order 3 Soil Survey of the Monument completed by the Soil Conservation Service in 1986 was digitized in 1997.

Digital Geological Map:
Both Geology Maps of Florissant Fossil Beds, 1989 RMRO and Evanoff UCM 1992, have been digitized.

Digital Paleontological Map:
During the summer of 1992, a fossil resource inventory and monitoring program was initiated. Nearly 50 exposures of the Florissant Formation were mapped on topographic maps and aerial photographs and coordinates taken with the Global Positioning System (GPS.) The data layer provides the foundation for an integrated resource monitoring and protection plan.

5. WATER RESOURCES

There are several streams and seeps scattered throughout the Monument. The few perennial streams are extremely small. Grape Creek is the major drainage, and wanders along the Florissant valley from the south to the northwest.

It is believed that the water for these streams comes from rainfall percolating through the soil from the higher ground that is privately owned around the Monument. The water quality of these surface flows appears to vary, based on whether the water surfaces from the shale or granite layers. Baseline data on surface water quality has been recorded since 1995.

Approximately 44 earthen dams were built in the 1950s in drainages within the Monument. Six dams permanently impound water which attract a variety of wildlife and waterfowl, and cause no significant downstream hazards. Some of the remaining dams have silted in to the point they no longer collect water. In 1998-99 the dams a model was developed to evaluate and prioritize the dams for restoration. In 2000, the five highest priority dams will first of the rankings will be restored.

Agricultural land and residential subdivisions abut the Monument. There are many individual wells and septic systems within the aquifer and watershed shared by the Monument. There is potential for contamination of Monument waters from outside sources.

In 1984, the Monument registered ten wells with the water court (reference District court, water div. No.1, Colorado Case No. W8439-76 W8798-77 through W8803-77.) Between 1984 and 1990, four hand dug shallow wells were abandoned and back filled by Monument staff for health/safety reasons.

In 1988, planning for a proposed new visitor center showed the need for a better water source. Hydrologist Rick Inglis, NPS Water Resource Division, Ft. Collins, CO, provided a complete field inventory of eleven wells and five springs, which monitored depth, flow, temperature, pH, map location and conductivity. None of the sources provided an adequate supply or quality desired. Since then, the "Saw Mill" Well was drilled, which provides 14 gallons per minute with low levels of minerals (ref. Rick Inglis). This well is currently not in use.

On a routine basis, the park drinking water is analyzed by the Colorado Dept. of Health for organic and inorganic chemistry, as required by the Environment Protection Agency. The 1994 analysis of the Visitor Center Well No. 12 revealed moderately high levels of the following minerals: fluoride, manganese, iron, sodium and calcium, but all are normal to this area. This 450-foot well serves offices and the current visitor center with a sustained flow of 4 gallons per minute.

Water Rights are of special concern, as proposed development and increased visitation will require quantities of water above current authorized levels. With the advent of the proposed visitor center and residential development, adequate water rights need to be secured or aligned with a commercial water system.

The NPS has purchased senior water rights and is currently operating under a temporary water supply plan approved by the State Engineer. The NPS' senior water rights are used to obtain releases from reservoirs and ditches which ensure that downstream right holders are not injured by NPS' junior diversions within the Monument. While the temporary plan is in effect, the NPS, through the Department of Justice, is seeking approval from the water court of a permanent water right at the Monument, and an augmentation plan to provide adequate water for current uses and proposed development.

6. AIR RESOURCES

The air quality is considered very good in this Federal Class II clean air area. Even though the major population centers of Colorado Springs, Pueblo, and Denver are only 30, 50, and 65 miles away, respectively, there is no visual indication that air pollution from these metropolitan areas affects the quality of air at the Monument.

There have been no studies or monitoring of air quality or acid precipitation at the Monument. Baseline data needs to be developed to aid in the evaluation of change. The increasing use of wood-burning stoves in private developments adjacent to the Monument and increased use of automobiles on a major county road that bisects the Monument could have an impact on the air quality over the long term. The effect of acid precipitation on the exposed petrified tree stumps could be studied.

Night Skies:
There is no baseline data on quality of night sky viewing nor on sources of artificial light affecting this resource. Lights from Denver and Colorado Springs produce a visible glow on the eastern horizon, but night sky quality in the immediate vicinity is

frequently commented on by the public. Nighttime air quality is one of the impacts considered when the Monument reviews local land development plans.

Ambient Sound:
There is no baseline data on ambient sounds. The values of quiet and solitude were identified as significant resources during the Management Assessment Workshop in 1993.

Ambient sounds are affected by traffic on Teller County Road One, a major county road which bisects the Monument property from north to south. Ultralight aircraft frequently fly over the Monument at low elevations from a private strip to the south. Over years, the various development plans for property adjacent to the Monument had potential to impact ambient sound. Proposals for a sanitation dump, and heavy equipment business both located next to the Monument's west boundary were denied by the Teller County Board of Commissioners.

7. METEOROLOGICAL DATA

Weather records for precipitation and maximum/minimum air temperature are recorded daily at the Visitor Center for the National Weather Service. Records from January 1979 to present are maintained in Monument files. There is no fire weather data collected in the Monument, but five miles away the Pike National Forest collects fire weather data in Lake George, Colorado.

The Monument receives an average of 15.25 inches of precipitation per year. Most of the moisture comes during the summer thunderstorms. Snowfall is generally light, seldom accumulating more than 6-12 inches. Average temperatures range in the winter from single digit lows to highs in the upper 30s F. In the summer, high temperatures average in the 70s F to lows of 30 F. Seasonal extremes of -35 F and 90 F are on record.

