UNITED STATES

DEPARTMENT OF THE INTERIOR

NATURAL RESOURCES MANAGEMENT HANDBOOK

NATIONAL PARK SERVICE

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INTRODUCTION

The accelerating rate of change in our society today poses a major challenge to the National Park Service and its evolving responsibilities for the management of the National Park System. The response to such changes calls for clarity of purpose, increasing knowledge, speedier action, and adaptability to changing needs and demands upon resources.

The fundamental philosophy of park management is that parks are preserved for people, for their continuing enjoyment, inspiration and education; parks are owned by the people, all of whom have equal rights to enjoy the resources; parks are needed by people, a belief basic to all others, and the progress and processes of modern civilization intensify this need.

Complementing the responsibility to provide for park use is the equally demanding responsibility of conserving park resources. As the marked increase in visitors develops new problems in providing services, the powerful environmental influences of modern society present complex problems to the resource manager - particularly in the natural areas.

Traditionally, in its stewardship of the natural resources of the National Park System, the Service has been guided by the philosophy of protection, a philosophy that plants and animals should have the opportunity to adapt to changing natural conditions as best they can.

In recent years it has become increasingly evident that park boundaries are not proof against the modern world of pesticides, of power and irrigation projects, of polluted air and water, or of science working its miracles. The dynamic forces of civilization cannot be locked out. The natural forces set in motion by every act of every animal and bacterium, by every inch added to the growth of plant or tree, affect the lives of all other creatures. The introduction of powerful new forces disturbs these ancient rhythms of life. Protection itself has in some cases interfered with natural processes, of which protection against fire is only one example.

Management of resources cannot be undertaken without a fund of knowledge which does not presently exist. In certain parks, or portions of parks, simple protection provides exactly what is needed. In others, it does not. The knowledge required to develop sound management programs, particularly for natural and historical resources, is dependent upon the breadth and depth of the Service's research program.

In looking back at the legislative enactments that have shaped the National Park System, it is clear that the Congress has included within the growing System three different categories of areas - natural, historical, and recreational.

It has been brought into sharp focus that a single, broad management concept encompassing these three categories of areas within the System is inadequate for their proper preservation or for realization of their full potential for public use as embodied in the expressions of congressional policy. Each of these categories requires a separate management concept and a separate set of management principles coordinated to form one organic management plan for the entire system.

Definitions

As used in this handbook, the following definitions shall apply:

Park (or Area) - The composite of all natural and cultural resources within an area and over which the National Park Service exercises management control and/or responsibility.

Resources - The inherent natural and cultural assets and characteristics of an area.

Natural Resources - The plant, animal, mineral, hydrological and earth forms singly and collectively as they compose the landscape.

Historical Resources - The historical and archeological structures and sites and scenes inherent in the area concerned. Natural resources of historical significance to the area will be included within the historical resource of the area concerned.

Definitions (con.)

Facilities - Man-made structures for the use of visitors or for the administration of the area.

Resources are inherent to the area itself while facilities are introduced structures for proper use and management of area resources and for administration of the area.

Application of Handbook

In view of the three management categories of areas, guidelines applicable to the management of resources in one category may or may not apply to similar resources of an area of a different management category. Therefore, this handbook has been prepared in four parts as follows:

Part I - All Areas
Part II - Natural Areas
Part III - Historical Areas
Part IV - Recreational Areas

Guidelines found in Part I are applicable in all three management categories, but Parts II, III, and IV apply only to the category as indicated.

It is the intent of this handbook to establish the guidelines for the management of the natural resources of an area but not to define the techniques of how such management will be carried out or accomplished. The techniques and methods of management and what needs to be done will necessarily vary from one area to another in order to accomplish the purpose of the area concerned.

THE CONCEPT OF MANAGEMENT

General

The purpose of the National Park Service is to "promote and regulate use" of the National Park System consistent with the purpose of the System which is

> "* * * to conserve the scenery and the natural and historical objects and the wildlife (the resources of the System) * * * and to provide for the enjoyment of the same (resources) in such manner and by such means as will leave them (the resources) unimpaired for future generations." (Act of August 25, 1916); (Parenthetical words added).

Accomplishment of this purpose is the mission of the Service. Thus, it can be seen the Service is charged to manage (conserve) resources for the nonconsumptive use and enjoyment by people and to do this in such a manner that resources are perpetuated unimpaired for all times. This mission is not a contradiction. In defining the purpose of the National Park System, the Congress presupposed the allocation of resources to the accommodation of visitors, but not at the expense of perpetuating resource values. The disturbance of any site for a visitor facility impairs the resource value of that site but it does not necessarily impair overall resources or resources within the vicinity of the facility. Impairment must be measured in terms of lasting damage to the resource concerned. Resource impairment also includes past and present management practices and their lasting effect. For example, indiscriminate forest fire control can have a permanent and devastating effect upon a forest recycled by natural fires. Resource impairment is the loss of resource values.

Many references can be found in the various acts relating to areas of the National Park System and to the National Park Service concerning the need to preserve and protect the wildlife, forests, mineral formations, historic objects, and curiosities. During the early years of the System and the Service, protection was indeed the most obvious and immediate need for conserving resources. Thus, for the most part, areas of the System became refuges where most things were afforded some measure of protection. "Protection," as

General (con.)

applied to area resources, became synonymous with management. Protection was management! Although some positive management practices have been applied to resources, there has been little major change in the overall approach to the management of resources within areas of the National Park System to the present.

Resource protection is one important management technique; however, it is not a substitute for management. The protection concept when applied to inanimate objects may be entirely appropriate if preservation of the thing itself is the objective. In this context, the resource in question might be an irreplaceable artifact. Biotic resources and certain natural phenomena are not static. They cannot be preserved as museum pieces through protection. Each living thing, plant or animal, including the giant sequoias, will eventually die, and all efforts to preserve them through protection of the individual specimen will be frustrated. Living resources (plants and animals); the Grand Canyon; the South Dakota Badlands; Old Faithful Geyser; Carlsbad Caverns; etc., are manifestations of dynamic natural processes. The objective of management is the perpetuation of these phenomena through maintenance of the processes that generated and sustained these manifestations of nature. Historically, protection has been applied to the manifestation (the thing itself), neglecting the processes which made the thing possible. It is recognized that manifestations must be protected from wanton destruction. However, it is far more important to preserve the forces that generate and sustain resources, than to attempt only to perpetuate the specimen itself. Management techniques will vary from the manipulation of complex process to the strictest protection - whichever fulfills the need. No single technique will suffice. In some situations, the only management required will be the protection of the processes from modification or external influence.

Resources Management Defined

In order to conserve the "scenery, the natural and the historic objects and the wildlife" (the resources of areas), it is essential that park management be resource-oriented and that resource-use be subordinated to the goal of resource perpetuation. This could well mean that resource-use, in some instances, may be

Resources Management Defined (con.)

deferred until such time that use can be properly regulated to safeguard the resource.

What, then, is park management?

The definition of park management developed by a committee at the First World Conference on National Parks (Seattle 1962) is paraphrased and adopted for application within the National Park Service.

> Management is any activity directed toward achieving or maintaining a given or desired resource condition in accordance with a documented plan formulated to accomplish the purpose for which the area was included within the National Park System.
>
> Management may involve active manipulation of ecological processes or the manifestations of those processes or the protection of either from modification or external influences.

This definition of management shall be applied to each area vis-a-vis the management category and the resources of the area concerned. Management within any area is an activity - a preconceived action based upon a meaningful plan for the conservation and use of the resources of that area. The objective of the plan and the management action is fulfillment of the area purpose. The management techniques to be applied are those necessary for perpetuation of the resources involved.

The Goal of Park Management

It is essential to know and to clearly state the purpose for which a given area of the National Park System was established. A management goal is then evolved, based upon the stated area purpose, guided by the mission of the National Park Service, and oriented to the resources to be managed. While there will be some similarities in the goals of management of various areas, the area management goal must be tailored precisely to fit the area concerned.

RESOURCES MANAGEMENT PLAN

General

Each superintendent will prepare a plan for the management for the natural resources of the area under his supervision. Limited geographic size or management category (natural, historical, or recreational) does not preclude the need for such a plan.

A resources management plan is a documented course of action for achieving or maintaining a given or desired resource condition in accordance with the purpose of the area concerned. Management may involve active manipulation of resources or their protection from modification or external influences.

In order to accomplish the purpose of any area and to fulfill the mission of the Service in that area, the course of action for the management of natural resources must be documented and implemented on the basis of the best available information. A resources management plan must provide continuity in reaching long-range objectives, and must include a program of action for reaching these objectives. The resources management plan should "flow" from the master plan, based on an ecological analysis of the natural resources and management objectives established for these resources. Accomplishment of the area purpose and reaching area objectives with regard to the resources and their use is the objective of the resources management plan.

Plan Format and Content

The form in which a resources management plan is prepared is considerably less important than the content; however, some degree of uniformity is desirable and advantageous. Usefulness of the plan as a guide in reaching management objectives is the prime criteria of its value. As experience is gained in plan preparation and implementation, the format should be revised to reflect current needs, new information, management techniques, research data and other factors. While the format of resources management plans may be similar, the content should apply only to the area for which the plan is prepared. The resources management plan will be prepared in outline form using complete sentences and with the indentation shown below:

Plan Format and Content (con.)

I. (Section)

A. (Subsection)

1.

a.

(1)

(a)

2, 3, 4, etc.

B, C, D, etc.

II, III, IV, etc.

The pages of each section and/or subsection should be numbered independently to facilitate revision without disturbing other sections and each page number should indicate its location in the plan. For example, page number II-B-10 would be the tenth page of subsection B in section II. The month and year (April 1968, for example) should appear in the lower right corner of each page. When a page is revised this date should reflect the month and year of the revision.

Graphics in the form of photographs, maps, charts, tables, etc. should be inserted in the plan as desirable to provide clarity; however, the plan should not be cluttered with such material. Supportive material, including additional graphics, should appear in the appendix.

The resources management plan will consist of five sections as follows, plus an appropriate introduction or preface:

I. AREA PURPOSE
(Why was the area included within the National Park System?)

Plan Format and Content (con.)

II. MANAGEMENT OBJECTIVES
(What is management trying to accomplish at this area?)

III. MANAGEMENT PROGRAM
(The action management proposes to carry out.)

IV. RESEARCH
(Identify research needs of the area for management of resources.)

V. APPENDIX
(Supporting information.)

The master plan for any area should contain an analysis of the resources, a statement of area purpose and a statement of objectives for the area. The statements of area purpose and objectives should be lifted from the master plans and restated for ready reference, as sections I and II. If the master plan does not contain an analysis of the resources, this should be done in accordance with current instructions in the "Park Planning Handbook" and submitted to the appropriate Service Center for approval and inclusion within the master plan.

I. AREA PURPOSE

(This section should answer the question, "Why was this area included within the National Park System?" The statement of area purpose as it appears in the master plan should be reviewed for compliance with current instructions in the "Park Planning Handbook." If the statement complies, it should be restated here as section I. If it does not comply, it should be revised to comply with current instructions and submitted to the appropriate Service Center, Office of Resource Planning for review and approval.)

II. MANAGEMENT OBJECTIVES

(The management objectives for natural resources of the area should appear in the master plan. The objectives as stated in the master plan should be reviewed for compliance with current instructions in the "Park Planning Handbook" and if they comply, they

Plan Format and Content (con.)

should be restated here as section II. If they do not comply, they should be revised to comply with current instructions and submitted to the appropriate Service Center, Office of Resource Planning, for review and approval. Refer to Chapter 2, Parts II, III, and IV for more specific instructions concerning the objectives of resources management in natural, historical, and recreational areas, respectively.)

