

D-17

NATURAL RESOURCES MANAGEMENT PLAN

AND

ENVIRONMENTAL ASSESSMENT

Florissant Fossil Beds National Monument

Recommended by Roger L. Martin Date _____
Superintendent

Approved by James B. Thompson 8/2/83 Date _____
Regional Director

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INTRODUCTION

Florissant Fossil Beds National Monument was established by Public Law 91-60 (83 Stat. 101) 91st Congress, August 20, 1969. The stated purpose is "...to preserve and interpret for the benefit and enjoyment of present and future generations the excellent preserved insect and leaf fossils and related geologic sites and objects at the Florissant lakebeds...." Although protection is in itself of prime importance, it is of little value if the public cannot benefit directly from it. Therefore, interpretation of the site has become the primary visitor-related program for the National Park Service.

The 5,992 acre monument preserves a major portion of the prehistoric Florissant lakebeds containing the most extensive fossil record of Oligocene Epoch insects and leaves in the world as well as some of the largest petrified metasequoia stumps.

The monument lies within the eastern slope of the Rocky Mountains at elevations ranging between 8,200 feet and 8,800 feet. It is located in Teller County, 35 miles west of Colorado Springs. The Florissant Basin lies in the Montane Life Zone characterized by Ponderosa pine and aspen forest interspersed with mountain meadows.

Protection and interpretation of the lakebed, and preservation of the natural setting have been, and will continue to be, the purpose of the Service's management of Florissant Fossil Beds National Monument. The major strategies for Monument Management are presented in the General Management Plan (GMP), September 1982, and the Statement for Management, January 1977. This Resource Management Plan is a planning document that is an extension of GMP. This Plan represents the first Resource Management Plan for the Monument, and includes a set of project statements which identifies needed management actions, monitoring actions, as well as research actions.

Management constraints and on-going research serve as guidelines for projects. The Plan will serve the Superintendent in two ways: 1. as a manual for management activities which will preserve paleontological and geological resources and restore natural ecosystems, and 2. as a set of research projects and priorities that are designed to obtain additional information for management and interpretation and to provide continuity in management and a ready source of information to in-coming employees.

The Resource Management Plan provides the framework for assessing, developing, and implementing pertinent elements of the Statement for Management. Resource management goals will be oriented toward allowing natural processes to operate while providing for visitor enjoyment of the resources without undue adverse impact.

The Resource Management Plan is a flexible document; the proposals and priorities are intended as guides. It is recognized that these guides will be reviewed and adjusted periodically to meet the requirements of changing conditions, as projects are completed, and as research provides new insights and uncovers previously undetected problems.

This plan addresses those natural resource related objectives stated in the draft Environmental Assessment for the General Management Plan. The resource management objectives of the Monument are to:

1. Manage the area with emphasis upon preservation and interpretation of the paleontological and geological resources.
2. Phase out grazing and nonemployee residential uses.
3. Restore natural forest and grassland communities.
4. Restore the land to eliminate effects of past unnatural erosion and other human-influenced surface disturbance.
5. Acquire sufficient base data to support preservation, enhancement, interpretation, and management of park resources.

OVERVIEW AND NEEDS

The highest resource priority is to expand basic knowledge of the fossil resources of the monument. This has important repercussions in terms of the management of the area and in terms of the quality of information that is given to the visiting public. Basic questions must be answered. These include: quantity and significance of remaining fossil material; locations of previously collected material; and quantity, location and significance of the petrified stumps. The research will require field work involving excavation, surveying, and collecting and analyzing samples as well as considerable library research.

The second priority is to protect petrified stumps which have been exposed by past excavations. A survey of the rate of deterioration and alternative ways to properly protect the stumps is needed. Protection alternatives may include building shelters, draining ground water applying plastic resin, or other innovative practices.

The monument has severe gulley erosion and sheet erosion problems. Soil derived from Pike's Peak Granite are highly erodible. Past grazing practices have reduced vegetative cover and exposed soils to erosion.

Elk and deer use the monument for winter forage. There is a risk that populations could exceed carrying capacity. Yearly cycles of Richardson's Ground Squirrels are very noticeable and could carry plague vectors. A complete faunal inventory needs to be done to identify rare and endangered plant and animal species.

Numerous developments surrounding the monument may affect surface and subsurface water quality within the monument. Stock dams left over from cattle grazing are gradually deteriorating. This could affect waterfowl populations and soil erosion.

Livestock grazing has been phased out but not much is known about the effect this will have on vegetational changes and the resulting changes in wildlife utilization.

As a Class II Air Shed steps must be taken to prevent deterioration of air quality.

Cooperation with the national Weather Service will likely continue for the benefit of monument visitors.

SCHEDULE OF ACCOMPLISHMENTS

PROTECTION OF FOSSIL RESOURCES

FY 84 - Start survey of remaining fossil material, location of remaining stumps, location of remaining fossil materials, location and significance of the historical quarry sites.

Funding/staffing required (beyond normal funding limits)
Research services (1 year) and miscellaneous support costs

\$ 8,500

FY 85 - Continue Survey

Research services (1 year) and miscellaneous support costs

\$ 9,000

FY 86, 87, 88 - Continue survey

\$ 9,500
10,000
10,500

Total \$ 38,500

MONITOR AND PRESERVE FOSSIL STUMPS

FY 84 - Initiate a comprehensive survey to locate and map buried fossil stumps. Determine best method of revealing and preserving the stumps. Identifying stumps to species.

