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A Proposed Analysis of Planning Factors within the Interpretive Planning Process

Christopher W. Sands
Utah State University

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A PROPOSED ANALYSIS OF PLANNING FACTORS WITHIN THE

INTERPRETIVE PLANNING PROCESS

by

Christopher W. Sands

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CHAPTER I

INTRODUCTION

Every year, millions of people visit parks and preserves and in the process learn
about the natural and cultural resources of these areas. These resources typically
include, but are not limited to, unique features of geology, hydrology, wildlife,
vegetation, and historical and prehistorical influences. Many of these resources may be
fragile, which is often the reason for park or preserve establishment, and therefore
vulnerable to the impacts created through uncontrolled visitor use. If these resources
are not protected from improper recreational use, the activities have the potential to
influence the species composition and diversity of vegetation, soil properties and
stability of the recreation environment, the behavior and population levels of various
wildlife species, and the overall quality of the visitors' experience (Kuss et al. 1990).

In order to help visitors learn about various physical, biological, and cultural
resources, interpretation has been suggested as a communication link between the
visitor and these often fragile resources (Sharpe 1976). As long as there is a need to
protect the resources of parks, preserves, and other similar areas, there is a need for
interpretation (Contor 1982). As a management tool interpretation has been used to
control visitor circulation through rehabilitated meadows, provide information on low
impact back-country use, protect valuable wildlife habitat, stimulate support for
historic site preservation, encourage protection of existing sites, promote enforcement
of laws, as well as to help achieve many other management goals (Sharpe and Gensler
1978). Purdy et al. (1987) suggest that interpretation can be the least offensive

method of control available to land managers because it preserves the visitors' freedom of choice .

Interpretation has many definitions, several of which are presented here. As described by Tilden (1967, p. 3) it is "an educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media rather than by simple communication of facts." Interpretation, as defined by Cherem (1975, p. 8), is "in part the artful ability to make an environment or subject matter come to life for a particular group of visitors." Risk believes that interpretation is "the translation of the technical and often complex language of the environment into nontechnical form, with no loss in accuracy, so as to create in the listener sensitivity, awareness, understanding, enthusiasm and commitment," (1976, p. 159) And finally in an effort to combine aspects of the other definitions, Peart (1978, p. 3) defined interpretation as "any communication process designed to reveal meanings and relationships of our cultural and natural heritage to the public (primarily) through firsthand involvement with an object, artifact, landscape or site." In short, interpretation is a means of effectively communicating messages, which usually consist of information pertaining to an area's unique natural and cultural resources or management objectives, to the targeted audience or visitor group.

In order to communicate effectively, a framework must be developed which guides the creation and implementation of any interpretive effort. A planning framework can provide the interpretive specialist with important information and guidelines designed to encourage the successful implementation of the interpretive program. The framework often used is called the interpretive plan. Other titles for this framework include "interpretive master plan" and "interpretive prospectus," which

essentially accomplish the same goals as an interpretive plan. Several descriptions of what an interpretive plan or prospectus encompasses have been developed and are presented here:

> "An interpretive plan is a document that guides the character, design, development, and operation of facilities and programs necessary to interpret a project" (Roggenbuch and Fritschen 1984, p. 35).

> "An interpretive prospectus is the framework from which museum and visitor center exhibits, audiovisual programs, wayside exhibits, and interpretive publications are produced. A good prospectus provides the interpretive designer with all the necessary information and guidelines to both locate and design all the parts of the interpretive strategy" (Bucy 1990, p. 1).

> "As one element of the planning process, the Interpretive Prospectus is designed to firm up proposals outlined in the General Management Plan and other planning documents. It identifies interpretive themes and objectives, and makes recommendations concerning appropriate media. It blends the interpretive presentation into a harmonious whole" (Paskowsky 1983, p. 3).

Without a plan, interpretation can result in an overlap or omission of pertinent information, or may leave a fragile environmental feature vulnerable to inappropriate use such as vandalism, overuse, or other depreciative behavior (Sharpe 1976). In addition to putting the resources at risk, poor interpretation can result in the presentation of disconnected information. Good interpretation can lead to a higher satisfaction level in visitors. Interpretation can increase the sustained flow of benefits emanating from our natural and cultural resources and in the process increase people's understanding, appreciation, and enjoyment of those resources without increasing impacts on those areas they use (Wagar 1976).

In order to develop an interpretive plan it is necessary to follow a logical planning process. As Bradley (1976, p. 57) states, "the task of developing an interpretive plan requires an appreciation for and an understanding of planning, both as an activity and as a process." Following a well developed and logical planning process is

an essential component in the development of an interpretive plan. As noted by Veverka and Capelle, "lack of proper attention to the need and value of interpretive planning often reflects unorganized interpretive activities which not only are 'homogeneous' in nature, but often reflect the interests of the interpreter, not the resource base or the visitor," (Veverka and Capelle 1988, p. 1). Paskowsky believes that "interpretive planning is necessary to coordinate all the informational and interpretive needs of a park and to develop cost estimates for the design and production of new facilities," (Paskowsky 1983, p. 4).

A number of interpretive planning processes have been developed. Three examples of common processes utilized by a few federal agencies and museum planners are presented in Figures 1-1 through 1-3. Each process offers a valid alternative to the interpretive planner. The specific situation confronted by an interpretive planner will dictate the specific planning process necessary to bring the interpretive plan to full realization.

This thesis will look at a typical planning process for interpretive planning purposes and will investigate the important factors to analyze when planning for interpretation at a park or preserve. These factors are derived from a review of literature pertinent to interpretive planning. Once these factors are determined, they will be incorporated into the interpretive planning process where appropriate.

A major portion of this thesis will take the recommended interpretive planning process, which includes the planning factors, and apply it to a wetland preserve recently acquired by The Nature Conservancy in southeastern Utah. This will provide an example of how the recommended process is to be utilized by interpretive planners for improving interpretive planning at parks and preserves. Although the preserve is unique in that

1. Formation of the Planning Team

5. Plan Evaluation
   and Revision

2. Goal
   Identification

4. Plan Development
   * Themes
   * Objectives
   * Sites and Media
   * Implementation
     Strategies

3. Inventory
   * Natural and Cultural Resources
   * Visitor Characteristics
   * Current Interpretation Services

Interpretive Planning Process (Roggenbuck and Fritschen 1984)

| GOALS | RESOURCE INVENTORY | VISITOR CHARACTERISTICS |

| THEME 1 | THEME 2 | THEME 3 | THEME 4 | THEME 5 |

| OBJECTIVE 1 | OBJECTIVE 2 | OBJECTIVE 3 |

SITE(S)

MEDIUM/MEDIA

IMPLEMENTATION STRATEGY(IES)
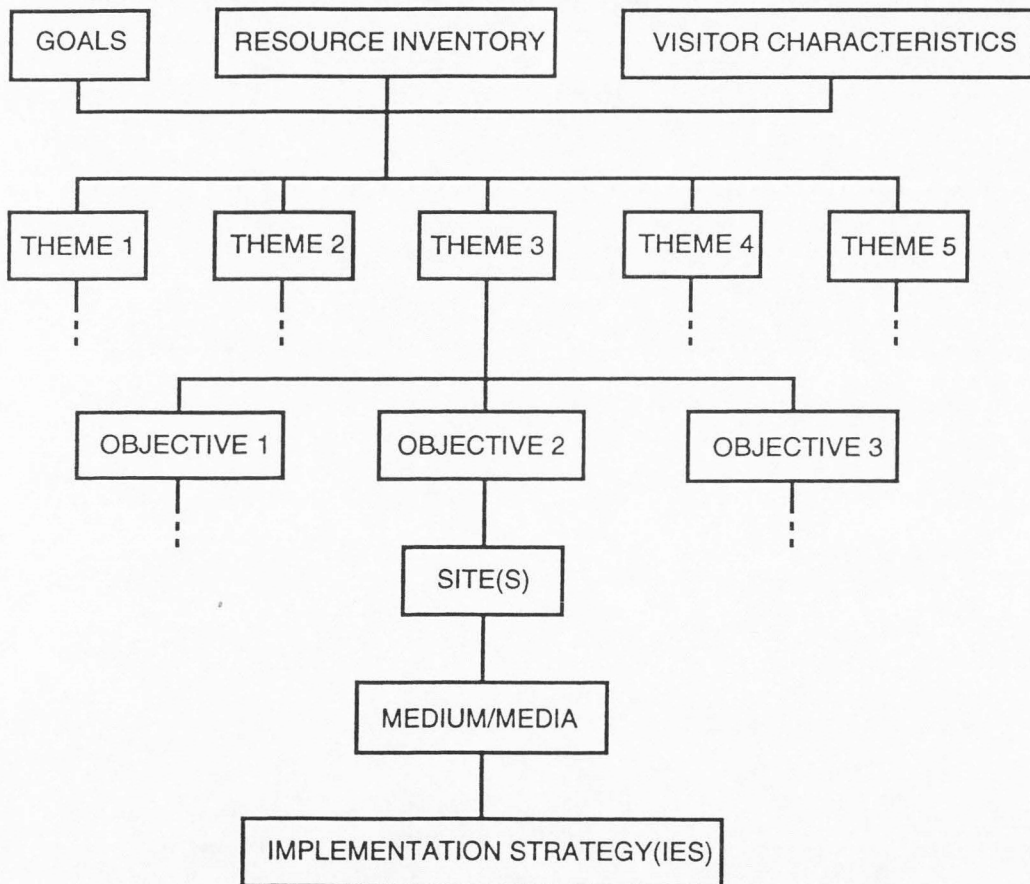
Planning Process (Roggenbuck and Fritschen 1984)

Figure 1-1. Interpretive Planning and Planning Processes Proposed for the U.S. Army Corps of Engineers.

Identification of the Planners and their Roles

Review of Statement of Intent

(a) Visitor Survey

(b) Market Analysis

(a) Communications or Public Programming Master Plan

(b) Collections Development Strategy

Policies on Access, Security, Conservation, Display, Interpretation

Facilities Needs Analysis and Facilities Programming

Financial Forecasts: (a) Capitol (b) Operating

Architectural Planning

Evaluation

⟶ Direct effect or influence on.

⤍ Check back, or review options

Museum Planning Process (Barry Lord/Gail Dexter Lord 1983)

Figure 1-2. The Museum Planning Process Proposed for Museums.

Information
Gathering

Analysis

The Plan

Review
Revision

Approval

Implementation
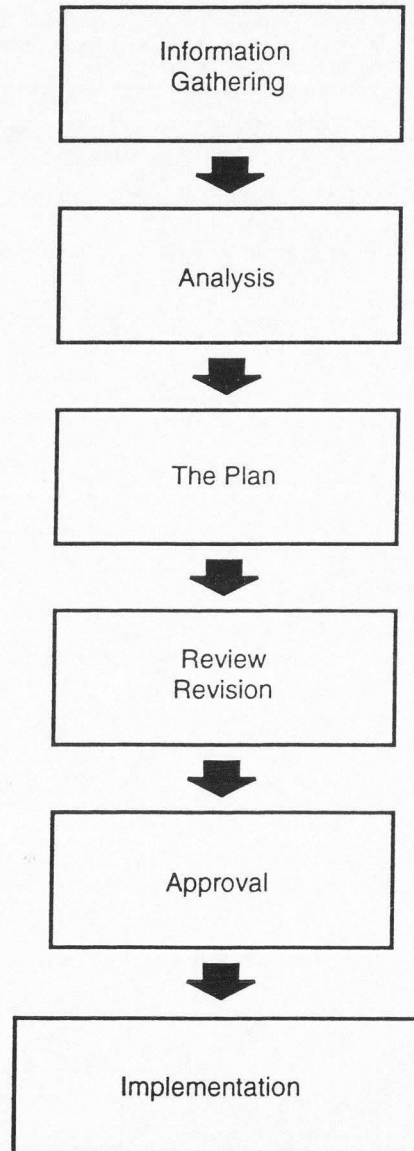
The Planning Process (Paskowshky 1983)

Figure 1-3. The Planning Process Proposed for the National Park Service.

it is a wetland environment set aside to help maintain a variety of sensitive wildlife species, the recommended process can and should be adapted to meet the specific planning needs of a variety of sites proposed for interpretation.

CHAPTER II

STATEMENT OF THE PROBLEM

The interpretive planning process is an integral component in developing interpretation strategies. Interpretive planning is a process, having logical and sequential steps that are continuing and ongoing (Bradley 1976). Interpretation strategies may be considered as interpretive program directives. In the Interpretive Planning Handbook, Paskowsky describes interpretive planning as a process with many purposes:

> "Interpretive planning is a process that analyzes the need for programs, facilities, media, and personal services to communicate information to park visitors. It is a process that defines objectives, examines various options and alternatives, and considers the financial, and possibly environmental, consequences of the proposals. It enables management to make informed decisions long before interpretive programs or facilities are developed and enables the allocation of the resources necessary to implement the plan," (Paskowsky 1983, p. 1)

Interpretive planning is the process that establishes what topics may be interpreted and how best to interpret them given the inherent social, environmental, and managerial issues present at a particular site.

The Interpretive Planning Process

According to Sharpe (1976) interpretive planning follows a series of phases. These phases, common to most interpretive planning processes, include:

- the establishment of goals and objectives

- an inventory of resource information and visitor characteristics

- an analysis of the inventory information gathered

- the synthesis of the analysis information

- development and design of the interpretive plan

- implementation of the interpretive plan

- evaluation and revision of plan specifics.

These phases are sequential (one phase leads to the next), interactive (looping, there is a need for input and feedback), and continual (a plan is never complete) (Bradley 1976). There may be several steps involved in each phase. Each phase is briefly discussed below.

Goals and Objectives. Objectives guide the specific actions necessary for implementing the goals of an interpretive plan. Goals and objectives are usually presented in a hierarchy, from the general to the more specific (Bradley 1976). For example, a goal may be to increase visitation while an objective would state that visitation will increase by 10% over the next year.

Inventory. Within this phase, the inventory or data collection identifies and locates the resources and amenities that make up the physical, biological, and cultural environment (Bradley 1976). An inventory may include the identification of major issues (physical, biological, cultural, and managerial), resource limitations or constraints, visitors and their characteristics, visitor uses, potential consequences as the result of these uses, and other possible interpretive opportunities (Bradley 1976).

Analysis. The analysis phase involves the examination and evaluation of information critical to interpretive plan development, assembling that information into interactive systems (Bradley 1976). The analysis phase takes the raw data gathered in the inventory phase and presents that data in manageable packages (Bradley 1976). These packages often include a series of maps and text describing the resource,

interpretive, user, and agency, opportunities and constraints.

Synthesis. Synthesis involves the generation of several alternative courses of action for implementing the interpretive plan and identifying the implications of each (Bradley 1976). These alternatives propose different means for meeting the stated objectives and should allow decision makers the opportunity to compare and contrast the relative advantages and disadvantages of each. A preferred alternative can then be identified for site specific designing.

The Plan. The plan itself involves the completion of all aspects of the preferred alternative including any revisions, estimate of impacts, and implementation strategies (Bradley 1976). Once a plan is assembled, other requirements, such as budgetary, staffing, timing, and organizing, must be addressed before the proposed interpretive program can become operational.

Plan Evaluation and Revision. The plan evaluation and revision phase includes the development of a monitoring plan to evaluate user and facility impacts on resources, as well as the impact of the program on the users. A comprehensive review helps to insure program viability (Bradley 1976).

Often a planning process is typical and tends to follow a universal pattern distinguished only by the specific planning objectives of the particular organization engaged in the interpretive planning (Bradley 1976). This typical interpretive planning process, which includes the phases described above, is utilized by most agencies and organizations responsible for interpretation (Figure 2 - 1). The standard phases help to provide the interpretive planner with a framework which guides the overall planning process for interpretation. They are particularly well suited to revealing the existing opportunities and constraints inherent in a particular site, user
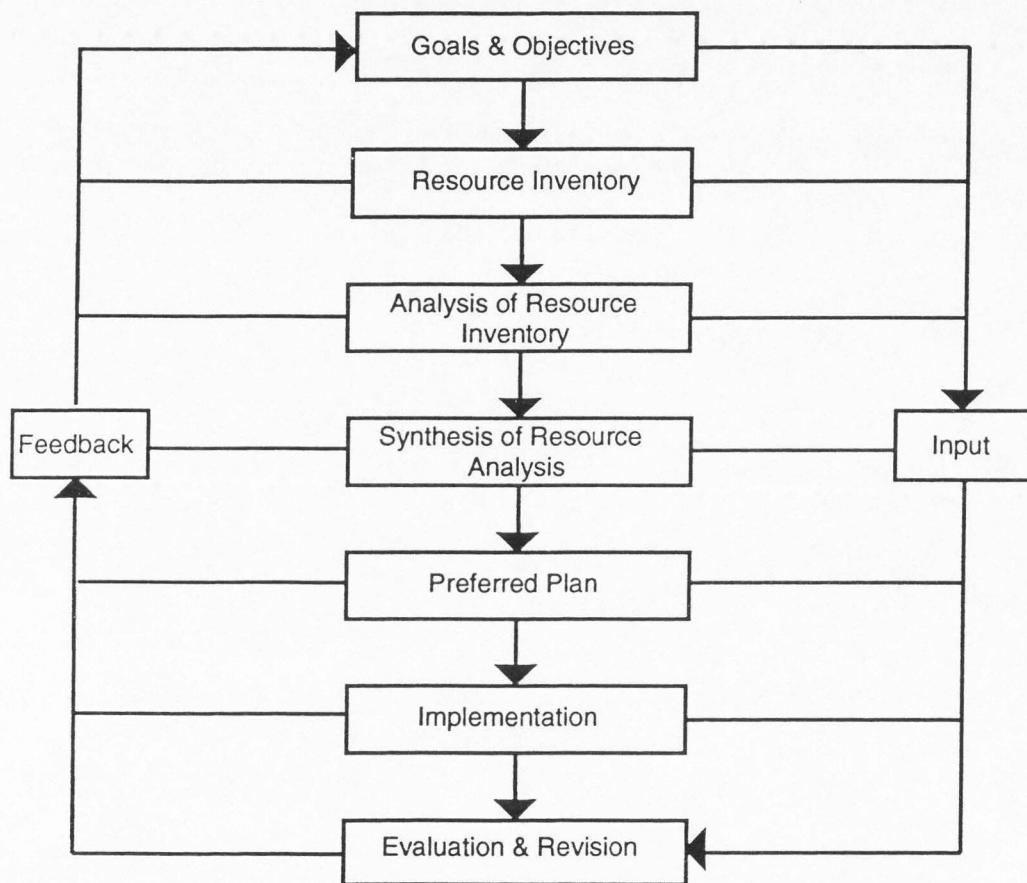
Interpretive planning phases as adopted from Bradley (1976).

Figure 2-1. The Interpretive Planning Phases as Described by Bradley (1976).

group, and management situation. However, many interpretive plans do not result in quality interpretation. They seem to overlook the important step of identifying the critical linkages between the resource inventory and the plan itself. That is, interpreters have not adequately developed a series of steps for more thoroughly analyzing the inventory data, revealing the relationships between the data gathered and the various factors critical to planning for interpretation.

Planning for Interpretation

When planning for interpretation at any site, it is essential that the purpose for the proposed interpretation be established before beginning the study. Sharpe (1976) believes that interpretation should achieve three objectives:

- the primary objective is to assist the visitor in developing a keener awareness, appreciation, and understanding of the area he or she is visiting;

- the second objective is to accomplish management goals such as encouraging thoughtful use of the recreation resource and minimizing human impact on the resources;

- the third objective is to promote public understanding of an agency and its programs.

Paskowsky (1983) identifies several objectives of interpretation in a National Park:

- to orient the visitor;

- to stimulate interest;

- and to promote understanding and appreciation of the park, thus making the visit more meaningful and enjoyable.

Hence, it is important to keep in mind that the visitor is the primary reason for proposing interpretation at any site; without visitors interpretation is simply not needed. Therefore, the interpreter must understand the visitor's needs, expectations, and characteristics. These visitor attributes are specific to each planning situation.

When planning for interpretation at any site there are some fundamental characteristics of the visitor which must be taken into account. First of all, "visitors differ widely in age, educational attainment, interests, and goals to be achieved within a natural leisure setting" (Field and Wagar 1976, p. 45). Secondly, when visitors attend interpretive services they come with different levels of knowledge about the information being presented, different attitudes about that information, different skill abilities, and different levels of expected enjoyment based upon past experiences (Veverka 1978). And finally, visitors have differing amounts of time allotted for each recreational engagement. Because of these diverse qualities the interpretive plan must provide for a variety of interpretive opportunities to meet the needs, expectations, and characteristics of the visitors.

There is also a need for understanding both the site and the interpretive facilities proposed on the site. These facilities, such as interpretive signage, interpretive brochures, interpreters, etc., act as linkages between the visitor and the site, and can be described as 'the media' for interpretation. Paskowsky indicates that "care should be taken to blend the media with its environment, and to design it with the needs of the visitor and the park in mind. The content, location, sequence, and length of programs are all important factors to consider," (Paskowsky 1983, p. 8). As a result, any media or method of presentation should be assigned to that part of the interpretive program for which it is best suited (Paskowsky 1983). In addition, there is a need for a systematic method for locating interpretive facilities within the context of the sequence of the topics to be covered and the inherent constraints of the site.

In general, most interpretive plans effectively indicate the topics to be interpreted and suggest ways to interpret them. However, many plans fall short in

developing a variety of interpretive opportunities for park and preserve visitors. These plans lack both variety in the complexity of information being presented and the diversity of interpretive facilities utilized. In addition, more attention is needed in developing the sequence of interpretive topics within the constraints of the site to more fully meet the needs of the visitor. In other words, most plans seem to lack a logical and coherent approach to establishing the linkages between the visitor and resource inventory and the interpretive plan while still protecting interpretive messages and natural resources (Fuhriman 1993; Blahna 1993).

What seems to be missing in most interpretive planning processes is a method of analysis which takes the existing condition information (that is site, developmental, interpretive, user, and managerial information) and analyzes it in a way that will help the interpretive planner to determine the suitability for the location of potential interpretive topics to be covered, establish a logical sequence for what is being interpreted, select the best medium for interpreting a topic, and provide for interpretation at a variety of experience, ability, and knowledge levels. The development of a more effective planning process, and specifically a method of site and program analysis that will effectively accomplish these objectives, is the primary goal of this study.

CHAPTER III

PURPOSE, OBJECTIVES, METHODS, AND LITERATURE REVIEW FOR THE STUDY

Purpose

The purpose of this study is to develop a method of analysis within the interpretive planning process which evaluates the natural resource, user, and managerial data collected in the inventory phase to:

- determine the suitability for the location of the potential interpretive facilities proposed;

- establish a logical sequence for what is to be interpreted;

- assist the interpreter in selecting the best medium for interpreting a topic;

- provide for interpretation at a variety of experience, ability, and knowledge levels.

This proposed method of analysis will provide for a better understanding of the relationships between the interpretive topics and several interpretive planning factors:

- the suitability of development at interpretive sites (e.g. are the facilities proposed within highly sensitive areas on site, etc.);

- the potential sequencing of interpretive topics (e.g. the building of messages from the general to the more complex);

- the modes of interpretation (e.g. interpretive signs, auto tour, visitor center, etc.);

- the levels of interpretation (e.g. for children or for experts; facilities for the physically challenged or for hikers and bikers).

Understanding these relationships can facilitate the planning for a variety of interpretive opportunities for the park or preserve visitor. This analysis will

encourage the development of site-specific interpretive programming alternatives for review and evaluation by the interpretive planning team. This analysis will also contribute to a more holistic approach to interpretive planning, thus increasing the quality of interpretation and the visitor experience.

Objectives

The objectives of this study are:

- to develop a planning process that will analyze the information gathered for interpretive planning purposes and suggest the relationships between the interpretive topics and the suitability, sequence, modes, and levels for interpretive facilities given the physical, biological, and social constraints of a particular site.

- to apply the proposed planning process to a real situation by developing an interpretive plan for a nature preserve.

Methods

The methods involved in this study include the review of existing literature pertinent to the development of interpretive planning processes; an evaluation of several interpretive plans using criteria developed through the literature review; presentation of a proposed interpretive planning process; and application of the proposed process to develop an interpretive master plan for a nature preserve.

Existing literature pertaining to interpretive planning was reviewed and summarized. A summary of the literature review included a list of criteria for evaluating interpretive plans. A sample of interpretive plans selected from those found at the Utah State University library and those provided by professors were evaluated to determine if the interpretive planning factors described in Chapter 2 were considered.

Following the evaluation of the plans, a method for improving the analysis of the factors and the incorporation of the findings into the interpretive plan are proposed. The

proposed new method of analysis was applied to the planning and design of an Interpretive Development Plan for the Scott M. Matheson Wetland Preserve in Moab, Utah. Finally, the general implications and applications of the proposed process are presented in conclusion.

Literature Review

The review of literature pertinent to interpretive planning was instrumental in suggesting important interpretive planning factor relationships which need to be identified during the analysis phase of the interpretive planning process. These relationships include those which exist between the interpretive topics and the suitability of interpretive sites, sequence of interpretive topics, modes of interpretation, and levels of interpretation. They formed the basic criteria used to evaluate interpretive plans.

The concept of 'interpretive site suitability' suggests that interpretive sites vary in suitability as the result of inherent physical, biological, social/cultural, and managerial constraints. For example, development of a self-guided interpretive trail through critical wetland habitat may not be suitable for the recovery of an endangered bird species which relies on minimal disturbance. The suitability of interpretive sites is proposed as a way to integrate the proposed interpretive facilities within the physical, biological, social/cultural, and managerial constraints of the park, preserve, or other similar area. Based upon information gathered in the resource inventory, determining interpretive site suitability will limit facility development to those areas that are appropriate and will also indicate the most appropriate type of facility.

The concept of 'sequencing' evolved from the idea that interpretive messages should be organized in such a way that one message can build upon the information

presented in previous messages. Pacing (Veverka 1978), which not only applies to the concept of sequencing but also to the concept of levels of interpretation, incorporates the idea of sequencing as a method of message organization. In terms of sequencing, pacing is considered as the purposeful development of stimuli which are presented in some sequence, from the simple through the complex stages, in order to allow the visitor to progress from one level to the next (Veverka 1978). For example, it would likely be necessary to discuss spawning prior to discussing fry emergence when the topic is the life cycle of anadromous fish. Sequencing can be developed in a variety of ways and is dependent upon both the information presented within the messages and the overall method for organization of that information.

The interpretive planner has a variety of options, or modes of interpretation, available for use as vehicles for delivering interpretive messages. These might include, but are not limited to, interpretive signs, brochures, auto tour routes with wayside exhibits, a visitor center, etc. Obviously, there may be advantages for using one mode or media over another due to the superior ability of that mode to deliver the specified interpretive message. For example, in the Interpretive Planning Handbook (Paskowsky 1983) the Park Service lists the advantages and disadvantages of various media and discusses their general characteristics. This information has been provided in Appendix A.