III. MANAGEMENT PROGRAM

(This section of the resources management plan must set forth the basis upon which management will be carried out and the rationale of that basis. Management units must be identified and described and the basic management techniques indicated. Known problems within the management unit will be identified and, where possible, a corrective action will be indicated. Research in progress as needed will be listed in order of priority. Each management unit must have a specific management objective with regard to the resources and their area. Refer to Chapter 2, Parts II, III, and IV for specific instructions concerning the preparation of this section for natural, historical, and recreational areas, respectively.)

IV. RESEARCH

(Incorporate the research plan for the area at this point if such a plan has been prepared. Otherwise, list all RSP's for the area and other research needs in order of priority.)

V. APPENDIX

(Include material as desirable to support the plan as a whole. Include charts, graphs, tables, photographs, checklists, etc., but do not include extraneous matter to obtain impressive volume.)

Approval Procedure

The preparation of resources management plans is the responsibility of the superintendent who will sign the title page as "Submitted by." Each plan will be reviewed in the appropriate regional office for adequacy and completeness, and the regional director will sign the title page as "Recommended by." Each plan will be

Approval Procedure (con.)

reviewed in the Washington Office for compliance with Service objectives and will be approved by the director or other designated official.

WILDERNESS

General

The Wilderness Act (P. L. 88-577) recognizes the outstanding accomplishments of the National Park Service in the field of wilderness management and makes it clear that nothing in the Act is intended to lower the standards evolved for the use and preservation of any area of the National Park System. The Act also clearly specifies that the purposes of the Act are to be within and supplemental to the purposes for which units of the National Park System were established and are being administered. The half century of management experience by the National Park Service is not being replaced by criteria enunciated in the Wilderness Act.

Wilderness Defined

A wilderness is "an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain." A wilderness, then, is an uninhabited area where essentially natural conditions prevail.

Wilderness is further defined or explained to mean for purposes of the Wilderness Act to be,

> "* * * an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitations, which is protected and managed so as to preserve its natural conditions * * *"

and which meets the following criteria:

(1) appears to have been affected primarily by the forces of nature and where the influences of man are minimal;

(2) provides outstanding opportunities for solitude or a primitive and unconfined type of outdoor experience;

(3) has at least 5000 contiguous acres of land or is of such size (less than 5000 acres) as to make it practicable for preservation and unimpaired use as wilderness;

Wilderness Defined (con.)

(4) May also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.

National Wilderness Preservation System (NWPS)

The National Wilderness Preservation System (NWPS) will consist of wilderness areas on Federal lands designated by the Wilderness Act and wilderness areas on Federal lands designated by the Congress pursuant to the Act.

Objectives

1. Use and enjoyment without loss of wilderness values for future use.

2. Perpetuate the wilderness character of the areas concerned.

3. Gather and disseminate information concerning use and enjoyment of wilderness areas.

Extent of NWPS

The NWPS, as of the passage of the Wilderness Act, consists only of areas within the national forests which were classified as "wilderness," "wild," or "canoe" areas by the Secretary of Agriculture or the Chief of the Forest Service at least 30 days prior to September 3, 1964. These were the only wilderness areas designated by the Wilderness Act and where the Act refers to "wilderness areas designated by this Act," the wilderness areas of reference are those within national forests.

The Wilderness Act did not designate any area within the National Park System for inclusion within the NWPS. As of this time, July 1968, there are no wilderness areas within the National Park System within the context of the Wilderness Act. Portions of National Park System areas will be designated as wilderness areas by the Congress pursuant to the Wilderness Act.

Effect of National Wilderness Preservation System Upon Management of Areas of the National Park System

The Wilderness Act is abundantly clear with regard to the overall effect the designation of a wilderness area within a unit of the National Park System will have on the management of that unit.

> "The purposes of this Act [Wilderness Act] are hereby declared to be within and supplemental to the purposes for which * * * units of the national park * * * system are established and administered and
>
> * * * * *
>
> "Nothing in this Act shall modify the statutory authority under which units of the National Park System are created. Further, the designation of any area of any park, monument, or other unit of the National Park System as a wilderness area pursuant to this Act shall in no manner lower the standards evolved for the use and preservation of such park, monument, or other unit of the National Park System in accordance with the Act of August 25, 1916, the statutory authority under which the area was created, or any other Act of Congress which might pertain to or affect such area, including but not limited to the Act of June 8, 1906 (34 Stat. 225; 16 U.S.C. 432 et seq); section 3(2) of the Federal Power Act (16 U.S.C. 796(2); and the Act of August 21, 1935 (49 Stat. 666; 16 U.S.C. 461 et seq.)"

The Act also provides:

> "Nothing contained herein shall, by implication or otherwise, be construed to lessen the present statutory authority of the Secretary of the Interior with respect to the maintenance of roadless areas within units of the National Park System."

From the above it can be seen that the Wilderness Act was not intended to lower the standards for use of preservation of units of the National Park System which have evolved over a half century of wildland management. In other words, units of the National Park System will continue to be managed in keeping with the National

Effect of National Wilderness Preservation System Upon Management of Areas of the National Park System (con.)

Park Service Act and the statutory authority under which each area was established. Wilderness areas are supplemental to the purposes for which the various units of the National Park System were established and; therefore, wilderness management must be coordinated with management of the unit in such a way that the purpose of the unit is fulfilled.

Wilderness Area Management

Any wilderness area of the NWPS within a unit of the National Park System will be managed by the National Park Service. No funds will be made available for any purpose connected with the NWPS nor will any additional personnel be available solely for the management or administration of areas because they are included within the NWPS.

Wilderness Purpose

"* * * Except as otherwise provided by this Act, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical uses." (Wilderness Act)

Management Objective

Park wilderness areas will be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness.

Resource Management

The resources of wilderness areas designated within units of the National Park System will be managed for fulfillment of the purpose for which the unit was included within the National Park System, in keeping with the Act of August 25, 1916, and the statutory authority under which each unit was established. Management

Wilderness Area Management (con.)

for purposes of the Wilderness Act will be supplemental to the purposes for which the affected unit was added to the National Park System.

Standards which have evolved for the use and perpetuation of resources of units within which wilderness areas are designated shall not be lowered by reason of wilderness designation. Patterns of use and management evolved within the affected unit will continue within wilderness areas of that unit when such use and management practices are in keeping with the purpose for inclusion of that unit within the National Park System.

The natural and cultural resources within wilderness areas will continue to be managed so as to achieve unimpaired preservation. It is anticipated that manipulative procedures will be applied to biotic resources in order to insure the perpetuation of those resources. For example, in some units of the National Park System it will be necessary to control populations of animals in order to preserve their habitats and thus the animals themselves. In other situations it may be necessary to apply prescribed burning techniques and/or permit natural fires to burn in order to perpetuate natural vegetative complexes. Resource management techniques to be applied will be prescribed in the natural resource management plan which will be individually structured to meet the needs of the resources concerned. Where appropriate, resources of wilderness areas within the National Park System will be managed on the basis of the ecosystem of which they are a part.

TOXIC CHEMICALS

General

Public attention continues to be focused on the use of toxic chemicals in various land management and pest control programs. Some of this attention has been directed toward the National Park Service and its use of pesticides, resulting from concern that use of these chemicals might be harmful to plants or animals and/or their environments, and to people. In view of the continuing public interest and controversy surrounding this issue, the position of the Service regarding the subject is restated; and guidelines covering implementation of all management programs involving pesticides are being reemphasized.

Pesticides, including insecticides, fungicides, rodenticides, and herbicides, may be used in certain park management and protection programs for conserving natural resources and for safeguarding human health and property. Specifically, chemical agents may be used, where necessary, for suppression of outbreaks of plant diseases, insects, and other pests for protection of scenic values in areas of concentrated visitor use; conservation of rare and scientifically important trees or plant communities; maintenance of shade trees in developed areas; preservation of historic structures and scenes; maintenance of turf and plantings in formally landscaped areas; and eradication of exotic and/or the control of noxious plants or animals; and for the restoration of native species of plants, animals and natural conditions. Chemicals may also be used within the parks, as needed, to control flies, mosquitoes, rodents, and other pests, for protecting public health; increasing visitor safety and comfort; protection of property, and for compliance with Federal or State quarantine laws. Programs involving the use of chemicals must be limited in number and in scope to those absolutely necessary to meet management objectives and responsibilities and must pose no known threat to human health. Chemicals are not to be used in Service administered areas if management objectives can be achieved by other methods. In this regard, economy alone is not sufficient justification for the use of a pesticide in management programs.

Federal Committee on Pest Control

During 1964, the Federal Committee on Pest Control (FCPC) was established to review all federally operated and technically guided or financed toxic chemical control projects, and to advise the various departments and agencies concerning problems in the use of pesticides. This review is to insure that proposed programs are safe, meet established criteria for sound design with respect to effectiveness in achieving desired objectives and consider possible adverse side effects, including possible hazards to man, livestock, plants, fish, and wildlife.

Heretofore, all programs involving the use of toxic chemicals, including nuisance as well as forest pest suppression, wildlife and aquatic management programs, and grounds maintenance activities, required the approval of this committee before actual work could be undertaken. This applied to new projects as well as those of a continuing nature. It was necessary to make annual submissions. Beginning with 1968 programs, the FCPC does not wish to review all proposals to use a toxic chemical; however, it does require FCPC review of any proposal falling within one or more of the following categories.

(a) Usage of a pesticide that is not registered under the Federal Insecticide, Fungicide and Rodenticide Act for that particular purpose or in that particular way.

(b) Usage of any of the compounds in any of the ways listed in Appendix E, "List of Pesticides of Special Interest to FCPC."

(c) Use of pesticides in a Federal installation when that usage is not under the direct supervision or on-site responsibility of a Federal employee trained in the safe and effective use of the pesticides involved.

(d) Any program or project in which one hundred or more contiguous acres will be treated as one application.

Federal Committee on Pest Control (con.)

(e) Any usage that could contaminate irrigation or domestic water supplies.

The conditions of category (c) may be met in Service administered areas if the use of the chemical is to be under the direct supervision of a Service employee capable of following manufacturer's instructions for the handling and application of its product. If all instructions for mixing, application, and safety precautions are to be rigidly followed, review and approval by the FCPC will not be required unless the proposed chemical or its use should fall within category (a), (b), (d) or (e) above.

From the foregoing, it can be deduced that most Service programs involving the use of chemicals will not require FCPC review and approval. This relaxation by FCPC places an increased burden upon the Service to properly police its own programs.

Forest Pest Control Programs

Proposals to use a toxic chemical in connection with forest insect or disease control programs that qualify for funding under the Forest Pest Control Act must be processed in the same manner as any other proposal to use a toxic chemical. Form 5200-10, Project Proposal Forest Insect and Disease Control, must be submitted in accordance with Report NPS (OR)-13 and must accompany FCPC Form #2 when review by FCPC is required. Alternatives to the use of toxic chemicals in forest insect and disease control programs must be sought and applied where possible.

Wildlife and Aquatic Control Programs

Proposals to use a toxic chemical in connection with wildlife or aquatic control programs must be processed in the same manner as any other proposal to use a toxic chemical. In addition, where terrestrial vertebrates are the target species, the control programs must be reflected in an approved long-range wildlife management plan. For aquatic plant and animal control programs, refer to Chapter 4, "Wildlife Management Handbook," Part II: Aquatic Resources, Natural and Historical Areas.