8. SOILS

The soils of the area are characterized by decomposed granite and alluvial materials. There are rocky outcroppings of Pikes Peak granite. The soil has poor cohesive qualities and erodes easily once the surface vegetation is disturbed. In areas where volcanic tuff and lake shales are present, clay and silty clay soil types are predominant. These also are highly susceptible to erosion following surface disturbance.

Past land use practices, grazing, and the construction of earth-filled dams in the 1950s, have in some areas reduced vegetative cover and exposed soils to sheet and gully erosion. There are approximately 50 miles of terracing. A 1998 inventory found 44 dams of potential safety concern. To slow gully erosion along

Lower Twin Rocks Road, 10 check dams and rip rap were built in September 1990.

An Order 3 Soil Survey of the Monument was completed by the Soil Conservation Service in 1986.

9. PALEONTOLOGICAL RESOURCES

The two primary fossil resources in the park are permineralized tree stumps and carbonized plants and insects found in the paper-thin shales of the Florissant Formation. Less common fossil resources include mammals, birds, fish, and mollusks. These resources are threatened by vandalism, illegal collection, and natural erosion.

Articles in the "Rocky Mountain News" as early as 1867 and 1869 describe a profusion of fossil stumps and logs in the Florissant valley. However, most of the horizontal petrified wood and logs were carted away before the area was made a national monument in 1969. Today, 10 fossil stumps of an extinct species of redwood (Sequoia affinis) are visible along the Petrified Forest Loop trail. These are fenced to prevent visitors from peeling pieces off the sides. Visitor damage and excessive erosion led to the reburial of smaller hardwood stumps along the trail in the 1980s. No more than 15 stumps remain exposed in the rest of the Monument. Open exposure of the large stumps continues to result in long-term weathering and exfoliation due to repetitive freeze-thaw cycles during much of the year. The planned construction of temporary shelters to cover two or three of the stump sites will begin to retard this decay process, but more permanent structures are needed.

It is likely that there are other unexposed stumps. Two university groups have used electrical conductivity to try to locate them. Although this method is limited by its sensitivity to a depth of 3 meters, anomalies have been recorded and apparently indicate the presence of buried stumps. A more complete survey needs to be conducted.

Individual sections exposing the fossil rich shale beds are generally no more than about 25-30 feet in thickness. There are two fossiliferous zones near the top of the shales which contain abundant insect and plant fossils. The rest of the shales are fossiliferous, but not to the extent of these two zones. In 1983, Dr.Ralph Root (NPS) described five sections of the lake shales. In 1992, Dr. Emmett Evanoff and others (University of Colorado) described eleven sections. The remaining shale outcrops need to be located and described with respect to these already measured sections, with attention to the presence of the fossil rich zones. Dr. Kate Gregory (University of Arizona) has correlated exposures up to one mile apart on the basis of

distinctive lithologic units, but this may not be possible over the entire lake basin. Additional studies are needed to attempt such correlations.

During the summer of 1992, Emmett Evanoff and others (University of Colorado Museum) initiated work that resulted in a progress report on the stratigraphy and paleontology of the monument. This work produced: 1) a detailed 1:10,000 scale geologic map of the monument; 2) a detailed topographic map showing the position of stumps in the Petrified Forest area; 3) measurements of eleven stratigraphic sections and definitions of five lithostratigraphic units ("members") within the Florissant Formation; 4) a preliminary magnetic susceptibility study; and 5) records of two new fossil vertebrate localities, increasing the number of known fossil mammal species from three to five.

The Florissant Formation was recently radiometrically dated using the Argon/Argon method. Dates of 34.1 ma and 34.2 Ma came from the "caprock" (unit Tf3) and overlying pumice beds associated with the lake shales of unit Tf4. These dates provide a good age assessment for the flora and fauna, although additional dates lower in the stratigraphic section would be useful. Newly recovered fossil mammals (Evanoff, 1992) indicate a Chadronian age, confirming placement of the Florissant Formation within the late Eocene epoch, near the transition between the Eocene and Oligocene.

The fossil plant parts were described in 1953 by H. D. MacGinitie in his monograph "Fossil Plants of the Florissant Lake Beds". This is an excellent reference, but the taxonomy and climatic interpretations need revision. The fossil insects have not been summarized in a single monograph, although many taxa have been dealt with in numerous publications by Scudder (between 1876 and 1900), Cockerell (between 1906 and 1941), and Wickham (between 1908 and 1917). A comprehensive taxonomic review and revision of the fossil insect fauna is needed. Fossil ostracods (freshwater crustaceans), gastropods (snails), bivalves (clams), and diatoms also occur in the lake shales but have not been studied. Research on these organisms would further our knowledge of the paleoecology and chemistry within the ancient lake environment.

Allan Hascall of the University of Michigan described 2 pollen sections from the lake shales, and additional work by three different researchers is in progress. Because pollen is widely dispersed, these data represent the regional vegetation, whereas the less transportable leaf fossils represent the local vegetation.

During the late summer of 1994, a large portion of a mammoth molar was collected from Pleistocene gravel deposits, providing the first documented evidence of a fossil mammoth within the

Monument. Further excavation in 1996 revealed only a jaw fragment, dated at more than 42,000 years old. This find is significant in that it is one of the oldest and highest elevation records for mammoths in North America. Deposits of Pleistocene gravel are extensive within the Monument and need to be closely monitored for fossil occurrences during any future construction activity.