"Each part of an interpretive program should be assigned to the medium or method best suited to do the job" (Paskowsky 1983, p. 9). Various media have different applications depending upon the specific planning situation. The advantages and disadvantages of each mode are therefore important to identify. Because of this, each planning situation will dictate the appropriate variety of interpretive media best suited

for providing quality interpretation. The appropriate variety will depend upon the existing characteristics of the site, its location, the messages being presented, and the specific visitor needs or desires.

The concept of the 'levels of interpretation' combines the concepts of experience levels as described by Fuhriman (1972), and the ability and knowledge levels (factors in paced interpretive services) as described by Veverka (1978). Experience levels address the fact that visitors come to refuges with various interests and the Refuge site development plan should allow for a variety of experience opportunities for all types of visitors (Fuhriman 1972). The idea of a hierarchy of interpretive planning levels can be included in the planning for all types of interpretive settings, such as parks and preserves. For instance, some visitors will seek opportunities which occur within highly developed facilities and require little effort to obtain, while others will prefer more natural encounters that may require great effort to obtain and involve high levels of interaction with the site and low levels of interaction with other visitors.

Paced interpretive services, as developed by Veverka (1978), provide a series of challenges, provide an opportunity to increase mastery of an experience or topic, and provide 'goals' for the visitor. For interpretive planning levels, "pacing would involve the development of a variety of interpretive programs and services, each at several different levels of visitor 'experience,' 'ability,' and 'knowledge,' so that both experts and novices could partake of and enjoy various levels of interpretive services offered at the park/site" (Veverka 1978, p. 20). Veverka (1978) has suggested four areas where interpretive pacing should be considered: enjoyment levels, complexity of information (knowledge) levels, skill ability levels, and attitude levels. Age groups and cultural backgrounds are also areas where interpretive pacing should be considered

(Veverka 1978). For the purposes of this report, only ability and knowledge levels will be addressed. Again, as with the modes of interpretation, the specific planning situation, in regards to the site and visitor characteristics, will dictate the appropriate variety of levels of visitor experiences, abilities, and knowledge.

These concepts should be considered for planning interpretation at any new or existing, park or preserve area. In the next chapter, these interpretive planning factors will be used as criteria for evaluating interpretive plans. For the purposes of this exercise, each interpretive plan was evaluated on the consideration given to the following factors:

1)   the suitability of interpretive sites,

2)   the methods of interpretive topic sequencing,

3)   the techniques used in identifying the relationships between the interpretive topics and the modes or media proposed for presenting interpretive messages,

4)   and the variety of interpretive planning levels offered.

Chapter IV details the evaluation of three interpretive plans using these factors as criteria.

CHAPTER IV

EVALUATING INTERPRETIVE PLANS

Criteria Development

The interpretive planning factors identified in the literature review will be used as criteria for evaluating several interpretive plans. The criteria is presented as a series of questions to be answered. The following is a listing of the questions used:

Criterion 1:   Interpretive Site Suitability.

-       Are the resources suitable for interpretive site facility development?

-       Is the interpretive site suitable for the proposed mode of interpretation?

Criterion 2:   Sequencing of Interpretive Topics.

-       Does the plan present interpretive topics in a sequence?

-       Is the sequence based upon a logical method of organization?

Criterion 3:   Modes of Interpretation.

-       Does the plan offer a variety of appropriate interpretive media as discussed on page 20?

-       Does the plan evaluate the interpretive media for its potential effectiveness of conveying each interpretive message?

Criterion 4:   Levels of Interpretation.

-       Does the plan offer an appropriate variety of visitor experiences as discussed on page 21?

-       Does the plan offer interpretation for a variety of visitor abilities, including consideration for persons with disabilities?

-       Does the plan offer interpretation at a variety of visitor knowledge levels?

Each interpretive plan was evaluated based upon the questions asked for each criterion.

The results have been presented in matrix form at the end of the chapter. Then each interpretive plan was evaluated in terms of it's ability to meet each criterion. The plan's ability to meet each criterion are represented by one of three levels:

- The interpretive plan meets this criterion completely,

- The interpretive plan partially meets this criterion,

- The interpretive plan does not meet this criterion.

Evaluation of Three Interpretive Plans

The plans evaluated are:

- The Walnut Creek National Wildlife Refuge - Prairie Learning Center: Public Use Plan (USFWS 1993).

- The Rainbow Bridge National Monument: General Management Plan, Development Concept Plan, Resource Management Plan, Interpretive Prospectus, and Environmental Assessment (NPS 1990).

- The Warm Springs National Fish Hatchery: Public Use Development Plan (USFWS Undated).

These plans were selected because they appeared on first review to comply with some of the criteria discussed above and were typical of park or preserve areas which utilize interpretation as a tool for educating visitors on unique natural environments (as opposed to historical sites for example). This evaluation indicated what type of analysis, if any, was utilized by those who prepared the plans, and whether those plans meet the criteria listed above. This evaluation also identified opportunities for improving the analysis phase of the interpretive planning process.

The three plans selected for evaluation were produced by different authors for different interpretive contexts. The following will be a brief summary of the three

plans, including an evaluation of the methods used by the interpretive planners to analyze the interpretive site's suitability for the proposed facilities, to present interpretive messages within a logical sequence, to select the various modes of interpretation, and to offer interpretive messages at various experience, ability, and knowledge levels. The summary of elements which relate to interpretation within each plan were presented by following the steps of the typical interpretive planning process as discussed in Chapter 2. The headings for each step were borrowed from the headings used in the plans themselves.

Plan 1: Public Use Plan for the Walnut Creek National Wildlife Refuge & Prairie Learning Center - U.S. Fish and Wildlife Service

Walnut Creek National Wildlife Refuge - Prairie Learning Center is situated southwest of Prairie City in Jasper County, approximately 20 miles east of Des Moines, Iowa. The main branch of Walnut Creek and its tributary streams run through the Refuge from north to south. The Refuge is part of the Des Moines Recreational River and GreenBelt. Located in a region of central Iowa once characterized by tallgrass prairie and islands of oak savanna, the Refuge was established to restore these ecosystems, presently the rarest of all North America's major natural landscapes. According to the USFWS, Walnut Creek will be a catalyst for the development of a citizenry primed to become stewards of America's natural resources. The Public Use Plan outlines the strategy by which the Service will attend to that most important process of encouraging and developing a sense of land stewardship within the visitors (USFWS 1993).

Purpose. The stated purpose of this plan is to provide "program direction and facility recommendations for the three public use areas: Environmental Education, Interpretation, and Wildlife/Wildlands Oriented Recreation" (USFWS 1993, p. 4). The

plan is a technical support document of the refuge Master Plan. It articulates the mission, themes, goals and objectives of the refuge's public use program, and documents the philosophy and direction that guided the planning of Walnut Creek facilities and programs (USFWS 1993). The mission statement is as follows:

"The Environmental Education, interpretive, and recreational facilities and programs at Walnut Creek Refuge are designed to educate and inform visitors about prairie in an exciting, compelling, and entertaining manner." (page 9)

A copy of the proposed facilities layout is included in Appendix B.

Goals and Objectives. The goals and objectives of the Walnut Creek Public Use Plan (PUP) fall into five categories: Environmental Education, Interpretation and Recreation, Biodiversity Preservation, Environmental Protection, and Research. For the purposes of this evaluation only the goal and objectives of the Interpretation and Recreation category will be discussed. The goal and objectives for this category are:

- Goal: Provide opportunities for the public to understand, enjoy and enhance wildlife and wildland resources.

- Objectives:

  A - Implement a customer-oriented approach to promote year-round quality wildlife experiences for all segments of the population (children, adults, and those with special needs).

  B - Provide an opportunity for people to develop wildlife and wildland-oriented recreational skills.

  C - Enhance partnerships with federal, state, and local governments, conservation organizations, volunteers, and the public to meet the needs for wildlife and wildland oriented public uses.

  D - Establish trails and observation points which support watchable wildlife programs and opportunities.

E - Establish interpretive programs and displays that relate the story of the native prairie landscape, its ecology, its values and the role of human interaction with the land.

F - Coordinate Refuge activities with other organizations, agencies, programs, and facilities by providing visitor information about the National Wildlife Refuge System, local nature centers and related regional facilities.

Inventory of Resource Information and Visitor Characteristics. An inventory of the existing conditions related to both the natural resources and the potential audience was undertaken as part of the Walnut Creek PUP. A historical perspective of the Refuge prior to settlement was presented along with an inventory of the remnant native vegetation as part of the natural resource inventory. A detailed Ecological Restoration Process was then presented in addition to the Conceptual Refuge Plan which revealed the proposed facilities for the Refuge within the newly restored landscape. This essentially completed the inventory of natural resources.

As part of the visitor characteristics inventory a User Analysis was conducted to identify potential users, their attitudes, needs and desires. Identified in this analysis are the potential user groups, the reasons for visiting, and the number of potential visitors as well as user demographics. A matrix was then developed to relate the categories of visitors and their likely interests in the Refuge based upon previous USFWS experience. The matrix was designed to evaluate exhibits, interpretive programs and facilities to ensure each of the audiences is engaged, informed and addressed. This matrix has been included in Appendix B.

Development and Design of the Interpretive Plan. Although no apparent detailed analysis or synthesis is presented in the Walnut Creek PUP, the results of such an effort are presumed to be revealed in a series of conceptual diagrams of specific visitor and facilities relationships as they might appear on site. In addition it is assumed that much

of the analysis and synthesis of the environmental constraints of the site were likely presented in the Master Plan. The Visitor Center Campus - Program Plan is presented and reveals the specific locations of facilities and interpretive stations. A very detailed presentation of the public use programs to be utilized as part of the environmental education component of the plan was also presented.

As part of the interpretation component, the topics to be covered by interpretive naturalists were presented. These are listed below:

- What goes where and why?: Reconstruction on a grand scale

- What can you learn from a water critter, anyway?

- A prairie for your own back yard

- Butterfly gardens

- Where have all the flowers gone: the demise of the tallgrass prairie

- Return of the Mole Crickets: reintroducing wildlife at Walnut Creek

- Prairie Predators, alive and well

- Prairie parade of color: wildflowers throughout the seasons

- Birds of the Savanna

- Life underground; hidden prairie secrets

- The prairie after dark

- Edible and poison plants of the prairie

- Never turn your back on a Bison

- Reading the landscape; advance and retreat of the forest

- Looks who's back; prairie and savanna phenology

- Prairie reptiles: they're not just for breakfast anymore!

- Prairie Fire; a part of the plan

- Who's eating who?: The world of prairie insects

- Don't I know you from somewhere? Animal and plant communications

- Life on the Prairie Sea; character interpretation of a pioneer family

- Native Americans, the first prairie managers

- Hunting for game on the tallgrass prairie

- Self propelled success; a bikers guide to viewing wildlife

- Reconstruction and restoration, an emerging science

- How will we know when we're done: measuring progress at the Refuge

- Get dirt under your fingernails, prairie restoration demonstration

The overall interpretive theme, "Restoring the Past to Protect Our Future", was then

presented with a series of five subthemes, which are as follows:

- Life on the prairie Sea

- Roots of Change

- Finding the Clues

- Making it Grow

- Prairie Through the Eyes of an Artist

The theme and subthemes were then integrated into a new main message for the

interpretive exhibits: "There's more to prairie than you ever imagined: more beauty,

diversity, hidden treasures and human involvement," (USFWS 1993, p. 53).

Following this, an exhibits narrative was presented, followed by several

conceptual drawings of visitor/facility interactions. The Walnut Creek PUP then

presented a description of various facilities, such as roads, environmental education

sites, trails, and other ancillary facilities along with conceptual plan drawings of each.

Interpretation stations are included within each conceptual plan for presentation of

various topics.

Marketing and Support Materials and Offsite Programs are presented as two of the final three chapters in the Walnut Creek PUP.

Implementation. Within the Implementation and Operations chapter in the Walnut Creek PUP, the phased development, review and updating of exhibit material, staffing requirements, research, and exhibit evaluation programs are presented. There is no separate evaluation and revision of plan specifics chapter included in the plan.

Evaluation of the Walnut Creek PUP

The evaluation of this plan relies on its ability to meet the aforementioned criteria. These criteria will be listed and then followed by a brief description of how well the plan met the criteria.

Criterion 1: Interpretive Site Suitability. Is the site suitable for facility development? As mentioned earlier, the analysis of the environmental constraints of the site were probably presented in the Master Plan. However, this can only be assumed to have taken place based upon the development of design criteria for the proposed facilities. No suitability map for interpretive facilities was presented in the PUP.

Is the interpretive site suitable for the mode of interpretation proposed? The Walnut Creek PUP offers some design recommendations for each of the interpretive media proposed. Each interpretive site will have to meet the design criteria before being selected. For instance, the visitor center is located within an area where each of the important topics are in relatively close proximity so that visitors can have an intimate experience with the various plant communities interpreted inside the visitor center.

Criterion 2: Sequencing of Interpretive Topics. Does the plan present interpretive topics in a sequence? Perhaps the weakest relationships between the

Walnut Creek PUP and the criteria developed are found here. The plan does not suggest a sequence of interpretive messages or programs.

Is the sequence based upon a natural sequence of organization? Again no sequence is proposed.

Criterion 3: Modes of Interpretation. Does the plan offer an appropriate variety of interpretive media? The Walnut Creek PUP indeed offers an appropriate variety of interpretive media throughout the refuge. These include an auto tour route, a visitor center, outdoor environmental education sites, trails, interpretive stations, observation blinds, and an environmental education campground.

Does the plan evaluate the interpretive media for effectiveness? Although no formal evaluation is presented, it is believed that each mode of interpretation was analyzed for its contribution to the overall interpretive effort. This work is evidenced in the audience matrix where facilities and activities are suggested for a specific visitor group and special notes are added which usually pertain to the characteristics of the visitor. However, no formal analysis is presented. Only the results or determinations of such an analysis are presented in the audience matrix.

Criterion 4: Levels of Interpretation. Does the plan offer an appropriate variety of visitor experiences? Yes, the Walnut Creek PUP does propose a variety of visitor experiences through the development of a number of interpretive facilities and programs.

Does the plan offer interpretation for a variety of abilities? Again through the comprehensive visitor analysis undertaken for the plan the designers were able to identify the various potential user groups which ranged from kindergarten children to environmental education specialists. The various programs offered include interpretive

stations along a half-mile handicapped accessible hardened trail, a two mile loop trail for hikers and walkers, bicycle trails, a campground, an auto tour route, and a visitor center. Other forms of public participation are also proposed including a volunteer program, a scientific research program, land stewardship activities, as well as many other offsite activities.

Does the plan offer interpretation at a variety of knowledge levels? The visitor analysis identified the various audiences that may utilize the preserve. These include preschool, primary, middle, and high school students, college and university students, teachers, families, youth groups, senior citizens, farmers and landowners, drive-by visitors, adult clubs and organizations, and other special populations. Through this identification of user groups the designers were able to develop a variety of facilities that respond to the different knowledge levels of the potential users.

Summary of the Plan 1 Evaluation.

- Criterion 1: Interpretive Site Suitability - The Walnut Creek PUP partially meets this criterion.

- Criterion 2: Sequencing of Interpretive Topics - The Walnut Creek PUP does not meet this criterion.

- Criterion 3: Modes of Interpretation - The Walnut Creek PUP meets this criterion.

- Criterion 4: Levels of Interpretation - The Walnut Creek PUP meets this criterion.

Plan 2: Rainbow Bridge National Monument: General Management Plan, Development Concept Plan, Resource Management Plan, Interpretive Prospectus, and Environmental Assessment

Located in southern central Utah's rugged canyon country, just north of the Arizona border, the Rainbow Bridge National Monument is bounded on three sides by the

Navajo Reservation and Glen Canyon National Recreation Area. The monument

encompasses a total of 160 acres in a region of outstanding recreational, scenic,

scientific, and historic interest. The adjacent Glen Canyon National Recreation Area

features a manmade lake in an otherwise arid environment. The immediate area

constitutes a significant part of the outstanding national parklands in the general region

including Canyonlands National Park, Capitol Reef National Park, Rainbow Bridge

National Monument, and Grand Canyon National Park. The monument was designated on

May 30, 1910 by President William H. Taft for its uniqueness as the world's largest

natural bridge and as an outstanding example of eccentric stream erosion (NPS 1990).

Purpose. This document is a compilation of several, often separate, National

Park Service (NPS) documents which describe future development plans for the

monument. This document presents the process used by the NPS in preparing a general

management plan (GMP), a development concept plan (DCP), a resource management

plan (RMP), and an interpretive prospectus (IP) for the monument. The purpose of

this document is to act as an environmental assessment (EA) which functions to provide

sufficient information and analysis for determining whether to prepare a Finding of No

Significant Impact (FONSI) or an Environmental Impact Statement (EIS) to meet the

requirements of the National Environmental Policy Act (NEPA) (NPS 1990).

The GMP for Rainbow Bridge National Monument (RBNM) provides the NPS with

direction for long-range management, development, and use of the monument. The GMP

"responds to issues identified during the planning process dealing with quality visitor

experience, protection of natural and cultural resources, access, interpretive services,

and facilities" (NPS 1990, p. iii). The GMP sets forth the basic management philosophy

for the RBNM and provides strategies for addressing issues and management objectives.

Appendices to the GMP include an interpretive prospectus and a resource management plan (NPS 1990).

The following is a list of management objectives outlined in the GMP:

1) To preserve Rainbow Bridge by such means as will leave this outstanding natural resource unimpaired for the enjoyment of present and future generations.

2) To identify, determine the significance of, and protect the cultural resources within the national monument.

3) To promote public understanding and appreciation of Rainbow Bridge and the monument's other natural resources in a setting as free as possible from the influence of human activities.

4) To determine and interpret the cultural significance of Rainbow Bridge.

5) To cooperate with the Bureau of Reclamation to insure that management of the Lake Powell impoundment is compatible to the greatest degree possible with the long-term preservation of Rainbow Bridge.

6) To foster and maintain a cooperative relationship for the use and protection of the national monument with the Navajo Tribe.

Issues which constitute the significant subjects identified for analysis in the GMP provide the focus of the planning effort. One issue which relates to this thesis asks: "what interpretive themes, services and facilities should be provided to enhance the visitor experience at the monument?" (NPS 1990, p. 12). It is suggested that the themes include the geologic significance of Rainbow Bridge, its natural and human history and its traditional use by American Indians. The GMP also identifies a need to determine what services and facilities are required to effectively convey the interpretive message to the public (NPS 1990). For the purposes of this evaluation only the IP will be reviewed in detail. A copy of the proposed facilities is included in Appendix C.

Themes, Goals, and Objectives. Interpretive themes, services, and facilities are proposed in the IP. Themes include: Geological Processes that Formed Bridge; Rainbow Bridge - Part of the Larger Colorado Plateau Ecosystem; People Have Interacted with the Bridge in Historic Times; and Human Activity's Impact on the Monument (NPS 1990). The goals identified for interpretation in the plan include:

- to increase visitor understanding of the geology, plants, and animals of the region

- to encourage visitor understanding of how Rainbow Bridge fits into the Colorado Plateau and ecosystem

- to help visitors understand that different cultures perceive resources differently

- to help visitors understand that the monument's resources do not end at its boundaries

- to generate visitor interest in the cultures and lifestyles of the people of the Rainbow Bridge region

- to stimulate visitor and local citizen understanding of external threats to monument resources

- to encourage visitor understanding of limited visitor access to Rainbow Bridge as one management device for reducing degradation of monument resources

- to foster safe, informed, minimum boat and foot impact access to monument resources

- to reduce visitor injury and hazards related to monument uses

- to help visitors understand and appreciate their role in maintaining the monument's natural and cultural resources

- to enhance the visitor's experience at Rainbow Bridge by providing a pleasant transition from a recreation activity to an environmental education experience

- and to foster visitor enjoyment through awareness of available activities and services and time needed for each, both in the monument and in Glen Canyon National Recreation Area.

Objectives, used to measure achievements, are established for visitors leaving the monument. They include:

- 80 percent will confirm that the received adequate information for a well-informed, safe, efficient, and enjoyable visit.

- 80 percent will be able to describe the primary resource that warrants the area's national monument designation.

- 80 percent will be able to identify RBNM as a separate National Park area, distinct from Glen Canyon National Recreation Area.

- 80 percent will know that the Rainbow Bridge is sacred to neighboring American Indians.

- 80 percent will be able to identify water erosion and fracturing as the two main factors in the formation of Rainbow Bridge.

- 80 percent will be able to identify at least one management measure used to reduce impacts on the monument's resources.

- 50 percent will be able to identify human impacts affecting Rainbow Bridge.

- 50 percent will be able to identify at least on action they can take to prevent degradation to the Rainbow Bridge.

- 50 percent will know that prehistoric people once lived in and around the monument.

Existing Conditions, Development, Visitor Use and Interpretation. Existing conditions of natural resources have deteriorated through increased ease of access by Lake Powell visitors and subsequent uncontrolled visitor use. Protection of natural resources has been lax and has resulted in vandalism and graffiti, use off of established trails, and spread of tamarisk within the monument boundary (NPS 1990). The Park Service proposes protecting these areas through management zoning and has prepared a map which reflects those areas to be developed versus those areas to be protected.

Facilities at Rainbow Bridge include 1,300 feet of floating dock walkway, a courtesy dock, a maintained trail, and two interpretive rest areas along the trail. The existing boat dock can hold about 20 boats. Three employees from the Glen Canyon NRA - one ranger, one interpreter, and one maintenance person - spend part of their time at the RBNM (NPS 1990).

Visitation currently exceeds 200,000 users annually. As user numbers increase, the use of visitor services and interpretation has become a very important part of management's objective of maximizing the opportunity for visitors to see Rainbow Bridge and maintaining a quality visitor experience. Two types of visitor conflicts occur: 1) those that affect the natural physical resource at the monument (visitor/resource conflicts) and 2) those that affect the enjoyment of the monument by other visitors (visitor/visitor conflicts) (NPS 1990).

Proposed Interpretive Services. Three primary forms of interpretive services are proposed: wayside exhibits, personal services, and printed material. Although no formal analysis or synthesis of the inventory information is presented, the GMP and the IP propose development of facilities which address the management objectives. The NPS proposal responds to resource protection, park management and operations, and visitor use needs. The plan provides for direct management of visitor access through a contact station which would allow for the sequenced and orderly access to the bridge by the public. The NPS believes that through organized, orderly access and management, the park can minimize visitor dissatisfaction. The plan calls for a two-phase approach for management of the monument (NPS 1990).

Phase I. Interpretive media proposed include an entry contact station, printed materials in the form of brochures, site bulletins, flyers, etc. Printed material will

include information pertaining to the five themes. Audio cassette tape players with prerecorded interpretive programs and safety messages will also be available. Wayside exhibits will be installed on the new floating interpretive platform on the monument dock. Waysides will be developed to address the following:

- Safety messages including an explanation of the flash flood warning system and what the visitor should do in the event of a flood or flood warning.

- Explanation of the geological processes that formed the world's largest natural bridge.

- Explanation of the religious significance of the bridge to neighboring American Indians.

- Explanation of the monument's ecosystems as being part of the greater Colorado Plateau, with floral and faunal examples given.

- Discussion of the changes to the monument's riparian environment resulting from the waters of Lake Powell backing up into the monument.

- Discussion of the ongoing monitoring of the bridge because of the concern that water at its base, during periods of high lake levels, may be weakening its natural underpinnings.

- List activities prohibited in the monument.

Personal services will be provided through the contact station and include orientation, information, safety messages and other visitor assistance. An interpretive ranger will be on site at the monument to answer visitor questions, provide assistance, and perform roving, formal and informal interpretive services. An interpreter will be on board concession tour boats and provide interpretive services for the 15 minute wakeless approach to the monument (NPS 1990).

Phase II. The contact station will be expanded into a transfer dock, which will include a small indoor Natural History Association Outlet. Audio cassette players will not be available as visitors will be required to board a shuttle boat at the transfer dock

and approach the bridge with an interpreter (NPS 1990).

Monitoring and Evaluation. Although no formal implementation section exists, the NPS has suggested how monitoring and evaluation will be developed. Park and concessioner management should discuss how monitoring and evaluation should be carried out; determine the frequency for evaluation, criteria for quality, and roles and responsibilities; and evaluate an individual's program through reinforcement of the positive aspects while working to improve the weak points. Park staff and the concessioner should remain open to suggestions for new programs of interpretive services (NPS 1990).

Evaluation of the RBNM GMP, DCP, RMP, IP, and EA

The evaluation of this plan relies on its ability to meet the aforementioned criteria. These criteria will be listed and then followed by a brief description of how well the plan met the criteria.

Criterion 1: Interpretive Site Suitability. Is the site suitable for facility development? Through management zoning the Park Service identified those areas suitable for development and those which are not suitable for development based upon resource constraints. Therefore, the plan meets this criterion.

Is the interpretive site suitable for the mode of interpretation proposed? There is no indication that the proposed media were evaluated in conjunction with the proposed interpretive sites concerning the wayside exhibits. However, it is believed that the printed material and the personal services will be general enough and flexible enough to partially meet this criterion.

Criterion 2: Sequencing of Interpretive Topics. Does the plan present interpretive topics in a sequence? Although the plan speaks to the need for a sequenced

form of access to RBNM, the plan does not address the sequence of interpretive topics or information.

Is the sequence based upon a natural sequence of organization? Again no sequence is proposed. Although information presented through interpreters may be sequenced, this is not evidenced in the plan.

Criterion 3: Modes of Interpretation. Does the plan offer an appropriate variety of interpretive media? The NPS proposal includes the use of three media: printed material, personal services, and wayside exhibits. These media make up the variety of interpretive methods used to interpret information at RBNM.

Does the plan evaluate the interpretive media for effectiveness? No formal interpretive media evaluation is presented in the document. In addition, interpretive themes were not divided among media for effectiveness.

Criterion 4: Levels of Interpretation. Does the plan offer an appropriate variety of visitor experiences? The NPS proposal primarily focusses on the transmission of information to visitors. Experiences visitors may encounter include a 15 minute boat ride, hiking along a floating dock, and hiking along a trail through the monument. There are no provisions for additional experience opportunities such as environmental education classes, volunteer programs, or guided interpretive excursions.

Does the plan offer interpretation for an appropriate variety of abilities? Apparently there has been no formal analysis of visitor demographics completed for the RBNM. Therefore, the NPS proposal does not address the differences among visitors in terms of age, background, or physical abilities. However, the plan proposes interpretation for non-English speaking individuals and access for the handicapped.

Does the plan offer interpretation at an appropriate variety of knowledge levels? Again, since no formal visitor analysis has been undertaken the NPS has not proposed interpretation at a variety of knowledge levels. Interpretation therefore is directed at a "generic" level of knowledge.

Summary of the Plan 2 Evaluation.

- Criterion 1: Interpretive Site Suitability - The RBNM plan partially meets this criterion.

- Criterion 2: Sequencing of Interpretive Topics - The RBNM plan does not meet this criterion.

- Criterion 3: Modes of Interpretation - The RBNM plan partially meets this criterion.

- Criterion 4: Levels of Interpretation - The RBNM plan partially meets this criterion.

Plan 3: Warm Springs National Fish Hatchery: Public Use Development Plan

The Warm Springs National Fish Hatchery (NFH or Hatchery) is located only three miles from Kah-Nee-Ta Hot Springs Resort, 28 miles from Madras, Oregon and about 100 miles from Portland, Oregon. The Hatchery is located within State School District 509J which serves a total of about 2000 students.