Other Management Programs

Programs involving use of pesticides for nuisance pest control and grounds maintenance are also affected. These include control of rats, mice, gophers, and other rodents indoors as well as outdoors; suppression of mosquitoes, flies, chiggers, sandfleas, and similar noxious pests; vegetation management programs utilizing herbicides or soil sterilants for control of weeds and noxious or exotic plants; and maintenance of shade trees, ornamental shrubs, and turf. These programs are vitally important to public health and welfare and for proper maintenance and preservation of developed areas and historic and archeological sites.

It must be noted that the control of terrestrial vertebrates in maintenance programs must be included in an approved wildlife management plan for the area concerned.

Program Implementation

Each proposal to use a toxic chemical will originate at the park level and will be prepared on FCPC Form #2 (Appendix C) in accordance with instructions contained in Appendix D, for review by a committee appointed by the superintendent. This committee shall consist of not less than three members best qualified to evaluate the proposal for compliance with Service objectives, program standards and desirability, and compliance with FCPC standards. Proposals concurred in by this committee shall be reviewed by the superintendent or the acting superintendent and those receiving his approval, signed by him. The original and two copies of each approved proposal which does not require FCPC approval, and 30 copies of each proposal which does require FCPC approval will be forwarded to the regional director.

Projects approved by the regional director may be continued from year to year without further approval so long as there is no change or deviation from the original proposals. Projects to be continued the following calendar year will be summarized early in November on Form FCPC #1 (Appendix A) in accordance with instructions in Appendix B and forwarded to the regional director for his review and approval.

Program Implementation (con.)

The original and two copies of Form FCPC #2 for proposals which do not require FCPC review and 30 copies of FCPC Form #2 for proposals which require FCPC review will be forwarded to the regional director. The original and two copies of Form FCPC #1 for continuing projects will be forwarded to the regional director.

Each superintendent in developing his program should refer to Appendix F, and he must avail himself of the services of biologists on his staff or assigned to his park and of applicable consulting agencies, such as the Public Health Service; County Extension Service; Agricultural Research Service; Bureau of Sport Fisheries and Wildlife, Fish and Wildlife Service; Forest Service; State fish and game departments and local universities, for advice on the type of chemical most effective against the target pest and with the least harmful side effects, on time phasing, and on procedures. Effort should be made to coordinate major projects with identical programs on adjacent lands where desirable and feasible. Also, several States now have pest control review boards or similar devices. Where such boards exist the superintendent should conform his programs to State standards.

Each regional director will appoint a screening committee for the purpose of evaluating each proposal for administrative and biological soundness, for completeness with regards to project data, and the need for review by FCPC. Membership of this committee shall consist of the best qualified personnel available. Project proposals that receive concurrence of this committee and which do not require review by FCPC or approval by the Director may receive final approval by the regional director or the person acting for him. The original copy will be returned to the park. A copy will be retained in the regional office and an information copy forwarded to the Washington Office. Proposals requiring review by FCPC and which have received concurrence of this committee will be summarized on FCPC Form #1 (Appendix A) in accordance with instructions in Appendix B. Twenty-nine (29) copies each of FCPC Forms #1 and #2 will be forwarded to the Washington Office.

Area summaries of continuing projects on FCPC Form #1 will be reviewed by the regional committee and those considered essential will be referred to the regional director for his review and approval, which will be indicated on the form. The original will be returned

Program Implementation (con.)

to the area. A copy will be retained in the regional office and an information copy forwarded to the Washington Office.

Regional directors will be responsible for the appropriateness of each proposal in accordance with the mission of the Service in the management of the area concerned.

Project proposals received in the Washington Office and requiring review by FCPC will be processed in the Division of Resources Management and Visitor Protection. Each proposal will be evaluated for administrative and biological soundness, for completeness with regard to project data, and compliance with the mission of the Service in the management of the area concerned. Assistance in this review will be obtained from other divisions having a direct or indirect interest in the proposal. Those proposals receiving concurrence in the Washington Office will be presented to FCPC for consideration. The original and one copy of each proposal, indicating the action by FCPC, will be returned to the regional office of the area concerned.

To the greatest extent possible, project needs for the following calendar year should be determined early in November and submitted in time to reach the Washington Office not later than December 1.

Emergency or Unexpected Programs

If an unexpected outbreak of a pest requires control measures, and FCPC review is required, the pesticide use proposal will be reviewed by FCPC as an emergency matter. If time is important, the necessary information may be phoned to the Chief, Branch of Resources Management, and he or his staff will obtain prompt review by FCPC so that the originating area may have the approval of FCPC before the project is initiated. Each such request to the Washington Office shall be made through the regional director.

In addition to review by FCPC, as described above, an emergency program in which any populated, nonfederally owned land is to be treated with pesticides by or in cooperation with a Federal agency, should be reported through channels for submission to FCPC for its information and records.

Program Evaluation and Controls

Regional directors will be responsible for evaluation of all proposals. This includes program screening plus follow up in each case to insure adherence to project details as approved. Biological studies must be programmed and carried out in connection with all major projects to determine effectiveness of controls and to determine immediate and long-range side effects. This may require cooperative efforts by this Service and the Bureau of Sport Fisheries and Wildlife, or other research organizations. All control programs and related biological studies must be completely documented, and the pertinent documents and reports of findings shall be available for review as desirable.

Because of the toxic characteristics of modern pesticides, each superintendent must exercise all possible safety precautions in storage and use of these chemicals and in disposal of unused chemicals and containers to insure against direct or incidental personal injury and environmental contamination. Particular attention must be given to keeping stored chemicals properly labeled and accountable under appropriate security. Only those pesticides that have been registered with the Department of Agriculture may be utilized in control programs, and strict adherence to prescribed use and precautionary measures as printed on container labels is required. DDT is specifically prohibited by direction of the Secretary of the Interior.

RD 2-68 is superseded by this handbook release.

FCPC FORM #1 (Rev. 67)

SUMMARY OF PESTICIDE PROJECT PROPOSALS

Department: _____ Agency: _____ (year) Date Submitted: _____

Area: _____

Project No.	State and/or Area	Objective	Pesticide to be Used Name	Pesticide to be Used Rate of Application	No. of Units to be Treated	Method of Application	Sensitive areas	Time of Application	Remarks
(1)	(2)	(3)	(4)		(5)	(6)	(7)	(8)	(9)

(This form can be reproduced on legal size paper to provide additional space)

INSTRUCTION SHEET FOR FCPC FORM #1 (Rev. 67)

USE OF FORM

This form will be used for all reports to FCPC for continuing and new project proposals for the coming year. New projects will be identified by an asterisk (*) and footnoted for the information of FCPC. Thirty (30) legible copies will be submitted. Twenty-five (25) are required by FCPC.

(1) Project Number:

The project number will consist of the area abbreviation and a numerical number (GLAC-4) and will serve to identify the project as long as it is active. The numerical part of the project number will be retired when the project becomes inactive or terminated.

(2) State and/or Area:

Indicate the State within which the project is located.

(3) Objective:

Identify the pest to be controlled by common name.

(4) Pesticide to be used:

Name - Use accepted common or coined name. In the absence of either, use the chemical name. Do not use trade names.

Rate of Application - This is to be expressed in terms of the active material and in terms of lbs/acre, lbs/100 gals., lbs/1000ft., lbs/acre ft., lbs/lineal ft., lbs/1000 ft., or other terms as applicable.

(5) Number of Units to be Treated:

Indicate the number of acres, square feet, animals, trees, or other appropriate unit.

(6) Method of Application:

Indicate the type of equipment as specifically as possible, e.g., helicopter, hand compression sprayer, Buffalo turbine, paint brush, etc., or techniques such as hand placement of baits, measured injection into irrigation water, etc.

(7) Sensitive Areas:

Some of the areas of most concern are sleeping quarters, food handling or preparation areas, any crop (specify what), food or milk animals, milking sheds, irrigation water, domestic water supplies, estuaries, and fish producing waters. Indicate which, if any, of these or similar areas may become contaminated and what protective measures, if any, are taken.

(8) Time of Application:

Be as specific as possible, i.e., expected month or months or, if necessary, the season of the year, and include information on the anticipated number and frequency of applications.

(9) Remarks:

1. Indicate effectiveness in prior projects as specifically as possible, and undesirable side effects, if any.

2. Indicate training and experience of supervisor and/or pesticide applicators at each installation.

FCPC FORM #2 (Rev. 67)

FEDERAL COMMITTEE ON PEST CONTROL
SUMMARY REPORT ON NEW OR SUBSTANTIALLY
CHANGED PROJECTS OR PROGRAMS USING PESTICIDES
PROGRAM NO. _____

DATE _____

1. Department, Agency, and Division:
2. Program Title:
3. Pesticide(s) used:

   Name

   Rate of Application
4. Location:
5. Objectives:
6. Economic importance:
7. Description of areas to be treated:
8. Special precautions exercised:
9. Are any other Federal Departments involved?
10. Are State and local governmental agencies involved?
11. Are private institutions, agencies, or individual interests involved?
12. Justification:

Submitted	Superintendent	Date
Concurred	Regional Director	Date
Admin. Approval	National Park Service	Date
Project Approval	FCPC	Date

(This is an outline only. The required information cannot be inserted in the spaces above.)

INSTRUCTION SHEET FOR FCPC FORM #2 (Rev. 67)

USE OF FORM

This form will be used for all new pesticide project proposals and to provide additional justification for continuing unusual projects and those of questionable safety of effectiveness. Thirty (30) legible copies will be submitted. Twenty-five (25) are required by FCPC.

The items shown on the sample form are topic headings to be elaborated upon in sufficient detail to present a clear and objective proposal. Use complete sentences and as much space as may be required (more than one sheet, if necessary). Inadequate information will necessitate a resubmission.

The program number at the top of the form will consist of the area abbreviation and a numerical number (GLAC-4) and will correspond with the project number, column (1) shown on FCPC Form #1 for the same project proposal.

(1) Department, Agency and Division:

Enter: Interior, National Park Service and the name of the area.

(2) Program title:

Enter a descriptive title for the proposed project.
Example: "Termite Control in Historic Buildings."

(3) Pesticide(s) used:

Name: - Use accepted common or coined name. In the absence of either, use the chemical name. Do not use trade names.

Rate of application - Express in terms of the active material and in terms of lbs/acre, lbs/100 gals., lbs/1000sq. ft., lbs/acre ft., lbs/lineal ft., lbs/cu. ft., or other terms as applicable.

(4) Location:

Clearly indicate where the project will be carried out within the area.

(5) Objectives:

Identify the target (pest, weed, etc.) and clearly state what is to be accomplished by the project.

(6) Economic importance:

This refers to the economic benefits or losses associated with the proposed project. Include here savings in labor costs to be realized as an alternate to other means of accomplishing the project results. Be specific.

(7) Description of areas to be treated:

Clearly identify the area(s) to be treated. Of particular interest are sensitive areas where possible adverse effects might accrue to people, domestic animals, agricultural crops or wildlife; sleeping quarters, food handling or processing areas, any crop (specify what), food or milk animals, milking sheds, irrigation water, domestic water supplies, estuaries and fish producing areas. Indicate the possibility of any of the above or similar areas that may become contaminated by treatment of the project area.

(8) Special precautions exercised:

Be specific. Precisely what precautions will be taken. An entry to the effect that label instructions will be followed is inadequate. Indicate what precautions will be taken to prevent contamination outside the project area. Indicate the schedule and degree of monitoring planned.

(9) Are any other Federal departments involved?

Directly or indirectly?

(10) Are any state or local governmental agencies involved?