Renewed excavations of sites within the Florissant Formation were undertaken in 1995-99 as a means of expanding the monument's paleontological collections. This has begun to provide a better data base for inventory of the paleontological resources as well as stimulate future research by providing a source of stratigraphically well documented collections, since many of the earlier collections lack adequate locality data.

The boundaries of the Monument were drawn to preserve as many of the significant fossil shale outcrops as possible. Illegal excavation frequently occurs along hiking trails and one of the Monument roads. Staff is insufficient to provide the required monitoring of these sites. There is no employee housing or after hours patrols to act as a deterrent. Photo documentation has begun to assess the extent of damage.

During the summer of 1992, a program to inventory and monitor fossil sites within the monument was initiated. Nearly 50 exposures of the Florissant Formation were located and mapped on topographic maps and aerial photographs. Each of these exposures were ranked according to fossil richness and vulnerability to vandalism. A monitoring schedule has been implemented for each exposure according to its ranking. The sites were located with the GPS, and loaded into a GIS data layer.

A literature and collection survey of non-NPS repositories was completed in 1999. A search of major libraries and museum collections for material on the park's paleontological resources was completed and copies of relevant articles need to be added to the Monument library. A search of archival materials and museum locality records produced valuable information on early researchers, type specimens, and locations of early collecting sites.

Numerous fossils and associated information were collected prior to the designation of the national monument, and are located in several museums and universities, worldwide. The collection survey has enabled the paleontologist to compile a database of information on these collections to facilitate research efforts. Photographic documentation of type and voucher specimens was collected and added to this database.

10. OTHER RESOURCES

Rights-of-Way and Easements

The rights-of-way for the 5.5 miles of county roads traversing the Monument were retained by Teller County. These roads are maintained by the Teller County Road Department.

There are two buried water pipelines serving Colorado Springs. One is the Homestake Municipal Waterline traversing the Monument from west to east within a 66 ft. right-of-way. The second line is the Blue River Pipeline that crosses the northeast corner of the monument. A corridor within rights-of-way is maintained by the city for patrol and maintenance.

There are four right-of-way permits for buried telephone cables within the Monument. Three of the permits are for fiber optic transmission cables and one is for a local exchange.

There is an overhead powerline maintained by Intermountain Rural Electric Association along Teller County Road #1.

Within Tract 01-108, a reservation for use and occupancy (Nelson) for noncommercial and residential purposes, expired at the end of its term of 25 years from September 26, 1970, to September 17, 1995. One residence and a number of outbuildings were associated with the reservation. The residence was found eligible for inclusion on the National Register of Historic Places in 1995. In 1996, an environmental assessment was prepared for disposition of these structures and for legal establishment of the location of a reserved right-of-way for an access road, 33 ft. in width, to provide access to land owned by the Nelson family contiguous to the Monument's southwest boundary. As a result, a ROD and FONSI was issued for allowing the Nelsons to retain ownership of and move the residence structure to their adjacent land, and to locate the right-of-way over their existing access road.

There is an easement consisting of a 60 ft. right-of-way through Tract 01-105 (Section 25). This right-of-way along an existing route west of Teller County #1, must be guaranteed for residential and ranching purposes (Snare).

During the purchase of Tract 01-103, a 50 ft. right-of-way across the southerly part of the tract in Sections 25 and 30, east of Teller County Road #1, was reserved by the seller (Maytag).

As decided during the judgement of stipulation in the purchase of Tract 01-102, an easement for ingress and egress is guaranteed across S1/2, NW1/4 of section 11, Township 13 South, Range 71 West. This easement is in the northwest section of the park

(Singer).

There is also an ingress and egress reservation from tracts 01-106 and 01-107 to and from the NE1/4, SE1/4 of Section 22. This reservation is for a 25 ft. access road right-of-way (Sanborn).

Also reserved is a right-of-way in the southwest corner across the E1/2, SW1/4, Section 26 in Tract 01-109 (Sanborn).

Reserved in a judgement of stipulation in the purchase of Tract 01-121, an easement 60 ft. wide along an existing jeep trail, or a route to be determined by the NPS to lands west of the Monument boundary. This access is only for residential and ranching purposes (Sanborn).

The Existing Land Ownership and Use Map, compiled by the Midwest Region in 1967, is provided in the Appendix as a reference to these land tracts.

CULTURAL RESOURCES BASELINE INFORMATION

The status of cultural resources is summarized in the Appendices under "Cultural Resources Documentation Checklist" and "Summary Charts for Cultural Resources". Significance, condition, and types of impacts are summarized in the narrative below.

CULTURAL CONTEXT/THEME

A cultural context is the framework for evaluating the significance of resources as related to ethnographic, historic or prehistoric themes; a particular geographic area; and a specific time period. The contexts identified for the Monument correspond to themes in the Revision of the National Park Service's Thematic Framework, June, 1994. This listing should be reviewed by a cultural resource specialist. The property types associated with each cultural context does not attempt a complete listing of individual park resources.

Cultural Context #6: Expanding Science and Technology:

Topic: Scientific Thought and Theory
Topic: Technological Applications
The evolving geologic story of the Florissant Fossil Beds also tells of changes in the science of paleontology; new technologies and approaches allow us to develop more encompassing theories to interpret the events leading to fossilization, the ancient geography, and paleoenvironment.
Property: Collection of paleontological objects

Cultural Context #2: Creating Social Institutions and Movements:

Topic: Recreational Activities
The history of fossil collection in the Florissant Valley represents a development in the public's interest in fossils and fossil collection leading to the popularization of the science of paleontology.
Property: Collection of paleontological objects; and cultural landscape.