Purpose. The purpose of the Hatchery Public Use Development Plan (plan) is to provide interpretive opportunities concerning the plight of the anadromous fish of the Columbia River Basin. A copy of the facilities layout is presented in Appendix D.

Interpretive and Information Objectives. Interpretation and environmental education will be the major public uses of the Hatchery. The emphases for interpretation include the needs and plight of anadromous fish in the Columbia River Basin and also the Warm Springs NFH contribution toward supporting fish populations. Using interpretive exhibits and a brochure visitors will learn about: 1) the value and

history of this fisheries resource, 2) factors causing a decline of salmon and steelhead, 3) the comparative roles of the Hatchery and the stream spawning habitat in supporting the fisheries, and 4) the relationships of salmon and other fish to the Indian culture.

Media will be aimed for the enjoyment and education of all ages and abilities of visitors even though not everyone will receive the same message. Visitors will be able to select different levels of media (photos, diagrams, headlines, subtitles, and text) consistent with their abilities and interest. This information will be presented in a self-guided format.

Inventory of Resource Information. Although no formal inventory was presented in the plan, the following information was retrieved from various sections of the plan for inclusion here. Existing facilities include a graveled parking lot, a main Hatchery building, a series of fish rearing ponds, and a food storage shed. The Hatchery is new and only temporary exhibits and leaflets are available to help visitors educate themselves. Visitation is slight (only 1060 visitors in 1979) because of the newness and consequent lack of publicity, interpretive facilities and directional signs. Facilities are self-guided although occasional guided tours are given to school groups by Hatchery personnel (USFWS undated).

Interpretive Experience and Facilities Sequence. As in the other two plans evaluated, the plan for Warm Springs NFH does not detail any analysis or synthesis of inventory information. For the Warm Springs NFH the experiences and facilities planned are sequenced so as to influence the quality of the visitor's experience and the effectiveness of the educational effort. Thus, it is important that each step or sub-facility not be taken out of the context of the whole. The public should be enticed to visit the site through graphic and written vignettes of the enjoyable, enriching and

memorable experiences they will have. Once interpretive facilities are installed, news releases for papers, magazines, radio and TV should be prepared along with an attractive leaflet/poster.

Highway and directional signs should be implemented to direct visitors to the site. The proposed entrance sign will welcome visitors to the Hatchery, identify the managing agency and set the architectural and graphic style of the Hatchery experience. Proposed plans for the site include planting of native vegetation that will provide a visual backdrop while the addition of directional signs will lead visitors to the parking area away from Hatchery residences.

Rationale for locating individual exhibits is variously related to the logical story sequence and the existing locations of Hatchery facilities. Exhibits are located along a one-way loop through the Hatchery to avoid back-tracking. The following is the sequence of interpretive topics:

1)   Introduction to Columbia River Fisheries

2)   Salmon and Steelhead Models in Hexagonal Monolith

3)   History and Plight of Salmon
        - Scene from the Past
        - Increased Fishing
        - Declining Spawning Grounds
        - Pollution

4)   Salmon Water Needs

5)   Indian Culture and Salmon

6)   Indian Mosaic Tile Designs

7)   Adult Spawning Salmon

8)   Scientific Monitoring

9)   Fish Barrier Dam and Ladder

10) Infants Need Extra Care

11) Spawning

12) Rearing Young Salmon

13) Rearing Pond, Fish Identification

14) Other Salmon of the Pacific Northwest

There is no implementation section or evaluation and revision section in this plan.

Evaluation of the Warm Springs NFH Public Use Development Plan

The evaluation of this plan relies on its ability to meet the aforementioned criteria. These criteria will be listed and then followed by a brief description of how well the plan met the criteria.

Criterion 1: Interpretive Site Suitability. Is the site suitable for facility development? The facilities are presumed to be suitable with the site because the interpretation proposed will take place within existing facilities. However, no analysis of this suitability was presented and other more suitable areas may be present. Therefore, the plan partially meets this criterion.

Is the interpretive site suitable for the mode of interpretation proposed? Although no formal analysis is presented, many of the interpretive facilities are located within the Hatchery main building and adjacent to hatchery facilities.

Criterion 2: Sequencing of Interpretive Topics. Does the plan present interpretive topics in a sequence? The Hatchery plan does indeed present interpretive topics in a logical sequence. All interpretive facilities and programs operate through this sequence.

Is the sequence based upon a natural sequence of organization? Yes. The Hatchery plan describes that the rationale for placing the individual exhibits is variously related to the logical story sequence of the anadromous fishes of the Columbia River Basin. This sequence is further reinforced through the natural life cycle of these anadromous fish.

Criterion 3: Modes of Interpretation. Does the plan offer an appropriate variety of interpretive media? The Hatchery plan proposes interpretation in the form of interpretive panels along a trail and several models. In addition to these, interpretation may be provided through Hatchery personnel for school students. The plan also proposes the development of a lesson plan for teachers which may include films, books, printed material, and exercises for students.

Does the plan evaluate the interpretive media for effectiveness? The plan presents no formal evaluation of the proposed media.

Criterion 4: Levels of Interpretation. Does the plan offer a variety of visitor experiences? Not really. The emphasis in the Hatchery plan is on self-guided interpretation so employees are not pulled away from their duties.

Does the plan offer interpretation for a variety of abilities? The plan proposes that the media and the interpreted information will be aimed at educating visitors of all ages and abilities. However, the proposal to present information for a variety of abilities is not detailed in the plan.

Does the plan offer interpretation at a variety of knowledge levels? Because of the emphasis towards providing information for elementary students, the Hatchery plan appears to partially offer interpretation at a variety of knowledge levels. However, this information is not clearly presented.

<u>Summary of the Plan 3 Evaluation.</u>

-   Criterion 1: Interpretive Site Suitability - The Warm Springs NFH plan partially meets this criterion.

-   Criterion 2: Sequencing of Interpretive Topics - The Warm Springs NFH plan meets this criterion.

-   Criterion 3: Modes of Interpretation - The Warm Springs NFH plan partially meets this criterion.

-   Criterion 4: Levels of Interpretation - The Warm Springs NFH plan partially meets this criterion.

<u>Summary of the Interpretive Plan Evaluations</u>

To summarize these evaluations, a matrix was developed which displays the three plans and describes how well they met the various criteria (Figure 4-1). What the matrix begins to indicate is that many interpretive plans may not be considering all four important interpretation factors identified in the literature review. When these factors are considered, the interpretive plans fall short in effectively analyzing all the factors and incorporating them into the planning process. Chapter 5 will propose the more comprehensive inclusion of the various interpretation factors into the interpretive planning process, and also suggest effective methods for analyzing those interpretation factors.

	Interpretive Factors			
Interpretive Plans	Criterion 1	Criterion 2	Criterion 3	Criterion 4
Plan 1: Public Use Plan for the Walnut Creek National Wildlife Refuge & Prairie Learning Center.	⊘	○	●	●
Plan 2: Rainbow Bridge National Monument - GMP, DCP, RMP, IP, and EA.	⊘	○	⊘	⊘
Plan 3: Warm Springs National Fish Hatchery - Public Use Development Plan.	⊘	●	⊘	⊘

● The Interpretive Plan Meets This Criterion.

⊘ The Interpretive Plan Partially Meets This Criterion.

○ The Interpretive Plan Does Not Meet This Criterion.

Criterion 1: Interpretive Site Suitability

Criterion 2: Sequencing of Interpretive Topics

Criterion 3: Modes of Interpretation

Criterion 4: Levels of Interpretation

Figure 4 - 1. Summary Evaluation of Interpretive Plans/Interpretive Factors Matrix.

CHAPTER 5

THE PROPOSED INTERPRETIVE PLANNING PROCESS

The Proposed Interpretive Planning Process

The interpretive planning factors previously discussed were incorporated into the analysis phase of the Interpretive Planning Process as presented by Bradley (1976) and shown in Figure 2-1 (Figure 5-1). The interpretive planning factors became steps within the analysis phase of the process and indicate the steps taken within each phase. The analyses create products that may be presented in the form of lists, matrices, and maps. In order to describe how these products were developed, a detailed description of each step is provided below. Important products developed within the previous phases, upon which the analysis phase will rely, include the identification of the project goals and objectives for interpretation within the Goals and Objectives phase, as well as teps within the Resource Inventory phase such as the identification of the park or preserve visitors and their demographic makeup, the identification of the resource issues or constraints (i.e., social/cultural, ecological, and managerial), the identification of existing interpretive efforts, the identification of the overall interpretive theme, and the identification of the proposed interpretive topics. These products must be available prior to initiating the analysis phase.

Interpretive Site Suitability Analysis. This first step in the proposed analysis phase is intended to indicate the suitability of each site for interpretation. This analysis would be based upon an inventory of sensitive areas, whether they be sensitive for social/cultural, ecological, or managerial reasons. The product of this analysis would
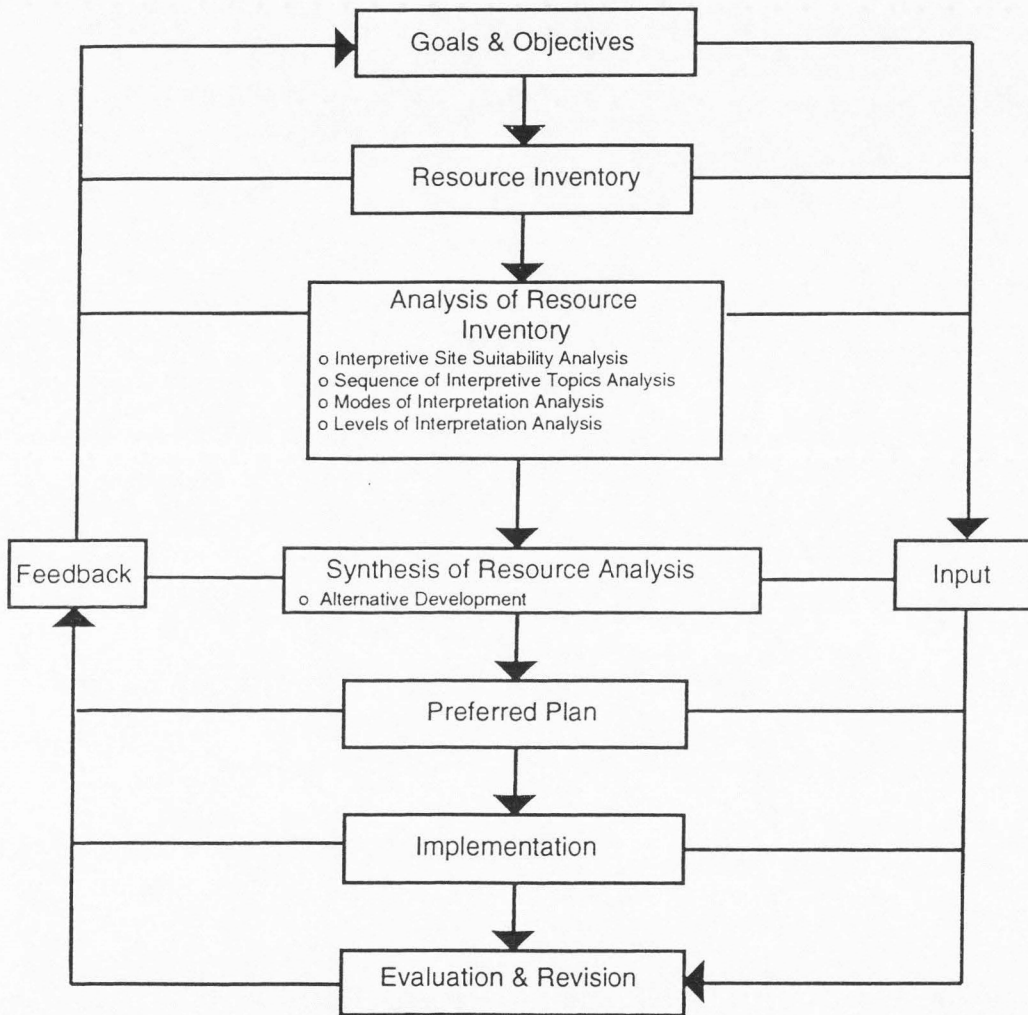
Interpretive planning phases as adopted from Bradley (1976).

Figure 5-1. The Interpretive Planning Process Showing the Proposed Steps Within the Analysis Phase.

include a map identifying different levels of site suitability. The characteristics which

make up these levels include:

- level one: sites able to withstand major environmental impacts (Fuhriman 1993); developed or disturbed sites; areas of low sensitivity.

- level two: sites able to withstand limited environmental impacts (Fuhriman 1993); minimally developed or disturbed sites; moderately sensitive areas.

- level three: sites able to withstand very limited environmental impacts (Fuhriman 1993); undeveloped or natural sites; highly sensitive areas.

Sequence of Interpretive Topics Analysis. The intent of this step is to identify the

ideal sequence of the interpretive topics proposed so that information can be presented in

an order from simple messages to more complex messages. First, a method of

organization must be identified. This will primarily depend upon the topics proposed for

interpretation and may be different for each specific park or preserve.

Second, the topics and sub-topics must be ordered into the sequence developed

through that organizational method. Some topics may be non-sequential and should be

indicated as such. The best approach for this may be a chart showing the various

sequence levels of the topics and sub-topics.

Finally, the specific site can be mapped to show where the most ideal locations

for interpreting each of the proposed interpretive topics exists. If this map indicates

that the interpretive sites are not compatible with the proposed sequence, then either

the sequence of interpretive topics or the locations of interpretive sites can be modified.

Modes of Interpretation Analysis. The intent of this step is to analyze the

relationships between the various topics proposed for interpretation and the various

modes of interpretation proposed to deliver the messages within those topics. An ideal

method for identifying these relationships includes the use of a matrix. The matrix will

indicate the potential of each mode of interpretation for effectively communicating a specific topic given the characteristics of the site, the users, and any management concerns. Each mode is rated as having excellent, good, or limited potential for effectively interpreting each topic within the matrix.

Levels of Interpretation Analysis. This step is intended to identify the relationships between the topics/modes of interpretation and the various experience, ability, and knowledge levels addressed by them. Based on the visitor survey conducted in the inventory phase, which identified user needs, this analysis will indicate where changes to the topics or modes of interpretation are needed in order to meet user needs. Each mode of interpretation and interpretive topic are assigned one of three interpretation levels within the matrix. In order to accomplish this, it is necessary to first identify the characteristics unique to each "planning" level. These are discussed and listed below.

Experience levels. Experience levels recognize that visitors come to parks and preserves with various interests, and therefore often seek different encounters, or experiences, with the site (Fuhriman 1972). These different desires can be summarized in three levels:

- level one: optimum opportunity for orientation and overview; minimal interaction with the site (Fuhriman 1972).

- level two: in-depth on site interpretation; high level of interaction with the site (Fuhriman 1972).

- level three: minimal to non-existent interpretation devices; maximum interaction with the site (Fuhriman 1972).

Ability levels. Ability levels pertain to the levels of motor skill or skill ability needed for some interpretive services, such as various levels of expertise at craft

programs or various levels of endurance needed for site activities (Veverka 1978). The

three levels include:

-     level one: easy access, high number of participants (Fuhriman 1993); introductory level for those with little or no mastery ability (Veverka 1978).

-     level two: more restrictive access, participant numbers diminish (Fuhriman 1993); a medium level for those with more experience and possessing a more developed mastery ability (Veverka 1978).

-     level three: very restrictive access, highly interested and skilled participants only (Fuhriman 1993); a top level for those who possess a high degree of mastery ability (Veverka 1978).

Knowledge levels. Knowledge levels are the various levels of complexity of

information provided at interpretive services (Veverka 1978). The three levels

proposed include:

-     level one: resource fundamentals, basic messages (Fuhriman 1993); introductory level for those with little or no previous knowledge of the subject being presented (Veverka 1978).

-     level two: advanced resource information, complex messages (Fuhriman 1993); a medium level for those with more knowledge of the subject being presented (Veverka 1978).

-     level three: technical resource information, specialized messages and research opportunities; a top level for those who possess a high degree of knowledge of the subject being presented (Veverka 1978).

For organization, the levels for each category can be combined and incorporated

into the interpretive topic matrix. The site can also be mapped to show the existing

levels of interpretation offered and can also be used to evaluate alternatives within the

synthesis phase of the planning process.

Summary and Conclusions

The analysis phase of the interpretive planning process has been proposed to

include a number of products that will assist with the analysis of those factors which

have been identified as essential components of planning for interpretation at any site. These factors to be analyzed now become steps within the analysis phase. Products within each step may include a series of lists, matrices, and/or maps depending upon the specific planning needs of the site. Chapter 6 will provide an example of how to use the proposed analysis within the interpretive planning process.

<u>Further Research</u>

Based upon the findings generated through this thesis, further research conducted on interpretive planning factors or the interpretive planning process is needed in the following areas: the addition of interpretive planning factors which are identified through emperical research on interpretation; the improvement of products such as lists, matrices, and/ or maps that effectively analyze interpretive planning factors developed for specific sites; and evaluations of the effectiveness of implementing interpretive plans that utilize the proposed interpretive planning process.

CHAPTER 6

THE PROPOSED INTERPRETIVE PLANNING PROCESS APPLIED: THE INTERPRETATION

DEVELOPMENT PLAN FOR THE MATHESON WETLAND PRESERVE, MOAB, UTAH.

This chapter discusses the application of the proposed interpretive planning

process to the Scott M. Matheson Wetland Preserve located in Grand County, north and

west of Moab, Utah. The preserve is owned and managed by The Nature Conservancy

(Conservancy) and the Utah Division of Wildlife Resources (UDWR). The Interpretation

Development Plan prepared for the preserve is an example of how to apply the proposed

analysis of interpretive planning factors, within the interpretive planning process, to a

preserve where interpretation is not currently available.

Introduction

Since settlement in the late 1800's, traditional use of the preserve lands, known

locally as the "sloughs", has included cattle grazing. Although plans for cultivation

never materialized, canals and dikes were constructed in the early 1970's to drain the

area and control river flooding (Collins 1992). A variety of consumptive and

nonconsumptive, legal and illegal activities have taken place on the preserve since the

beginning of the uranium boom some 40 years ago (GBFO 1991a). Some of these uses

include hunting, birding, clearing of vegetation, broom ball in the winter, diking and

building canals, and visits by environmental education groups. Until the Conservancy

and UDWR purchased the sloughs, many of these activities were in trespass. Currently,

an estimated 1000 visitors come to the preserve annually. Sparked by recent publicity,

tourist interest in visitation to the preserve has been high (GBFO 1991a).

The Great Basin Field Office (GBFO) of the Conservancy and the UDWR purchased, he preserve over a three year period from 1991 to 1993. Each owns about half of the ?00 acre tract of this Colorado River-side floodplain. The preserve consists of approximately 400 acres of dry river bottom and 500 acres of wetland, as well as the nouth of Mill Creek (Collins 1992). The preserve is managed to provide a secure efuge for a variety of avian species, to enhance wildlife species diversity and abundance, and to afford the public limited outdoor recreation opportunities consistent with preserving the unique wildlife species and their habitats found at the preserve.

The preserve is made up largely of a complex system of wetland habitats and associated wildlife species including birds, fish, amphibians, reptiles, mammals, and nsects. Sensitive habitats and species occur throughout the preserve and warrant protection. These include, but are not limited to, the Great blue heron rookery and hundreds of acres of potential endangered fish rearing habitat. As defined by the GBFO, nanagement and development of the Matheson Wetland Preserve includes a three-pronged approach, within a philosophy of maintaining a maximum level of species and habitat diversity:

·   Preserve existing key habitats.

·   Enhance degraded habitats, or those that could sustain more wildlife with a better hydrologic regime.

·   Provide for public enjoyment and education consistent with preservation of the unique wildlife which occur at the preserve (GBFO 1992).

The GBFO envisions the Matheson Wetland Preserve as the flagship of a candidate Bioreserve on the Colorado Plateau (GBFO 1991b). The UDWR envisions the sloughs as one of four premium showcase public wetland environs statewide (GBFO 1991b). "The GBFO and the UDWR have agreed to unify management, which will emphasize nongame

habitats and public enjoyment of the site's extremely varied birdlife (over 150 recorded species)" (GBFO 1991b, p. 1). Currently the preserve has no defined points of entry, no interpretive signage, no acknowledgment of local interest and support, and no explicit regulations (GBFO 1991b). These conditions could lead to depreciative behavior by uncontrolled visitation, which may result in wildlife displacement.

An Interim Management Plan (Collins 1992) has been recently completed. It highlights immediate concerns and coordination between the Conservancy and UDWR. "The Interim Management Plan sets general management goals and then specifies objectives and actions for the short term (through 1992) and the interim term (through 1995)" (Collins 1992, p. 1). The goal of the Interim Management Plan is to "preserve and enhance the natural diversity of this unique Colorado River floodplain and wetlands system," (Collins 1992, p. 1). The Interim Management Plan emphasizes enhancement of disturbed wildlife habitats, and protection of high quality habitats from future degradation. The element of natural change through flooding of the preserve is recognized as an important component of the dynamic processes of the preserve (Collins 1992).

Remnants of the natural ecosystem of the preserve are, for the most part, still intact. Some human disturbances have occurred through grazing, clearing, draining, and water withdrawal. Much of this disturbance has resulted in the proliferation of the invasive exotic tamarisk (*Tamarix*). However, many of the important ecosystem processes, such as the hydrologic regime, continue to maintain much of the preserve in its natural state.

The Interpretation Development Plan, the primary emphasis of this chapter, will address long range preserve goals and management issues. The purpose of the plan is to carefully locate interpretation and environmental education facilities within the preserve. This plan will serve as a guide for implementing facilities within the preserve that will encourage learning through understanding of the unique physical and biological processes that are the essence of the preserve.

Background

The Colorado River - likened to the Nile of Africa and the Amazon of South America because of its immense basin, which covers over half of the land area of the United States - has played a major role in shaping the physical and cultural history of the southwestern portion of the North American continent (Rosenberg et al. 1990). According to Bishop and Porcella (1980) the natural physical setting of the Colorado River Basin can best be described by the word 'diversity'. The river travels some 3000 km, from high mountain elevations to high plateaus and then low desert valleys, and drops over 4,000 m in elevation before it reaches the Gulf of California in Mexico (Rosenberg et al. 1990).

The waters of the Colorado River now serve millions of people; uses include domestic water supplies, irrigated agriculture, energy production, industry, mining, recreation, and aesthetic values (Bishop and Porcella 1980). The Colorado River carries water from melting snows in a pulse of flooding and retreating that creates a narrow alluvial valley of riparian forests and marshes (Rosenberg et al. 1990). The natural cycle of annual flooding has been diverted and the most productive lands have been inundated by reservoirs or developed for agriculture, resulting in fragmentation and alteration of the riparian habitat, drastically affecting animals dependent on these

habitats (Rosenberg et al. 1990). The riparian environment along the Colorado River has undergone dramatic changes brought about by disturbance from human activities. As a result, the Colorado River system currently has the largest number of rare and endangered fish and wildlife species of any river system in the United States (Bishop and Porcella 1980). Water diversions and pollution continue to increase, which results in further wildlife habitat loss and degradation. The ability of the Colorado River to sustain these unique fish and wildlife species will be in even greater jeopardy.

Freshwater marshes, such as those found at the preserve, are unique, long-lived, and highly productive systems, and are a critical resource for wildlife (Weller 1978). The benefits derived from freshwater wetlands include desyncronization of flood waters, pollution reduction, habitat for fish and wildlife, clean water supply to aquifers, provision of recreation and aesthetic values, and educational opportunities (Adamus et. al. 1991).

Unfortunately, some of these benefits conflict. Recreational use of the Colorado River is putting additional pressure on the wildlife that inhabit this fragile ecosystem. Recreation activities include boating, fishing, swimming, float trips, camping, off-road vehicle use, hunting, hiking, and touring (Bishop and Porcella 1980). Recreational activities have increased steadily in the upper Colorado River basin since early this century; especially in the last thirty years. Kuss et al. (1990) have found through extensive literature review that the most typical behavioral responses of wildlife to recreational activities include modified movement, feeding, and reproductive patterns. When these recreational activities occur in an area which is not protected through some form of active management, they have the potential to influence the species composition and diversity of vegetation, the soil properties and stability of the recreation

environment, the behavior and population levels of various wildlife species, and the overall quality of the visitors' experience (Kuss et al. 1990).

Given these concerns over conflicting beneficial uses, wise land use planning will be necessary to protect the unique features of the preserve. Because UDWR owns about half of the preserve, public hunting must be allowed there. The Conservancy-owned parts of the preserve will be managed more restrictively with respect to hunting, and recreational uses will favor the birdwatcher, naturalist, and education group participant (GBFO 1991a). Regardless of the activity, the potential for adverse impacts on existing habitat is great.

Process Overview

The planning process for creating the Interpretation Development Plan for the Matheson Wetland Preserve is based upon a series of seven phases. Within each phase are steps that lead from one to the next while allowing for input and feedback throughout (see Figure 6-1). This process is dynamic and will require updating and revision of the plan as new information becomes available.

This seven phases of the process are:

- 1) Goal and Objectives;

- 2) Resource Inventory;

- 3) Analysis of Resource Inventory;

- 4) Synthesis of Resource Analysis;

- 5) Selection of a Preferred Plan;

- 6) Implementation of the Preferred Plan; and

- 7) Evaluation and Revision.

Goals & Objectives

Resource Inventory
o Existing and Potential Users
o Identified Resource Issues
o Existing Interpretive Efforts
o Preserve Interpretive Theme
o Potential Interpretive Topics

Analysis of Resource Inventory
o Interpretive Site Suitability Analysis
o Sequence of Interpretive Topics Analysis
o Modes of Interpretation Analysis
o Levels of Interpretation Analysis

Synthesis of Resource Analysis
o Alternative 1: Minimal Development
o Alternative 2: Moderate Development
o Alternative 3: Maximum Development

Feedback

Input

Preferred Plan

Implementation

Evaluation & Revision

Interpretive planning phases as adopted from Bradley (1976).

Figure 6-1.   The Planning Process Used in the Interpretation Development Plan for the Matheson Wetland Preserve.

Within each phase are a series of steps and/or products to be developed. These phases and steps are described below.

Goal and Objectives

A goal is an overriding statement that, in this case, defines the purpose for interpretation. "Objectives are the guides to specific actions required in an interpretive plan," (Bradley 1976, p. 68). Putney and Wagar (1973) suggest that objectives be developed within a hierarchy that includes broad policy objectives at the top level, objectives to guide selection of opportunities at the second level, and evaluation objectives at the third level. First level objectives are essentially policy statements that define program direction and balance; second level objectives further guide the selection of opportunities available for interpretation; and third level objectives define the desired outcome and permit measurement and evaluation (Putney and Wagar 1973). For the purposes of this plan, only first and second level objectives will be established. Third level objectives can then be established when site specific design of interpretive facilities begins.