Directly or indirectly? Does the project comply with state or local regulations?

(11) Are private institutions, agencies, or individual interests involved?

Directly or indirectly?

(12) Justification:

Each project proposal must be supported by a justification in sufficient detail to present a clear analysis of the problem and the need to use a chemical for its solution. "Economy" alone is not sufficient justification and projects will not be approved by FCPC for this sole reason. Alternatives to the use of chemicals must be identified and it must be shown that the use of chemicals is clearly justified for the project.

LIST OF PESTICIDES OF SPECIAL INTEREST TO FCPC

Amitrole - any proposed usage that might contaminate food or feed crops or any type of water supply should be submitted regardless of volume.

Aramite - any proposed usage that might contaminate food or feed crops or any type of water supply should be submitted regardless of volume.

Cyanide, in any of its forms - any usage other than fumigation in vaults designed for that purpose.

DNCompounds such as dinitro cresol - if more than ten pounds or one gallon of concentrate is to be used.

Mercurials - any usage.

Nicotine, either as alkaloid or as a salt - any usage.

Sodium arsenite - any usage.

Sodium monofluoroacetate (1080) - any usage.

Thallium sulfate - any usage.

Aldrin, dieldrin, endosulfan, endrin, toxaphene - any usage other than termite control.

DDT, DDD (TDE), benzene hexachloride, lindane, chlordane, heptachlor, Kepone, Strobane, methoxychlor - if more than 100 pounds (active ingredients) are to be used per season on a contiguous block.

Parathion, methyl parathion, asinphosmethyl (Guthion), Azodrin, Bidrin, carbophenothion (Trithion), coumaphos, demeton, dioxathion, disulfoton (Di-Syston), EPN, ethion, mevinphos (Phosdrin), phorate (Thimet), phosphamiden, TEPP, diazinon - any usage.

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Malathion, dichlorvos, dimethoate, naled (Dibrom), ronnel, Ruelene, trichlorofon, carbaryl, zectran - if more than 1000 pounds (active ingredients) are to be used per season on a contiguous block.

GUIDE FOR REVIEW OF PEST CONTROL PROGRAMS

A. PRIOR REVIEW

1. Have the health, economic, and/or aesthetic bases of your program been reviewed and approved by all concerned within the area?

2. Has preliminary review and approval been given by a State that may be involved?

B. PROGRAM MANAGEMENT

1. What, if any, changes have there been between last year's program and the proposed program?

   a. Scope?
   b. Location?
   c. Amount and toxicity of pesticides?
   d. Reasons for continuation or change?

2. Could less control be tolerated?

   a. What degree of control is your objective?
   b. On what basis has this criterion been set?
   c. What would the implications be if this degree of control was reduced (cost, health, aesthetic)?

3. Have alternative pesticides or non-pesticidal methods been explored?

   a. Is there a less toxic alternative?
   b. Is there a less persistent alternative?
   c. Is there a less expensive alternative?
   d. Has a non-chemical method of control been considered?

4. Are pest control programs routine or are they adjusted to meet actual needs?

5. How is the effectiveness of a pest control program determined?

a. Pre-post treatment evaluation?
b. How often are evaluations made?

C. PROTECTION AGAINST ADVERSE EFFECTS

1. Human health aspects:

   a. What precautions will be taken to prevent residues on food crops and forage?

   b. What precautions will be taken to minimize or prevent contamination of potable water supplies?

   c. What precautions will be taken to protect applicator or formulator personnel or other users; and the general public?

2. Possible adverse effects on the ecosystem:

   a. Precautions to protect wildlife.
   b. Precautions to protect fish and aquatic organisms.
   c. Precautions to protect microorganisms.

3. What is the LD-50 and other toxicological characteristics of any experimental pesticides?

4. What disadvantages, if any, would accrue through the use of the proposed pest control agents?

5. Is each pesticide used in accordance with registered use patterns?

6. Is the program conducted under the direction of trained personnel?

   a. Are personnel familiar with the toxicity and proper handling of the pesticides?

   b. Do personnel actually follow safe handling procedures?

D. APPLICATION INFORMATION

1. Rate of application:

   a. Pounds acid equivalent of herbicide per acre?
   b. Concentration of pesticides?
   c. Dosage rate of finished pesticide?

2. Number of pesticide applications per year?

3. If 2,4-D or 2,4,5-T is used, what is the exact formulation (amine, ester, etc.)?

4. Have you listed all test plot or field test uses of pesticides each of which is 100 or more acres?

5. If you have test plot or field tests in less than 100-acre areas, how many of these do you estimate you have?

RESOURCES MANAGEMENT CONCEPT

General

Natural areas of the National Park System should represent, as nearly as possible, a vignette of primitive America. This does not mean, necessarily, America as it appeared at any specific time in the past, but primitive America as it would have evolved, free from the influences of non-aboriginal man.

Few, if any, of the areas of the National Park System are large enough to be self-regulating ecological units; most are ecological islands subject to modifications from surrounding environments. Management must take these conditions into account and counteract them to the greatest extent possible. Resources within an area cannot be managed oblivious of the influences exerted from the surrounding environs.

Most biotic communities are in a constant state of change due to natural processes of ecological succession or man-caused disturbances. Under natural conditions, the rate of change is usually slow; however, man-induced changes can greatly accelerate this rate and cause significant changes in the community within a short period of time. Generally, it is not desirable to interfere with natural succession except when it is the objective of management to stabilize a successional or "subclimax" community at a desired stage. Normally, it will be an objective of management to rectify man-induced successional changes so that natural ecological processes may run their courses.

Where man-induced changes have disturbed natural ecological processes or their manifestations, it may be necessary to utilize manipulative techniques to restore the most natural association possible. For example, this principle would apply where ungulate populations exceed the carrying capacity of their habitat due to loss of predators, immigration from surrounding areas, or compression of normal migratory patterns. Other examples would include man-induced changes in vegetative types through the control of natural fire, or changes in the ecology of a cavern resulting from the diversion of water "feeding" the cavern, or air for cooling purposes.

General (con.)

The need for overt management, the feasibility of methods, and evaluation of results must be based upon scientific data. Both research and management must be undertaken and carried out by qualified personnel. Research, management planning and execution must consider and regulate the human uses for which the area was intended. Resources management based on scientific data is essential in maintaining biotic communities and natural phenomena in accordance with a documented resources management plan for the area concerned.

The Ecosystem

Until recently, resources management thinking has not been ecological. It has dealt with individual resources, not the whole natural resource complex. The environment has been viewed in terms of individual parts rather than as a whole composed of many parts. The environment must be viewed as a working mechanism of interacting components - an ecosystem.

Ecosystem Defined 1/

Through ecology, man attempts to understand the relationship of plants and animals to their environments - where they live, how they live there, and why they live there. The environment of an organism is the sum of all external forces or influences that affect the life of the organism. Each living organism has an environmental history different from that of any other organism, and each is the product of its total environmental history (as it has affected the action of the inherited genetic code). Plants, as biotic organisms, have unique and continually changing environments, although, since plants are fixed in one spot, their environments change principally in time.

1/ Billings, W. D., Plants and the Ecosystem, Wadsworth Publishing Co., Belmont, California, 1966.

Ecosystem Defined (con.)

There are three main levels of integration in ecology; that is, three principal kinds of ecological systems:

1. The individual
2. The population
3. The ecosystem

Each system is a concrete reality, and its structure and interactions can be observed and measured. The complexity of structure and operation of these systems increases manyfold from the individual to the population, and almost astronomically from the population to the ecosystem.

The individual plant or animal is a genetically uniform entity; normally, no subdivision or part can live independently of the rest of the organism for more than a short time. The individual and its accompanying environment make up an individual ecological system.

The ecology of the individual is concerned with the way that particular plant or animal interacts with its environment. This individual organism - environment complex should be thought of as a system that changes somewhat over time. The environmental part of the system supplies the energy and raw materials that the organic part of the system (the individual) uses in living and in the production of new protoplasm.

An individual plant or animal is related to other organisms in two ways: (a) genetically to other members of its species, and (b) ecologically to other plants and animals of its biological community.

Any relatively isolated, interbreeding group of individuals is a local population. Because of the gene exchange and the continuity of the population through time, the local population rather than the individual is the basic unit in evolution. The genetic structure of each local population in a species is often somewhat different from that of other local populations of the same species. This is so because, through natural selection, individuals with

Ecosystem Defined (con.)

genes that allow them to be particularly well fitted to that local environment tend to survive in greater numbers than individuals not so well adapted.

Individuals and populations do not live alone in nature but in associations with at least a few, and usually a great many, other plants and animals. These aggregations of organisms are not haphazard accumulations; on the contrary, they are spatially ordered, machine-like organizations which utilize energy and raw materials in operation. Such a machine-like community of plants and animals, together with the environment that controls it, is called an ecosystem. An ecosystem represents the highest level of integration in ecological systems; it consists of many individual systems and population systems.

Ecosystems can be of any size - from a jar of water containing algae and protozoa to the Great Plains - or to the Earth itself. Whatever the size, an ecosystem operates as a whole unit; both its physical and biological parts are so enmeshed in their functions that it is difficult to describe the system by neat separate categories according to the roles these parts play in the machine. All of the organisms play at least two roles: as parts of the living core of the system, and as parts of the environment itself. To understand ecosystems, an analysis must be made of their structure and the functions of the various components. Sharp lines do not delimit the roles of each component and even apparently sharp boundaries may shift with the seasons or over long periods of time.

The biological part of the system usually consists of four or five energy levels. These trophic levels are based on how far the original energy has come through the community. In the following outline, trophic level 1 is indicated by T-1, trophic level 2 by T-2, and so on.

T-1 is the green vegetation. This is the part of the community that captures and stores solar energy in photosynthesis and releases oxygen. The rest of the community is completely dependent upon this level. It is often called the "producer" level.

Ecosystem Defined (con.)

T-2 consists of the herbivores, which range in size from certain plant-parasitic fungi to elephants, and which digest plant material from T-1 and derive their energy from plant food.

T-3 and T-4 consist of carnivores, animals that get their energy by eating herbivores; the energy is thus one more step removed from its original source. The animals at T-4 get at least part of their energy by eating carnivores at T-3. Carnivores are normally thought of as being tigers or mountain lions, but there are many other carnivores, ranging from insects and spiders to birds and lizards, weasels and shrews. Some organisms, such as bears and man, are difficult to pigeonhole as T-2 or T-3 because they are omnivores, sometimes eating plant material and sometimes eating other animals.

T-5 includes fungi, bacteria, some protozoa, and other small organisms that use dead plant and animal material for food. These decomposers break down organic structures and substances, releasing compounds and elements back into the environment and also utilizing energy and carrying it another step or several steps beyond its capture. Although all these decomposers are lumped into this level, the situation is far more complex. Trophic level 5 is really a collection of several different trophic levels all utilizing energy, with the "top" decomposers finally releasing the last of the energy back to the environment. The various members of this decomposer level also utilize dead plant and animal material or wastes from all the lower trophic levels.

In terrestrial ecosystems, most of the decomposers live on the surface or in the upper part of the soil, converting dead material into humus and eventually into minerals, gases, and water. The importance of decomposers is obvious; without them dead material would simply accumulate and raw materials in short supply, such as phosphorus, would be tied up in the remains of plants and animals. The decomposers provide the necessary cycling mechanism in the ecosystem. Energy simply flows in one end of an ecosystem (at photosynthesis) and flows out (by respiration) everywhere along the line. But because of decomposers, all elemental materials cycle, at least to some extent, within the system and between systems.

Ecosystem Defined (con.)