Cultural Context #7: Transforming the Environment:

Topic: Conservation
The long history of exploitation of the fossils of Florissant and the awakening interest in the environment and activism resulted in a preservation movement in 1969 that led to the creation of the National Monument.
Property: Collection of paleontological objects; and cultural landscape.

Topic: Altering the Landscape
Historic fossil quarries, homesteading, ranching, and soil

conservation projects have resulted in extensive altering of the natural landscape.
Property: Cultural landscape; and NRHP structure.

Cultural Context #1: Peopling Places:
Topics: Migration; Encounter, Conflict and Colonization
The Florissant Valley has a varied record of different peoples utilizing the valley for subsistence, as evidenced by lithic sites, culturally scarred trees, a historic homestead, and traces of agricultural activities. These sites represent the changing cultures that have occupied the valley.
Property: Ethnographic resources to be determined through research and consultation; recorded archeological sites and collection of archeological objects; cultural landscapes; and NRHP structure.

Topic: Family and the Life Cycle
The story of Adeline Hornbek represents a profound change in the role of women in American society. The Homestead Act enabled them, as head of a household, to own property, thus becoming an equal force in the American economy.
Property: NRHP structure.

Cultural Context #5: Developing the American Economy
Topic: Workers and Work Culture
Homestead Act and the implications for women
The Hornbek Homestead represents the implications of the Homestead Act in allowing women to own property and to become a viable force in the American economy.
Property: NRHP structure.

CONDITION OF CULTURAL RESOURCES

1. Sites

Definition: Sites are distinguishable pieces of ground; or areas upon which occurred some historic or prehistoric event; or which are significantly associated with historic or prehistoric events, persons, or cultures; or which were subjected to sustained human activity.

In 1974, a reconnaissance level archeological survey was completed by Olson and Rowland, Denver University. Over 80% of the Monument was surveyed at 10 foot intervals, with special attention to drainages, ridge tops, and rock outcrops. Twenty-one archaeological sites were identified and recorded. In 1975, Olson and Bridge excavated two sites, and found little subsurface artifactual material. Based on this testing, none of the known

sites were deemed eligible for inclusion on the National Register of Historic Places (NRHP.)

The archeological resources are representative of sites found in the foothills and lower intermountain areas of the Colorado front range. Known sites are most frequently located in open terraces above drainages with a good aspect or view of the valley; and appear to represent locations used seasonally by the prehistoric inhabitants (Olson and Rowland, 1974).

2. Structures

Definition: Structures are works of humans, consciously constructed to serve some form of human activity. Structures are usually immovable by nature or design.

There are six structures on the Monument's List of Classified Structures (LCS.) The LCS was updated in 1993. One of these structures, the Hornbek House (part of the Hornbek Homestead) was entered on the National Register on December 8, 1981. The remaining five structures on the LCS were determined not eligible for inclusion on the NHRP. These include: 1) the Hornbek Root Cellar - management category B; 2) the Maytag Bunkhouse (moved to the Hornbek site in 1976) - management category C; 3) the Maytag Ranch (red) barn - management category C. Two other structures on the original LCS have been demolished.

Major stabilization and restoration of the Hornbek house began in the mid 1970's. Cyclic and annual preservation maintenance projects on the two story log structure, built in 1878, are completed under direction of the Chief of Maintenance. The exterior envelope and structural condition is considered in very good condition. The interior of the home includes deteriorating remnants of original surface materials such as wallcoverings and flooring. Documentation and recommendations for treatment or conservation of the interior needs to be developed. Lack of physical security and environmental controls limit the potential for refurnishing the homestead. Other than hand-held fire extinguishers, the building has no fire protection. Physical security of the building is limited to padlocks on exterior doors. The exterior doors and thresholds are severly damaged from vandalism and age, and need to be replaced to improve the security and weatherproofing of the building. The first floor of the home is open for daily interpretive tours during the summer, and may receive up to 200 visitors daily.

3. Cultural Landscapes

Definition: A geographical area, including both cultural and natural resources and the wildlife... that has been influenced by or reflects human activity...

The Hornbek Homestead has been identified as a potentially eligible cultural landscape (RMR, 11/93.) The Hornbek home, the remaining original structure from the 1879 homestead, is listed on the NRHP. An assessment of the landscape associated with this structure was not addressed when the National Register nomination was approved in 1981. The Hornbek homestead was the first to be filed in the Florissant valley and the entire 160 acres are located within Monument boundaries. Research and documentation of the agricultural use and location of remaining physical features is needed.

Excavations of fossils, for scientific study and private collections, have occurred in the area since the early 1870s. A number of these quarry sites were used repeatedly by universities and researchers, and are associated with a significant body of research. The excavation of petrified tree stumps and promotion of these resources as tourist attractions is documented back to the 1920s, but may have occurred as early as the 1880s. The in-situ location of paleontological resources such as the petrified stumps, and desire to continue excavations from historic fossil quarry sites may complicate evaluation of these cultural landscape features. These sites are also subject to illegal collecting activities.

Evidence of heavy agricultural use of the Florissant valley remains in the form of structures, such as barns and windmills, and earthworks, such as soil terraces and dams. In 1993, the structures and associated landscapes were evaluated for NRHP listing and found to be ineligible.

4. Objects (Museum Collections)

Definition: Objects are material things possessing functional, aesthetic, cultural, symbolic, and/or scientific value. An object is usually moveable by nature or design.