Funding/staffing required (beyond normal funding limits)
Research services (1 year)

\$ 4,300

FY 85, 86

Continue research and support services

\$ 4,700
5,000

Total \$ 14,000

PROJECT STATEMENTS BY PRIORITY

1. Fossil Resources Management - FLFO-N-002
2. Soil and Vegetation Management - FLFO-N-005
3. Wildlife Management - FLFO-N-008
4. Wildland Fire Management - FLFO-N-006
5. Water Resources Management - FLFO-N-004
6. Livestock Grazing Management - FLFO-N-007
7. Air Resources Management - FLFO-N-001
8. Weather Management - FLFO-N-003

PROJECTS STATEMENT SECTION

FLFO-N-001 AIR RESOURCES MANAGEMENT

1. Statement of Problem

Florissant Fossil Beds National Monument has been designated as a Class II federal air quality area (CAA, Section 162[b]). The air quality to date has been considered to be excellent. Vistas such as Pike's Peak, 25 miles to the southeast have been relatively unimpaired. The Sangre de Cristo Range, 80 miles to the south, and the Saguache Range, 50 miles to the west, occasionally appear hazy. Energy development on the Western Slope in Colorado and housing developments adjacent to the park may cause future degradation in the air quality. An increase in housing developments, and the subsequent increase in the use of wood-burning stoves and automobiles could result in a higher concentration of particulates, CO, and NO_x. Air quality in the monument does not seem to have been affected by mining operations which have been developed to date, such as the Texas Gulf Mill in Cripple Creek, 20 miles to the south. Two coal-fired power plants located in Colorado Springs do not seem to affect this area since prevailing winds blow away from the monument.

At present, there is no documentation of air quality at the monument, nor has there been any study done on acid precipitation. Unpaved roads through the park, with high amounts of traffic, create dusty conditions which affects the visibility and could affect visitor enjoyment as well as result in a decrease in visitor safety. The dust affects the aesthetic qualities of the area, especially around the Visitor Center. There is no knowledge as to whether acid precipitation could affect the exposed fossil-bearing shales and petrified tree stumps.

2. Alternative Actions and Probable Impact

A. No Action - This is our action at the present time and because of this, we have no criteria on which to base air quality trends. With this action, it is uncertain whether the resource is being protected.

B. Determine the feasibility of establishing a monitoring program - Find out what other agencies are doing in the area and coordinate efforts. Under this alternative it is possible that the monument's air quality could be protected or resource impacts mitigated through the use of information obtained by other agencies.

C. Develop and implement an air quality monitoring program - If demonstrated to be feasible and desirable then obtain baseline data on air quality of the area in terms of visibility, particulate matter, and acid rain. This data base should be the minimum to determine trends in the area. This alternative would help protect the quality of the scenic vistas and would provide an early warning system so impacts could be mitigated.

D. Determine if fossil materials would be affected by acid rain - This alternative would allow management to take protective measures in advance should acid rain become a problem in the future.

3. Recommended Course of Action

It is recommended that alternative B and D be implemented and alternative C may be implemented depending on the results of alternative B.

4. Summary of Actions:

A. Management Action

FLFO-N-001-01 - Coordinate with other agencies in vicinity of the monument to determine if findings would apply and meet our needs.

B. Research Action

FLFO-N-001-02 - Determine if fossil materials would be affected by acid rain.

C. Monitoring Action

FLFO-N-001-03 - Monitor air quality under standards prescribed by the National Park Service Division of Air Quality, if feasibility study indicates need.

FLFO-N-002 FOSSIL RESOURCES MANAGEMENT

1. Statement of Problem

The Florissant Fossil Beds form one of the most extensive fossil record of its type in the world. Impressions of flies, beetles, ants, butterflies, spiders, fish, two mammals and birds, and innumerable insects that lived here 34 to 35 million years ago are almost perfectly preserved. Fossil leaves from birches, willows, maples, beeches, and hickories, and needles from pine and giant sequoia trees are abundant. There are even plants which may indicate that a warmer subtropical climate once prevailed here.

Though the fossil impressions can be seen only in displays at the visitor center, giant petrified tree stumps which were excavated prior to the establishment of the monument can be viewed by visitors touring the area.

The fossils of the Florissant lakebed were described by Dr. A.C. Peale of the U.S. Geological Survey in 1874. Since then, scientists from around the world have dug into the shales and have removed over 80,000 specimens, identifying more than 1,100 species of insects, including almost all the fossil butterflies of the New World, over 140 plant species, and several species of fish, birds, and small mammals.

The fossils at Florissant can be divided into two groups: (1) the large Sequoia stumps preserved by silicate inundation, and (2) the delicate carbonaceous impressions of leaves and insects. The ancient Sequoias formed a forest which bordered the old drainage of the Florissant Valley. Stumps are preserved in much of the Florissant lakebed formation within the monument. The leaf and insect fossils are preserved in quantity only within a relatively thin member of the lakebed formation.

Both large and small fossils are susceptible to deterioration when exposed to air. A number of the petrified stumps up to 41 feet in circumference were unearthed for interpretive purposes prior to the establishment of the monument. The unearthing exposed the stumps to the harsh climatic conditions causing substantial deterioration. The stumps are but moderately silicified, and moisture migrating through the porous cell structures results in spalling of the exterior after repeated freezing and thawing. At the present time, the rate of deterioration is unknown. It is assumed that temperature and moisture are responsible for the stumps' deterioration. Little is known about protecting such artifacts in situ. Continued exposure of the petrified stumps to the elements will result in their eventual disintegration by natural processes. At the present time, the monument staff is developing a pictorial record of the amount of disintegration taking place on an annual basis.

In 1980 a geologic survey was conducted to cover those areas of development identified in the general development plan in order to

protect the natural resources, maximize interpretive potentials in selecting development sites and insure the success and function of all future developments.

In June of 1981, the geologic survey was expanded to include the drilling of test holes on those sites involved in each of the general development alternatives. The purpose of the test holes was to confirm the geologic and soil condition of specific sites in order to better assess the potential impacts associated with each general development alternative.

2. Alternative Actions and Probable Impact

A. No Program - This alternative could result in new developments being constructed over or causing damage to significant resources, management decisions being made which could damage paleontological resources, exposed petrified stumps continuing to deteriorate, and illegal fossil collecting.

B. No Action - The current management action would result in continued deterioration of the petrified stumps even though the rate of deterioration is being monitored using sequence photography; illegal fossil collecting will continue to some degree because staffing does not provide for continuous protection.

C. Expand Resource Data Base - An expansion of the paleontological resource inventory would prevent developments from being placed where base resources could be damaged and knowing the extent of subsurface petrified stumps would determine how critical it is to protect the existing exposed stumps.