At the level of the individual, at the level of the population, and at the level of the vegetation, it is possible to speak of plant ecology and animal ecology. But the interactions of the ecosystem involve all kinds of organisms in a complex community whose understanding requires a broader viewpoint, that of ecology itself.

Man in the Ecosystem

No matter how unique man may be from the standpoint of intellect, aesthetics or metaphysics, he has the same overall biological demands as any other animal. Despite the apparent complexity, self-sufficiency, and independence of human civilization, the laws governing population growth and maintenance in plants and animals are very similar to those governing population growth and maintenance in man.

Civilization, particularly in its recent history, has been a major source of geologic change on the earth, equivalent in the magnitude of its effects to the natural geologic forces of rain and frost. Man's construction and maintenance activities alter the direction of some geologic changes and increase greatly the rate of others. For most of its history, the nonhuman biologic world has existed under conditions of relatively slow geologic change, but the new geology of man has brought about relatively rapid change in the lives of many organisms.

In addition to altering the geologic surface of the earth, man acts directly on biological systems. He has eliminated some of the large organisms that he considered at the time to be dangerous or useless. Often a species or a population vanishes by accident because it appears to be in the way of some other biological effort of man. Since man has food requirements similar to those of other large mammals, he encourages the increase of certain plants and animals that provide him with food and with the peculiarly human requirements of clothing and armament. In this process, man, assuming the role of director of evolution, has appropriated at least 10 percent of the earth's surface. The importance of man continues to increase and the possibility of the biological world ever being as stable as it was in prehuman time becomes more and more remote.

Man in the Ecosystem (con.)

The normal activities of man cannot continue without constant disruption of nature. The primary problem is to ensure, so far as possible, that the disturbance produced by man is reversible. By keeping a careful check on what we may call "man-associated" nature it may be possible to see the effects of disturbance while we can still change our activities. 1/

Under ideal conditions, man in the ecosystems of National Park System natural areas would be a "passive participant." He would not derive energy from the ecosystem, release energy back to the ecosystem, nor would he interfere in any way with natural ecological processes. This degree of passive participation is not possible. Man in the ecosystems of National Park System areas does derive some energy from the ecosystem and does release energy and he does, or has, interfered with natural ecological processes. Man not only is a functioning part of the ecosystem, he and the results of his acts are the objects of management. One of the principle objectives of resources management is to minimize the effect of man upon the ecosystem.

Ecosystems and the Management of Resources

Traditionally, resources have been considered on the basis of categories, i.e., wildlife, forests, grasslands, soil, etc., as if each resource existed as an independent entity with little or no relationship to the whole complex. Wildlife does not exist independently of plants; and plants are dependent upon soil and other factors. One component of the ecosystem relates to all other components. The entire complex must be considered as an intricate machine.

The ecosystem will constitute the unit for resources management purposes in natural areas of the National Park System. For the most part these are presently known and readily recognized.

1/ Slobodkin, Lawrence B., Growth and Regulation of Animal Population; Holt, Rinehart and Winston, Inc., New York, 1962, pp 1-7.

Ecosystems and the Management of Resources (con.)

In most cases, the ecosystem will be confined to one community type, such as alpine tundra, desert scrub, ponderosa pine forest, et cetera. In other situations, it may be desirable to combine several community types into a rational management unit. Purity of community type is far less important than the rationale of the unit to be managed. There will be situations where it will be desirable to identify ecosystems on some basis other than community type, and here, the rationale of the management unit should govern. For example, a cavern ecosystem would be a rational management unit and the ecosystem would include the surface and all related drainage as well as the subterranean portion. Should refinement of the classification system become necessary or desirable at a later date, a redescription of the ecosystems can and should be made. In this way it is possible to start with what is presently known and move toward the unknown as skills and competency are developed in the management of resources.

The management of resources by ecosystems must recognize the interaction of resource components within the system and that any action directed toward one component will also affect the system as a whole. Since an ecosystem is all inclusive, the task of management might appear hopelessly complex. However, by analyzing the system in terms of the components and their relationships, much of that which appeared mysterious is dissipated. The ecosystem is composed of those elements familiar to all; plants, animals, soil, water, climate, fire, flood, man, et cetera. The ecosystem can be divided roughly into the biotic variables (plants and animals) and the environmental variables (soil, water, climate, etc.). Management will be concerned with both variables and in most instances the biotic variable, particularly with reference to man and his induced ecological changes. The key to successful management will be found in identifying man's adverse influences, correcting them, and properly regulating his future activities within the ecosystem concerned.

Naturalness versus "Beauty"

Effective management of natural resources of natural areas must clearly recognize the mission of the Service to perpetuate natural ecological relationships as opposed to the "enhancement"

Naturalness versus "Beauty" (con.)

of these relationships in an effort to create an aesthetically pleasing situation. For example, the aftermath of an avalanche or landslide may not be aesthetically pleasing, but it is natural. The results of natural phenomena must be recognized for their role in contributing to the total environment of a natural area. It is not within the role of a manager of a natural area to transform natural relationships to aesthetically pleasing situations and to recognize the difference between naturalness and "beauty" is the first step in effective natural resources management.

NATURAL RESOURCES MANAGEMENT PLAN

General

The resources management plan for a natural area will be concerned necessarily with the maintenance and/or restoration of those natural ecological processes responsible for generating and sustaining natural resource conditions which prevailed before the area was disturbed by non-aboriginal man. Few, if any, natural areas of the National Park System are self-regulating ecological units. Instead, they are ecological islands which have been subjected to direct and indirect modification by the activities of man within the area as well as his activities outside the area. It is essential, therefore, that natural resources of natural areas be managed for accomplishment of the area purpose consistent with the mission of the Service.

In order to maintain or restore natural ecological processes and the manifestation of those processes, it is necessary to identify man-caused disturbances and resultant imbalances in plant and animal associations. Specifically, man has interfered by burning lands or by limiting natural fires; by the elimination of predators or the introduction of exotic plants and animals; by over-using natural forage for domestic livestock grazing; by clearing forests, tilling the land, depleting the soil or altering the water regime; by encouraging unnatural plant succession; by physically disturbing land surfaces and contributing to unnatural erosion. The problem of resource management is in finding out what needs to be rectified and doing so with minimum adverse effect upon the total resource mosaic.

Management activities may include the manipulation of plant and animal communities or their protection from modification or external influences. There may be no need for active manipulation to maintain relatively stable "climax" associations which under protection of the ecological processes which generated and sustains the association, perpetuate themselves indefinitely. However, most biotic associations are in a state of constant change due to natural or man-caused processes of ecological succession. In natural "successional" communities, it is necessary to identify the controlling factor(s) and insure their continued functioning for perpetuation of the association. Management practices, at times, may call

General (con.)

for use of the tractor, chain-saw, rifle or flame thrower when the job to be done justifies their use.

The need for management, the feasibility of management methods, and the evaluation of results must be based upon current and continuing scientific information. Management without knowledge is a dangerous undertaking. Much help and guidance can be obtained from ecologic research conducted by others; however, such information must be evaluated and applied within the context of Service resources management responsibilities and objectives.

Management Objective

The overall objective of **resources management in natural areas** is the maintenance or reestablishment of resource conditions as they most probably might have been today had non-aboriginal man not interfered. A natural area should represent a vignette of primitive America. This will not be easily or completely done, yet if the objective cannot be fully achieved it can be approached and the constraints to full accomplishment must be identified. A reasonable illusion to primitive America can be achieved, using the utmost in skill, judgment, and ecologic sensitivity. The accomplishment of this objective does not mean turning back the "ecologic clock" and freezing ecologic succession, but instead, it means finding out what needs rectifying, doing so, and then maintaining the desired resource condition.

The accomplishment of this objective requires recognition of the enormous complexity of ecologic communities and the diversity of management procedures required to restore and maintain them.

Plan Format and Content

The plan format for natural areas will follow the outline in Part I, Chapter 2 with the following supplemental instructions:

I. AREA PURPOSE (First page)
(Refer to Part I, Chapter 2)

Plan Format and Content (con.)

II. MANAGEMENT OBJECTIVES (Start new page)
(Refer to Part I, Chapter 2 for general instructions.)

A. Resources
(The objective for resources management of the area as a whole must include the philosophy of the Secretary's Advisory Board on Wildlife Management ("The Leopold Report") as follows:

> "* * * As a primary goal, we would recommend that the biotic association within each park be maintained, or where necessary recreated (reestablished), as nearly as possible in the condition that prevailed when the area was first visited by the white man * * *
> "* * * if the goal cannot be fully achieved, it can be approached. A reasonable illusion of primitive America could be recreated (reestablished), using the utmost in skill, judgement, and ecologic sensitivity * * *" (Parenthetical words provided.)

(This goal cannot be taken literally to mean that an ecological condition will be reestablished and then held in that condition through management. The goal will be the reestablishment of primeval ecological conditions to the greatest extent possible and then allowing these conditions to run their courses through maintenance of natural ecological processes. In many instances, the effects of man will have to be undone, including the exclusion of fire from the ecosystem.

(The management objectives must be oriented to the area purpose and the resources of the area.)

B. Use (Start new page)
(Clearly and concisely state the objective of management with regard to use of resources of the area. This objective must take into account the fact that it is the purpose

Plan Format and Content (con.)

of the National Park Service to "promote and regulate use" in such a manner that the purpose of the area is fulfilled.)

III. MANAGEMENT PROGRAM (Start new page)
(Delineate management units on a base map of the park suitable for inclusion following the first page of this section. Resources will be managed on the basis of ecosystems. Each ecosystem will constitute a management unit. Indicate the basis for ecosystem identification. It is not necessary to classify all ecosystems on the same basis. Identify each ecosystem by a descriptive name.)

A. _____ Ecosystem

1. Description
(Describe the ecosystem in terms of the resources, their interrelationship and the controlling factors; vegetation, wildlife, soil, climate, fire, et cetera. Identify major elements or components of the ecosystem and their relationship to the whole.)

a. Rare, Endangered and Extirpated Species
(Identify plants and animals in this category as they apply within the ecosystem and relate this situation to the park and the region generally and indicate the significance of the situation concerned.)

b. Adverse Influences of Man
(Summarize man-caused disturbances which have occurred within the ecosystem and the resultant deviations from original natural conditions and identify the effects of such disturbances; for example, fire control, grazing, timber cutting, predator elimination, introduction of exotics, overuse by visitors, et cetera. Indicate present uses which should be discontinued.)

Plan Format and Content (con.)

2. Use
(Indicate the ability of this ecosystem to withstand visitor use and the types of use that should be permitted consistent with perpetuation of the resources.)

3. Management Objectives

a. Resources
(State the objective of management concerning resources of this ecosystem.)

b. Use
(State the use objective for this ecosystem.)

4. Management Practices
(Summarize the management practices necessary to maintain or reestablish the resources condition that existed prior to disturbance by non-aboriginal man. The management program must recognize appropriate use of the resource, consistent with the purpose of the area, but without abuse.)

5. Management Problems
(Identify and describe each known or suspected deviation from original natural conditions and indicate the action necessary for restoration of natural conditions. List in order of priority. Start each problem on a new page.)

(1) Problem: (Identify)
(Describe, in order of priority, the resource condition to be corrected and the cause of the deviation. This should be a short paragraph.)

(1) Action:
(Indicate what must be done to eliminate the problem situation, and what the action will accomplish.)

Plan Format and Content (con.)

(1) Research:
(List research, in order of priority, needed to initiate the action or management practices. If research has been proposed or accomplished, show RSP number and title.)