The Monument has a collection of 3494 objects. The collection includes the following categories:

1179	biological objects
567	archaeological objects
468	historical objects
712	archival objects
538	paleontological objects
30	geologic objects

Present storage for archival items is in a fireproof, locked safe-file. The majority of archeological objects (118) are stored at the Midwest Archeological Center, Lincoln, Nebraska until appropriate space is available in the Monument. The

remaining objects, mostly paleontological and geological items, along with the archives, are stored in metal museum cabinets in a locked concrete basement under stable climatic conditions. Public access to this building is controlled, but there is no electronic security or fire suppression. The historical collection is stored in an area that has no specific controls for temperature, humidity, light, infestation or fire. Historical objects are subject to detoriation from these conditions. Conservation treatment of historical objects need to be assessed in a Collection Condition Survey. Many of the historic objects have questionable relevance and little significance to Monument resources. The Scope of Collection statement should be revised to provide better guidance on future museum accquisitions.

The Monument has a collection of approximately 500 paleontological objects. Due to the paper-thin nature of the Florissant lake shale these fossils are generally very fragile and easily damaged from handling. They may also fade from exposure to light. Storage conditions have been developed to minimize these threats. It was past practice to coat the fossils with a preservative. Many of these treatments have yellowed and cracked, and destroyed the research value of the specimens.

The significance of the Monument's fossil collection was enhanced with the acquisition of the "Princeton" insect collection from F. Martin Brown in 1993. While there are large collections of Florissant fossils in several major museums and universities, the NPS collection should be enlarged. Expanding the current collection would stimulate and facilitate research, a major goal and one of the purposes for establishing the Monument. The objects generated by an active research and excavation program will have implications on storage and cataloging.

There is a cataloging backlog of approximately 227 paleontological items obtained during excavations in the Florissant formation by Herb Meyer in 1995, and during Kathryn Gregory's research in 1994. A backlog of an estimated 250 archival items is being held by the Midwest Archeological Center in relation to archological artifacts. Cataloging of other items is current at present.

5. Ethnographic Resources

Definition: Ethnographic resources, in this context, are park resources that have traditional subsistence, sacred ceremonial or religious, residential, or other cultural meaning for members of contemporary park-associated ethnic groups, including Native Americans.

No survey of ethnographic resources at Florissant Fossil Beds has occurred. This RMP proposes one. The existence of

archaeological and historic sites within the Monument indicates that such resources exist. Isolated findings of seven culturally scarred trees have been identified, and are most likely affiliated with the historic occupation of the area by the Utes; though the Ute tribe has not been consulted about these trees. A more complete survey of the Monument and consultation with ethnic communities, including Native Americans, is needed to identify ethnographic resources.

Three of the scarred trees were surveyed in 1990 by Archeologist Betty LeFree (NPS) and age data obtained from the University of Colorado at Colorado Springs. Generally ponderosa pine, the trees age from 181 to 265 years. Cores taken from the peeled sections date the scars at 79 to 119 years before present. In 1992, an annual monitoring program was established. The program includes a sketch, photo, and data sheet for each specimen. Threats such as disease, insect and animal damage, build up of understory vegetation (fire) and increased human presence (presence of litter or social trails) are identified. The monitoring plan lacks long-term management recommendations. Locations need to be added to the GIS data base.

III. RESOURCE MANAGEMENT PROGRAM

OVERVIEW OF CURRENT PROGRAM AND NEEDS

Ecosystem Management

Resource management at Florissant Fossil Beds National Monument has long been an interdisciplinary and cooperative program. While most of the past efforts have focused on resource protection activities, recent additions to the park staff and changes to the organizational structure have strengthened the professionalism in managing resources. With a current total of 11 FTE at the Monument, managing natural and cultural resources will continue to be an interdisciplinary and interdivisional program.

This tradition of cooperation and integration places the Monument in a good position to adopt an ecosystem-based approach. A strategy which addresses the myriad of issues, threats, and problems facing the Monument in a future which does not promise increased staffing or budgets needs to be developed. Ecosystem management is a developing concept which has potential to improve our resource management capabilities.

Two slightly different definitions of ecosystem management may improve understanding of the future direction of resource management at Florissant Fossil Beds.

> Ecosystem management is a collaborative approach to natural and cultural resource management that integrates scientific knowledge of ecological relationships with resource stewardship practices for the goal of sustainable ecological, cultural, and socioeconomic systems. (Ecosystem Management in the National Park Service, September 1994.)
>
> Ecosystem management integrates scientific knowledge of ecological relationships within a complex sociopolitical and values framework toward the general goal of protecting native ecosystem integrity and cultural integrity over the long term (R. Edward Grumbine, "What is Ecosystem Management", 1994; and Thomas Wiley, "Working Notes", 1994.)

Despite these broad-ranging definitions, the challenge remains to create a meaningful program. Resource problems and issues affecting Florissant Fossil Beds do not remain contained within the Monument boundaries. An ecosystem approach will demand flexible management. Greater emphasis will be placed on working cooperatively with others, and on partnerships that take action on issues affecting park resources whether they originate inside or outside park boundaries.

Discussions on ecosystem management in the Pikes Peak region have begun with the Pike and San Isabel National Forest (USFS) and Canon City District of the Bureau of Land Management. The Monument has existing cooperative agreements with the USFS and BLM, and worked with these agencies on interpretive programs, planning for a national scenic by-way, wildlife studies, and a national conference on fossil resources held in Colorado Springs in the fall of 1994.