D. Develop a comprehensive museum collection of area fossils - This action would help determine the significance of the various fossils and interpret the fossils for the park visitors.

E. Provide staffing to adequately protect the fossil beds - This action would prevent the resource from being removed and/or damaged.

F. Research means of protecting the exposed petrified stumps from the elements - This action would determine the most cost-effective means of preserving the exposed stumps.

G. Apply protection techniques to preserve stumps - This alternative would protect the stumps if it is determined that they should be protected and if it is feasible to do so.

3. Recommended Course of Action

It is recommended that alternatives C, D, E, and F be implemented and the monitoring portion of alternative B be continued. Alternative G would be implemented depending on the results of the research outlined in alternative F.

4. Summary of Actions

A. Management Actions - FLFO-N-002-01 Develop a comprehensive collection of area fossils.

FLFO-N-002-02 Provide patrols to prevent illegal removal of fossils.

B. Research Actions - FLFO-N-002-03 Inventory location and extent of significant paleontological resources.

FLFO-N-002-04 Develop techniques for protecting exposed petrified stumps.

C. Monitoring Action - FLFO-N-002-05 Continue photographic monitoring of rate of deterioration of exposed petrified stumps.

FLFO-N-003 WEATHER MONITORING1. Statement of Problem

The monument participates in a cooperative weather monitoring program with the National Weather Service. General weather information, temperature (maximum and minimum), and precipitation are the parameters recorded daily. These records are supplied to the National Weather Service for their data base. This data, plus fire weather information obtained from the U.S. Forest Service, is used for fire presuppression and suppression activities in the monument. The weather data is also used for visitor information. There is a need to maintain this activity.

2. Alternative Actions and Probable Impact

A. No Program - Discontinue weather monitoring program. The weather cooperators would not be able to obtain weather data and would be forced to obtain the information through other means. Local weather information would not be available to supplement the fire weather data risking mistakes in fire behavior prediction in suppression. The park visitors would not have access to local weather information, risking hypothermia and other discomfort.

B. No Action - Maintain present weather data collecting methods - This action would maintain cooperative efforts with other agencies. Local data would be available for fire suppression. Park visitors would have access to local weather information for their health and comfort.

3. Recommended Course of Action - Alternative B4. Summary of Actions

A. Management Action - FLFO-N-003-01 - Maintain cooperative program with National Weather Service.

B. Monitoring Action - FLFO-N-003-02 - Monitor weather in monument daily.

FLFO-N-004 WATER RESOURCES MANAGEMENT1. Statement of Problem

Subdivisions surround the monument. All have individual septic tanks and no sewer systems. All have individual wells within the aquifer. The monument contains only a portion of land within the watershed. The main land uses outside the monument are for residential dwellings and livestock. There is a potential for contamination of monument waters from outside sources.

There are an unknown number of registered wells in the monument. This registration gives the monument simple fee rights. There are two major park wells that provide water for human consumption. Well No. 1 is located adjacent to the Visitor Center. It is 165 feet deep and is capable of an estimated 4-6 gallons per minute and is held in a 50 gallon pressure tank and is treated by a chlorinator for use at the Visitor Center. It is monitored for bacterial content. Water quality is poor because of high amounts of trace minerals. This is presently being remedied by the installation of a series of filters and chlorination to make it potable for visitors.

Well No. 2 is located at residence No. 1 at the eastern edge of the park. This well is 160 feet deep and is capable of producing an estimated 1/2-1 gallon per minute. This water also has a high mineral content and is used for sanitation purposes only. Drinking water and water for culinary uses is hauled.

Other wells, abandoned, are known to occur in the monument; their number and location have not been determined. The quality and quantity of water from these wells is not known.

Two major perennial streams and an undetermined number of springs occur on the monument. The quality and quantity are unknown.

There are an unknown number of stock ponds on the monument which were used by past livestock operations. Several of these dams have produced large ponds which attract a variety of waterfowl and shore birds. Other dams have silted-in to the point that they do not collect water. There is a need to inventory, assess and monitor the water resources of the monument. There is a need to develop a Water Resources Management Plan for this area.

2. Alternative Actions and Probable Impact

A. No Program - Subsurface wells would not be monitored (as is presently being done) for bacterial content or treated. This would risk health problems to the visitors and park employees. There would be no knowledge of threats to these waters from local contamination so that impacts could be mitigated. The quality, location, and quantity of other monument wells and surface waters would remain unknown. Threats to these resources from monument and local use would not be detected or

mitigated. The stock ponds will eventually fill in, and form wet meadows. This will result in some loss of waterfowl and shorebird habitat. There would be no plan to systematically assess and manage the area's water resources.

B. Maintain present actions and expand monument water resources program as funds become available - Monitor wells for bacteriological contamination and treat the water to insure that the health and safety of the park visitor and staff is maintained. Let stock ponds deteriorate through natural processes and serve as check-dams for gully erosion. Inventory quality and quantity of surface water to obtain baseline data. Locate and map all abandoned wells. Develop a Water Resources Management Plan.

This alternative should provide for sound management of the park's water resources. Impacts to the water resources should be detected and identified for protection and mitigation. Visitor and employee health would be protected.

3. Recommended Course of Action Alternative B

4. Summary of Actions

A. Resource Management Actions

FLFO-N-004-01 - Maintain treatment of well water in monument.

FLFO-N-004-02 - Develop a Water Resources Management Plan for the area.

B. Monitoring Actions

FLFO-N-004-03 - Monitor well water used for administrative purposes for bacteriological contamination.

FLFO-N-004-04 - Monitor selected surface and subsurface quality and quantity to detect damages to water resources.

C. Research Actions

FLFO-N-004-05 - Conduct an inventory of monument waters and their legal status and determine their quality and quantity for baseline data.

FLFO-N-005 SOIL AND VEGETATION MANAGEMENT

1. Statement of Problem

The vegetation of Florissant Fossil Beds National Monument consists of dense forest stands on the hilltops and steeper slopes, with grasses, shrubs and cactus predominately in the open meadows. Meadows occupy most of the area which falls within the limits of the Florissant prehistoric lakebeds.