B. _____ Ecosystem (Start new page)
(Repeat as for A above for each ecosystem within the area. The entire area must be included.)

IV. RESEARCH (Start new page)
(Refer to Part I, Chapter 2)

V. APPENDIX (Start new page)
(Refer to Part I, Chapter 2)

The natural resources management plan has been completed. This is only a plan for action. Upon concurrence by the Regional Director and approval by the Director, action for accomplishment of the plan should commence. In all probability, it will be desirable and necessary to prepare specific plans of action to accomplish specific objectives; for example, fisheries management, soil and moisture conservation, wildlife management, grazing, et cetera. Each of these must be integrated into the total plan for the area.

RESOURCES MANAGEMENT CONCEPT

General

The historical area category comprises those units of the National Park System officially designated as national historical parks, military parks, memorial parks, battlefields, battlefield parks, battlefield sites, historic sites, memorials, and cemeteries, and those national parks and national monuments that were established primarily to preserve sites of prehistoric or historic importance. Taken together, the areas cover a sweep of time from prehistoric man's occupation of the land up to the events and people of today.

As used in this statement, the words historical and historic are used in an all-inclusive sense, encompassing sites, structures, and objects of historic, prehistoric, archeologic or anthropologic importance.

The Historic Sites Act of August 21, 1935, declares that

> "* * * it is a national policy to preserve for public use historic sites, buildings and objects of national significance for the inspiration and benefit of the people of the United States."

Management of historical areas has as its objective the carrying out of the intent of the aforestated general statement of policy by the Congress and the specific Congressional statements of policy included in the legislation for each area.

Historical area administration is primarily concerned with maintaining and, where necessary, restoring the historical integrity of structures, sites, objects and scenes significant to the commemoration or illustration of a particular historical story. The objectives of management are preservation of the historical resources and the presentation of these resources in such a manner that the nation's historical heritage becomes a meaningful experience for visitors.

It must be recognized that integrity and authenticity of historical resources cannot be maintained or restored without consideration of related natural resources, particularly plants and animals.

General (con.)

While physical historical resources are normally placed in a position of preeminence in historical area management, their maintenance, restoration and presentation to the visitor must recognize and include the overall setting within which the historical event occurred. Plant and animal communities significant to the historical story should be managed in such a way that a particular setting is maintained. In this context, species management is a major concern. In the maintenance or restoration of related biotic resources, broad latitude exists in the application of manipulative techniques and methods. Here, the end result is a desired effect - historical authenticity.

In some historical areas, there may be no physical historical resources. The resource of historical value would be the site or scene where a historically significant event took place and its preservation may be either a simple or a complicated program of natural resources management, rather than the maintenance, restoration, reconstruction, etc., of physical historical resources. Resources management must include the total resource mosaic, natural resources and historical, and particularly the importance and relationship of natural resources to the maintenance and preservation of historical integrity and authenticity of the historical story. Natural resources which contribute to historical integrity will be managed as part of the historical resources.

The relationship of natural resources to prehistoric resources may be impossible to establish, particularly with regard to plants and animals. In many instances, the setting as of a specific time in history cannot be restored or even approximated. Maintenance of a "suitable" environment consistent with the nature of the historical resources will constitute an objective of management. Where a choice exists, preference should be given to biotic associations which have evolved on the site. Research into vegetational succession may reveal little or no change in the overall composition of the vegetation mosaic. In such situations, maintenance of settings typical of those at the time portrayed by the historical resource should be stressed.

General (con.)

Natural resources bearing no specific relationship to the historical resources of an area may be managed so as to provide visitor use and enjoyment when such use can be accommodated without impairment of historical integrity. Some historical areas contain significant natural resources. The best use of these will be realized from their management as enclaves presented to visitors on the basis of their natural values. Other natural resources may be present which can be developed for participation types of recreation. In neither case should resource use be permitted at the expense of historical integrity or intrusion upon aesthetic enjoyment of the historical resource.

NATURAL RESOURCES MANAGEMENT PLAN

General

The resources management plan for a historical area must provide for the orderly management of all natural resources of the area in keeping with the purpose of the area concerned and must provide for continuity of management practices over time. Management practices must contribute to preservation of historical integrity where natural resources relate directly or indirectly to physical historical resources. In some areas, physical historical resources may be minimal or absent, and in such cases, historical integrity may be preserved solely through the management of natural resources for preservation of a particular site or scene. Therefore, documentation of conditions to be preserved and the practices for their management is a necessity.

Management Objective

The primary objective of **resources management in historical** areas is the maintenance and, where necessary, the restoration of historical integrity of structures, sites and objects significant to the commemoration or illustration of the historical story. Natural resources may contribute directly or indirectly to the integrity of an area or they may be the only medium for presenting the historical story. In this context, land forms and the presence of vegetation representative of that which existed at the time of the event commemorated are of special importance. The absence of vegetation may be equally important. Historical accuracy of the natural resource mosaic is the basic theme of natural resources management.

The management objective for natural resources not related to maintenance of historical integrity will vary with the resource and from area to area. Consideration must be given to the inherent value of natural resource in an essentially natural state as well as their value for uses compatible with the historical integrity of the area.

Plan Format and Content

The plan format for historical areas will follow the outline in Part I, Chapter 2, with the following supplemental instructions:

Plan Format and Content (con.)

I. AREA PURPOSE (First page)
(Refer to Part I, Chapter 2)

II. MANAGEMENT OBJECTIVE (Start new page)
(The objectives for the management and use of natural resources should be taken from the Master Plan.

A. Resources

1. Related to historical integrity
(Clearly and concisely state the overall objectives of management with regard to the natural resources which relate in some way to the historical integrity of the area. This statement should include the date or period commemorated by the area.)

2. Not related to historical integrity
(Clearly and concisely state the objectives of management with regard to these resources. Consideration must be given to the overall setting of the area, the need for screening, natural values, recreational values, and other possible uses. In other words, what does management propose to do with these resources?)

B. Use (Start new page)
(Clearly and concisely state the objectives of management with regard to visitor use of natural resources of the area. It should be presumed that visitor use of natural resources related to historical integrity would be in keeping with the primary purpose of the area. Visitor uses of other natural resources must not diminish the historical integrity of the area or cause deterioration of the resource. It may be desirable to state two use objectives as 1 and 2 above.)

III. MANAGEMENT PROGRAM (Start new page)
(Delineate management units on a base map of the area suitable for inclusion following the first page of this section. Natural resources will be managed on the basis of land classification as set forth in the "Park Planning Handbook." This

Plan Format and Content (con.)

classification is as follows:

Class I - High Density Recreation Area

Class II - General Outdoor Recreation Area

Class III - Natural Environment Area

Class IV - Outstanding Natural Area

Class V - Primitive Area

Class VI - Historical and Cultural Area

Wilderness (This has been added)

Each land class will constitute a management unit.

(The lead paragraph of this section should state the basis of the management units by reference to land classification and that each land class constitutes a management unit. Apply the land classification definitions to the park or as a whole and classify all lands. Class VI lands, including related natural resources, should be identified first.)

A. Class VI - Historical and Cultural Areas

(These are lands on which are located the historic resources (structures, sites, or objects) that warranted the establishment of the area.)

1. Class VI - (Name of site)

a. Description
(Identify the historic resources of this site, describe the natural resources and indicate how they do or should relate to historical integrity.)

(1) Historical Inaccuracies
(If natural resources no longer portray the historic scene, summarize the nature and

Plan Format and Content (con.)

extent of the deviations and the extent to which such deviations diminish historical integrity.)

(2) Rare, Endangered and Extirpated Species (Identify plant and animal species in this category and their relationship to historical integrity.)

b. Use
(Indicate the types of uses and extent of such uses to which the natural resources of this site can be put consistent with preservation of historical integrity. Indicate those uses which should be discontinued.)

c. Management Objectives
(Clearly and concisely state the objectives of management with regard to the natural resources of this site and their use.)

(1) Resources

(2) Use

d. Management Practices
(Summarize the management practices required to achieve the stated objectives. It should be anticipated that intensive management will be required.)

e. Management Problems
(Identify, in order of priority, and describe each known or suspected natural resources deviation from the historic period and indicate the action required to resolve the situation. Indicate research needs, in order of priority, for each action. Start each problem on a new page.)

Plan Format and Content (con.)

(1) Problem: (Identify)
(Describe the natural resource condition to be corrected and the cause of the deviation from historical accuracy. This should be a short paragraph.)

(1) Action:
(Indicate what needs to be done to resolve the problem and what will be accomplished.)

(1) Research:
(List research needs to initiate the action or management practices. If research has been proposed or completed, show RSP number and title.)

2. Class VI - (Name of site) (Start new page)
(Repeat as for 1 above until all Class VI sites have been included.)

B. Class I-II - High Density or General Outdoor Recreation (Start new page.)
(Identify lands and associated natural resources reserved for recreation facilities and visitor accommodations, (campgrounds, picnic areas, two-way roads, administrative facilities, etc. (existing and proposed); if no Class I-II sites occur within the area, so state.)

1. Class I-II - (Name of site)

a. Description
(Describe the lands and resources used for recreation and include natural resources necessary or desirable for environment control, screening, or enhancement of recreation.)

(1) Adverse Influences of Man
(Summarize those activities of man which have or tend to deteriorate the resource.)

Plan Format and Content (con.)

b. Use
(Indicate the ability of the resources to support recreation activities and the intensity of such uses. Indicate the types of activities for which the resources should be managed and the uses which should be discontinued.)

c. Management Objectives
(Clearly and concisely state the objectives with regard to the resources and their use. These statements must reflect the primary purpose of Class I-II sites as being for active participation in recreation and the need for environmental control.)

(1) Resources

(2) Uses

d. Management Practices
(Summarize the management practices necessary to accomplish the stated objectives. It should be presupposed that intensive management will be required to maintain the quality of resources for recreation.)

e. Management Problems
(Identify and describe, in order of priority, each known or suspected resource problem and indicate the action required for its solution. Identify research needs, in order of priority, for each problem. Start each problem on a new page.)

(1) Problem: (Identify)
(Describe the natural resource condition to be corrected and the cause of the problem. This should be a short paragraph. Begin each problem on a new page.)

Plan Format and Content (con.)

(1) Action:
(Indicate what needs to be done to resolve the situation and what will be accomplished.)

(1) Research:
(List research needed to initiate the action or management practices. If research has been proposed or accomplished, show RSP number and title.)

2. Class I-II - (Name of site) (Start new page)
(Repeat as for 1 above until all Class I-II sites have been included.)

C. Class III - Natural Environment Area (Start new page)
(Lands and related resources in this classification provide a setting, environment, or atmosphere for the historic features of the area and are important to the preservation, interpretation, and management of historic resources. They also serve to accommodate appropriate visitor uses, of less intensity than those of Class I-II, by means that preserve the integrity of the historic resources. These lands may include limited facilities, such as one-way motor roads, foot and horse trails, small overlooks, informal picnic sites, etc., all in harmony with the historic values of the area. The extent of Class III lands may vary from very little to most of the land of an area. It may be desirable to divide these lands into management units of similar or ecologically related resources. If no Class III lands exist within the area, so state.)

1. Class III - (Name of unit)

a. Description
(Describe the natural resources of this unit and their importance in providing a setting, environment, or atmosphere for the historic features or to the preservation, interpretation and management of historic resources. Natural resources

Plan Format and Content (con.)

not within the above categories should be considered on the basis of their inherent values as natural environments and they should be described in terms of ecological relationships or ecosystems.)