The 5998 acres of Florissant Fossil Beds does not encompass an intact ecosystem. This was not the intent of establishing the Monument in 1969. However, the Monument may contain resources that become more significant when evaluated on a different scale.

Research and planning to manage the natural and cultural landscape preserved by the Monument is needed. Forest health has been proposed as one of the values to maintain. Critical ecological processes that maintain the natural diversity of this landscape need to be identified. The effect of management activities (or lack of action) that support natural processes and preserve cultural features need to be evaluated. What is meant by the terms of sustainable landscapes and landscape patterns need to be defined for the Monument. The role of wildland fire in this natural scene is currently unknown. Project statements on the need to conduct research on vegetation and soils, a Wildland Fire Plan, and Landscape Management Plan are listed respetively in the document under FLFO-N-30,-60,-80. Cultural landscape planning should be integrated with natural landscape plans and are discussed in project statement FLFO-C-40.

The role and impact of wildlife populations, rather than focus on single species management, within this landscape will also be a critical area to study. Baseline data and species inventories are needed. Residential subdivision of the rural agricultural land that surrounds the Monument is occurring throughout the county. Fragmentation of wildlife habitat is only one of the by-products of this development. As this trend continues and the effects accumulate, it will become more important to work with the various affected parties on ways to maintain a healthy environment and quality of life.

MAJOR ISSUES

Paleontological Resources

The protection of the paleontological resources for which the Monument was established is the primary focus of management activities at FLFO. The goal of the current program is to prevent the loss or permanent deterioration of these resources; to provide for their display or curation; promote research opportunities; and provide scientifically accurate interpretation of their origin and significance.

The paleo resource monitoring program, started in 1992, will be refined under direction of the Paleontologist and resource management division. This inventory of fossil sites and their ranking according to significance and vulnerability to vandalism needs to be kept current as new localities are discovered. The monitoring schedule, that was suggested according to ranking, needs to be followed. Documentation of problems and illegal activities should be improved, and possible mitigative actions explored.

Many paleontological resources uncovered by earlier excavations are exposed to harsh weathering agents and may be destroyed by environmental factors in a relatively short period of time. Building shelters over the petrified stumps may provide only short term protection from harsh weather. The condition of the stumps and erosion rates will need to be monitored even after construction of shelters to determine if other mitigation measures need to be taken.

The human threat from illegal collecting is occurring in several areas of the Monument. Interpretive programs and material consistently emphasize the consequences of "casual" collecting on the resource, and for the visitor. Roving interpretive patrols have as one of their objectives the detection of these activities. The staff is alert for signs of illegal collecting, such as disturbed fossil-bearing shale outcrops, but seasonal staffing, limited uniformed patrols, and no on-site housing for a full-time protection presence hinders this effort.

Renewed excavation of the Florissant Formation was begun in 1995. This activity will expand the scope of existing collections and provide a better database for taxonomic inventory of paleontological resources. This activity will also provide specimens for exhibit and educational use. The primary reasons for an active collection program are to stimulate and facilitate research, one of the main purposes for establishing the Monument. Such research and excavations will provide a more complete

assessment of taxonomic and morphological diversity; provide a source of specimens with adequate locality and stratigraphic documentation; and correct collecting biases that may otherwise distort paleoenvironmental interpretations.

in 1974, approximately 20% of the Monument, should be evaluated for potential to yield information important to understanding of past human use of the region and previously surveyed areas inventoried more intensively.

Ethnographic Resources

Isolated examples of seven culturally scarred trees point to the need for a more thorough survey of the Monument for ethnographic resources. These resources are most likely affiliated with the historic occupation of the area by the Ute tribe; although no formal consultation with the tribe has occurred. The current program calls for an ethnographic overview and assessment to be prepared which will identify those resources and ethnic groups, and needs for further study.

In 1992, a mapping and monitoring program was initiated to annually check the condition of the scarred trees. Short-term actions to improve this program include: determining geo-referenced coordinates for addition to the GIS data base; and expanding the existing monitoring program as new examples of trees are discovered. Most significantly, consultation with interested groups needs to take place to develop a long-term strategy for managing these living natural/cultural resources.

Aesthetic Values

With the adoption of the Zoning Resolution by the Board of Teller County Commissioners in 1973, the county designated a National Monument Protective Zone (NP Zone.) The intent of this zone is to prevent encroachment on the Monument, to protect the views from and to the Monument, and to create a visually pleasant environment.

The NP Zone was originally proposed as a blanket zone 200 yards around the border of the Monument and 400 yards along roads entering the Monument. When finally adopted, the zone, as it applies to roads entering the Monument, was reduced to a distance of 1/4 mile and to a depth of 200 yards on either side of the road right-of-way.

While the NP Zone provides substantial protection for the scenic resources along the roads entering the Monument, it does not protect the Monument's resources from impacts caused by incompatible development adjacent to the boundary.

The proliferation of boundary developments has the potential to impact the Monument's resources. Natural elk migration routes are being blocked or altered. Substantial cutting of trees or altering of natural landforms for homesites may impact scenic views from within the Monument. Likewise, construction materials and the siting of homes may have the same adverse impacts.

Adverse impacts to the scenic and other resource values may also occur from development by utility companies. These impacts may also occur with the placement of water, power, telephone and other utility rights-of-way within the Monument or immediately adjacent to the boundary.