Plant communities vary from highly disturbed to relatively undisturbed. Historic disturbances include logging, fire suppression, grazing, crop cultivation, and commercial excavation of fossils. Heavy cattle grazing in the late 1800's and early 1900's reduced the plant cover and created sheet and gully erosion. Many of the sites disturbed by agriculture are healing through natural processes. However, there are some sites which need direct restoration such as gullies, roads, old development sites, borrow pits, and waterline right-of-ways. A 200-foot wide waterline which crosses the monument from east to west has been seeded with nonnative species.

Extensive logging has created a large number of stumps in the vicinity of monument roads. The stumps detract from the natural scene.

A plant species inventory is on-going; however, no vegetation or soils maps have been developed. None of the plant species found thus far in the monument are classified as threatened or endangered. However, some monument species are included in the Denver Botanical Gardens conservation list. These include Shooting-Star (Dodecatheon pulchellum), Mariposa Lily (Calochortus gunnisonii) and Ball Cactus (Corphantha vivipara), also found here is the Colorado Columbine (Aquilegia coerula) which is protected by State Law.

Periodic outbreaks of mountain pine beetle (Dendroctonus ponderosae) occur within the monument and on adjacent lands. Populations are generally endemic and there is always the potential for epidemics. The U.S. Forest Service monitors bark beetle populations and damage. No control programs have been conducted.

Dwarf mistletoe, a native parasite which impacts ponderosa pine, is prevalent in several pine stands within the monument. No control programs have been conducted.

2. Alternative Actions and Probable Impact

A. No Program - Natural processes will eventually restore the vegetative communities and heal most of the erosion scars. There will be some areas of past heavy erosion which may take centuries to heal. Nonnative species of vegetation will remain and may spread to new areas, displacing native plants. Stumps will persist for many years.

Endangered plant species may be present and may be threatened by our management actions (or lack thereof).

B. No Action - Maintain the status quo. Maintain the on-going plant identification program. Stumps will continue to persist. Endangered plants may or may not be identified and protected. Mountain pine beetle epidemics could occur unexpectedly. Erosion scars will continue to be corrected as possible.

C. Conduct a comprehensive survey of vegetation and soils, including a vegetation/soils map and threatened and endangered plant species inventory - This action would help protect occurring threatened and endangered species, identify exotics, and provide information for improving the management of all park resources.

D. Develop and implement a plan to restore natural land forms and vegetation - This plan would identify past damages needing accelerated rehabilitation and how the projects would be conducted (the reintroduction of fire to the ecosystem is covered in FLFO-N-006).

E. Investigate means of accelerating decomposition of stumps remaining from past logging - If it proves feasible to inoculate stumps with rapid decomposers, the process of decomposition could be accelerated thus eliminating the offensive stumps from the natural scene.

F. Monitor dwarf mistletoe and mountain pine beetle activity - Management can cooperate better with adjacent land owners if we understand population trends. The monitoring should be conducted jointly with the Colorado State Forest Service and the U.S. Forest Service.

3. Recommended Course of Action

It is recommended that alternatives C, D, E, and F be implemented.

4. Summary of Actions

A. Management Actions

FLFO-N-005-01 - Develop and implement a land rehabilitation plan.

FLFO-N-005-02 - Investigate feasibility of inoculating stumps.

B. Monitoring Actions

FLFO-N-005-03 - Conduct vegetation/soils survey and monitor long-term trends.

FLFO-N-005-04 - Monitor dwarf mistletoe and mountain pine beetle activity.

FLFO-N-006 WILDLAND FIRE MANAGEMENT1. Statement of Problem

Historically, fire was an important force in maintaining the monument's grassland and forest ecosystems. The introduction of heavy livestock grazing in the late 1800's reduced the herbaceous layer to the point where ground fires could not be sustained. The reduction in herbaceous cover stimulated the invasion of trees and shrubs into the grassland communities. Logging throughout the area opened up forest stands, but stimulated the establishment of dense stands of forest reproduction which has increased the fire hazard. Concurrently, wildland fire control initiated in the early 1900's has contributed to the maintenance of unnatural, dense stands of trees, large amounts of dead fuel on the forest floor, and the encroachment of the forest community onto the grasslands.

Since the establishment of the monument, grazing has been phased out. There has been an increase in herbaceous fuels. The density of this fuel layer will increase in the future as succession and restoration occur. The monument staff has been suppressing all fires since the monument came into being in 1969. However, with the increasing fuel loads, there is a serious risk of a catastrophic fire in the area regardless of fire suppression. There is a need to restore the vegetative communities in the park and to reduce unnatural, high-risk fuels.

2. Alternative Actions and Probable Impact

A. No Program - This alternative would eliminate fire suppression and a natural fire regime would eventually be reestablished in the area. The forest invasion of grasslands would be halted and forest stands would be thinned and established in a more open condition. There would also be a reduction in fuels. The risk of large catastrophic fires would be increased because of the elevated fuel loadings in the area, and this would endanger human life and property in and adjacent to the monument. It would also damage the soil/vegetative resources.

B. No Action - The current program alternative calls for suppression of all fires in the monument. The increase in herbaceous ground cover through natural processes and the presence of a high fuel loading within the forested areas creates a situation where the risk of a catastrophic fire is increasing. This risk will eventually endanger life and property within and outside the monument, and catastrophic fires will probably cause long-term damage to soil/vegetative resources.

C. Conduct research to determine natural fire history and fuel loads - This action would enable the development of a comprehensive fire management plan which would apply prescribed burning as a substitute for natural fire. Findings of similar studies in the vicinity of the monument could be applied if available and appropriate.

D. Develop and implement a fire management plan - This action would restore fire as a natural component of the monument ecosystem by substituting prescribed burning for natural fire. Suppression actions would continue because it is highly unlikely that prescribed natural fire could be allowed due to the relatively small acreage of the monument. The proper application of prescribed fire would restore a quasi-natural ecosystem and prevent the catastrophic fire and its attendant damage.