Goal. The overall goal of the Interpretation Development Plan for the Matheson Wetland Preserve is to provide for public enjoyment and environmental education consistent with the protection and enhancement of the natural wildlife habitats at the preserve. Hence, there are two components to the overall goal of the plan: 1) public enjoyment and environmental education and 2) protection and enhancement of important wildlife habitats.

Objectives. First level objectives are as follows: 1) provide interpretation that will enhance visitor experiences while educating them on the unique natural features of the preserve; and 2) plan for the protection of important wildlife habitats and

demonstrate opportunities for enhancement of these habitats.

Level one objective: Provide interpretation that will enhance visitor

experiences while educating them on the unique features of the preserve.

Level two objectives:

-    Assist visitors in developing a keener awareness, appreciation, and
     understanding of the preserve and Colorado River environs in general.

-    Accomplish management goals through encouraging thoughtful use of recreation
     resources and minimizing human impact of biophysical resources.

-    Promote the public's understanding of the Nature Conservancy's/UDWR's goals
     and objectives.

Level one objective: Plan for the protection of important wildlife habitats and

demonstrate opportunities for enhancement of these habitats.

Level two objectives:

-    Identify habitats on the preserve most critical to wildlife and sensitive to human
     disturbance.

-    Identify those human activities which lead to wildlife displacement and
     implement management strategies which modify that behavior.

Resource Inventory

Decisions regarding programming and selection of interpretive facilities cannot

be undertaken until a comprehensive resource data base has been prepared. This data

base can be used to identify and locate the features which make the preserve unique. In

addition, gathering information regarding existing and potential users is an integral part

of this phase.

The resource inventory phase involves the collection of resource information

that constitutes the physical, biological, and cultural features of the preserve. This

resource inventory includes an inventory of existing and potential users and their

characteristics, the location and mapping of identified resource issues, a discussion of existing interpretive efforts, the identification of a preserve theme, and the listing of potential interpretive topics. This inventory will set the guidelines for developing interpretive facilities at the preserve.

Inventory of Existing and Potential Users. A comprehensive plan relies on a clear understanding of the user groups, their needs, interests, and expectations. This information will aid in developing interpretive services that respond to these needs, interests, and expectations. Although the development of a comprehensive user analysis falls beyon the scope of this report, provisions for including data from a future analysis should be planned to take advantage of these resources as they become available. The current inventory relies upon observations made during field visits and conversations with preserve personnel.

Existing preserve users are composed primarily of birders, hunters, and other recreationists. The birders tend to be well educated, familiar with the preserve, and from local communities. Hunters tend to be local residents who have historically used the preserve to provide for sustenance and sporting opportunities. Other recreationists are typically local residents who live near the preserve and consider it their nature park, where there are opportunities for broom-ball in the winter, picnicking in the summer, and year-round exploration of preserve features. Current visitation is approximately 1000 persons per year (GBFO 1991a) and is primarily restricted by the lack of facility development.

Potential users include visitors from within the region who are travelling through the area as national park tourists, as well as visitors who are familiar with the preserve through membership in the Nature Conservancy. Tourists travelling through

the area could find out about the preserve via the Multi-agency Visitor Center located in Moab or through conversations with personnel at area parks. Conservancy members would most likely find out about the preserve through informational mailings from the Conservancy. As implementation of the preferred plan begins, a formal user analysis should be undertaken to ascertain the specific characteristics of preserve users.

Inventory of Identified Resource Issues. The inventory of identified resource issues included the mapping of existing natural resource, land use, and management data. The approach taken included identifying the natural and human-influenced resources at the preserve. This information was used to determine areas that will require habitat enhancement and areas that are sensitive to disturbance and should therefore be avoided. This will help to facilitate the protection of key wildlife species and their habitats later on in the process. This inventory revealed the opportunities for, and constraints to, developing interpretive facilities at the preserve. Because there is still much to learn from on-going and future studies of other physical and biological components of the wetland system, this inventory is not entirely comprehensive. The resources inventoried include vegetation types, wildlife, wildlife habitat sensitivity to human presence, trails, and management concerns. The location and character of these resources were researched and recorded to establish their contribution to the unique environment found at the preserve.

Vegetation types. The first objective of this step was to identify the various vegetation types that exists at the preserve. Wildlife species often utilize specific vegetation types differently. Since it became obvious that, for a majority of the species found at the preserve, critical habitat was associated with some form of wetland and various wetland vegetation types, an inventory of these wetland habitats was necessary.

The classification system utilized by the U. S. Fish and Wildlife Service was used to categorize the various wetland habitats found at the preserve. According to the classification system (Cowardin et. al. 1979) the preserve's wetlands fall into the Palustrine System classification. The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, and emergent mosses or lichens bounded by upland or any of the other wetland systems (Cowardin et. al. 1979). The Palustrine system can be broken down further into classes and subclasses. Because no formal wetland delineation has been undertaken at the preserve, the preserve will be divided into classes only. These classes include emergent wetland, scrub-shrub wetland, forested wetland, and open water as defined by Cowardin and others (1979). Figure 6-2 shows the various wetland habitats that can be found at the preserve. A brief description of each of the habitats is provided below.

The Emergent Wetland class is characterized by erect, rooted, herbaceous hydrophytes, primarily perennial plants, which are present most of the growing season (Cowardin et. al. 1979). Emergent Wetlands are known by many names, including marsh, meadow, fen, prairie pothole, and slough (Cowardin et. al. 1979). On the preserve, this class of wetlands typically contains a diverse array of herbaceous hydrophytes such as cattails (*Typha* spp.), bulrushes (*Scirpus* spp.), and sedges (*Carex* spp.).

The class Scrub-Shrub Wetland includes areas dominated by woody vegetation less than 6 m tall which includes true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions (Cowardin et. al. 1979). These communities may represent a successional stage leading to Forested Wetland, or they may be relatively stable communities (Cowardin et. al. 1979). The Scrub-Shrub

Legend

- Open Water
- Emergent Wetland
- Scrub-Shrub Wetland
- Forested Wetland
- Beaches
- Disturbed Upland - Tamarisk
- Disturbed Scrub-Shrub Wetland
- Sagebrush

DEVELOPMENT PLAN

Scott M. Matheson Wetland Preserve
Moab, Utah

Key Wildlife Habitats
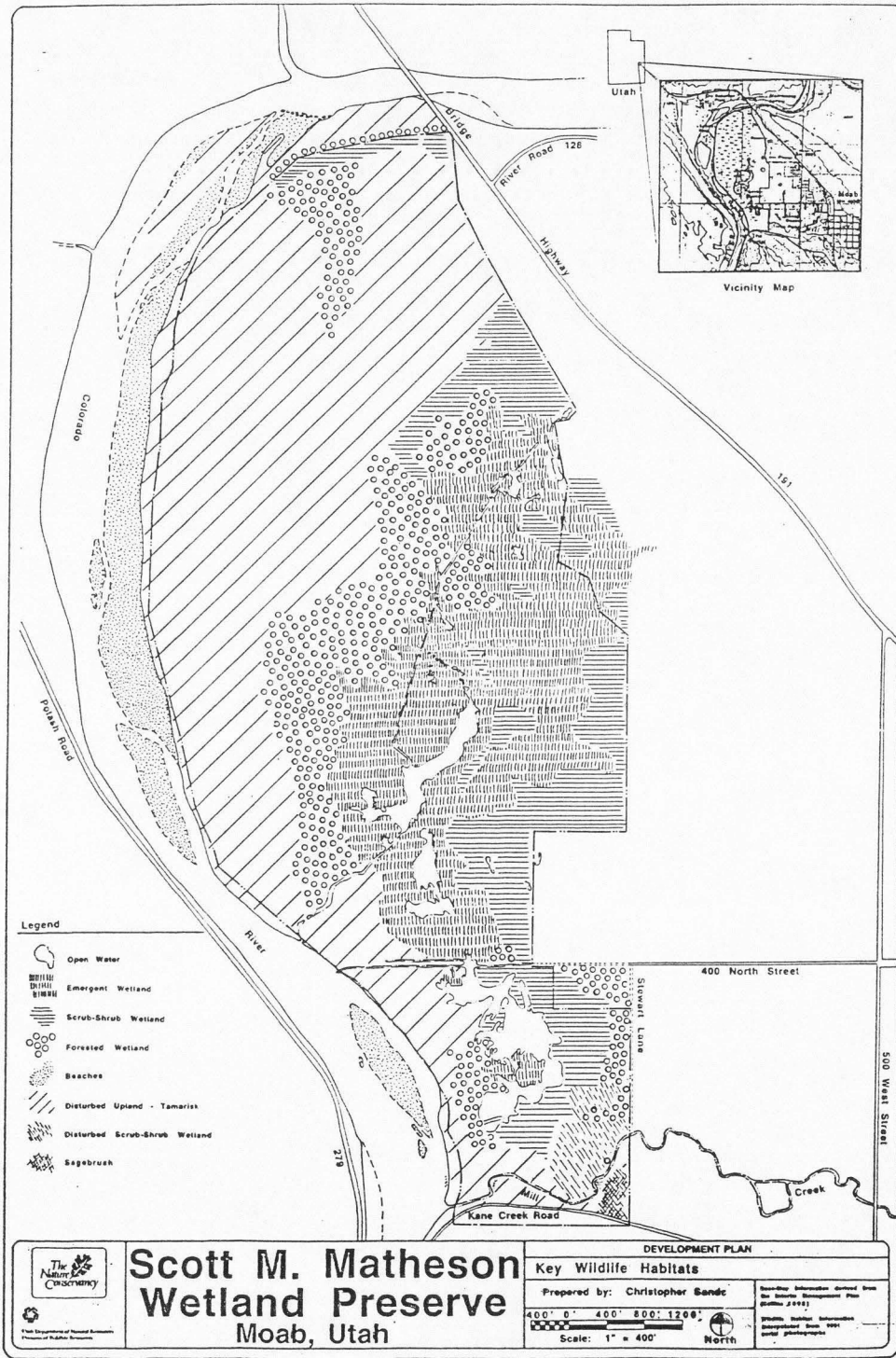
Prepared by: Christopher Sands

Scale: 1" = 400'

Figure 6-2. Vegetation Types Found at the Matheson Wetland Preserve.

Wetland community found at the preserve is dominated by tamarisk (*Tamarix*) and russian olive (*Elaeagnus angustifolia*) with some residual stands of willows (*salix* spp).

The class Forested Wetland is characterized by woody vegetation greater than 6 m tall (Cowardin et. al. 1979). These areas are dominated by an overstory of trees, with an understory of young trees or shrubs, and an herbaceous layer (Cowardin et. al. 1979). At the preserve these habitats consist mainly of cottonwoods (*Populus* spp.).

The open water class has been developed specifically for this report to combine several of the possible classes found at the preserve into one class. Due to the lack of available data, it was not possible to determine the specific classes under which these areas should be categorized. This class may actually include the Rock Bottom, Unconsolidated Bottom, or Aquatic Bed classes as described in the classification system (Cowardin et. al. 1979). These areas can be described as open water with no emergent vegetation present.

Other areas of the preserve fall into one of the following categories: Beaches, Disturbed Upland dominated by tamarisk, Disturbed Scrub-Shrub Wetland, and Sagebrush (*Artemesia* spp.). Beaches are associated with the Riverine Wetland system and are dominated by sand. The Disturbed Upland areas have been cleared of former vegetation and tamarisk has established itself as the dominant plant species. The Disturbed Scrub-Shrub Wetland are areas formerly dominated by the wetland community which have since been cleared for agricultural purposes. These areas are in a state of succession back to the former Scrub-Shrub Wetland. And finally, the Sagebrush areas are upland areas dominated by sagebrush.

Wildlife. The next objective was to identify sensitive wildlife species. A limited amount of field inventory work has occurred at the preserve. No detailed species list has

been assembled. What information is available was collected mainly by birders, probably the most frequent visitors to the preserve. Nelson Boshen, a resident birding specialist in Moab, undertook a bird survey for the Park Service in 1985 (Boshen 1985). As part of this study, Boshen surveyed the preserve as a control for birds found within the National Parks of concern. This survey represents the most extensive listing of avian species found at the preserve and will be used as the foundation for planning for the protection of sensitive species.

When asked to develop a list of those bird species found at the preserve that could be considered particularly sensitive to human disturbance, Bolshen provided a list of fourteen potential species:

- Great blue heron   (*Ardea herodias L.*)

- Common yellowthroat   (*Geothlypis trichas*)

- Red-winged blackbird   (*Agelaius phoeniceus*)

- Yellow-breasted chat   (*Icteria virens*)

- Cooper's hawk   (*Accipiter cooperii*)

- American coot   (*Fulica americana*)

- Spotted sandpiper   (*Actitis macularia*)

- Mallard   (*Anas platyrhynchos*)

- Canada goose   (*Branta canadensis*)

- Sora   (*Porzana carolina*)

- Common snipe   (*Gallinago gallinago*)

- Yellow warbler   (*Dendroica petechia*)

- White-crowned sparrow   (*Zonotrichia leucophrys*)

- Song sparrow   (*Melospiza melodia*)

A brief literature search was conducted for each of the species to ascertain the availability of information on their habitat needs. Detailed information on habitat use of four species existed. These are the mallard (*Anas platyrhynchos*), the great blue heron (*Ardea herodias L.*), the American coot (*Fulica americana*), and the yellow warbler (*Dendroica petechia*). These species became target species for the preserve, with their habitat needs receiving primary consideration in the planning process. This information was found primarily in the Habitat Suitability Index (HSI) Models authored by the USFWS. The models were used to gain knowledge of habitat use in order to determine which habitats were most critical (e.g. most often used for life functions) to the target species. These habitats could then be protected from impacts associated with facility development. A summary of the habitat use information follows. The summary is structured to follow the HSI format which discusses habitat use in terms of food, water, cover, reproduction, interspersion, and special considerations when appropriate.

Habitat use by mallards is partially dictated by the availability of foods primarily consisting of invertebrates associated with leaf litter, moist-soil foods (e.g., invertebrates, seeds, rootlets and tubers of wetland plants), mast, and agricultural grains (Allen 1987). The importance of water for the dietary requirements of mallards is based upon the influence water has on the availability of foods and habitats (Allen 1987), and is therefore not a requirement for consumption, but a requirement for production. According to Allen (1987) cover requirements are less important than the attributes of flooding and vegetation when it comes to defining quality of habitat. The requirements for mallards in regards to interspersion includes close proximity to a diversity of wetlands influenced by differing flooding regimes, which provides greater food diversity and availability within a small geographic area (Allen 1987). A special

consideration for mallards includes the gradual flooding or removal of surface water in wetland areas to provide a continuous and dynamic land/water interface that maximizes the availability of foraging sites (Allen 1987). In summary, the entire wetland complex is a sensitive habitat for the mallard, but emergent wetlands, forested wetlands, and open water areas are more heavily utilized for life functions than any of the other habitat types. Therefore, emergent wetlands, forested wetlands and open water habitats are sensitive to the mallard and should be avoided by preserve users.

Although great blue herons feed anywhere they can locate prey, they are typically found foraging in water containing emergent or submergent vegetation , in scattered marshy ponds, sloughs, forested wetlands, and in open water away from a main channel, and prefer fish, although they will feed on frogs, toads, tadpoles, snakes, lizards, rodents, birds, insects, snails, and carrion (Short and Cooper 1985). As with the mallard, water is only important to the heron for food production. Cover for concealment apparently is not a limiting factor (Short and Cooper 1985). Trees are the preferred sites for nests which are commonly placed from 5 to 15 m above the ground and usually within 5 km from feeding areas (Short and Cooper 1985). Nest locations are typically isolated from human habitation and disturbance, normally at least 3.3 km from human dwellings and 1.3 km from a road, although herons can become habituated to noise, traffic, and other human activities (Short and Cooper 1985). A special consideration for Heron colonies are that they are traditional and usually remain active until disturbed by land use changes such as housing and industrial development, water recreation, and highway construction (Short and Cooper 1985). In summary, sensitive habitats for great blue herons include open water, emergent wetlands, and forested wetlands. Preserve users should be kept as far away from rookeries as practicable.

Seasonal trail closures may be necessary.

American coots primarily feed on vegetation where surface waters provide submerged aquatic plants, usually associated with semipermanent ponds and lakes, although during certain periods they consume animal foods such as invertebrates (Allen 1985). Again, water is primarily important as a component of food production and not necessarily consumption. Stable water levels and adequate cover consisting of robust emergent vegetation, such as cattail and bulrush with immediate access to open water, are required during the breeding season for nesting sites (Allen 1985). In summary, sensitive habitats for the American coot includes open water and emergent wetland habitat types. These areas should be protected from human disturbance.

Yellow warblers prefer wet habitats with abundant shrubs or small trees such as willows (*Salix* spp.), aspen (*Populus* spp.), cottonwoods and alders (*Alnus* spp.)(Schroeder 1982). More than 90 percent of the food of yellow warblers are insects which are foraged from small limbs in deciduous foliage (Schroeder 1982). As with the other target species, water is not necessarily a dietary requirement as much as a component of primary food production (Schroeder 1982). Preferred foraging and nesting habitats are wet areas partially covered by willows and alders ranging in height from 1.5 to 4 meters (Schroeder 1982). Nests are usually placed 0.9 to 2.4 m above ground in shrubs and small trees, such as willows, alders, and cottonwoods, within wetland habitats (Schroeder 1982). In summary, sensitive habitat for the Yellow warbler includes scrub-shrub wetlands and forested wetlands. Facility development should avoid these areas.

Wildlife habitat sensitivity to human presence. Mapping sensitive wildlife habitat became the third objective of this step. The Matrix (Figure 6-3) indicates

which habitats are used for which life functions for each target species. For habitats supporting two or more life functions the habitat was labeled as sensitive in the matrix.

Figure 6-4 shows the designated sensitive wildlife habitat areas within the preserve. Those habitats of critical importance to the target species were mapped as more sensitive than habitats of lesser importance. Habitats identified through the literature as supporting two or more life functions (i.e., food, water, cover, reproduction, or interspersion) for two or more sensitive species were identified as highly sensitive wildlife habitats. Habitats identified as supporting two or more life functions for less than two sensitive species were identified as moderately sensitive wildlife habitats. And finally, habitats which supported only one of the life functions of any of the sensitive species were identified as minimally sensitive wildlife habitats. However, if the habitat supported a life function that was critical for the survival of a particular species, that information was provided on the map. Any unique habitat or special considerations required for a particular species were included on the map as well. Open water, emergent wetland, and forested wetland habitats emerged from this review as highly sensitive while the scrub-shrub wetlands are moderately sensitive. All other preserve habitats are minimally sensitive.

This system of identifying sensitive wildlife habitats is not all-encompassing for each of the species found at the preserve. However, given that the only defensible data gathered is on avian species and that the preserve was primarily established to protect those avian species, this approach seemed reasonable. The review of avian species was also limited to those species for which HSI's were found. Further research on other wildlife species habitat needs is necessary.

Species	Wetland Type				Special Considerations
	Emergent Wetland	Scrub-shrub Wetland	Forested Wetland	Open Water	
Mallard	Food Water	Water	Food Water	Food Water	Periodic Flooding, Interspersion
Great blue heron	Food Water	Water	Food Water Reproduction	Food Water	Traditional Nesting Site, Sensitive to Human Disturbance
American coot	Food Water Cover Reproduction	Water	Water	Food Water Cover	
Yellow warbler	Water	Food Water Reproduction	Water Reproduction	Water	

☐ Sensitive Habitat

Figure 6-3. Matrix Showing Target Species and Their Uses for the Wetland Habitats Found at the Matheson Wetland Preserve.
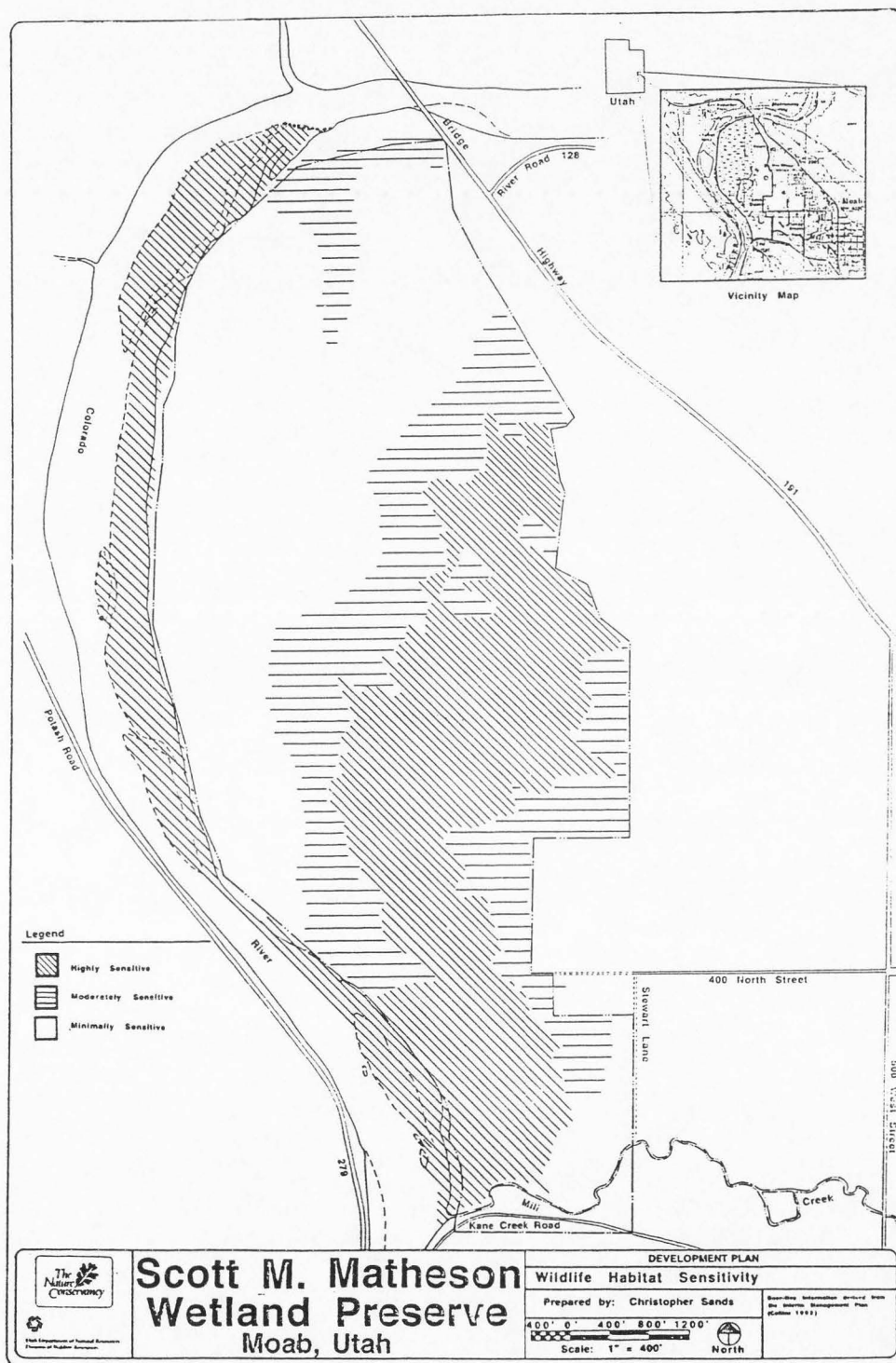
Figure 6-4. Wildlife Habitat Sensitivity Areas Within the Matheson Wetland Preserve.

Trails. The fourth objective in the identification of resource issues step involved the identification of existing trail opportunities. Existing trails were identified from detailed aerial photographs taken of the preserve in 1991, and were inventoried and verified during several field visits. Opportunities included existing canals and dikes, four-wheel track primitive roads, game trails, recreational trails, and debris piles associated with previous land-clearing efforts. The opportunities identified are illustrated in Figure 6-5.

Management concerns. The final objective for the identification of resource issues step was to identify existing concerns for management of the preserve. Based upon personal observations made during fieldwork and interviews with other specialists and preserve recreationists, four issues were identified as threatening to the sensitive wildlife found at the preserve. These are: 1) dogs and cats, 2) bicyclists, 3) visitors venturing off designated trails within sensitive habitat, and 4) visitors feeding wildlife. Currently dogs, cats and bicyclists are prohibited on the preserve. These regulations are not clearly posted and are therefore often violated because visitors are not aware of them. A series of informational signs incorporated into the overall interpretive system should discourage these activities. In addition, accommodating bicyclists with parking facilities near the entrance to the preserve would provide an opportunity for them to leave their bicycles before entering more sensitive areas within the site. Monitoring and evaluating these activities for resource impacts is an ongoing process essential to wildlife protection.

Inventory of Existing Interpretive Efforts. Interpretive opportunities were determined through the identification of existing gaps in interpretation efforts on federal and state lands within the local area. Interpretive efforts describing the unique fish and
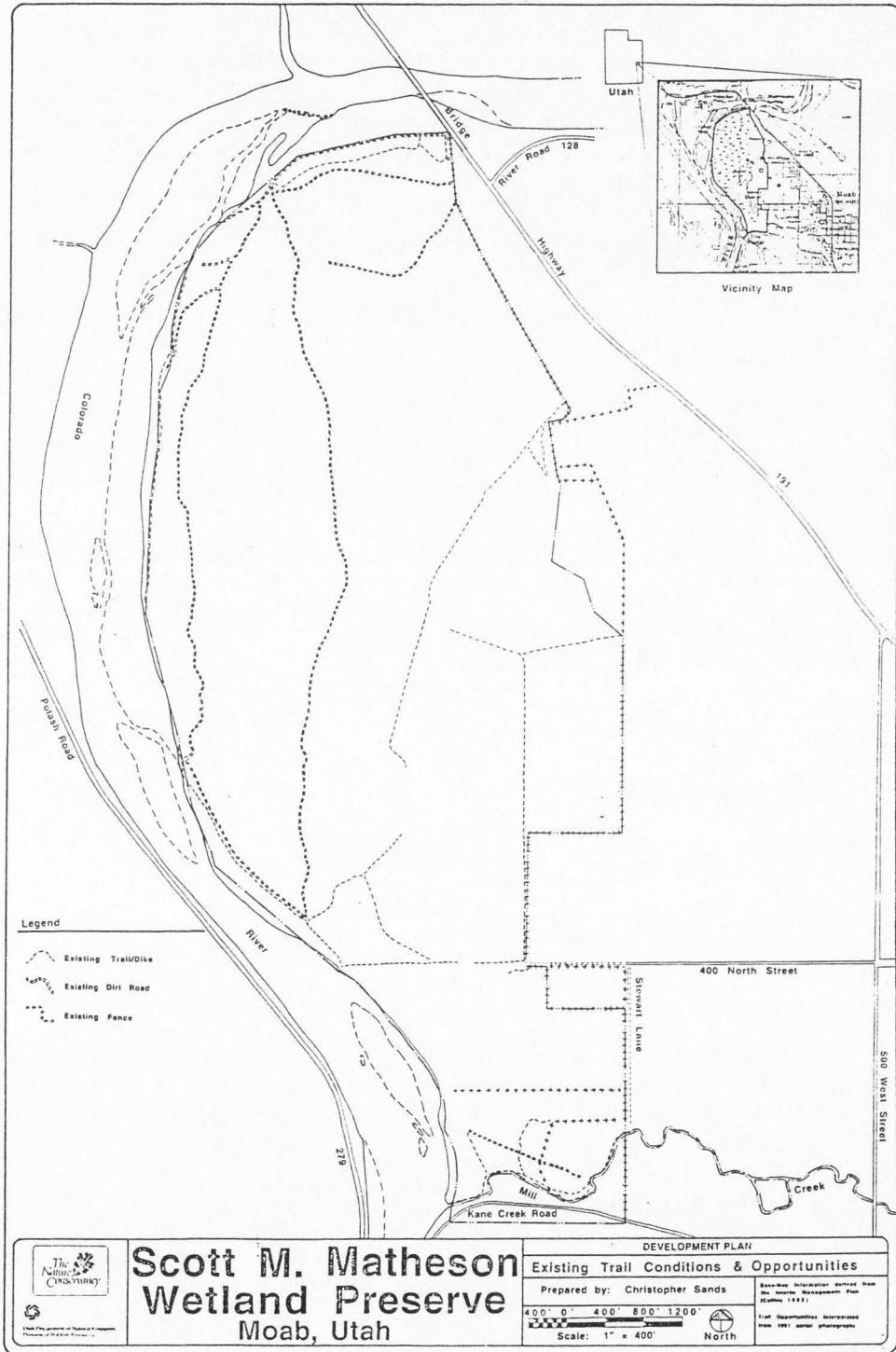
Legend

Existing Trail/Dike

Existing Dirt Road

Existing Fence

Vicinity Map

	DEVELOPMENT PLAN	
Scott M. Matheson Wetland Preserve Moab, Utah	Existing Trail Conditions & Opportunities	
	Prepared by: Christopher Sands	Base-Map information derived from the Interim Management Plan (Collins 1992)
	400' 0' 400' 800' 1200' Scale: 1" = 400' North	Trail Opportunities incorporated from 1991 aerial photographs

Figure 6-5. Existing Trail Opportunities at the Matheson Wetland Preserve.

wildlife found within wetland environments in the same geographic region were inventoried. In an effort to keep from duplicating those topics currently interpreted within the local area, an informal survey of interpretation at area parks was undertaken through telephone conversations and site visits. For the purposes of the Interpretation Development Plan it was important to determine whether interpretation was ongoing at other areas concerning wetlands, the Colorado River, or wildlife species found within the area.