The concern for these values extends beyond Monument boundaries in protection of regional resources along the Gold-Belt Backcountry Scenic Byway. This national by-way is administered by the Canon City District of the Bureau of Land Management in partnership with several public and private entities.

Mitigation of these impacts ranges from expressing the above concerns to the local landowners, developers, community organizations, and the county, to application of formal county guidelines, not to prohibit development, but to guide the development in a way that is compatible with the Teller County Growth Management Plan and the visual qualities associated with the natural landscape in western Teller County.

PROGRAM MANAGEMENT

CAPABILITIES AND DEFICIENCIES

Current resource management activities include: interpretive efforts to encourage appreciation and understanding of the resources; law enforcement activities aimed at resource protection; inventorying and monitoring of paleontological resources; recording wildlife observations; curation of museum collections; and maintenance and preservation of historic structures.

Deficiencies include insufficient staffing, budget, and support infrastructure to ensure the protection of these resources through preservation activities, and completion of baseline resource studies.

The critical shortage of office space and minimum equipment for a functional resource management program was highlighted with the addition of a paleontologist position in 1994. While cramped office space was eventually created, base funding for discretionary program development is still lacking. In 1989, preliminary designs for a new headquarters and visitor center were developed. In addition to interpretive exhibits and auditorium (both lacking in the existing visitor center,) the building would include park offices, museum, curatorial storage, and fossil preparation laboratory. The support this would give to all aspects of park operations is obivious. Construction of this facility has not been funded.

The Monument has current cooperative agreements for structural and wildland fire suppression with Four Mile Emergency Services, Inc.; Teller County Sheriff; Colorado State Forest Service; and Pike and San Isabel National Forests. Cooperative agreements also exist with the Canon City District of the Bureau of Land Management for management of the Gold Belt Tour, a Colorado Backcountry Scenic Byway, and a variety of interpretive and paleontological resource projects. A cooperative agreement with Teller County Sheriff to improve law enforcement response and resolve jurisdictional questions is being pursued.

Staffing

A subject-to-furlough GS-11 paleontologist/curator, is responsible for paleontological resource management and museum curation. This position is under direct supervision of the Superintendent.

The Chief of Interpretation and Resource Management (GS-0025) directs the activities of resource management, interpretation, and law enforcement, and devotes approximately 25% time to

resource management duties. This is woefully inadequate to address the suite of natural resources issues present in the Monument, and a Resource Management Specialist position is badly needed to elevate the program to a professional level.

The Chief of Maintenance (GS-1640) handles environmental and historic compliance issues and historic structures preservation. A maintenance worker (WG-4749) devotes about 10% time to historic preservation, and water quality duties. Resource management activities are also completed by seasonal visitor service, maintenance and volunteer staff. A GIS position at Curecanti National Recreation Area devotes 25% of their time to activities at the Monument. The Fire Management Officer for the Monument is based at Rocky Mountain National Park.
Other staffing deficiencies, with implications for resource management activities, include: an environmental education coordinator; a maintenance position for historic preservation; and additional resource protection staff (either as an interpretive or resource management positions.)

Budget

The Programming Sheets, Tables 1 and 2, and current organizational chart summarize the current program and needs.

An additional 1.8 FTEs, at a cost of $87,000.00, will be responsible for implementing the RMP. Additional funding and FTE have been identified through the R-Map process. The top priority is to obtain funding and FTE for a Natural Resource Management Specialist (GS-401 or 408.) This is proposed increase is critical to implementing the RMP. With professional staffing, management will work proactively to address resource issues and attain stature for a research program with scientific and academic institutions. If not funded, management decisions will be based on reacting to threats, while resource conditions continue to deteriorate.

NATURAL RESOURCE PROJECT STATEMENTS

FLFO-N-010 Survey/Inventory/Monitor Paleontological Resources
FLFO-N-011 Resource Stabilization Plan
FLFO-N-012 Literature and Collections Survey

FLFO-N-020 Geographic Information System (GIS)
FLFO-N-021 Baseline Inventory and Long-Term Monitoring Plan

FLFO-N-030 Vegetation and Soils Management Plan
FLFO-N-031 Inventory and Monitor Threatened and Endangered Species

FLFO-N-040 Wildlife Management Plan
FLFO-N-041 Conduct Elk Research Program
FLFO-N-042 Small Mammal Study

FLFO-N-050 Integrated Pest Management Plan (IPM)

FLFO-N-060 Wildland Fire Management Plan

FLFO-N-070 Water Resources Management Plan

FLFO-N-080 Landscape Management Plan
FLFO-N-081 Monitor Dam Removal/Rehabilitation Project

FLFO-N-090 Monitor External/Boundary Issues
FLFO-N-091 Boundary Management
FLFO-N-092 Trail Management Plan

FLFO-N-100 Monitor Air Quality

CULTURAL RESOURCE PROJECT STATEMENTS

FLFO-C-010 Revise List of Classified Structures
FLFO-C-011 Maintenance/Preservation of Historic Structures

FLFO-C-020 Develop Ethnographic Overview/Assessment
FLFO-C-021 Survey and Monitor Culturally Scarred Trees

FLFO-C-030 Administrative History of Monument

FLFO-C-040 Cultural Landscape Report

FLFO-C-050 Revise Museum Collections Management
FLFO-C-051 Update Scope of Collections Statement

FLFO-C-060 Conduct a Visitor Use Survey

FLFO-C-070 Update Archeological Survey

Active Filter: (No filter)

Output Selections:
Sorted by: Resource Type + Project Number
Years: All years
Show subtotal after change in Resource Type
Show grand total