3. Recommended Course of Action

It is recommended that alternative C be implemented, alternative B be continued in the interim, and alternative D be initiated upon completion of alternative C.

4. Summary of Actions

A. Management Action

FLFO-N-006-01 - Continue full fire suppression program.

B. Research Action

FLFO-N-006-02 - Determine fire history (natural frequency) and fuel loadings.

FLFO-N-007 LIVESTOCK GRAZING MANAGEMENT1. Statement of Problem

As mandated by legislation, grazing is being phased out. The last lease will terminate in 1984. The long-term park policy is to prohibit any livestock trespassing and allow native vegetation to become reestablished. The monument boundary is completely fenced.

2. Alternatives and Probable Impacts

A. No Program - Phase out of grazing would continue. No fence maintenance and no patrols would result in deteriorating boundary fences and increasing trespass livestock. Impacts on resources would become increasingly severe.

B. No Action - The current management action is to phase out grazing in the park and to remove the internal fences. The external boundary fence will be maintained at current levels to prevent livestock trespassing and regular patrols of the fence will be maintained. Trespass livestock will be removed from the area when discovered. This program will adequately protect the monument's vegetative resources.

3. Recommended Course of Action

It is recommended that alternative B be implemented.

4. Summary of Actions

A. Management Actions - FLFO-N-007-01 - Remove internal fencing.

FLFO-N-007-02 - Maintain boundary fence and patrol for trespass livestock.

FLFO-N-008 WILDLIFE MANAGEMENT1. Statement of Problem

Large wildlife species commonly found in the area are deer, antelope, elk, and an occasional black bear. Mountain lions are also typical within the general region. These animals usually migrate to lower elevations for the winter although elk sometimes remain in the monument. Small animals include bobcats, gophers, coyotes, beaver, porcupines, badgers, weasels, chipmunks, squirrels, cottontail rabbits, prairie dogs, bats, mice, and possibly over 100 species of birds including golden eagles inhabit the area. There are also numerous insect and butterfly species.

Deer, elk, and antelope are found seasonally. During the winter there is a partial movement of elk from the Pikes Peak area toward the monument. Hunting pressure coupled with severe weather is responsible for some of the migration behavior of this species. Deer migrate to lower elevation during severe winters, however, a number of elk remain in the monument. Rare or endangered species present within the monument are the bald eagle and the American peregrine falcon. These species have been sighted in the park as a summer visitor only. There is no record of confirmed nesting sites for either of these species within the monument.

The monument is a winter home to an elk herd of approximately 100 animals. The elimination of grazing and removal of interior fencing has created a more favorable winter habitat which is creating an increase in population. It is anticipated that the population will increase above carrying capacity this potentially damaging the range and becoming a nuisance factor to adjacent landowners. Little is known of the impact on vegetation, or of population dynamics, distribution, and migration patterns of the herd. The monument staff is cooperating with the Colorado Division of Wildlife Resources to access this situation.

One pair of golden eagles has been observed in the area since 1976. It is not known whether these birds are nesting in the monument, or what effect, if any, increased development and visitor use will have on them.

There is evidence of extensive porcupine feeding on mature ponderosa pine. Regeneration of ponderosa pine is severely affected in some areas of the monument. This may be the result of favorable porcupine habitat being created by fire suppression and logging. There is a need to develop an understanding of the phenomenon to determine if management action is needed.

Populations of Richardson's ground squirrel occur in and adjacent to the monument. Visitor use areas and developed areas have populations which have the potential for harboring bubonic plague carrying fleas. The monument maintains a cooperative plague monitoring program with Teller County. A ground squirrel control program was initiated in visitor use

areas in past years. A flea control program is now being used in lieu of the ground squirrel control program in visitor use areas and developed areas. "Sevin" is dusted in ground squirrel burrows to kill fleas and as a precautionary measure to prevent bubonic plague from becoming a problem.

Bald eagles and peregrine falcons have been observed in the monument vicinity. A nesting pair of goshawks has also been observed. There may be other mammals and birds living within the monument that are but not known to the park staff. No faunal inventories have been conducted at the monument.

2. Alternatives and Probable Impact

A. No Program - Changes in elk populations are occurring, however, it will not be known if unnatural populations are reached and what damages could result. Whether golden eagles are nesting in the monument or if park operations are affecting the eagles will not be determined. The effects and degree of porcupine feeding on ponderosa pine and dynamics and trends will not be determined which could adversely affect the ecosystem. Bubonic plague could become an unacceptable health hazard if not monitored and prevented. Management actions may adversely affect unknown endangered species and other wildlife if species and numbers are undetermined.

B. No Action - Impacts of the status quo alternative would be the same as alternative A, except dusting of ground squirrel burrows would continue and the cooperative testing programs for bubonic plague would continue which would prevent bubonic plague from becoming a health risk. Maintain cooperation with Colorado State Division of Wildlife area elk management program.

C. Survey elk plant community relationships, monitor elk population dynamics and vegetation utilization, determine food habits, seasonal distribution, and migrational patterns - This information should provide the basis to develop management strategies to effectively manage the elk herd in relationship to the other resources.

D. Survey the monument for golden eagle nesting - Obtain an assessment of the area as potential golden eagle nesting habitat. This information will serve as the basis for future management action on this species.

E. Conduct research on porcupine/vegetation dynamics and monitor porcupine utilization of ponderosa pine - This action would enable management to determine if corrective action is necessary to bring the ecosystem into a more natural balance.

F. Conduct a comprehensive survey of fauna, including a threatened and endangered species inventory - This action would help protect threatened and endangered species, identify nonnative species which should be removed or controlled, and provide information for improving management of wildlife.

3. Recommended Course of Action

It is recommended that alternatives C, D, E, and F, and the testing and dusting of ground squirrel portions of alternative B be implemented.

4. Summary of Actions

A. Management Actions - FLFO-N-008-01 - Maintain cooperative elk management program with State of Colorado.

FLFO-N-008-02 - Maintain cooperative bubonic plague testing program with Teller County.

FLFO-N-008-03 - Continue dusting of ground squirrel burrows.