This survey revealed that other than on-site visits with experts utilized by the Canyonlands Field Institute, state and federal agencies have little funding for interpretation, and therefore little interpretation is provided. The opportunities for interpretation at the preserve are thus relatively unlimited.

Identification of the Preserve Interpretive Theme. Webster defines the word 'theme' as "a subject or topic on which a person writes or speaks, ... the leading subject in a composition or movement." An interpretive theme can be considered a full sentence, provable statement about a topic (Bucy 1990). A theme will guide the overall interpretive effort at the preserve. The interpretive theme for the preserve is:

"Understanding the ecology of a Colorado River wetland environment can enhance a visitor's awareness and appreciation for these unique areas and help preserve them for future generations to enjoy."

Providing interpretation within this theme will not only introduce visitors to conservation and wildlife management organizations such as TNC and the UDWR, but will help to reconnect people to the environment and stimulate a stewardship of our natural resources. Interpretive topics which help visitors to understand the ecology of a Colorado River wetland environment, in particular the Matheson Wetland Preserve,

were advanced for interpretation at the preserve.

Identification of Potential Interpretive Topics. This step involves the selection of information to be presented in the form of interpretive topics that fit within the interpretive theme as described above. Each topic identified will be analyzed in a later phase to determine which mode or medium is best for presenting the information. These topics are presented below as points to include within the primary topic and then further refined into sub-topics which may be interpreted in other areas of the preserve. These topics are not necessarily listed in sequential order.

Topic - the Nature Conservancy's goals and objectives. Points to include - 1) History of the Nature Conservancy, 2) Contrast TNC lands with other public lands, 3) Prime goals of the Nature Conservancy, and 4) Objectives for achieving those goals. Sub-topics - 1) Number of TNC preserves worldwide and 2) Information on the Great Basin TNC holdings 3) Membership information.

Topic - UDWR's goals and objectives. Points to include - 1) Contrast UDWR lands with other state and federal public lands, 2) Prime goals of UDWR, and 3) Objectives for achieving those goals. Sub-topics - 1) Number of UDWR lands, 2) Location of other UDWR preserves, and 3) Fund raising information.

Topic - the Scott M. Matheson Wetland Preserve. Points to include - 1) Acquisition of the preserve and a brief history, 2) Uniqueness of the preserve as it relates to the overall upper Colorado River basin, and 3) Permitted and prohibited activities at the preserve. Sub-topics - 1) Who is Scott Matheson?

Topic - featured wildlife species found at the preserve. Points to include - 1) Mammals (i.e., deer and beaver), 2) Birds (i.e., great blue heron, mallards, yellow warbler, and american coot), 3) Reptiles, 4) Amphibians, 5) Fish (Carp, Razorback

sucker, Humpback chub, etc), and 6) Insects. Sub-topics - 1) Predators (i.e., coyotes, hawks, osprey) and Prey in the Food Chain.

Topic - wetland ecology and diversity. Points to include - 1) Definition of a wetland, 2) Discussion of the various wetland habitats found at the preserve, 3) Plant and animal communities within a wetland and their interactions. Sub-topics - 1) Benefits derived from freshwater wetlands

Topic - the Colorado River. Points to include - 1) From the mountains to the sea, and 2) The endangered fish recovery program. Sub-topics - 1) Man's influence on the hydrology of the Colorado River

Topic - the Colorado Plateau. Points to include - 1) Canyon country geology, 2) Riparian corridors within the desert landscape, 3) Plant and animal adaptations to desert climates. Sub-topics - 1) Brief history of settlement within the plateau.

Topic - geology of the preserve. Points to include - 1) How the preserve was formed, 2) Erosional forces. Sub-topics - 1) Brief history on mining in the region.

Topic - prehistoric and historic human activities which occurred at the preserve. Points to include - 1) How the preserve has been used by man historically. Sub-topics - 1) Prehistoric Native American settlements in the area.

Topic - beavers. Points to include - 1) Foods, 2) Shelter, and 3) Dam building. Sub-topics - 1) Importance of beavers in maintaining water levels.

Topic - great birds of the preserve. Points to include - 1) Great blue heron, 2) Hawks, and 3) Ospreys. Sub-topics - 1) Food, 2) Cover, 3) Nesting, and 4) Migration requirements for each of the above.

Topic - wetland plant communities. Points to include - 1) Species composition of each wetland habitat, 2) Animal use of each wetland habitat. Sub-topics - 1)

Maintenance of wetland habitats at the preserve.

Topic - riparian plant communities. Points to include - 1) Species composition of the riparian plant community, 2) Wildlife use of the riparian corridor. Sub-topics - 1) Human uses of the riparian corridor.

Topic - exotic plant species eradication. Points to include - 1) Exotic plant species found at the preserve, 2) History of exotic plant species establishment, and 3) Reasons for removing these species. Sub-topics - Techniques for exotic plant species removal.

Analysis of Resource Inventory Data

This phase of the process deals with the analysis and integration of the data gathered in the previous phases. Information that influenced interpretive opportunities at the preserve was particularly pertinent to this analysis. The data includes information on preserve vegetation types, wildlife, wildlife habitat sensitivity, existing and potential preserve users, management concerns, trail opportunities, existing interpretive efforts, preserve interpretive theme, and potential interpretive topics. This data will be integrated with the interpretive planning factors and then analyzed in order to identify opportunities and constraints to interpretive facility development. Four factors have been identified that are essential components of planning for interpretation. These include interpretive site suitability, interpretive topics sequence, modes of interpretation, and interpretive levels. Each of these factors can be analyzed in regard to the specific planning situation at the Matheson Wetland Preserve. An analysis of each of these factors as they relate to the Matheson Wetland Preserve is provided below.

Interpretive Site Suitability Analysis. The first step in this phase is designed to indicate a preserve-wide suitability for facility development at each interpretive site given the constraints identified in the resource inventory phase. This will direct proposed development to those areas where facilities will be appropriate for interpretation purposes and where impacts can be minimized. This was accomplished for the Matheson Wetland Preserve by combining information from the identified resource issues step within the resource inventory phase and using a multiple map overlay technique to indicate areas of resource constraint. Using the information collected, a map showing three levels of interpretive site suitability was prepared (Figure 6-6).

From the maps showing vegetation types and wildlife habitat sensitivity, those areas designated as sagebrush, disturbed scrub-shrub wetland, disturbed upland, or minimally sensitive were placed within the suitability level one category because they are disturbed areas or areas of low sensitivity. Areas identified as highly sensitive wildlife habitat were placed within the suitability level three category because they are areas able to withstand very limited environmental impacts. All other areas were placed within the suitability level two category because they are moderately sensitive and can only withstand limited environmental impacts.

This analysis has shown that facility development can take place near Kane Creek Road in the southeast corner of the preserve and in much of the upper northwest portion of the preserve between Highway 191 and the river without compromising sensitive wildlife habitat. Areas designated as suitability levels two and three should be avoided for location of major interpretive facilities such as a visitor center or parking area. Trail development within suitability level three areas should be
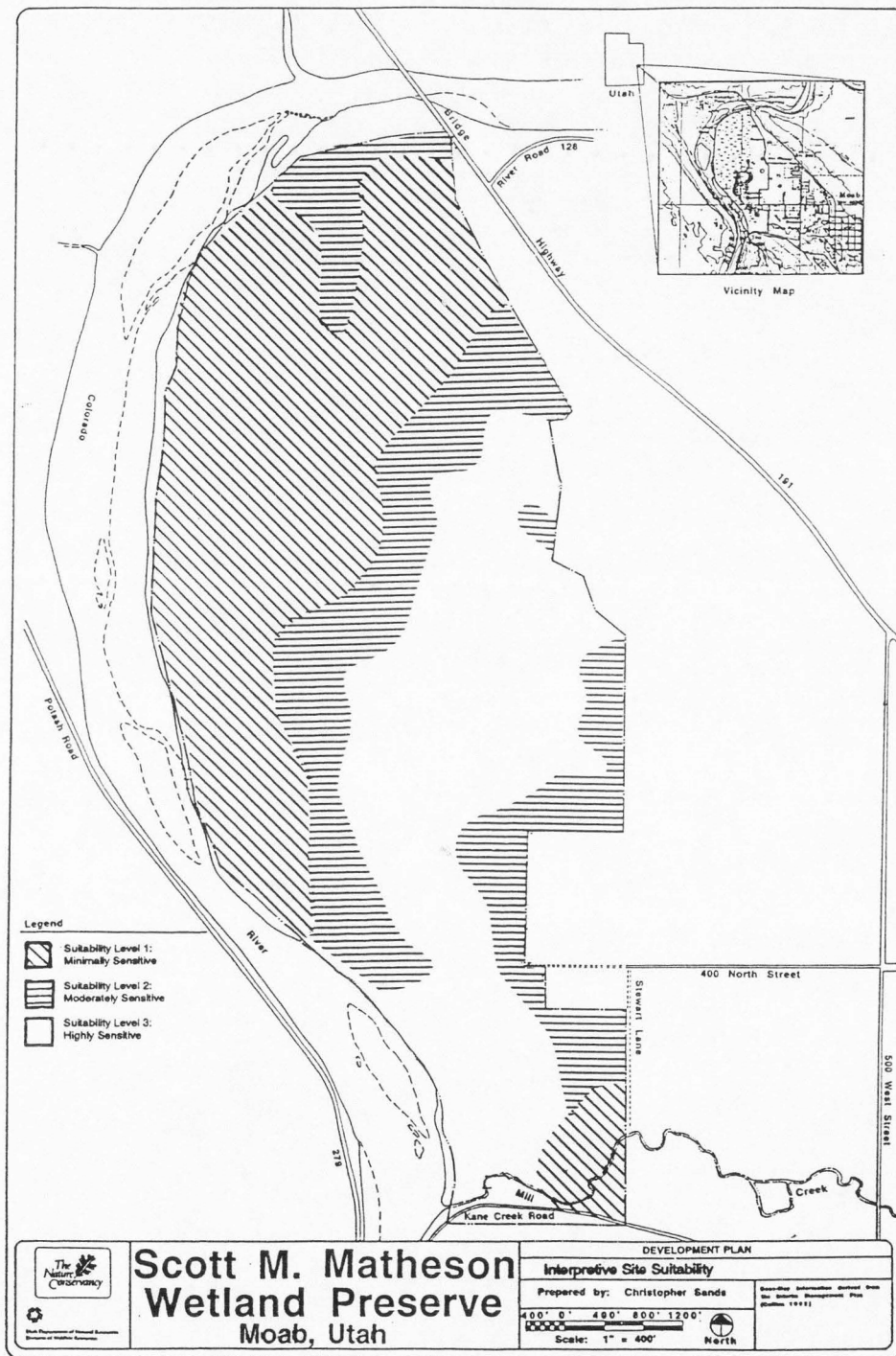
Figure 6-6. Map showing the Interpretive Site Suitability Levels for the Matheson Wetland Preserve.

limited to short spurs off of the main trail and should traverse patches of sensitive wildlife habitat perpendicularly to the long axis of the entire patch, not parallel to the axis. Trail development in suitability level two and three areas should utilize existing trail opportunities as much as practicable. The area directly west of 400 North Street, where the dike once traversed the open water habitat, should be used as the corridor through sensitivity level three habitat to connect the southeast and northwest corners of the preserve. In this area, a trail can be developed across the open water to provide prime opportunities for wildlife viewing. This crossing can, and when necessary, should, be closed seasonally to avoid disturbing sensitive species.

Sequence of Interpretive Topics Analysis. Sequencing involves the distribution of the interpretive topics proposed so that information can be presented progressively from simple messages to more complex messages. Some topics are best located near the entrance to the preserve so that visitors will read them first. Other topics build upon previous topics and should therefore follow them in sequence in the most appropriate location. The sequence established for the topics proposed at the Matheson Wetland Preserve follows the natural cycle of ecological processes (e.g. geological features formed, from which erosion develops soils, from which plants grow, from which the animal chain is linked, etc.) However, topics which introduce the preserve, orient the visitor, and provide information on any rules or regulations would be presented before visitors entered the site. These are called orientation topics and do not follow the proposed sequence format. In addition, some topics may not fit into the sequence format. These are called non-sequential topics.

Given the selection of this organizational format, the proposed topics and sub-topics were placed in a sequence chart that indicates the suggested sequence. The results

of this effort are displayed in Figure 6-7 with topics 1 through 4 selected as orientation topics; followed by topics 5 through 11 which are the primary sequenced topics; and finally topics 12 through 14 which are non-sequential topics.

The final step in this task was accomplished by overlaying the trail opportunities map identified in the resource inventory phase and the interpretive site suitability map. The composite map indicated where access would likely be provided to areas that could withstand facility development. A site review of potential areas for facility development was made to determine where the best specific location for interpreting each of the proposed topics existed. A final map of the proposed sequence of interpretive topics was then prepared to show general locations for each potential interpretive station. This map is shown in Figure 6-8.

Modes of Interpretation Analysis. The modes of interpretation are the vehicles for delivering interpretive messages. These modes are the media or medium selected as the best suited for interpreting the given message. Due to the sheer number of modes available, selection can be lengthy. However, the planning situation can usually dictate which modes have the greatest potential for being used. At the Matheson Wetland Preserve, visitors will be limited to access by foot, thus greatly simplifying the number of mode possibilities. For example, an auto tour route with wayside exhibits at the Matheson Wetland Preserve would not be an appropriate mode since the preserve lacks existing roadways and construction of any roadways would be in conflict with preserving wildlife

habitat. Modes of interpretation selected as appropriate for the Matheson Wetland Preserve include:

Interpretive Topics				
1 - Scott Matheson Wetland Preserve # a - Who was Scott Matheson?				
2 - The Nature Conservancy # a - TNC World-Wide Preserve b - GBFO c - Membership Information				
3 - Utah Division of Wildlife Resources # a - UDWR Reserves in Utah				
4 - Featured Wildlife Species # a - Predators and Prey				
5 - The Colorado Plateau				
6 - Geology a - Soils b - Mining in the Region				
7 - Wetland Ecology a - Benefits of Freshwater Wetlands				
8 - Wetland Plant Communities a - Wetland Enhancement				
9 - Riparian Plant Communities a - Human Use of Riparian Corridors				
10 - Great Birds of the Preserve a - Food b - Cover c - Reproduction d - Migration				
11 - Beavers a - Beavers Build Wetlands				
12 - The Colorado River * a - Man's Infleuence On the River				
13 - Prehistoric/Historic Human Activities * a - Regional Native American Settlements				
14 - Exotic Plant Eradication * a - Techniques of Eradication				

1 - Primary Topic
a - Sub Topic
- Orientation Topic
* - Non-sequential Topic

Figure 6-7. Interpretive Topic Sequence Chart for the Matheson Wetland Preserve.

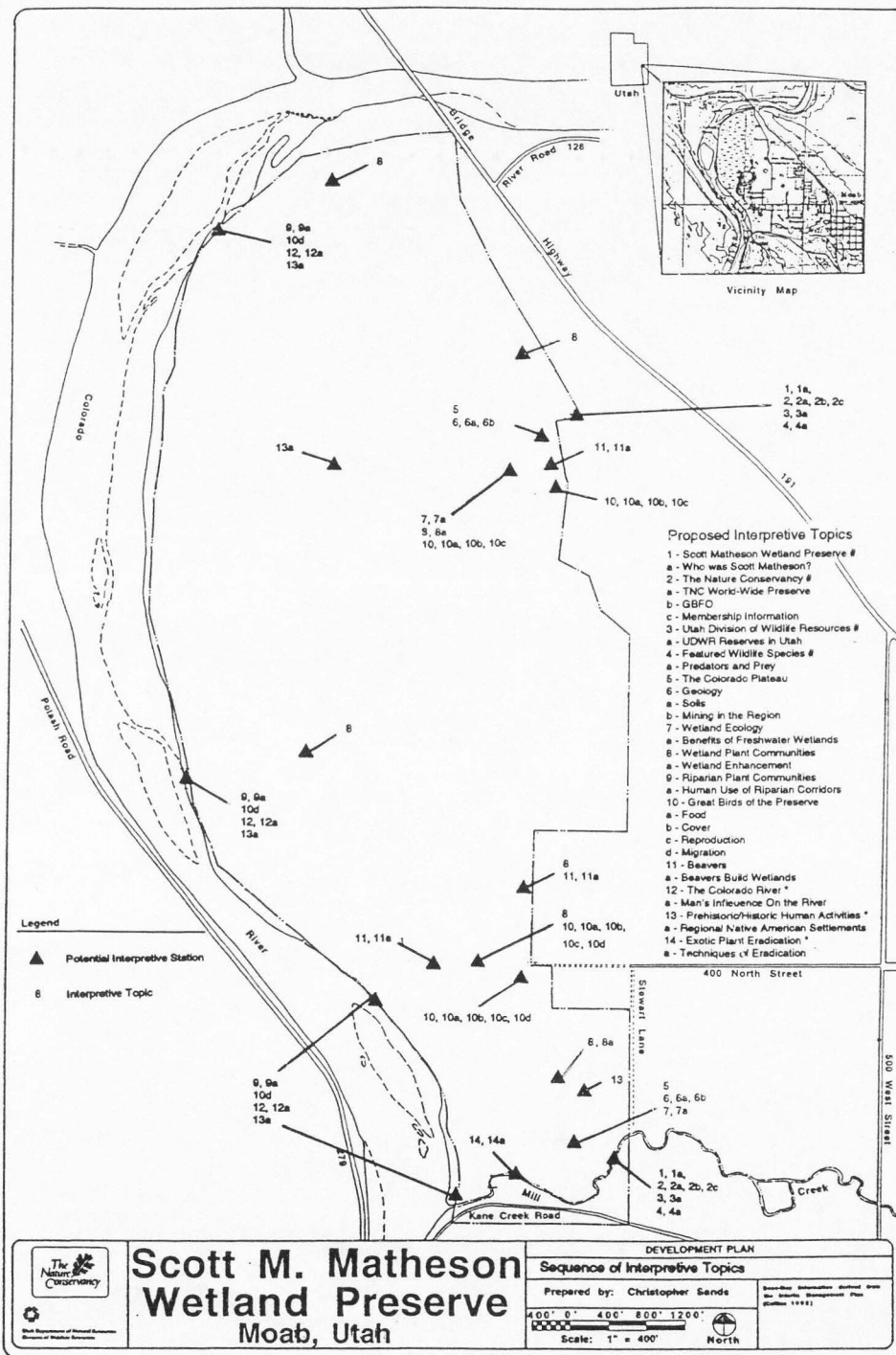**Proposed Interpretive Topics**

1 - Scott Matheson Wetland Preserve #
a - Who was Scott Matheson?
2 - The Nature Conservancy #
a - TNC World-Wide Preserve
b - GBFO
c - Membership Information
3 - Utah Division of Wildlife Resources #
a - UDWR Reserves in Utah
4 - Featured Wildlife Species #
a - Predators and Prey
5 - The Colorado Plateau
6 - Geology
a - Soils
b - Mining in the Region
7 - Wetland Ecology
a - Benefits of Freshwater Wetlands
8 - Wetland Plant Communities
a - Wetland Enhancement
9 - Riparian Plant Communities
a - Human Use of Riparian Corridors
10 - Great Birds of the Preserve
a - Food
b - Cover
c - Reproduction
d - Migration
11 - Beavers
a - Beavers Build Wetlands
12 - The Colorado River *
a - Man's Influence On the River
13 - Prehistoric/Historic Human Activities *
a - Regional Native American Settlements
14 - Exotic Plant Eradication *
a - Techniques of Eradication

Legend

▲ Potential Interpretive Station

8 Interpretive Topic

Scott M. Matheson Wetland Preserve
Moab, Utah

DEVELOPMENT PLAN
Sequence of Interpretive Topics
Prepared by: Christopher Sands
Scale: 1" = 400'
North

Figure 6-8. Map Showing the Sequence of Interpretive Topics for the Matheson Wetland Preserve.

- Visitor Center

- Trails with Interpretive Exhibits (e.g. signage, displays, etc.)

- Publications

- Personal Services

- Off-site Interpretation

These modes were selected because they would meet user needs and could be implemented at the preserve without adversely impacting wetlands and wildlife.

The next task was to review the list of topics and sub-topics that have been selected for interpretation. The modes of interpretation and the interpretive topics were then be placed in a matrix format for analysis purposes to determine which modes best serve which topics. This analysis is designed to provide a manageable way to evaluate the potential for the modes of interpretation to effectively present the information for each proposed interpretive topic. This analysis is shown in Figure 6-9, which indicates that a visitor center and exhibits along trails would have the best potential for interpreting most of the topics. Personal services have better potential for those topics requiring more interaction with the site. Publications and off-site interpretation should be used only for topics requiring little interaction with the site.

Levels of Interpretation Analysis. This step was developed to identify the relationships between the topics/modes of interpretation and the various interpretation levels offered by them. The analysis of the levels of interpretation should be modified to meet the specific needs of the particular planning situation, in this case the Matheson Wetland Preserve. The analysis at this step involved the designation of interpretive topics, presented by the selected modes of interpretation, as being appropriate for one of three levels of interpretation. The criteria for each of these levels were presented in

Interpretive Topics	Modes of Interpretation				
	Visitor Center	Exhibits Along Trails	Publications	Personal Services	Off-site Interpretation
1 - Scott Matheson Wetland Preserve #	●	●	●	●	●
a - Who was Scott Matheson?	●	●	●	●	●
2 - The Nature Conservancy #	●	●	●	⊘	●
a - TNC World-Wide Preserve	●	●	●	⊘	●
b - GBFO	●	●	●	⊘	●
c - Membership Information	●	●	●	⊘	●
3 - Utah Division of Wildlife Resources #	●	●	●	⊘	●
a - UDWR Reserves in Utah	●	●	●	⊘	●
4 - Featured Wildlife Species #	●	●	●	●	●
a - Predators and Prey	●	●	●	●	○
5 - The Colorado Plateau	●	⊘	●	⊘	○
6 - Geology	⊘	●	●	●	⊘
a - Soils	⊘	●	⊘	●	○
b - Mining in the Region	●	⊘	●	⊘	○
7 - Wetland Ecology	●	●	⊘	●	○
a - Benefits of Freshwater Wetlands	●	●	⊘	●	○
8 - Wetland Plant Communities	⊘	●	⊘	●	⊘
a - Wetland Enhancement	⊘	●	⊘	●	○
9 - Riparian Plant Communities	⊘	●	⊘	●	⊘
a - Human Use of Riparian Corridors	⊘	●	⊘	●	○
10 - Great Birds of the Preserve	●	●	●	●	⊘
a - Food	⊘	●	⊘	●	○
b - Cover	⊘	●	⊘	●	○
c - Reproduction	⊘	●	⊘	●	○
d - Migration	⊘	●	⊘	●	○
11 - Beavers	●	●	●	●	○
a - Beavers Build Wetlands	⊘	●	⊘	●	○
12 - The Colorado River *	●	●	●	●	⊘
a - Man's Infleuence On the River	⊘	●	●	●	○
13 - Prehistoric/Historic Human Activities *	●	●	●	●	○
a - Regional Native American Settlements	●	⊘	●	●	○
14 - Exotic Plant Eradication *	⊘	●	●	●	○
a - Techniques of Eradication	⊘	●	⊘	●	○

1 - Primary Topic
a - Sub Topic
- Orientation Topic
* - Non-sequential Topic

● - Excellent Potential
⊘ - Good Potential
○ - Limited Potential

Figure 6-9. Matrix Showing the Modes of Interpretation Analysis for the Matheson Wetland Preserve.

Chapter 5 and are summerized here:

Level 1:

- Optimum opportunity for orientation and overview; minimal interaction with the site.

- Easy access, high number of participants; introductory level for those with little or no mastery ability.

- Resource fundamentals, basic interpretive messages; introductory level for those with little or no previous knowledge of the subject being presented.

Level 2:

- In-depth, on-site interpretation, high level of interaction with the site.

- More restrictive access, participant numbers diminish (greater than 1/4 mile from entrance point); a medium level for those with more experience and possessing a more developed mastery ability.

- Advanced resource information, complex messages; a medium level for those with more knowledge of the subject being presented.

Level 3:

- Minimal to non-existent interpretation devices, maximum interaction with the site.

- Very restrictive access, highly interested and skilled participants only (greater than 1 mile from entrance point); a top level for those who possess a high degree of ability.

- Technical resource information, specialized messages and research opportunities; a top level for those who possess a high degree of knowledge of the subject being presented.

The results of this task are shown in Figure 6-10. This matrix indicates that topics 1 through 7 are primarily interpretation level one for each of the modes of interpretation proposed. Topics 8 through 14 are mostly interpretation levels one and two at the visitor center and for publications, but mostly interpretation levels two and three along the trails with exhibits and personal services.