(1) Rare, Endangered or Extirpated species
(Identify plant and animal species in this category as they relate to the overall integrity of the area. Where possible, a historic area should contain plant and animal associations characteristic of the historic period commemorated.)

(2) Adverse Influences of Man
(Summarize the adverse influences of man within this management unit and the changes which have occurred in the historic environment. Indicate present uses which should be discontinued.)

b. Use
(Indicate those uses and their extent which the resources will support without loss of quality as a natural environment area.)

c. Management Objectives
(Clearly and concisely state the objectives of management with regard to the resources of this unit and their use.)

(1) Resources

(2) Use

d. Management Practices
(Summarize the management practices required to achieve the objectives stated above. It should be anticipated that management will be somewhat less intensive than that required for Class VI

Plan Format and Content (con.)

or Class I-II areas. Where natural values are involved, consideration must be given to the maintenance or restoration of ecological relationships and processes.)

e. Management Problems
(Identify and describe, in order of priority, known or suspected natural resource problems, and indicate the action necessary for their solution. Identify research needs, in order of priority, to initiate the action or management practices. Start each problem on a new page.)

(1) Problem: (Identify)
(Describe the natural resource condition to be corrected and the cause of the problem. This should be a short paragraph.)

(1) Action:
(Indicate what needs to be done and what will be accomplished.)

(1) Research:
(List research needed to initiate the action or management practices. If research has been proposed or accomplished, show RSP number and title.)

2. Class III - (Name of unit) (Start new page)
(Repeat as for 1 above until all Class III units have been included.)

D. Class IV - Outstanding Natural Feature (Start new page)
(These lands encompass features which are truly unique or outstanding considering the general category to which the feature belongs. "The only one of its type" within a specific area may not be sufficient cause for classifying it Class IV. When such features do occur, nothing should alter or impinge upon their integrity. Many historical areas do not contain Class IV lands and in such instances, so state.)

Plan Format and Content (con.)

1. Class IV - (Name of site)

   a. Description
   (Describe the feature and explain why it is unique or outstanding.)

      (1) Rare, Endangered or Extirpated Species
      (Identify plant and animal species in this category and how they relate to the feature.)

      (2) Adverse Influences of Man
      (Summarize the adverse influences of man upon this feature and which, through management, may be negated and original values restored. Indicate present uses which should be discontinued.)

   b. Use
   (Indicate the uses this feature can support without loss of resource quality.

   c. Management Objectives
   (Clearly and concisely state the objectives of management with regard to the resources of this site and their use.)

      (1) Resources

      (2) Use

   d. Management Practices
   (Summarize the management practices required to accomplish the stated objectives. The nature of the feature will dictate the types of practices and their intensity of application for maintenance of the outstanding quality of the feature.)

   e. Management Problems
   (Identify and describe, in order of priority, each known or suspected problem and indicate

Plan Format and Content (con.)

the action required for its solution. Identify research needs, in order of priority, for each problem. Begin each problem on a new page.)

(1) Problem: (Identify)
(Describe the natural resource condition to be corrected and the cause of the problem. This should be a short paragraph.)

(1) Action:
(Indicate what needs to be done and what will be accomplished.)

(1) Research:
(List research needed to initiate the action or management practices. If research has been proposed or accomplished, show RSP number and title.)

2. Class IV - (Name of feature) (Start new page)
(Repeat as for 1 above until all Class IV sites have been included.)

E. Class V - Primitive Area (Start new page)
(Primitive lands should remain pristine and undisturbed. Where they exist in sufficient size, they should be considered for inclusion within the National Wilderness Preservation System. Primitive areas should contain the essence of naturalness or should be in the process of reversion to an essentially natural condition. If no Class V units exist within the area, so state.)

1. Class V - (Name of unit)

a. Description
(Describe the natural resources of this unit in terms of their ecological relationships and the degree to which the unit meets Class V criteria.)

Plan Format and Content (con.)

(1) Rare, Endangered or Extirpated Species
(Identify plants and animals in this category and the significance of the situation to primitive character of this unit.)

(2) Adverse Influences of Man
(Summarize the adverse influences of man upon the primitive character of this unit and which, through management, may be negated. Indicate present uses which should be discontinued.)

b. Use
(Indicate the uses which the resources of this unit will support without loss of primitive values.)

c. Management Objectives
(Clearly and concisely state the objectives of management with regard to the resources of this unit and their use.)

(1) Resources

(2) Use

d. Management Practices
(Summarize the management practices required to accomplish the stated objectives. Normally, these practices will be extensive in nature and directed to the maintenance or restoration of primitive conditions.)

e. Management Problems
(Identify and describe, in order of priority, known or suspected natural resource problems and indicate the action required for their solution. Identify research needs, in order of priority. Begin each problem on a new page.)

Plan Format and Content (con.)

(1) Problem: (Identify)
(Describe the natural resource condition to be corrected and the cause of the problem. This should be a short paragraph.)

(1) Action:
(Indicate what needs to be done and what will be accomplished.)

(1) Research:
(List research needed to initiate the action or management practices. If research has been proposed or accomplished, show RSP number and title.)

2. Class V - (Name of unit) (Start new page)
(Repeat as for 1 above until all Class V units have been included.)

F. Wilderness (Start new page)
(Those portions of a historical area designated as wilderness will have met the criteria for lands to be included within the National Wilderness Preservation System. If there is no wilderness within the area, so state.)

1. Wilderness - (Name)

a. Description
(Describe the natural resources of this wilderness area, their ecological relationships, and controlling factors.)

(1) Rare, Endangered and Extirpated Species
(Identify plants and animals in this category and the significance of the situation to the preservation of wilderness values.)

(2) Adverse Influences of Man
(Summarize the adverse influences of man upon wilderness values and which, through

Plan Format and Content (con.)

management, can be negated. Indicate present uses which should be discontinued.)

b. Use
(Indicate those uses which are consistent with "Wilderness Management Criteria.")

c. Management Objectives
(Clearly and concisely state the objectives of management of the resources of this wilderness and their use.)

(1) Resources

(2) Use

d. Management Practices
(Summarize the management practices required to accomplish the stated objectives and for preservation of wilderness values. Refer to "Wilderness Management Criteria." It should be borne in mind that wilderness is supplemental to the purpose for which the area was established.)

e. Management Problems
(Identify and describe, in order of priority, known or suspected natural resource problems and indicate the action required for their solution. Identify research needs in order of priority for each problem. Start each problem on a new page.)

(1) Problem: (Identify)
(Describe the natural resource problem to be corrected and the cause. This should be a short paragraph.)

(1) Action:
(Indicate what needs to be done and what will be accomplished.)

Plan Format and Content (con.)

(1) Research:
(List research needs to accomplish the action or management practices. If research has been proposed or accomplished, show RSP number and title.)

2. Wilderness - (Name) (Start new page)
(Repeat as for 1 above until all wilderness areas have been included.)

IV. RESEARCH (Start new page)
(Refer to Part I, Chapter 2)

V. APPENDIX (Start new page)
(Refer to Part I, Chapter 2)

The natural resources management plan has been completed. This is only a plan for action. Upon concurrence by the Regional Director and approval by the Director, action for accomplishment should commence. In all probability, it will be desirable and necessary to prepare specific plans of action to accomplish specific objectives; for example, fisheries management, soil and moisture conservation, wildlife management, grazing, et cetera. Each of these must be integrated into the total plan for the area.

RESOURCES MANAGEMENT CONCEPT

General

The Recreational Area Category includes a wide variety of areas (seashores, lakeshores, parkways, etc.) having diverse resource values. The presence of significant natural and historical resources in some of these areas was a primary reason for their inclusion within the National Park System. In other areas, man-made facilities (dams) have created significant resources (reservoirs) which provide outstanding opportunities for water-oriented recreation. In many instances, a combination of resources exists, thus, multiplying the value of the area for recreation purposes.

Area management is basically concerned with providing opportunities for nonurban recreation in a pleasing environment. This does not mean that significant natural or historical resources are ignored. Such resources, when present, will be managed to provide for their conservation and enhancement of the overall recreational opportunities available within the area.

Recreational uses of resources will vary widely from high to low intensity. High intensity recreation requires the allocation of space and resources and quite often necessitates site alteration to a considerable degree. The allocation of resources for recreation uses must recognize the inherent values of significant scenic, historic, scientific, scarce or disappearing resources, and their relationship to the purpose of the area.

The management of natural resources within recreation areas must be approached from several points of view: (1) Resources allocated for the installation of recreation facilities and those in the vicinity of such facilities; (2) Resources which contribute to the overall environment of the area; (3) Resources consumed through recreation uses; and (4) Resources allocated for recreational use but which are compatible with the basic purpose of the area.

Since the basic mission of the Service is to provide opportunities for nonurban recreation in a pleasing environment, space and associated resources must be allocated for the installation

General (con.)

of recreation facilities and for the maintenance of a suitable environment for recreation activities. In most instances, recreation activity will be intensive and the impact on natural resources will be severe. Preservation of resource quality in and immediately surrounding recreation facilities will necessitate intensive management. The techniques of management will vary with the objectives to be accomplished. In these situations, the axiom, "the end justifies the means," may be an appropriate guideline. Management of the environment in the vicinity of recreation facilities should enhance recreation use of those facilities.

Resources management should strive to preserve the overall basic character or environment of a recreation area. The natural environment areas (Class III) contribute to overall recreation enjoyment. Recreation activity will be extensive; however, the total space and resource allocation normally will exceed similar allocations for intensive uses. Management requirements will be less severe and extensive in nature. The basic concern will be the maintenance of resource conditions which contribute to perpetuate the overall environment of the area. Management techniques applied to a given situation should be those which will best accomplish the desired objective. For example, techniques of silvicultural management, including the removal of mature trees, may be appropriate in the management of forests of a recreation area.

Hunting and fishing are recognized as appropriate recreation activities and the management of game species and their habitats to this end are appropriate resource management activities. Habitat and species management must be integral parts of the total resource management activity.

Resources allocated to activities other than recreation or environment control, but which are compatible with these primary uses, will be managed in such a manner to preserve resource quality. In this context, the grazing of domestic livestock is a major concern. Range resources must be managed to prevent soil and vegetation loss.

NATURAL RESOURCES MANAGEMENT PLAN

General

The natural resources management plan for an area in the Recreation Area Category must provide for the orderly management of all natural resources in keeping with the purpose of the area concerned and must provide for continuity of management practices over time. The plan must be guided by the Master Plan, administrative policy, agreements with other agencies, and specific legislation. The purpose of the plan is to spell out the details for management of natural resources for accomplishment of the area purpose.

Management Objective

Management of natural resources for outdoor recreation in its broadest sense is the primary objective of resources management. Resources not required for recreation activities may be managed for uses compatible with fulfilling the basic recreation purpose of the area. Resources of particular scenic or scientific value or which are scarce or disappearing will be managed for their inherent values compatible with the primary purpose of the area.

Plan Format and Content

The plan format will follow the outline in Part I, Chapter 2, with the following supplemental instructions:

I. AREA PURPOSE (First page)
(Refer to Part I, Chapter 2)

II. MANAGEMENT OBJECTIVE (Start new page)
(The objectives for management and use of natural resources should be taken from the Master Plan. These statements should be clear and concisely phrased and should refer specifically to the area. These statements can be relatively broad because more precise objectives will be formulated later with regard to each management unit.)

A. Resources

B. Use

Plan Format and Content (con.)