B. Monitoring Actions - FLFO-N-008-04 - Monitor elk population and vegetation utilization.

FLFO-N-008-05 - Monitor porcupine utilization of ponderosa pine.

C. Research Actions - FLFO-N-008-06 - Conduct study of elk/ lant community relationships, determine food habits, seasonal distribution and migration patterns.

FLFO-N-008-07 - Survey golden eagle nesting sites and assess for nesting site potential.

FLFO-N-008-08 - Research porcupine/vegetation dynamics.

FLFO-N-008-09 - Conduct comprehensive survey of fauna, including a threatened and endangered species inventory.

ENVIRONMENTAL ASSESSMENT

SUMMARY

There are eight projects listed in this plan. Most involve gathering information that will be the basis for any management decisions. The top priorities represent something of a management dilemma since we are charged with protecting a resource, making it available to the public, and yet that very resource, the petrified stumps, is deteriorating within view of the visiting public.

There is much that needs to be known about the fossils themselves. Most are scattered in various museums. The significance of these fossils is buried either in the literature (in some cases inaccurate) or in museum storage cases. Questions will undoubtedly arise whether continued excavation of remaining fossil areas is feasible or desired.

Phaseout of grazing will result in changes in the soil and vegetation resources of the park. These changes could have drastic effects on the visitor experience to the park. Plant communities could change, rare and endangered species could be eliminated. What effects will fire prevention or prescribed burns have? Without good basic information sound management decisions are going to be extremely difficult to make.

RESOURCES PROGRAMMING SHEET

FILED PARK REGION STATE CO ☒ Natural ☐ Cultural DATE Page 1 of 1

Area Pri- ority	RMP Ref. No.	PROJECT TITLE	Action Type	YEAR 1		YEAR 2		YEAR 3		YEAR 4		YEAR 5	
				NPS M.Y.	Cost/ \$1000	NPS M.Y.	Cost/ \$1000	NPS M.Y.	Cost/ \$1000	NPS M.Y.	Cost/ \$1000	NPS M.Y.	Cost/ \$1000
1		Fossil Resources Management	P,O,R	1.0	17.8	1.0	18.7	1.0	20.0	.7	15.5	.7	11.0
2		Soil & Vegetation Management	P,O,R	.8	17.5	.4	14.5	.4	14.5	.2	1.2	.3	12.0
3		Wildlife Management	P,O,R	2.1	34.0	.6	10.5	.6	10.5	.6	10.5	.6	10.5
4		Wildland Fire Management	O,R	.3	4.3	.3	4.7	.3	5.0	.3	5.3	.3	5.6
5		Water Resources Management	O,R	.3	7.0	.2	1.0	.1	1.0	.1	1.0	.1	1.0
6		Livestock Grazing Management	P,R	.3	5.0	.1	1.0	.1	1.0	.1	1.0	.1	1.0
7		Air Resources Management	O	.1	1.0	.1	1.0	.1	1.0	.1	1.0	.1	1.0
8		Weather Management	O	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1

Action Type - P = Protection O = Monitoring R = Research

RESOURCE MANAGEMENT PLAN - ASSESSMENT MATRIX

PROJECT STATEMENT:	AIR RESOURCES MANAGEMENT	FLFO-N-001	
NEED FOR PROGRAM:	Designated Class II federal air quality area		
ALTERNATIVE ACTIONS	A. No Action	B. Establish Monitoring Program	C. Develop and Implement an Air Quality Monitoring Program
RESOURCE AFFECTED			
AIR	Unknown	Unknown	Protect scenic vistas and provide warning of deterioration
PETRIFIED TREE STUMPS	Unknown	Unknown	Unknown

RESOURCE MANAGEMENT PLAN - ASSESSMENT MATRIX

PROJECT STATEMENT:	AIR RESOURCES MANAGEMENT (CON'T)		
NEED FOR PROGRAM:	Designate Class II federal air quality area		
ALTERNATIVE ACTIONS	D. Determine if fossil materials are affected by acid rain		
RESOURCE AFFECTED			
FOSSIL MATERIALS	Unknown		

RESOURCE MANAGEMENT PLAN - ASSESSMENT MATRIX

PROJECT STATEMENT:	FOSSIL RESOURCES MANAGEMENT	FLFO-N-002	
NEED FOR PROGRAM:	Basic questions concerning the fossils and the petrified tree stumps affecting management and interpretation of these resources need to be answered.		
ALTERNATIVE ACTIONS	A. No Program Maintain status quo. The present action is to preserve and protect fossil resources as personnel and funds allow.	B. No Action Same as A	C. Alternative Expand Resource Data Base Additional surveys are needed to locate stumps yet unknown and to map fossiliferous shale
RESOURCE AFFECTED			
PETRIFIED TREE STUMPS	Stumps will continue to deteriorate, Adverse public comments will continue to accumulate.	Same as A	Stumps may be protected from adverse construction projects
FOSSILS/SHALE	Pilferage and digging will continue. Inaccurate information will be disseminated to visitors.	Same as A	Fossil bearing shales could be better protected from theft and adverse construction projects.

RESOURCE MANAGEMENT PLAN - ASSESSMENT MATRIX

PROJECT STATEMENT:	FOSSIL RESOURCES MANAGEMENT (CON'T)		
NEED FOR PROGRAM:	Basic questions concerning fossils and petrified tree stumps affecting management and interpretation of these resources need to be answered.		
ALTERNATIVE ACTIONS RESOURCE AFFECTED	D.	E.	F.
	Develop museum collection	Provide additional staffing	Research means of protecting exposed stumps
PETRIFIED TREE STUMPS	None	Prevent further damage and deterioration	Prolong useful life of petrified stumps view by public
FOSSILS/SHALE	Prime representative samples would be used to reference new samples and for display purposes.	Prevent further loss of fossils and damage of monument features.	