Interpretive Topics	Modes of Interpretation				
	Visitor Center	Exhibits Along Trails	Publica-tions	Personal Services	Off-site Interpre-tation
1 - Scott Matheson Wetland Preserve #	● 1	● 1	● 1	● 2	● 1
a - Who was Scott Matheson?	● 1	● 1	● 1	● 2	● 1
2 - The Nature Conservancy #	● 1	● 1	● 1	⊘ 1	● 1
a - TNC World-Wide Preserve	● 1	● 1	● 1	⊘ 1	● 1
b - GBFO	● 1	● 1	● 1	⊘ 1	● 1
c - Membership Information	● 1	● 1	● 1	⊘ 1	● 1
3 - Utah Division of Wildlife Resources #	● 1	● 1	● 1	⊘ 1	● 1
a - UDWR Reserves in Utah	● 1	● 1	● 1	⊘ 1	● 1
4 - Featured Wildlife Species #	● 1	● 1	● 1	● 2	● 1
a - Predators and Prey	● 1	● 2	● 2	● 3	○ 1
5 - The Colorado Plateau	● 1	⊘ 1	● 1	⊘ 2	○ 1
6 - Geology	⊘ 1	● 1	● 1	● 2	⊘ 1
a - Soils	⊘ 1	● 1	⊘ 1	● 2	○ 1
b - Mining in the Region	● 1	⊘ 2	● 2	⊘ 3	○ 1
7 - Wetland Ecology	● 1	● 1	⊘ 1	● 2	○ 1
a - Benefits of Freshwater Wetlands	● 1	● 1	⊘ 1	● 3	○ 1
8 - Wetland Plant Communities	⊘ 2	● 2	⊘ 1	● 2	⊘ 1
a - Wetland Enhancement	⊘ 2	● 2	⊘ 2	● 3	○ 1
9 - Riparian Plant Communities	⊘ 2	● 2	⊘ 1	● 2	⊘ 1
a - Human Use of Riparian Corridors	⊘ 2	● 2	⊘ 2	● 3	○ 1
10 - Great Birds of the Preserve	● 1	● 1	● 1	● 2	⊘ 1
a - Food	⊘ 2	● 2	⊘ 2	● 3	○ 2
b - Cover	⊘ 2	● 2	⊘ 2	● 3	○ 2
c - Reproduction	⊘ 2	● 2	⊘ 2	● 3	○ 2
d - Migration	⊘ 2	● 2	⊘ 2	● 3	○ 2
11 - Beavers	● 1	● 2	● 1	● 2	○ 1
a - Beavers Build Wetlands	⊘ 2	● 2	⊘ 2	● 3	○ 2
12 - The Colorado River *	● 1	● 2	● 1	● 2	⊘ 1
a - Man's Infleuence On the River	⊘ 2	● 2	● 2	● 3	○ 2
13 - Prehistoric/Historic Human Activities *	● 1	● 2	● 1	● 2	○ 1
a - Regional Native American Settlements	● 2	⊘ 2	● 2	● 3	○ 2
14 - Exotic Plant Eradication *	⊘ 1	● 2	● 1	● 2	○ 1
a - Techniques of Eradication	⊘ 2	● 3	⊘ 2	● 3	○ 2

1 - Primary Topic   ● - Excellent Potential   1 - Interpretation Level One
a - Sub Topic   ⊘ - Good Potential   2 - Interpretation Level Two
- Orientation Topic   ○ - Limited Potential   3 - Interpretation Level Three
* - Non-sequential Topic

Figure 6-10. Matrix Showing the Various Interpretation Levels for the Interpretive Topics and the Modes of Interpretation Proposed at the Matheson Wetland Preserve.

An important final task in this analysis is to determine which areas of the site are appropriate for the different levels of interpretation. Figure 6-11 shows the existing interpretation level designations for the Matheson Wetland Preserve. Because the preserve does not currently have any developed facilities, levels one and two are presented simply as areas that are close to access points with a high number of visitors (level 1) and areas more than 1/4 mile from an access point with a moderate number of visitors (level 2). This figure shows that interpretation level one areas are confined to the southeast corner of the preserve, where most of the birding and fishing visitors use existing undeveloped trails, and in the northeast central portion of the preserve near the existing ponds, where some fishing visitors are using existing dikes for access. Interpretation level two areas generally occur beyond level one areas where access is provided along existing trails and dikes.

Synthesis of Resource Analysis

This phase of the process deals with identifying alternative development schemes that respond to issues identified during the inventory and analysis phases. This will involve the development of alternatives by selecting from the various topics and modes proposed to produce different degrees of interpretive facility development. Three alternatives were produced for the Matheson Wetland Preserve which correspond to three degrees of development: 1) minimal degree of facility development, 2) moderate degree of facility development, and 3) maximum degree of facility development.

One way to illustrate these alternatives is by mapping the proposed levels of interpretation for the preserve with conceptual facility development superimposed. Facility developments for each alternative are, of course, constrained by the physical, biological, and social/cultural features inherent at the preserve, identified in the
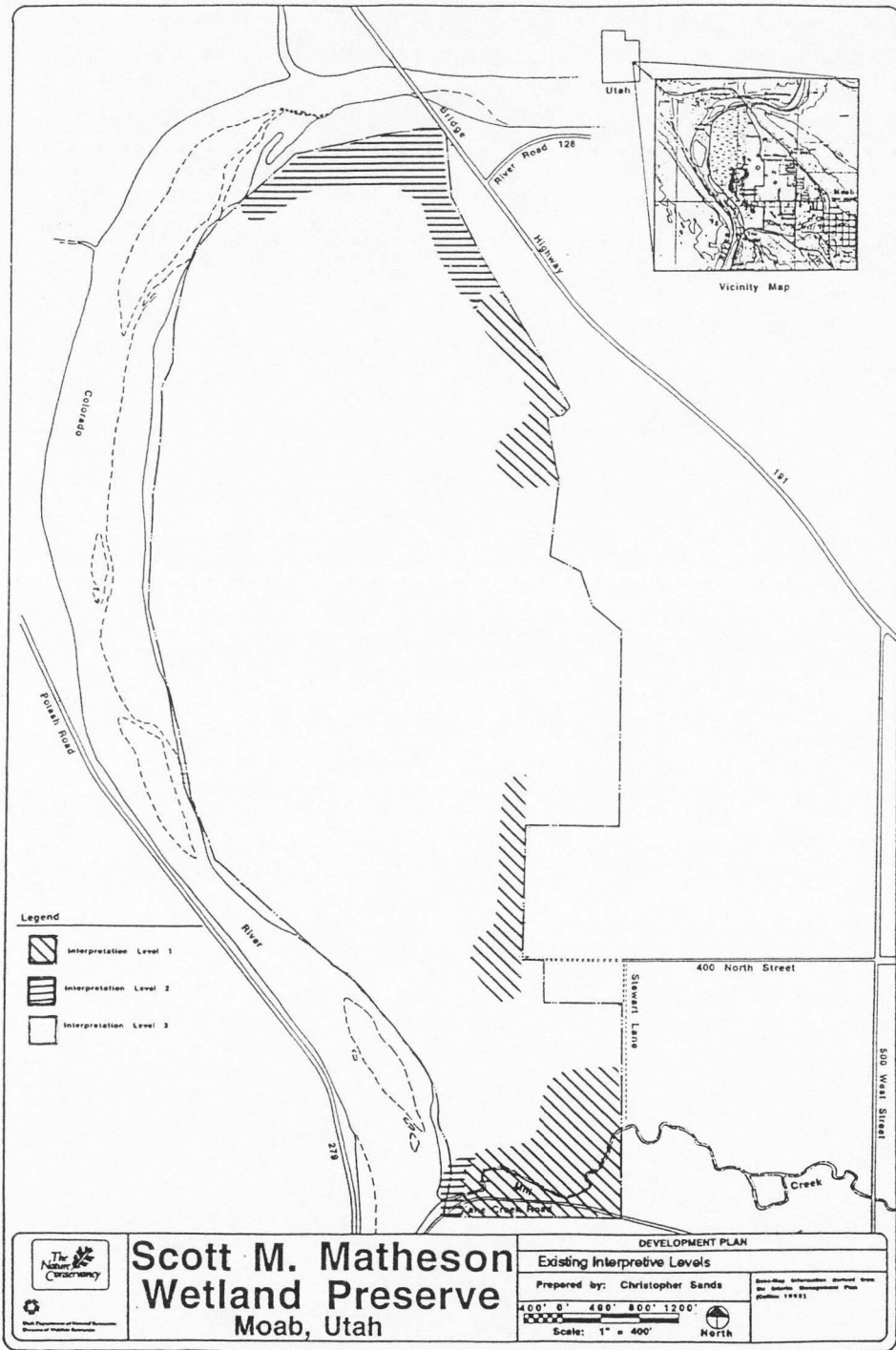
Figure 6-11. Map Showing the Existing Interpretation Level Designations for the Matheson Wetland Preserve.

earlier suitability analysis. Each alternative has been developed with different characteristics. The characteristics specific to each alternative are described below and illustrated on accompanying maps.

Alternative 1: minimal degree of facility development. This alternative focuses on limiting facility development and associated costs. It includes one preserve entry site, with a parking area off of Kane Creek Road, with minimal interpretive devices. Interpretation will include the publication of a series of brochures that emphasize the major interpretive topics and accompany visitors through a brief self-guided interpretive trail system. Opportunities to develop a loop trail system are limited by the suitability constraints within this portion of the preserve. Therefore, trails will be developed to access the greatest diversity of wetland habitats within this area without compromising wildlife security. Advantages of this alternative are that it is the least expensive to implement and will have the least impact on sensitive wildlife species. Disadvantages are that this alternative would provide for a low level of management presence and a low level of interpretive activities. This alternative is illustrated in Figure 6-12.

Alternative 2: moderate degree of facility development. Alternative 2 focuses on providing an optimal level of interpretive facility development without the inclusion of a visitor center. Components of this alternative include two entrance sites, a main entrance off of Kane Creek Road and a minor entrance off of Highway 191 developed by UDWR for hunters, a system of interpretive trails with interpretive stations, personal services provided by specialists for environmental education purposes, and off-site interpretation provided at the Multi Agency Visitor Center located in downtown Moab. Advantages of this alternative include a higher level of interpretive activities and
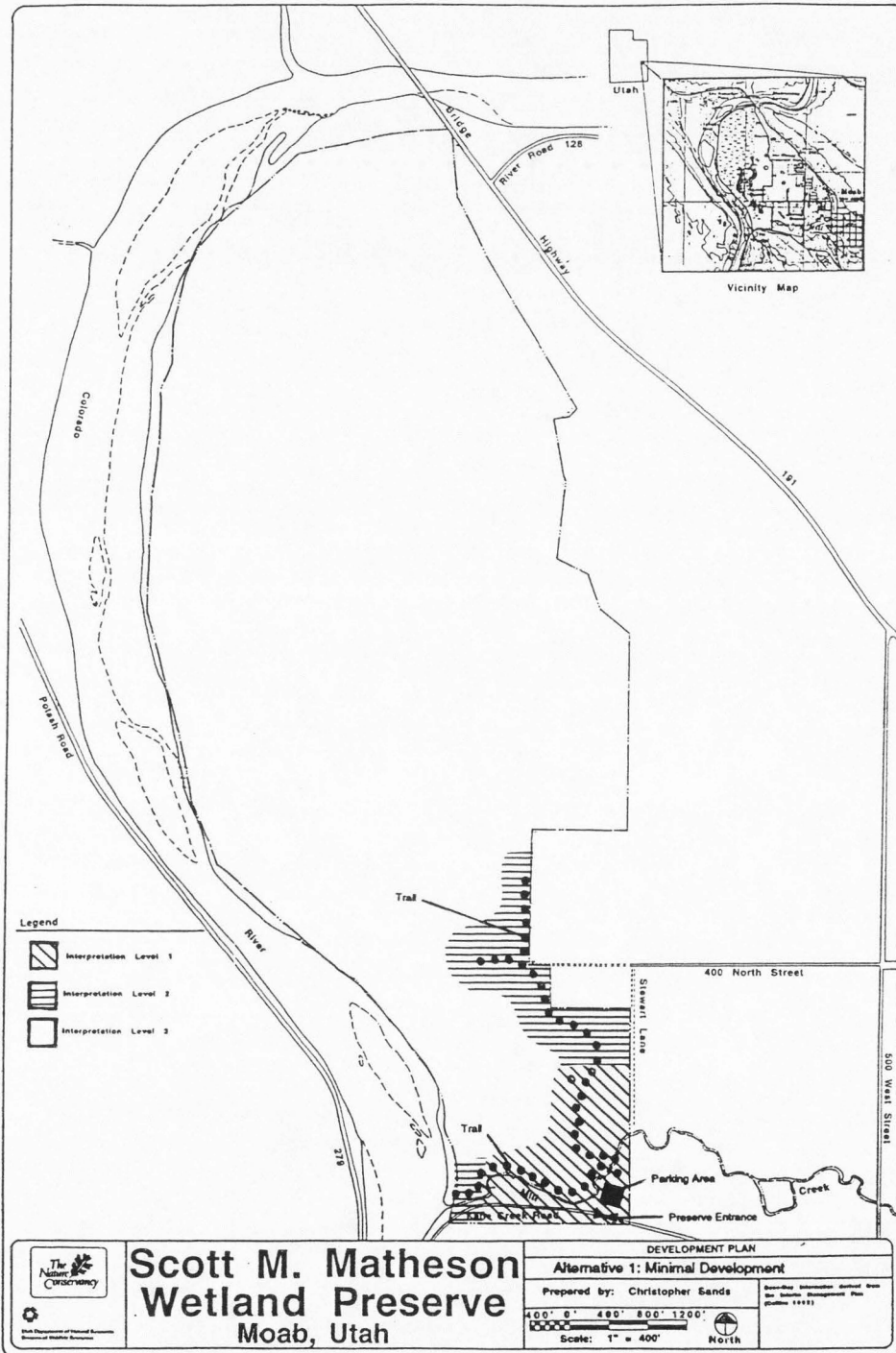
Figure 6 - 12. Alternative 1: Minimal Degree of Facility Development.

programs. Disadvantages include a moderate expense for facility implementation and a higher potential for wildlife disturbance given the increased number of visitors. This alternative is illustrated in Figure 6-13.

Alternative 3: maximum degree of facility development. This alternative provides for the highest level of interpretive facility development possible without undue compromise of the continued protection of sensitive wildlife habitat. This alternative would include the components of Alternative 2 with the addition of a visitor center. Advantages to this alternative include a high level of visitor/interpretation contact, a high level of programmed educational opportunities, and a greater management presence at the preserve. Disadvantages include the expense of implementing facilities and the greatest potential for wildlife disturbance of the three alternatives. This alternative is illustrated in Figure 6-14.

Selection of a Preferred Plan

The preferred interpretation development plan, which generally follows the Alternative 2 - moderate degree of development scenario, was selected by the Conservancy for several reasons. This alternative provided a high level of interpretation, while avoiding sensitive habitats, for a moderate cost. Although Alternative 3 provided the highest level of interpretation, the Conservancy was not prepared to "put all the eggs into one basket" without adequate funding and without carefully considering the potential impacts to sensitive wildlife species through elevated visitor levels. In addition, selection of Alternative 2 would not preclude the construction of a visitor center at a later date when funding might be available and when potential impacts to sensitive wildlife species are better understood with respect to the site. The preferred alternative is presented in Figure 6-15 and shows the location of preserve
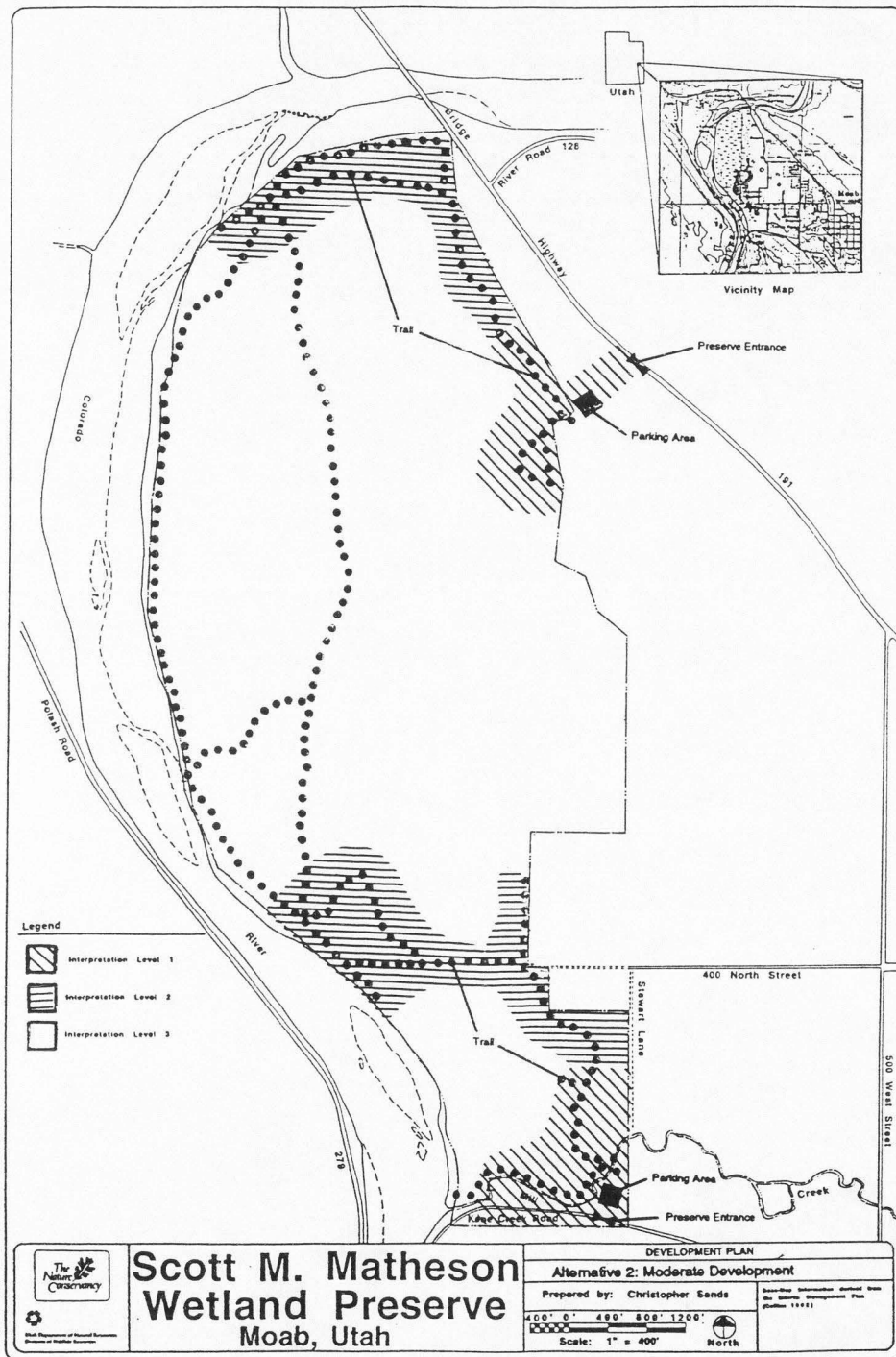
Figure 6 - 13.   Alternative 2: Moderate Degree of Facility Development.
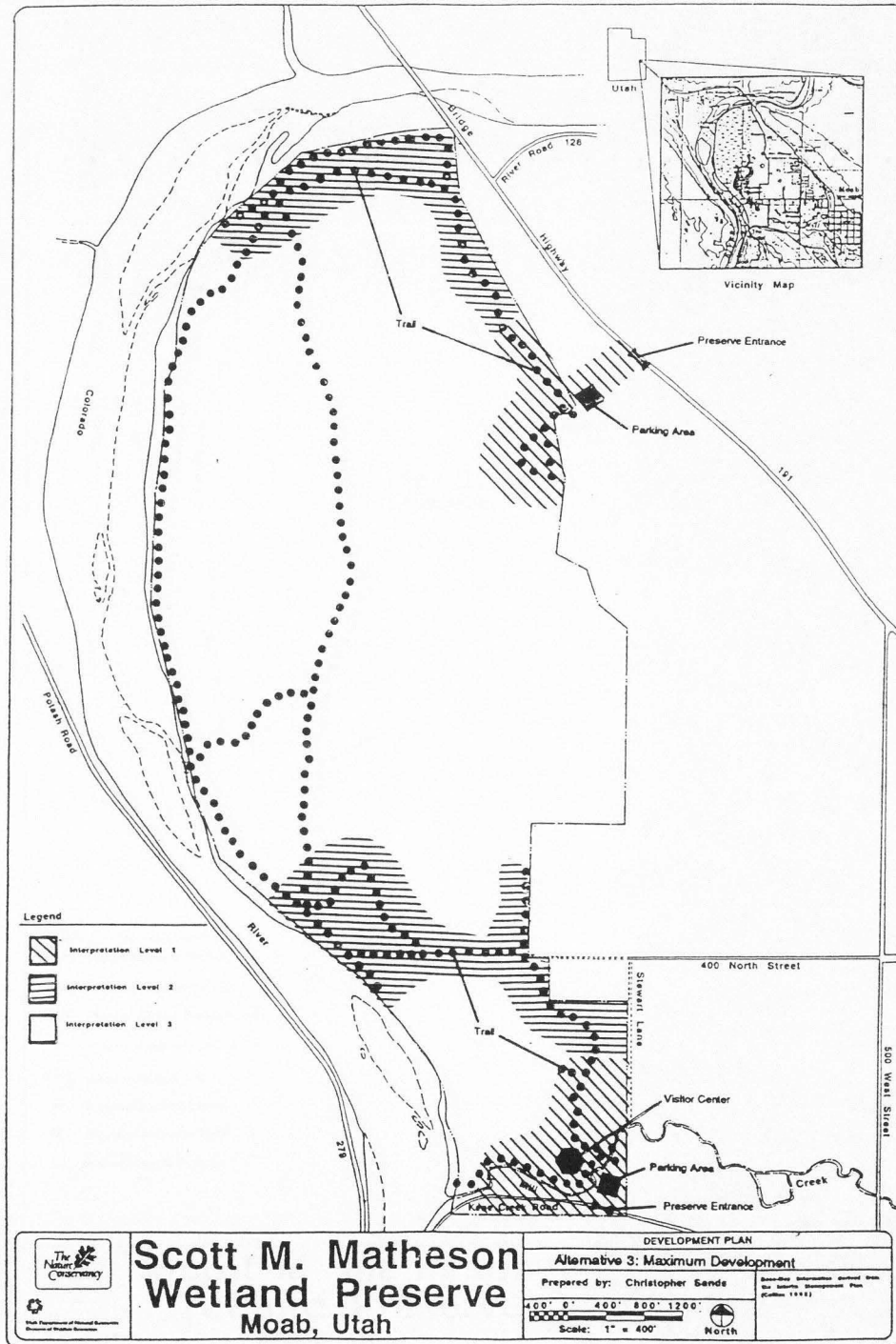
Figure 6 - 14. Alternative 3: Maximum Degree of Facility Development.
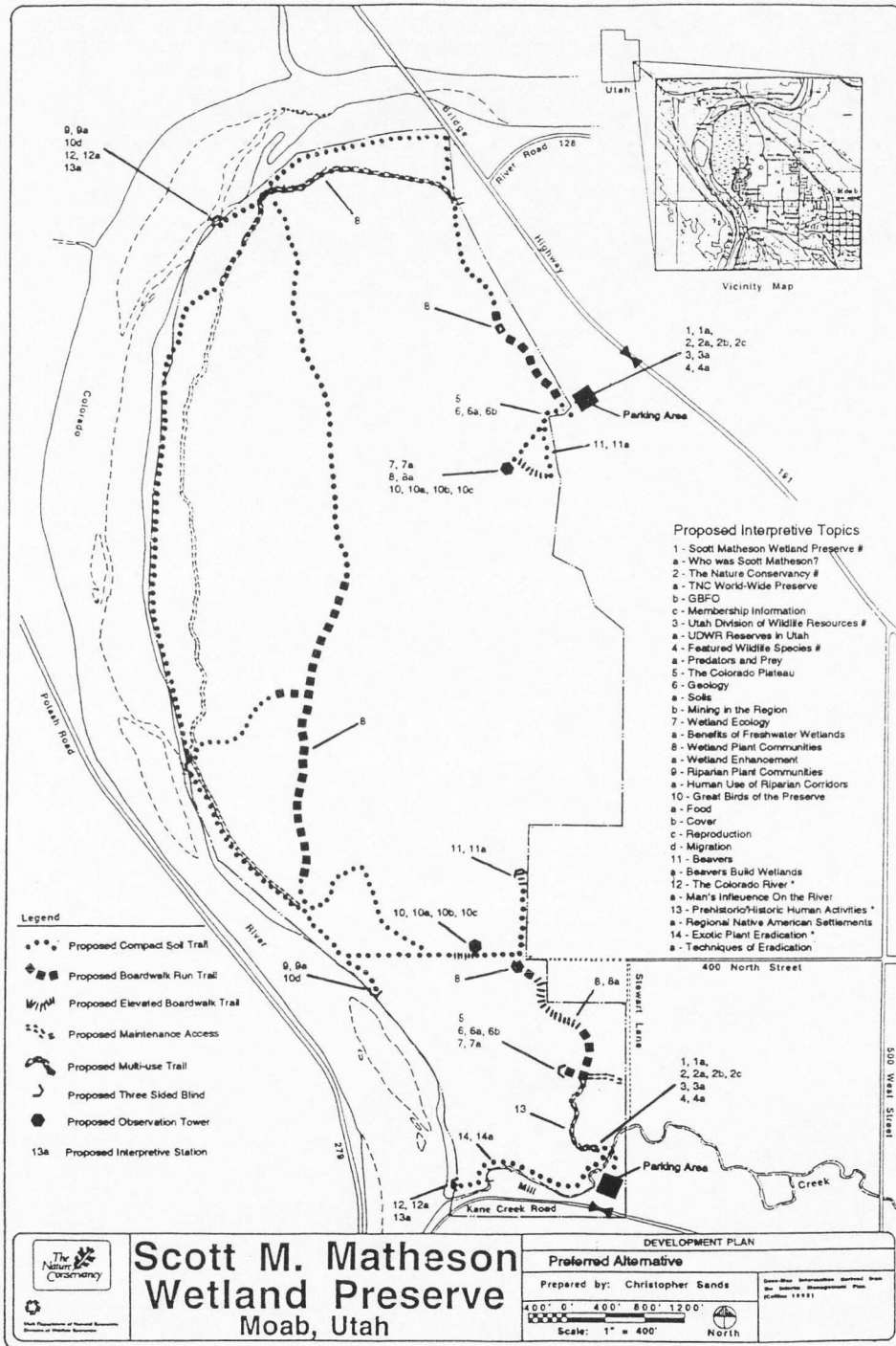
Figure 6-15. Preferred Alternative for the Matheson Wetland Preserve.

entrances, parking areas, trails, and interpretive stations. In addition, observation towers and three-sided blinds were located in suitability level two and three areas to take advantage of prime wildlife viewing areas without disrupting wildlife behavior.