III. MANAGEMENT PROGRAM (Start new page)
(Delineate management units on a base map of the area suitable for inclusion following the first page of this section. Natural resources will be managed on the basis of land classifications as set forth in the "Park Planning Handbook." This classification is as follows:

Class I-II - High Density and General Outdoor Recreation Area

Class III - Natural Environment Area

Class IV - Outstanding Natural Area

Class V - Primitive Area

Class VI - Historical and Cultural Area

(The lead paragraph of this section should state the basis of the management units by reference to land classification and that each land class constitutes a management unit. Apply land classification definitions to the area as a whole and classify all lands. The first to be identified should be Class I and Class II lands, including related natural resources needed to maintain a suitable environment for recreation activities.)

A. Class I-II - High Density and General Outdoor Recreation
(These are existing and proposed areas reserved for recreation facilities and visitor accommodations (public beaches, marinas, formal campgrounds, two-way roads, etc.) of high or moderate density and for administrative purposes. Resources in the vicinity of installations should be included for maintenance of a suitable environment for present or proposed activities.)

1. Class I-II - (Name of site)

Plan Format and Content (con.)

a. Description
(Describe the natural resources of this site, how they are used for recreation and/or how they relate to the maintenance of a suitable environment for recreation activities.)

b. Impact of Man
(Summarize the impact of man on the natural resources of this site. Since these sites are designated for moderate to high density recreation activities, the immediate and long-range effect upon the resources must be determined.)

c. Management Objectives
(Clearly and concisely state the objectives of management with regard to the resources of this site and their use. These statements must reflect the primary purpose of Class I-II sites as being for participation in recreation activities within a pleasing environment.)

(1) Resources

(2) Use

d. Management Practices
(Summarize the management practices necessary to accomplish the stated objectives. It should be presupposed that Class I-II sites will require intensive management for maintenance of resource quality for recreational and environmental purposes. How will management be carried out? How will man's impact be offset?)

e. Management Problems
(Identify and describe each known or suspected resource problem of this site and indicate the action required for its solution. Indicate research needs for each problem. Start each problem on a new page.)

Plan Format and Content (con.)

(1) Problem: (Identify)
(Describe each problem in order of priority and identify the cause. This should be a short paragraph.)

(1) Action
(Indicate what needs to be done and what the action will accomplish.)

(1) Research
(List research needs in order of priority to accomplish the action or carry out management practices. If research has been proposed or accomplished, show RSP number and title.)

2. Class I-II - (Name of site) (Start new page)
(Repeat as for 1 above until all Class I-II sites have been included.)

B. Class III - Natural Environment (Start new page)
(Identify the natural environment areas. Lands in this class will occupy the bulk of the area. These lands may include facilities and uses which provide for additional public activities such as public recreation hunting or nature study. Other resource uses compatible with the recreational purpose of the area may be included within this land class; for example, grazing or agricultural activities.

(Since all natural environment lands can not be managed according to the same principles, it will be necessary to divide Class III lands into management units. Where possible, the ecosystem concept should be applied in delineating these units. (See Part II Chapter 1 for a discussion of ecosystems.) It must be recognized that deviations from pure ecological relationships will occur and must be provided for in management practices. For example, wildlife habitat enhancement will be a proper management practice. Similarly, range improvements will be incorporated in the management plan for lands grazed by domestic livestock. The needs of wildlife using the same range must be included.

Plan Format and Content (con.)

1. Class III - (Name of unit)

a. Description
(Describe the natural resources (plants, animals, soil, water, geology, topography, etc.) their ecological relationships and controlling factors (fire, weather, etc.). Identify major elements or components (mountain meadow within a forest type, riparian type penetrating a desert association, etc.) and indicate their relationship to the unit as a whole.)

(1) Rare, Endangered or Extirpated Species
(Identify plant and animal species and indicate the significance of the situation to the value of the unit for recreational purposes.)

(2) Adverse Influences of Man
(Summarize past and present influences and activities of man and how they have diminished the quality of the resources for recreation. Identify present activities which should be discontinued.)

b. Use
(Identify and summarize the types of recreation activities for which the resources of this unit are best suited and which can be supported without loss of resource value. Recreation uses include public hunting, "rock hounding" and other collecting activities. Also consider grazing and other agricultural activities.)

c. Management Objectives
(Clearly and concisely state the objectives of management with regard to the resources of this unit and their use (recreation and other).)

(1) Resources

(2) Use

Plan Format and Content (con.)

d. Management Practices
(Summarize the management practices necessary to accomplish the stated objectives for this unit. Management practices applied to the resources of Class III lands will be extensive, as compared to the intensive practices applied to Class I-II lands. Examples of extensive management practices would include the silvicultural treatment of a forest, including the removal of mature trees and seedbed preparation for regenerating the forest; habitat enhancement for increasing the variety and number of upland game or waterfowl; water development and forage improvement for domestic livestock grazing; soil improvement for agricultural purposes; etc.)

e. Management Problems
(Identify and describe each known or suspected resource problem of this site and indicate the action required for its solution. Indicate research needs for each problem. Start each problem on a new page.)

(1) Problem: (Identify)
(Describe each problem in order of priority and identify the cause. This should be a short paragraph.)

(1) Action:
(Indicate what must be done and what the action will accomplish.)

(1) Research:
(List research needs in order of priority to accomplish the action or to carry out management practices. If research has been proposed or accomplished, show the RSP number and title.)

Plan Format and Content (con.)

2. Class III - (Name of unit) (Start new page)
(Repeat as for 1 above until all Class III units have been included.)

C. Class IV - Outstanding Natural Area (Start new page)
(Lands and resources in this class must be truly outstanding and/or unique, considering the general category to which the resource belongs. "The only one of its type" within the area as a whole may not be sufficient justification for classifying the feature as Class IV. When such features do occur, nothing should alter or impinge upon their integrity since they serve to enhance and supplement the recreational values of the area as a whole. If the area contains no Class IV features, so state.)

1. Class IV - (Name of site or feature)

a. Description
(Describe the resources and explain why they are outstanding. When biotic or dynamic geologic resources are involved, consideration must be given to ecological relationships.)

(1) Rare, Endangered or Extirpated Species
(Indicate as appropriate to the resources described. The fact that a species is rare or endangered may be justification for inclusion in Class IV.)

(2) Adverse Influences of Man
(Identify adverse influences man has exerted upon the resource and which, through management, can be negated and original values restored.)

b. Use
(Indicate the uses this feature can support without loss of resource quality and those uses which should be discontinued.)

Plan Format and Content (con.)

c. Management Objectives
(Clearly and concisely state the objectives of management with regard to these resources and their use.)

(1) Resources

(2) Use

d. Management Practices
(Summarize the management practices necessary to accomplish the stated objectives for these resources. Since these resources are outstanding for their inherent natural values, the management practices must be precisely tailored to perpetuate the resources in an unimpaired natural condition.)

e. Management Problems
(Identify and describe each known or suspected resource problem of this site and indicate the action required for its solution. Indicate research needs for each problem. Start each problem on a new page.)

(1) Problem: (Identify)
(Describe each problem in order of priority and identify the cause. This should be a short paragraph.)

(1) Action:
(Indicate what needs to be done and what the action would accomplish.)

(1) Research:
(List research needs for each problem in order of priority to accomplish the action or to carry out management practices. If research has been proposed or accomplished, show the RSP number and title.)

Plan Format and Content (con.)

2. Class IV - (Name of site or feature) (Start new page)
(Repeat for 1 above until all Class IV areas have been included.)

D. Class V - Primitive Area (Start new page)
(Primitive lands are essentially pristine and undisturbed. Where they exist in sufficient size, they should be considered for inclusion within the National Wilderness Preservation System in accordance with criteria for wilderness within the Recreation Area Category.)

1. Class V - (Name of unit)

a. Description
(Describe this unit and its resources in terms of its primitive character, ecological relationships, and value for recreation.)

(1) Rare, Endangered and Extirpated Species
(Identify plants and animals in this category and indicate the significance of the situation to the maintenance or restoration of the primitive character of this unit.)

(2) Adverse Influences of Man
(Summarize past and present activities and influences and how they have diminished the primitive character of this unit. Indicate which of these are reversible.)

b. Use
(Indicate the types of uses and extent of uses which this unit can support without loss of value as a primitive area. Indicate present uses which should be discontinued.)

c. Management Objectives
(Clearly and concisely state the objectives of management with regard to the resources of this unit and their use.)

Plan Format and Content (con.)

(1) Resources

(2) Use

d. Management Practices
(Summarize the management practices necessary to accomplish the stated objectives for this unit. Management practices must provide for the maintenance of the primitive character of the unit for recreation activities including public hunting and other appropriate uses of a primitive area.)

e. Management Problems
(Identify and describe each known or suspected resource problem of this unit and indicate the action required for its solution. Indicate research needs for each problem. Start each problem on a new page.)

(1) Problem: (Identify)
(Describe each problem in order of priority and identify the cause. This should be a short paragraph.)

(1) Action:
(Indicate what must be done and what the action will accomplish.)

(1) Research:
(List research needs in order of priority to accomplish the action or to carry out management practices. If research has been proposed or accomplished, show the RSP number and title.)

2. Class V - (Name of unit) (Start new page)
(Repeat as for 1 above until all Class V areas have been included.)

Plan Format and Content (con.)

E. Class VI - Historical and Cultural Areas (Start new page)
(Identify significant historical or cultural resources (building, sites or scenes) worthy of preservation for their contribution to historical heritage. These may not be present, and if not, so state.)

1. Class VI - (Name of site)

a. Description
(Identify the historical resources of this site, and indicate how natural resources relate to the preservation of historical integrity or authenticity of the historical story.)

(1) Rare, Endangered or Extirpated Species
(Identify species in this category and their relation to historical integrity.)

(2) Adverse Influences of Man
(Summarize past and present influences and activities of man and how they have diminished natural resource values in relation to the historical resources of this site. Indicate those uses which should be discontinued.)

b. Use
(Indicate the types and extent of uses the natural resources can support without loss of value to historical integrity of the site as a whole.)

c. Management Objectives
(Clearly and concisely state the objectives of management of the natural resources of this site

(1) Resources

(2) Use

Plan Format and Content (con.)

d. Management Practices
(Summarize the management practices to be applied to the natural resources of this site to accomplish the stated objectives. Management practices should relate to the preservation of historical integrity of this site.)

e. Management Problems
(Identify and describe known or suspected natural resource problems of this site and indicate the action required for its solution. Indicate research needs for each problem. Start each problem on a new page.)

(1) Problem: (Identify)
(Describe each natural resource problem in order of priority and identify the cause. This should be a short paragraph.)

(1) Action:
(Indicate what needs to be done and what the action will accomplish.)

(1) Research:
(List research needs in order of priority to accomplish the action or to carry out management practices. If research has been programed or accomplished, show the RSP number and title.)

2. Class VI - (Name of unit) (Start new page)
(Repeat as for 1 above until all Class VI areas have been included.)

F. Wilderness (Start new page)
(Criteria for the selection of lands and their management as wilderness within the Recreation Area Category has not been developed. When this is accomplished, it will be necessary to develop an appropriate management plan consistent with the criteria established for these wilderness areas.

Plan Format and Content (con.)

IV. APPENDIX (Start new page)
(Insert such additional material as desirable for ready reference to supplement or explain the foregoing parts. Do not add material to create impressive bulk.)

The natural resources management plan has been completed. This is only a plan for action. Upon concurrence by the Regional Director and approval by the Director, action for accomplishment of the plan should commence. In all probability, it will be desirable and necessary to prepare specific plans of action to accomplish specific objectives; for example, fisheries management, soil and moisture conservation, wildlife management, grazing, recreation site management, et cetera. Each of these must be integrated into the total plan for the area.