RESOURCE MANAGEMENT PLAN - ASSESSMENT MATRIX

PROJECT STATEMENT:	WEATHER MANAGEMENT	FLFO-N-003	
NEED FOR PROGRAM:	Monument cooperates with NWS		
ALTERNATIVE ACTIONS	A. No program Discontinue weather monitoring	B. No Action Maintain present weather data gathering	
RESOURCE AFFECTED			
PARK VISITOR	Risk hypothermia, discomfort warning hazards	Would have access to weather information	
FIRE MANAGEMENT PLAN	Monument would not be able to supplement fire weather information	Opposite of A	

RESOURCE MANAGEMENT PLAN - ASSESSMENT MATRIX

PROJECT STATEMENT:	WATER RESOURCES MANAGEMENT FLFO-N-004		
NEED FOR PROGRAM:	Surrounding developments could affect water quality in the monument.		
ALTERNATIVE ACTIONS	A. No program	B. Maintain status quo and expand water resources program as funds permit monitor for bacteria count	
RESOURCE AFFECTED			
SURFACE WATERS	Stock ponds will fill in loss of waterfowl habitat	Same as A	
SUBSURFACE WATERS	Possible health risks water quality could deteriorate or be contaminated	Visitor and employee health would be protected	

RESOURCE MANAGEMENT PLAN - ASSESSMENT MATRIX

PROJECT STATEMENT:	SOIL AND VEGETATION MANAGEMENT FLFO-N-005		
NEED FOR PROGRAM:	Historic and ongoing impacts have impacted resources and the visitor expense.		
ALTERNATIVE ACTIONS	A. No Program Natural processes will continue and eventually establish an "equilibrium."	B. No Action Maintain status quo Same as A	C. Alternative Conduct a comprehensive soil and vegetation survey
RESOURCE AFFECTED			
FOREST TREE STANDS	Will probably increase	Same as A	None
SOILS	Continued erosion	Same as A	Will indicate problem areas and measure needed to prevent further deterioration
GRASSLANDS	Grasses will change composition and grassland areas will diminish in size	Same as A	Should improve the quality of the grasslands
RARE AND ENDANGERED PLANTS	Unknown	Unknown	Will indicate existing rare/endangered species and measures needed to protect them
AESTHETICS	Gradual improvement over time	Same	Same. However findings may result in accelerated rehabilitation program.

RESOURCE MANAGEMENT PLAN - ASSESSMENT MATRIX

PROJECT STATEMENT:	SOIL AND VEGETATION MANAGEMENT (CON'T)		
NEED FOR PROGRAM:	Problems		
ALTERNATIVE ACTIONS RESOURCE AFFECTED	D. Alternative Develop and implement a plan to restore natural land forms and vegetation	E. Alternative Investigate means of accelerating decomposition of stumps remaining from past logging	F. Alternative Monitor Dwarf Mistletoe and MPB
FOREST TREE STANDS	Stand density will decrease	Tree stumps will be removed	Little or no effect
SOILS	Erosion will be reduced	None	None
GRASSLANDS	Will be preserved; meadow encroachment will be stopped	Will have a visually continuous appearance	None
RARE AND ENDANGERED PLANTS	Will be protected	None	None

RESOURCE MANAGEMENT PLAN - ASSESSMENT MATRIX

PROJECT STATEMENT:	WILDLAND FIRE MANACEMENT FLFO-N-006		
NEED FOR PROGRAM:	Fire suppression has altered the ecosystem.		
ALTERNATIVE ACTIONS	A. No Program Eliminate fire suppression	B. No Action Maintain status quo - suppress all fires	C. Conduct Research to develop comprehensive fire management plan
RESOURCE AFFECTED			
VEGETATION	Natural fire regime will be reestablished. Reduce fuel loads. Risk of catastrophic fires, damage to life and property	Increase ground cover Increase fuel loading with greater risk of catastrophic fires endangering life and property	Improve ground cover and forage for native wildli species
WILDLIFE	Unknown	Unknown	Research should yield answers relating to habitat forwildli

RESOURCE MANAGEMENT PLAN - ASSESSMENT MATRIX

PROJECT STATEMENT:	WILDLAND FIRE MANAGEMENT (CON'T)		
NEED FOR PROGRAM:	FIRE SUPPRESSION HAS ALTERED THE ECOSYSTEM		
ALTERNATIVE ACTIONS	D. Develop and implement a a Fire Management Plan		
RESOURCE AFFECTED			
VEGETATION	Restore quasi-natural ecosystem		
WILDLIFE	Unknown. Will have to rely on more research		

RESOURCE MANAGEMENT PLAN - ASSESSMENT MATRIX

PROJECT STATEMENT:	LIVESTOCK GRAZING MANAGEMENT	FLFO-N-007	
NEED FOR PROGRAM:	Grazing is being phased out. Effects of this change are unknown.		
ALTERNATIVE ACTIONS	A. No program Grazing phase-out will continue	B. No Action Continue phase-out remove internal fencing	
RESOURCE AFFECTED			
VEGETATION	Unknown	Unknown	
WILDLIFE	Unknown	Unknown	

RESOURCE MANAGEMENT PLAN - ASSESSMENT MATRIX

PROJECT STATEMENT:	WILDLIFE MANAGEMENT FLFO-N-008		
NEED FOR PROGRAM:	Practically nothing is known about wildlife interrelationships within the monument ecosystem.		
ALTERNATIVE ACTIONS	A. No program	B. No Action Maintain status quo	C. Survey elk/plant community relationships
RESOURCE AFFECTED			
LARGE MAMMALS	Unknown	Same as A	Determine population dynamics, vegetation utilization, food habits, seasonal migration and distribution
PLANT COMMUNITIES	Unknown	Same as A	None
BIRDS	Unknown	Same as A	None
FAUNA AS A WHOLE	Unknown	Same as A	None
SMALL MAMMALS	Unknown. Potential outbreaks of plague may occur	Dusting program will continue but effectiveness is not known	None