For the preferred plan, a main preserve entrance was located off of Kane Creek Road in the upland sagebrush area where constructing a parking area will be relatively easy and will not disrupt sensitive wildlife habitat. From the parking area a bridge will cross Mill Creek to an interpretive kiosk which will display the orientational interpretive topics. From this point access to the main preserve will be via trails which lead in a northerly and southerly direction to other points within the preserve. Trails were selected for use based upon their existing condition, existing use, potential for uses, and location within sensitive wildlife habitat. Where possible trails were selected if they could provide access to potential interpretive areas with minimal disturbance to highly sensitive wildlife habitat. Existing trails were avoided as much as practicable if they impacted highly sensitive wildlife habitat. Interpretive stations were located in areas that were ideal for interpreting specific topics and could withstand potential impacts.

Figures 6-16 and 6-17 begin to suggest a materials vocabulary for proposed facilities. Constructed facilities should consist of a variety of native materials, such as wood, soil, and gravel, in order to enhance the natural character of the site. Once constructed, facilities will blend with the natural colors and textures present at the preserve so as not to be obtrusive to viewers within and outside of the preserve. Facilities include three types of constructed trails (e.g. compacted soil, boardwalk run, and elevated boardwalk), a three-sided blind, an observation tower, bicycle parking, Mill Creek bridge and kiosk, an entrance sign, and the Kane Creek Road entrance site
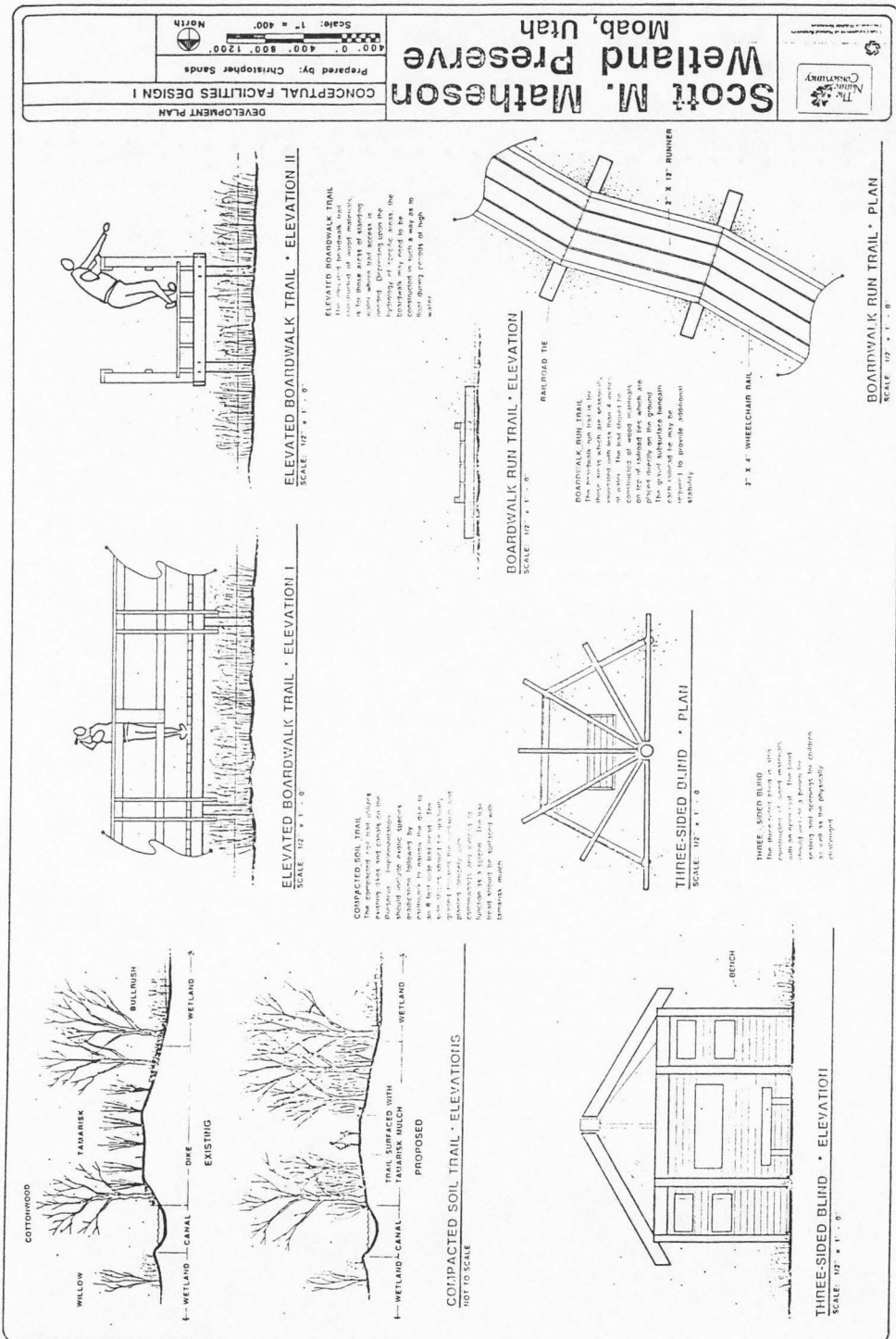
Figure 6-16. Conceptual Facilities Design Sheet One for the Matheson Wetland Preserve.

Figure 6-17. Conceptual Facilities Design Sheet Two for the Matheson Wetland Preserve.

plan.

The media recommended to be used for each interpretive station is designed to follow the interpretation level designations that were established for the Alternative 2 development scenario. The recommended media, along with descriptions for each, is provided below.

- Interpretation Level 1 - Embedded Fiberglass; variety of silk screened colors available; can use photographs; expensive, however copies should be made at the time of printing for replacements which are relatively inexpensive.

- Interpretation Level 2 - Etched Aluminum; limited colors, black background with aluminum etching; durable although easily scratched; inexpensive although replacements take time.

- Interpretation Level 3 - Educational Group Tours; very specialized topics for very interested participants; no specific facility development; closed to general public; tours should be supervised by trained interpretive specialists; inexpensive if Canyonlands Field Institute is utilized for these services.

Implementation of the Preferred Plan

Proposed facilities associated with the preferred plan should be scheduled for completion based upon a phased development plan that prioritizes which areas are to be constructed first and which areas are to follow depending upon available funding. First phase development, funded primarily by TNC, should include the main entrance off of Kane Creek Road with associated vehicle and bicycle parking facilities, the Mill Creek Bridge, and the primary trails that lead from the bridge south and west to the river along Mill Creek and north and west to the observation tower. Following an assessment of the need to replace the dike across open water located west of 400 North Street, second phase development, also funded by TNC, would include constructing the remaining primary trail system west to the river and north through the preserve to the first loop through the forested wetland habitat. Third phase development would include

implementation of the HIghway 191 entrance and all associated trail and interpretive facilities to tie in with the first two phases. This third phase will be developed and staffed by UDWR personnel. The implementation plan is shown in Figure 6-18.

Evaluation and Revision

Renewing and updating of exhibit material should be completed as the information contained therein becomes inoperative or obsolete. Changes may reflect changes in the physical landscape, changes in the story of the Matheson Wetland Preserve, and changes in management strategies. Despite the best efforts of exhibit designers and preserve staff, some of the interpretive materials are bound to perform inadequately because of their physical function or method of communication. To prevent inadequate interpretation, facilities should be revised and updated based upon evaluation studies for determining the effectiveness of interpretive facilities. Programs and materials should be updated to keep current with the conditions of the preserve, new information as the result of research, and contemporary interpretive practices.

Research Needs

Research will be an integral part of proposed future changes at the preserve. Opportunities for original and significant research in wetland ecology, wetland flora and fauna, and the hydrologic regime at the preserve abound and will be essential for management of wildlife and wildlife habitat. Additional research will be required as facility development is implemented, including user impacts to wildlife and their habitats, visitor and wildlife behavior, hunting impacts, hunter/birder conflicts, wetland restoration, and endangered fish recovery areas. This plan should be updated as research data becomes available or, at a minimum, every 5 years. Preserve personnel should develop a research plan and application process, and should approve and monitor
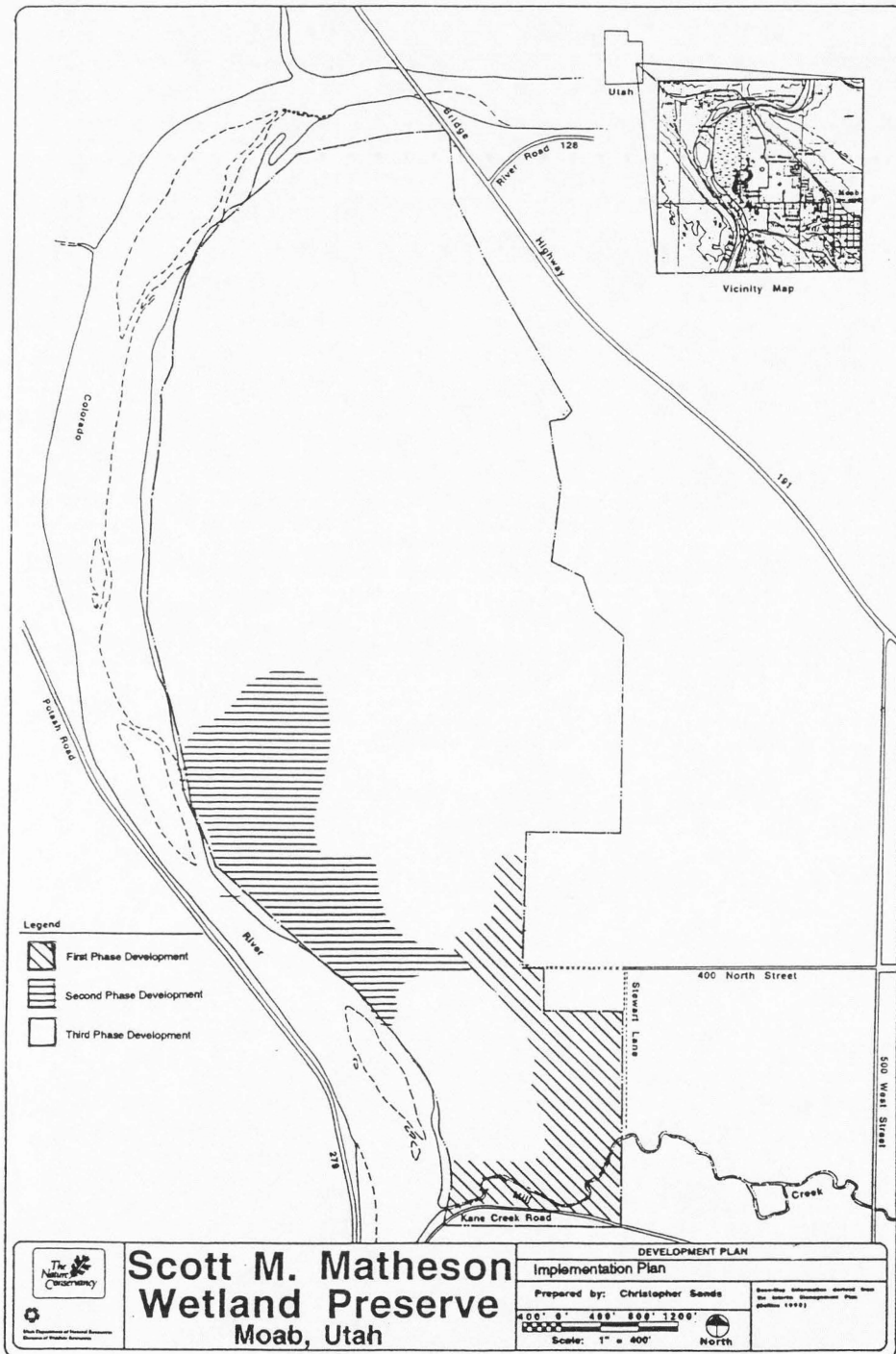
Figure 6-18. Implementation Plan for the Matheson Wetland Preserve.

all research activities. Results should be shared with other individuals and

organizations involved in areas of wetland restoration, environmental education, wetland

ecology, and other related fields.

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APPENDIX A

ADVANTAGES AND DISADVANTAGES OF VARIOUS MEDIA AS DESCRIBED BY PASKOWSKY

(1 9 8 3)

CHAPTER FIVE

INTERPRETIVE MEDIA CHARACTERISTICS

This chapter is designed to provide the reader with a general appreciation for interpretive media and some of their applications to National Park situations. Written from a broad perspective, the chapter lists the advantages and disadvantages of various media and discusses their general characteristics. The chapter is not intended to be a comprehensive discourse on the subject, but rather to provide some basis for evaluating interpretive proposals.

EXHIBITS

General Comments

Exhibits are versatile interpretive media. They can be designed in all shapes, sizes, colors, and textures for both indoor and outdoor use. They can incorporate artifacts, artwork, or mixed media to produce desired atmosphere and effects. The three dimensional image can frequently convey complex ideas understandable at a moment's glance. Exhibits can transcend language and cultural barriers. They can promote the use of the senses to aid the preception of the able-bodied and handicapped visitor alike.

Exhibits work best when they use things -- personal effects, historic objects, maps, photographs, models, - or, in the case of wayside ex-

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hibits, the actual scene - as the prime focus of attention. The objects can be complemented by brief, concise label copy, short audio messages, or special lighting effects to great advantage. The historic house might be considered as a special kind of "walk-through" exhibit that captures a moment or period in time.

Exhibits, however, are generally static displays that change only occasionally, if at all. Permanent exhibits can be grouped with rotating or seasonal temporary displays to provide a sense of change.

Exhibits are limited by the artifacts and materials of which they are made. Most artifacts are sensitive to environmental changes, and their preservation requires that original objects be protected from agents of deterioration, including any use that damages the historic fabric (consumptive use). Reproductions can frequently be employed to provide visitors with a "hands-on" experience. Exhibit materials often have high commercial value, making them prime targets for theft. The design, therefore, must take physical security into consideration.

EXHIBITS

ADVANTAGES

Can be viewed at visitor's pace.

Can display objects associated with the site.

Can display three-dimensional objects.

Can promote visitor participation.

Can be complemented by publications or audiovisual programs.

Can be designed for both indoor and outdoor use.

Are well suited for presenting ideas which can be illustrated graphically.

LIMITATIONS

Are sensitive to agents of deterioration.

Require security and maintenance.

Tend to compete for the visitor's attention.

Do not work well with largely verbal sequential stories.

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WAYSIDE EXHIBITS

Waysides are outdoor exhibits used primarily as orientation devices
(at trailheads for example), or to emphasize and interpret prominent
features and sites. Waysides generally consist of flat panels con-
taining label copy and complementary graphics. In contrast to indoor
exhibits, artifacts are rarely used in waysides.

Special care should be taken in locating wayside exhibits. They
should be placed where they can be readily seen, and where they pro-
vide a good view of the object of interpretation.

Waysides can be produced in a variety of materials (metals, wood, and
plastics) each with their own special characteristics. Metals, for
example, are very durable, but are limited by the kinds of graphic
processes that can be performed on them. Plastics, on the other
hand, offer greater artistic freedom. However, they are not as
durable as metals. The choice of materials will depend on a number
of factors including the site location, the environmental conditions,
the graphics to be used, and the anticipated levels of vandalism.

WAYSIDE EXHIBITS

ADVANTAGES	LIMITATIONS
Are always available.	Can be subject to vandalism.
Can be viewed at viewer's pace.	Are static and inflexible.
Use real objects and features as the object of interpretation.	
Are relatively inexpensive.	
Can use audio components to complement text and graphics.	
Can be designed to blend with site environment.	

PUBLICATIONS

General Comments

Publications are portable. They can be carried with visitors and used at their own pace. Maps, self-service guides, and other orientation literature are particularly useful. Publications can treat a subject in-depth, a luxury rarely possible in other media.

Visitors can use publications when they can't be in the field. Publications can be used before going to the park, during the visit, or after returning home. Unfortunately, few visitors take advantage of pre-visit literature.

Publications can be produced to treat the same subject for different audiences. Visitors can read orientation folders for a brief summary of an area's significance. They usually can purchase a more detailed popular publication, or, in some cases, in-depth technical studies.

The small unit cost of publications makes them one of the most cost effective methods of interpretation. Publications can be revised as information changes, and they can be translated into foreign languages. Publications can be especially effective in new areas with few interpretive facilities.

PUBLICATIONS

ADVANTAGES

Are portable.

Are relatively inexpensive.

Have a souvenir value.

Provide a source of detailed reference information.

Can be produced in foreign languages.

Allow a variety of illustrative techniques.

Are suited to presenting sequential material.

Can be read at visitor's pace

Can produce income.

Complement personal services.

Can be revised easily.

Can be produced at various levels of detail.

LIMITATIONS

Can discourage audience with lengthy texts.

Can be a source of park litter.

Can dampen interest and present poor image unless professionally written, designed, and illustrated.

Require periodic revision to remain accurate.

PERSONAL SERVICES

General Comments

Personal services have, with good reason, been considered the ideal interpretive method when they can be used. All other interpretation may be considered supplementary to direct communication. Personal services have the unparalleled advantage of being alive and of being tailored to the needs of individuals or groups. They can take advantage of unexpected and unusual opportunities. In short, they are versatile, effective, and easy to implement. A good interpreter can raise an interpretive program to celestial heights, but a poor (even mediocre) interpreter is less than ideal.

The actual cost of interpreters can vary from zero with the use of volunteers to being fairly expensive if professional interpreters are employed. The cost of training, management, and equipment also must be considered.

Forms of personal services, such as "living history," demonstrations and playlets, have proven effective in the National Park System, but they need to be carefully planned and professionally executed.

PERSONAL SERVICES

ADVANTAGES	LIMITATIONS
Appeal to visitors.	Require trained interpreters.
May be tailored to needs and interests of groups.	Require close management.
Use group reactions to stimulate individual interest.	Are difficult and expensive to maintain year round.
Answer visitor's questions.	Are not consistently good, for interpreters usually "burn out" for some period of time.
Prove effective during peak visitation periods.	Are difficult to critique properly.
May be monitored and changed accordingly.	Require periodic revision to remain accurate.
May take advantage of unexpected or unusual opportunities.	
Tap diverse skills of individual interpreter.	

AUDIOVISUALS

Audiovisual programs offer a wide variety of approaches to interpretation ranging from simple audio messages to full length motion pictures. They are well suited to the presentation of chronological and sequential material and have been successfully employed to present an overview or brief introduction to a subject.

The use of sound offers the opportunity to introduce special effects and music to heighten the authenticity and effectiveness of the visual program. Short verbal commentary and instructions can be made in lieu of text and publications, offering visitors an uninterrupted view of the subject matter. Multiple audio tracks afford the opportunity for multilingual messages. And audiovisuals can be designed to complement a specific exhibit.

Yet audiovisual programs can be costly. Besides production costs, equipment and maintenance expenses must be considered. It is important to have backup equipment and software in case of malfunction.

In addition to inherent problems such as warped slides and scratched film, there are other interpretive shortcomings. Unlike an exhibit or publication, audiovisuals offer no opportunity to "browse" or study an item in depth. They simply are one-shot affairs.

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Audiovisual programs and equipment can be visual intrusions in some cases, especially in historic scenes, and ambient sound can be a nuisance in certain situations. Repetitious sound tracks can drive a visitor center staff "batty," and some people feel that audiovisual programs (especially poorly produced ones) are too sterile and impersonal. Programs work best when presented under controlled conditions, such as in auditoriums.

AUDIOVISUAL MEDIA

ADVANTAGES

Capture realism and provide emotional impact.

Provide good introductions to park stories.

Provide opportunities for dramatization.

Provide visual and sound effects.

Are portable for off-site use.

Provide views of places, animals, and plants, and seasons otherwise unavailable or inaccessible.

Create a mood or atmosphere.

Reach many visitors at one time.

Provide a service for handicapped.

Can illustrate before and after effects.

Can provide continuous programs.

Can ensure consistently reliable information

LIMITATIONS

Cannot be used everywhere.

Require back-up equipment, periodic maintenance, and regular monitoring.

May be perceived as sterile or impersonal.

May be a visual or auditory intrusion.

APPENDIX B

COPIES OF PERTINENT MATERIAL FROM THE WALNUT CREEK NATIONAL WILDLIFE

REFUGE - PRAIRIE LEARNING CENTER PUBLIC USE PLAN (1993)

POLK CO.

415

69 35

Saylorville
Lake

Ankeny

JASPER CO.

14

Newton

65

80 6

Colfax

117

Des Moines

163

Prairie
City

316

Walnut Creek
NWR

Monroe

235

Des Moines River

Lake Red Rock

163

65

69

5

14

Indianola

92

92

Knoxville

92

69

WARREN CO.

65

14

MARION CO.

5
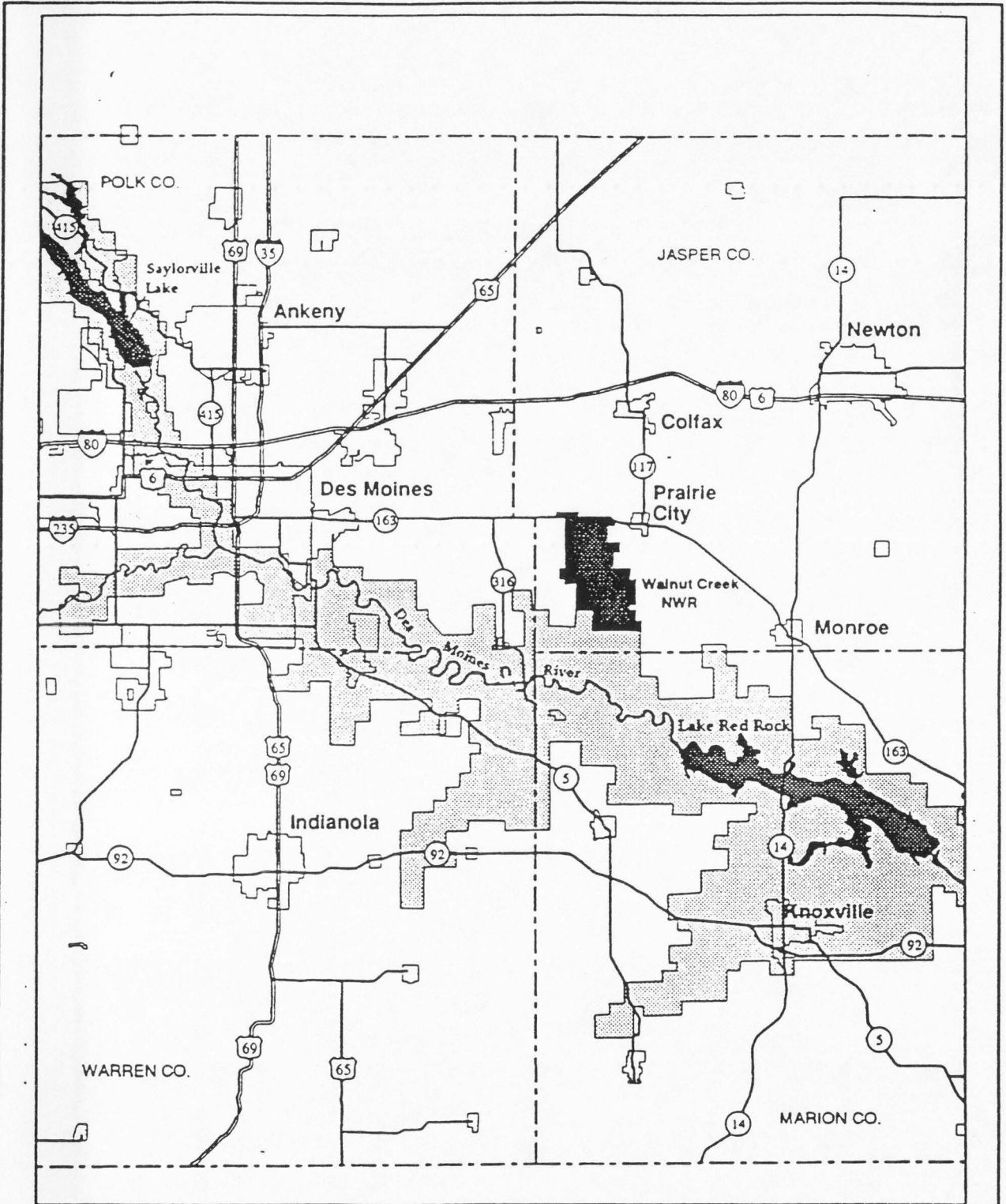
Refuge Location and Regional Context

Walnut Creek National
Wildlife Refuge

Des Moines Recreational
River and Greenbelt

NORTH

0   2   6   10 miles
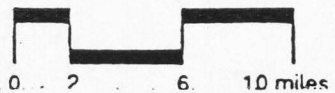
Source: Compass Plant Consultants, "Walnut Creek National Wildlife Refuge Native Community Assessment", October 1991.
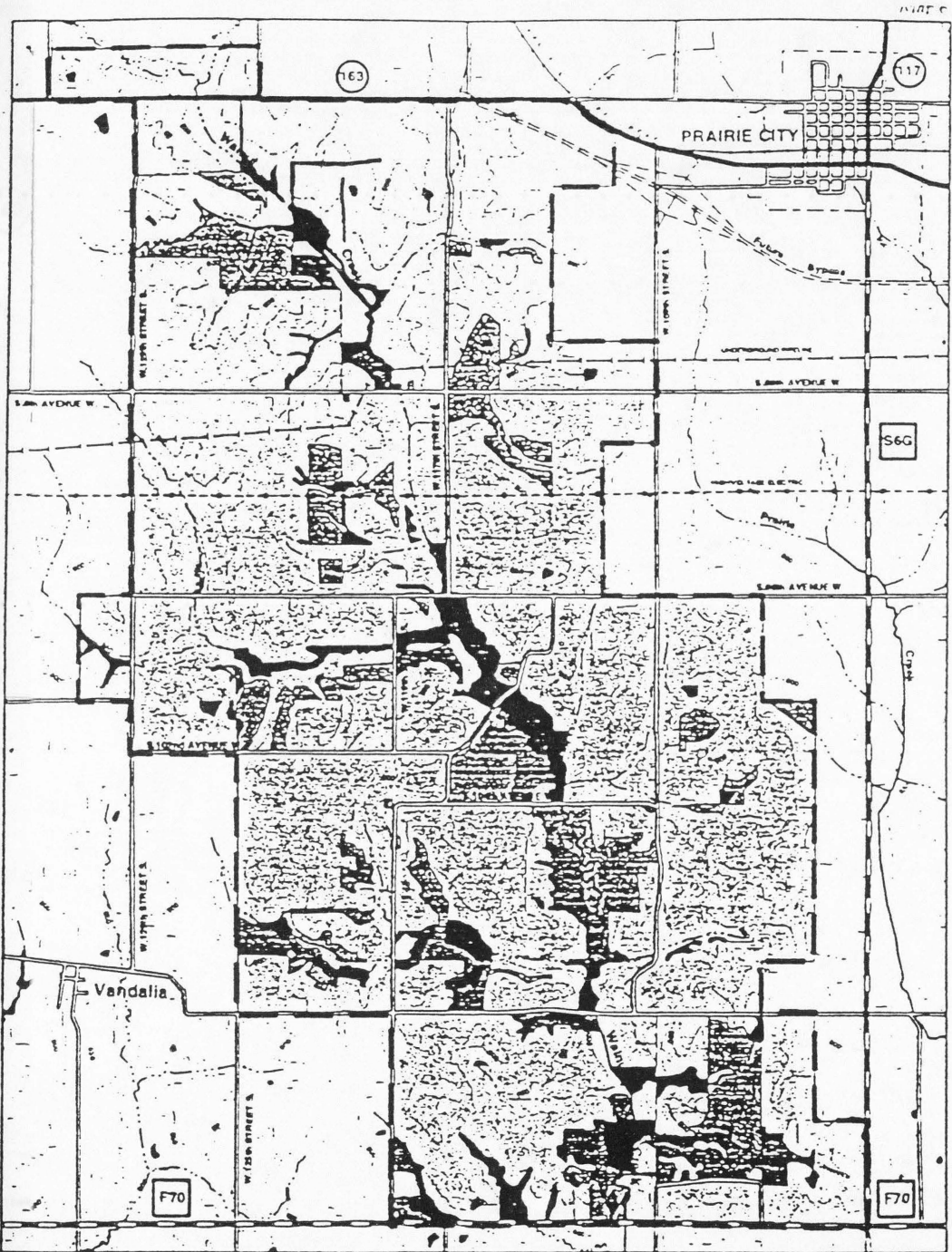
Rennant Native Vegetation