PRIORITY	PROJECT NUMBER	PROJECT TITLE	SUB-TITLE	FUNDED	UNFUNDED	PROP YEAR	LAST UPDATE
2	FLFO-C-011.000	MAINTENANCE/PRESERVATION OF HISTORIC STRUCTURES		66.00	87.80	1992	02/23/99
2	FLFO-C-011.001	CONSERVE AND INTERPRET HISTORIC WALL COVERINGS		0.00	41.00	1997	02/27/98
999	FLFO-C-011.002	PRESERVE HORNBEK HOMESTEAD DOORS AND WINDOWS		15.00	0.00	1998	02/23/99
1	FLFO-C-014.000	RESTORE HORNBEK ROOT CELLAR		6.50	0.00	1995	02/27/98
7	FLFO-C-020.000	ETHNOGRAPHIC OVERVIEW AND ASSESSMENT		0.00	10.00	1994	04/11/96
9	FLFO-C-021.000	SURVEY AND MONITOR CULTURALLY SCARRED TREES		1.60	7.00	1992	02/23/99
10	FLFO-C-030.000	ADMINISTRATIVE HISTORY OF THE MONUMENT		1.00	30.60	1992	02/25/99
8	FLFO-C-040.000	CULTURAL LANDSCAPE INVENTORY		0.00	20.00	1994	04/11/96
6	FLFO-C-050.000	IMPROVE MUSEUM COLLECTIONS MANAGEMENT		10.00	35.00	1994	02/23/99
3	FLFO-C-060.000	CONDUCT A VISITOR USE SURVEY		0.00	15.00	1994	03/02/97
11	FLFO-C-070.000	UPDATE ARCHEOLOGICAL SURVEY		0.04	30.00	1994	02/25/99
5	FLFO-C-080.000	FIRE/SECURITY PROTECTION FOR STRUCTURES/COLLECT		0.00	84.00	1997	02/23/99
Resource Type Sub-total----------				100.14	360.40		
3	FLFO-N-010.000	SURVEY/INVENTORY/MONITOR PALEONTOLOGICAL RESOUR		100.00	102.50	1992	02/23/99
999	FLFO-N-011.000	RESOURCE STABILIZATION PLAN		77.50	405.00	1992	02/27/98
1	FLFO-N-012.000	LITERATURE AND COLLECTIONS SURVEY		88.50	10.00	1992	02/23/99
4	FLFO-N-012.001	LITERATURE AND COLLECTIONS SURVEY	BUILD DATABASE	22.00	15.00	1997	08/31/98
999	FLFO-N-013.000	UPDATE FOSSIL INSECT AND PLANT TAXONOMY		0.00	36.00	1998	02/23/99
2	FLFO-N-014.000	EXCAVATE/CURATE FLORISSANT FORMATION FOSSILS		39.80	9.00	1997	02/23/99
10	FLFO-N-020.000	GEOGRAPHIC INFORMATION SYSTEM (GIS)		11.00	32.00	1992	02/23/99
999	FLFO-N-021.000	BASELINE INVENTORY		0.00	75.00	1994	03/02/97
999	FLFO-N-030.000	VEGETATION AND SOILS MANAGEMENT PLAN		1.00	25.00	1994	02/27/98
999	FLFO-N-031.000	INVENTORY AND MONITOR T & E SPECIES		0.00	33.00	1994	04/20/95
999	FLFO-N-032.000	SURVEY AND MONITOR FOREST HEALTH		0.00	16.00	1994	04/11/96
999	FLFO-N-040.000	WILDLIFE MANAGEMENT PLAN		0.00	27.00	1994	03/02/97
999	FLFO-N-041.000	CONDUCT ELK RESEARCH		2.40	67.00	1994	02/23/99
999	FLFO-N-042.000	SMALL MAMMAL STUDY		0.00	46.00	1994	04/11/96
999	FLFO-N-050.000	INTEGRATED PEST MANAGEMENT PLAN (IPM)		0.00	50.00	1994	03/02/97
6	FLFO-N-051.000	EXOTIC PLANT MANAGEMENT		20.54	12.00	1997	02/25/99
5	FLFO-N-060.000	WILDLAND FIRE MANAGEMENT PLAN		7.00	33.00	1994	02/25/99
999	FLFO-N-070.000	WATER RESOURCES MANAGEMENT PLAN		0.00	28.00	1994	03/02/97
7	FLFO-N-071.000	IMPLEMENT WATER QUALITY MONITORING PROGRAM		7.50	9.00	1995	02/23/99
999	FLFO-N-080.000	LANDSCAPE MANAGEMENT PLAN		0.00	100.00	1992	04/20/95
9	FLFO-N-081.000	MONITOR DAM REMOVAL/ REHABILITATION PROJECT		4.20	36.00	1994	02/25/99
11	FLFO-N-082.000	LANDSCAPE MITIGATION-NELSON PROPERTY		2.00	46.00	1995	02/27/98
8	FLFO-N-090.000	EXTERNAL/BOUNDARY ISSUES		0.50	21.00	1992	02/23/99
999	FLFO-N-091.000	BOUNDARY MANAGEMENT		50.00	72.00	1992	04/21/95
999	FLFO-N-092.000	TRAIL MANAGEMENT PLAN		38.00	28.00	1992	02/27/98
999	FLFO-N-100.000	MONITOR AIR QUALITY		0.00	13.00	1994	04/20/95
Resource Type Sub-total----------				471.94	1346.50		
Grand Total==========				572.08	1706.90		

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