RESOURCE MANAGEMENT PLAN - ASSESSMENT MATRIX

PROJECT STATEMENT:	WILDLIFE MANAGEMENT (CON'T)		
NEED FOR PROGRAM:			
ALTERNATIVE ACTIONS	D. Survey Bald Eagles	E. Porcupine Research	F. Survey fauna should identify threatened or endangered species
RESOURCE AFFECTED			
LARGE MAMMALS	Unknown	Unknown	Unknown
PLANT COMMUNITIES	Unknown	Unknown - will determine if management action is necessary	Unknown
BIRDS	Information about eagles may yield methods of protecting them or enhancing eagle habitat.	None	Unknown
FAUNA	Unknown	None	Unknown
SMALL MAMMALS	Unknown - may be affected by predator-prey relationship	Unknown	Unknown

EVALUATION OF CUMULATIVE IMPACTS OF PROPOSED ACTIONS

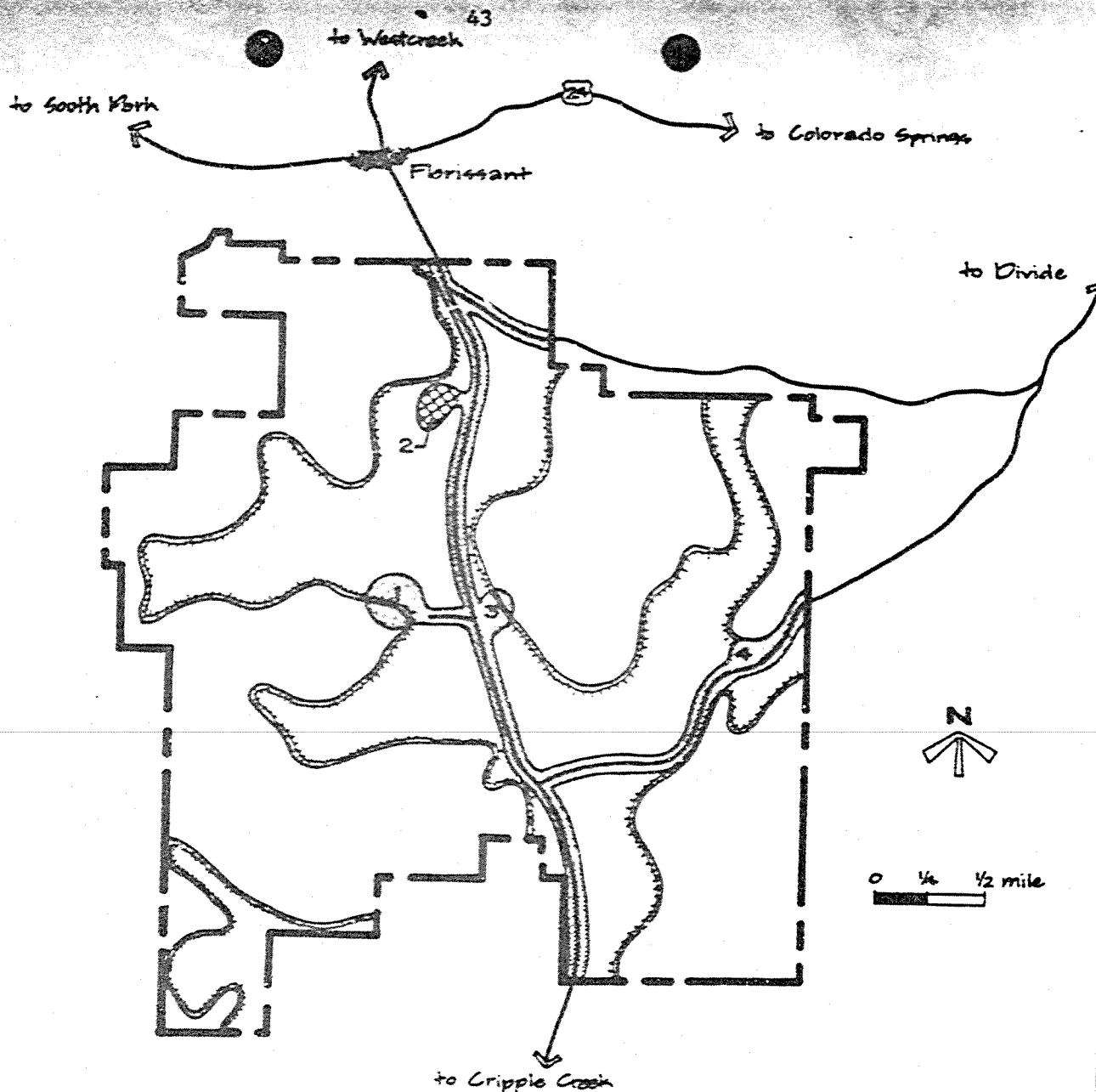
The proposed projects will have, with the exception of the fire management/prescribed burn program, minimal impact. Even the fire management plan will be directed toward maintaining a natural environment, much like it was before the manipulations by humans. The projects are primarily directed toward gathering information with any management initiatives to come at a later date.

AGENCIES AND INDIVIDUALS CONSULTED

Henry E. McCutchen, National Park Service, Rocky Mountain Region,
Denver, Colorado.

INFORMATION BASELINE LIST

1. Topography: A U.S.G.S. map of Florissant Fossil Beds, Lake George Quadrangle, Colorado. 7½ minute series.
N3852.5 - W10515/7.5
Scale: 1:24,000
Revised: 1975
Available at Park Headquarters
2. Geology: Geologic maps, research papers, study reports, and books are available at Park Headquarters.
3. Land Use and Ownership: Land status and boundary maps which denote status of lands within the boundaries are available at Park Headquarters.
4. Recreation, Development, and Support Facilities: Maps and schematic diagrams of these areas are available in the files at Park Headquarters.
5. Climate: Detailed weather information including rainfall, snowfall, and temperatures is available at Park Headquarters.



- | | |
|--|--|
| 1 Visitor center |  natural zone |
| 2 Hornbeck Homestead |  development zone |
| 3 utility barn |  historic zone |
| 4 N.P.S. residence | |
|  ancient lakebed line | |

Existing Land Management and Use

Florissant Fossil Beds National Monument

Colorado

United States Department of the Interior-National Park Service

171 | 80.016B
 NOV. '80 | R.M.R.

ON MICROFILM

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