- Prairie / Prairie Plants in Brome
- Savanna
- Forest
- Wetland
- Anthropogenic Communities and Agriculture
- Refuge Boundary

100 acres
40
10

0 1000 3000 5000 Ft.
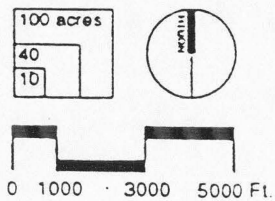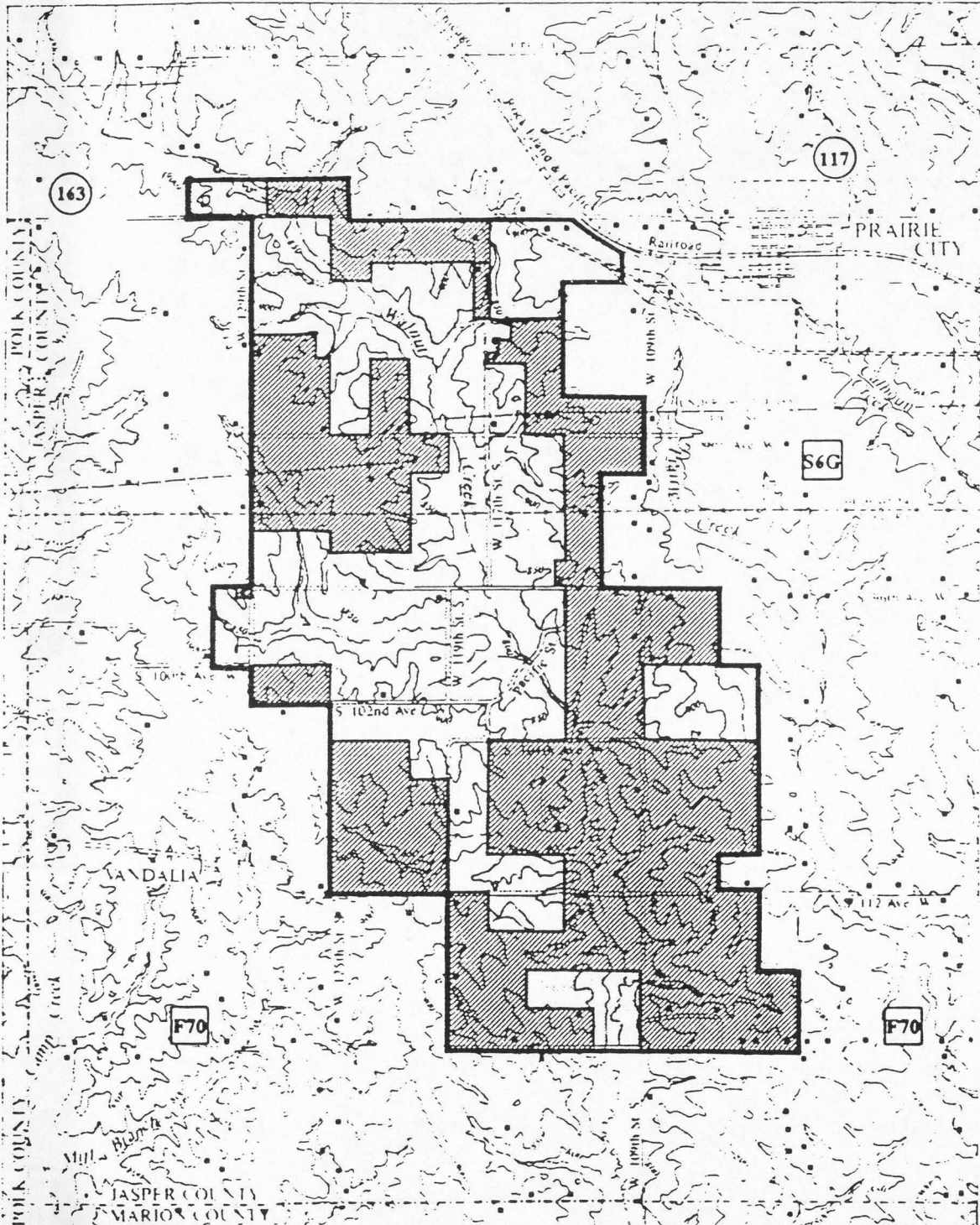
REFUGE BOUNDARY

U.S. Fish and Wildlife Service Property (As of April 1992)

Other Property to be Acquired Through Willing Seller Program

Refuge Boundary

U.S. Fish & Wildlife Service

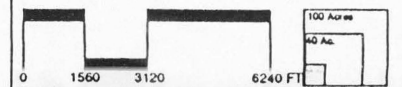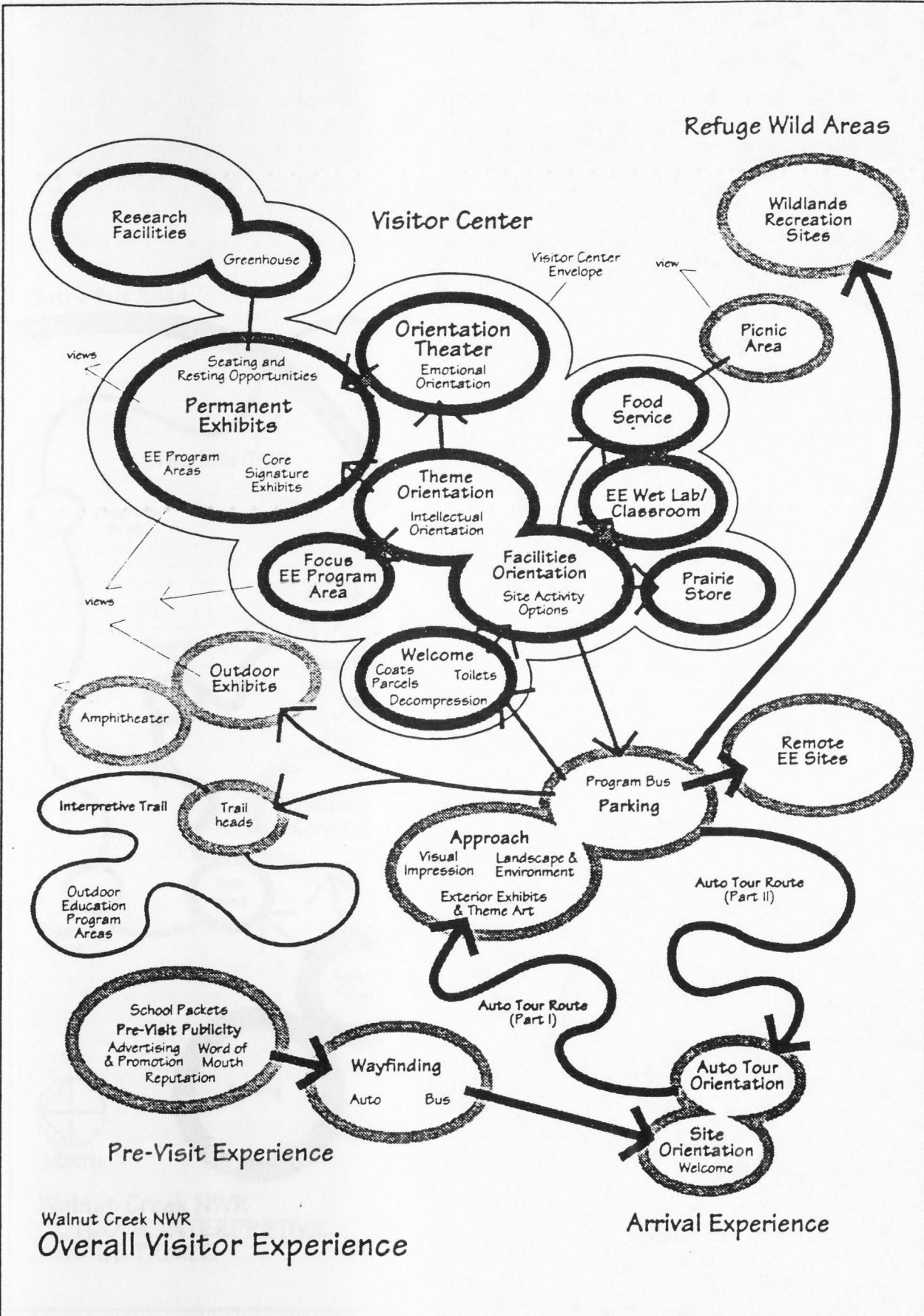Walnut Creek
National Wildlife Refuge-Prairie Learning Center

0   2500   5000 Ft.
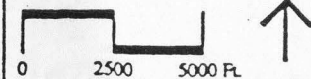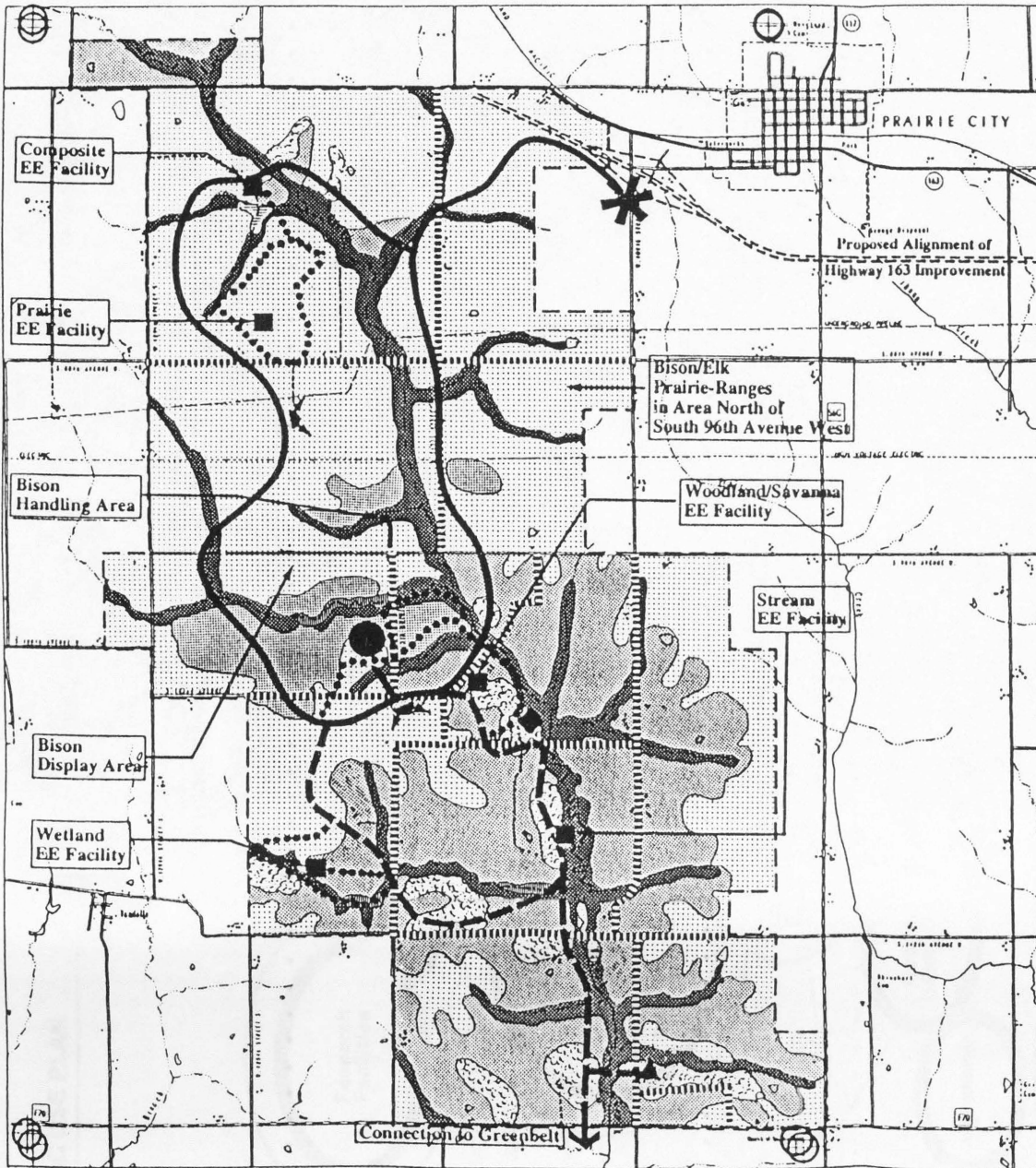
Figure 6

CONCEPTUAL REFUGE PLAN
(PREFERRED ALTERNATIVE)

Legend:
- Prairie
- Prairie/Savanna
- Riparian
- Forest
- Moist Soil Unit
- Impoundment
- ● Preferred Campus Location (Option C-6B)
- ◆ Native Plant Preserve
- ■ Environmental Education Outdoor Classroom Facility
- ✳ Preferred Refuge Access (Option B)
- Tour Route (one way) Entry Road (two way)
- Hiking/Biking Trail
- Vista Point
- •••• Trail
- ▲ Environmental Education Campground
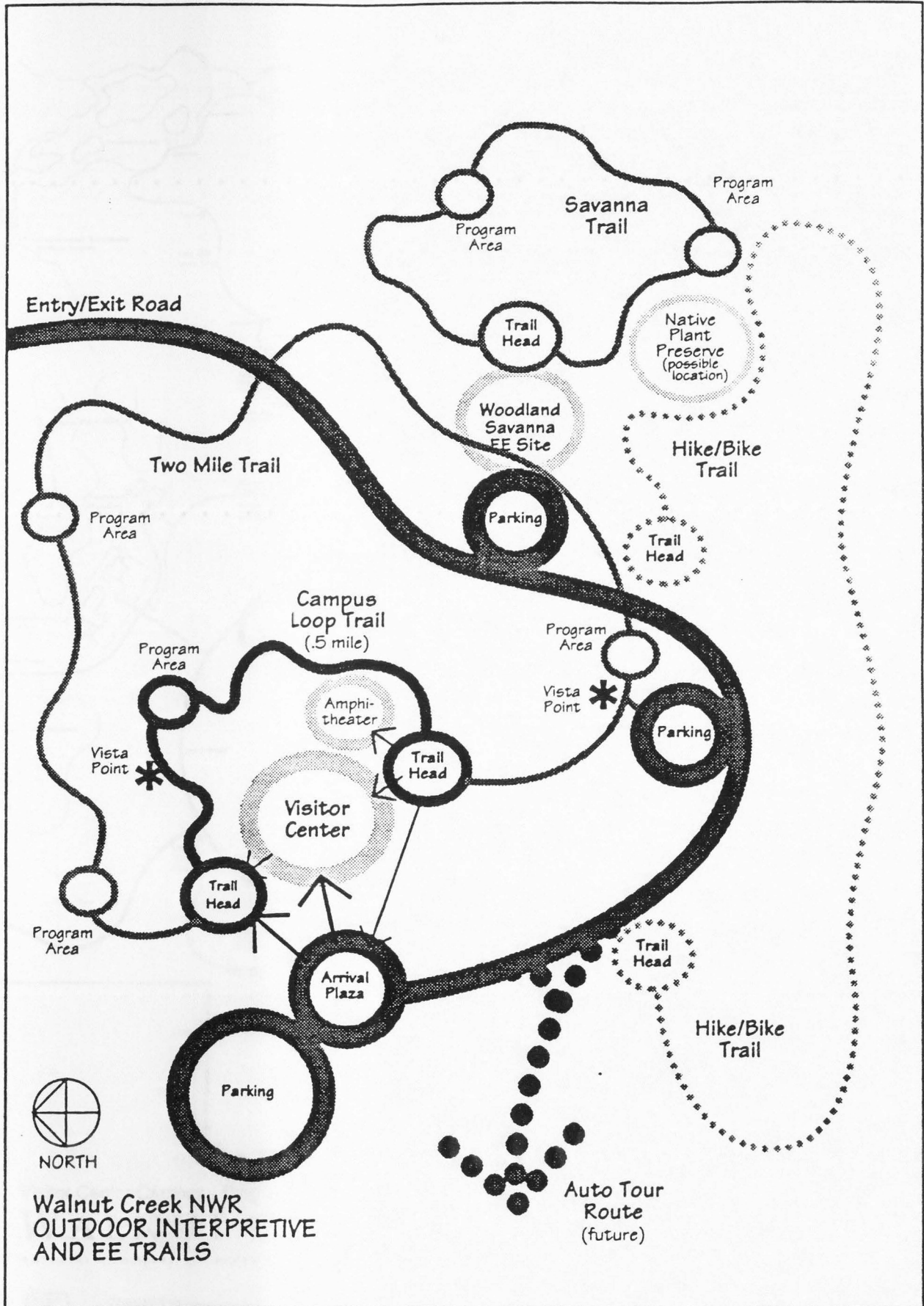- Proposed Roadway Closings (Subject to County Approval)

0   1560   3120   6240 FT
100 Acres
40 Ac.

U.S. Fish & Wildlife Service

Walnut Creek
National Wildlife Refuge-Prairie Learning Center

Map labels:
- Composite EE Facility
- Prairie EE Facility
- Bison Handling Area
- Bison Display Area
- Wetland EE Facility
- PRAIRIE CITY
- Proposed Alignment of Highway 163 Improvement
- Bison/Elk Prairie-Ranges in Area North of South 96th Avenue West
- Woodland/Savanna EE Facility
- Stream EE Facility
- Connection to Greenbelt

Refuge Wild Areas

Visitor Center

Research Facilities

Greenhouse

Visitor Center Envelope

view

Wildlands Recreation Sites

views

Orientation Theater
Emotional Orientation

Picnic Area

Seating and Resting Opportunities

Permanent Exhibits

Food Service

EE Program Areas

Core Signature Exhibits

Theme Orientation
Intellectual Orientation

EE Wet Lab/ Classroom

Focus EE Program Area

Facilities Orientation
Site Activity Options

Prairie Store

views

Welcome
Coats Parcels   Toilets
Decompression

Outdoor Exhibits

Amphitheater

Remote EE Sites

Interpretive Trail

Trail heads

Program Bus
Parking

Approach
Visual Impression   Landscape & Environment
Exterior Exhibits & Theme Art

Auto Tour Route (Part II)

Outdoor Education Program Areas

Auto Tour Route (Part I)

School Packets
Pre-Visit Publicity
Advertising   Word of
& Promotion   Mouth
Reputation

Wayfinding
Auto   Bus

Auto Tour Orientation

Site Orientation
Welcome

Pre-Visit Experience

Arrival Experience

Walnut Creek NWR
Overall Visitor Experience

Program
Area

Savanna
Trail

Program
Area

Entry/Exit Road

Native
Plant
Preserve
(possible
location)

Trail
Head

Woodland
Savanna
EE Site

Hike/Bike
Trail

Two Mile Trail

Program
Area

Parking

Trail
Head

Campus
Loop Trail
(.5 mile)

Program
Area

Program
Area

Amphi-
theater

Vista
Point

Program
Area

Trail
Head

Parking

Vista
Point

Visitor
Center

Trail
Head

Program
Area

Trail
Head

Arrival
Plaza

Hike/Bike
Trail

Parking

NORTH

Auto Tour
Route
(future)

**Walnut Creek NWR
OUTDOOR INTERPRETIVE
AND EE TRAILS**

Visitor Center Campus - Program Plan

WALNUT CREEK

NATIONAL WILDLIFE REFUGE and PRAIRIE LEARNING CENTER

LEGEND

- Roads
- Trails
- Special Definition
- Drainages
- Key Views
- Prairie Demonstration Area
- Prairie Garden

Refuge - Program Plan

WALNUT CREEK

NATIONAL WILDLIFE REFUGE AND PRAIRIE LEARNING CENTER

LEGEND

Entry Road

Highway 163

Glimpse of Entry
Statement from
Highway 163

Project Signage
at Refuge Boundary

Project Entrance
Statement

Information
Kiosk

Tour Loop Road
to Composite EE
Site

Farm to Market Road

Visitor Center
Campus

Woodland/Savanna
EE Site

Tour Loop
Road
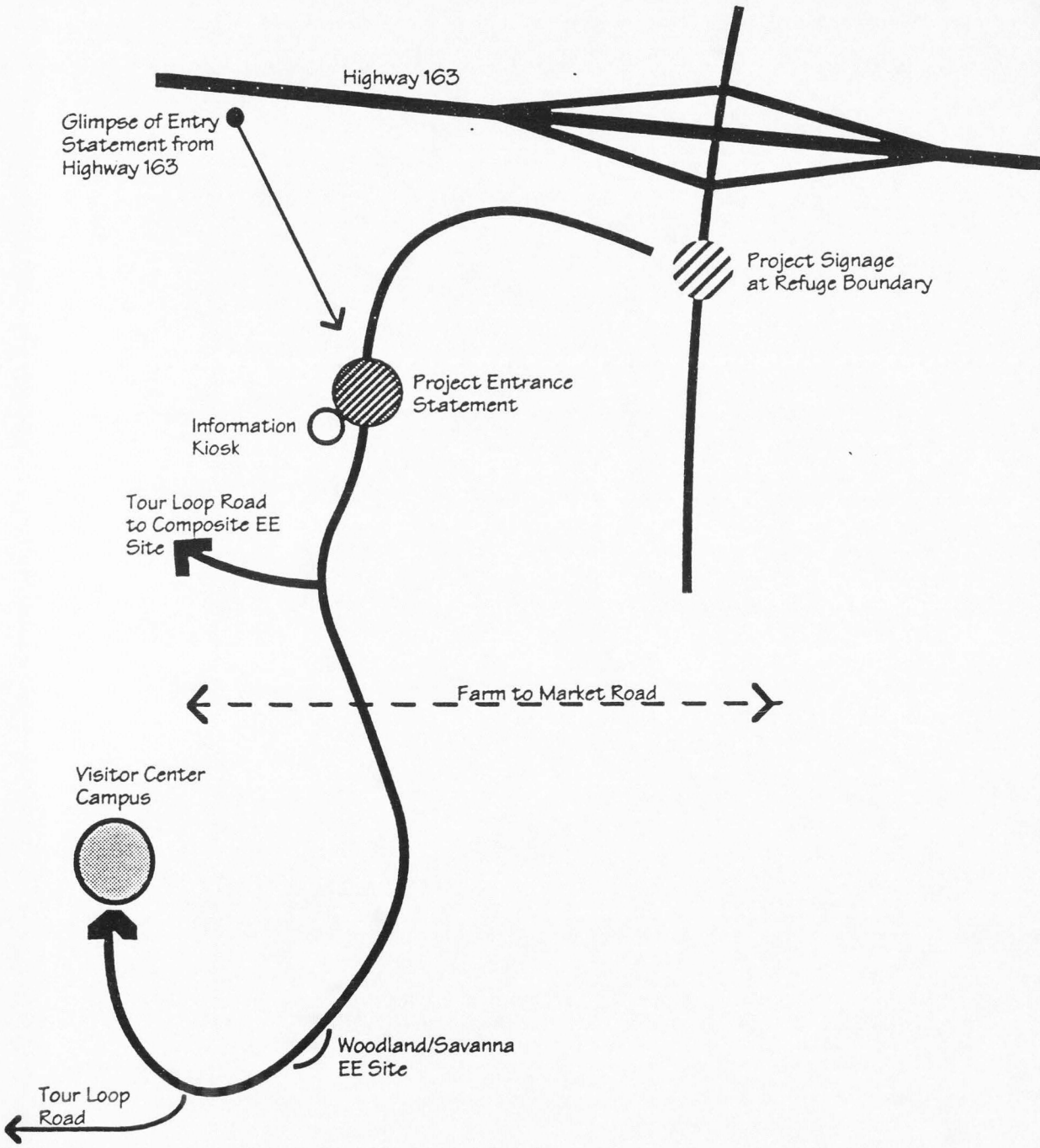
Prairie Demonstration Exhibit Area

View to Prairie, wetland impoundment, and Bison/Elk

Vista Point/Overlook

Two Mile Loop Trail

Campus Loop Trail

Prairie Demonstration Area

Visitor Center

Visitor Arrival Plaza

Maintenance Road

Entry Road

Outdoor Assembly Area

Visitor Center

Amphitheater

Visitor Arrival
Plaza

Portion of
Campus
Loop Trail

View to East or
Southeast

Visitor Arrival
from Parking

Outdoor EE
Multi-Purpose
Area

Allow visual isolation from trail
to prevent casual trail users
from distracting scheduled EE
activities.

Tall Prairie
Grass

Paved Path forms
Edge of EE Multi-
Purpose
Space

Short Grass
Within
EE Space

Surface material to be
durable and comfortable

36"

12"-18"

Provide direct access for
impaired individuals and senior
citizens to the amphitheater
floor in a similar manner and
with the same experience as
unimpared users.

Campus Loop Trail

Bison/Elk Display Area

Impoundment

View to Prairie/Pasture

Two Mile Loop Trail

Vista Point/Overlook

Typical Interpretive Station

Trailhead

Visitor Center

Prairie Nursery

Visitor Arrival Plaza

Entry Road

Maintenance Road

Two Mile Loop Trail

Display Pasture

Impoundment

Impoundment Interpretation

Prairie Stream

View to Prairie/Pasture

Wetland Interpretation

ShrubSavannah

Vista Point/Overlook

Typical Interpretive Station on Campus Loop

Trailhead at two mile loop trail

Visitor Center

Mesic Wooded Slope

Visitor Arrival Plaza

Two Mile Loop Trail

Maintenance Road

Entry Road

Prairie Reconstruction

Prairie

Vista Point

Bike Trailhead at Tour Loop road

EE Site and Bike Route Trailhead

EE Site

Tour Loop Road

Woodland/Savanna EE Site - Trail

Composite E.E. Outdoor Classroom

Woodland
Interpretation

Wetland/Impoundmet
Interpretation

Composite EE Trail

Impoundment

Prairie
Interpretation

EE Classroom

Toilets   Trailhead Kiosk

Parking

Tour Loop Road
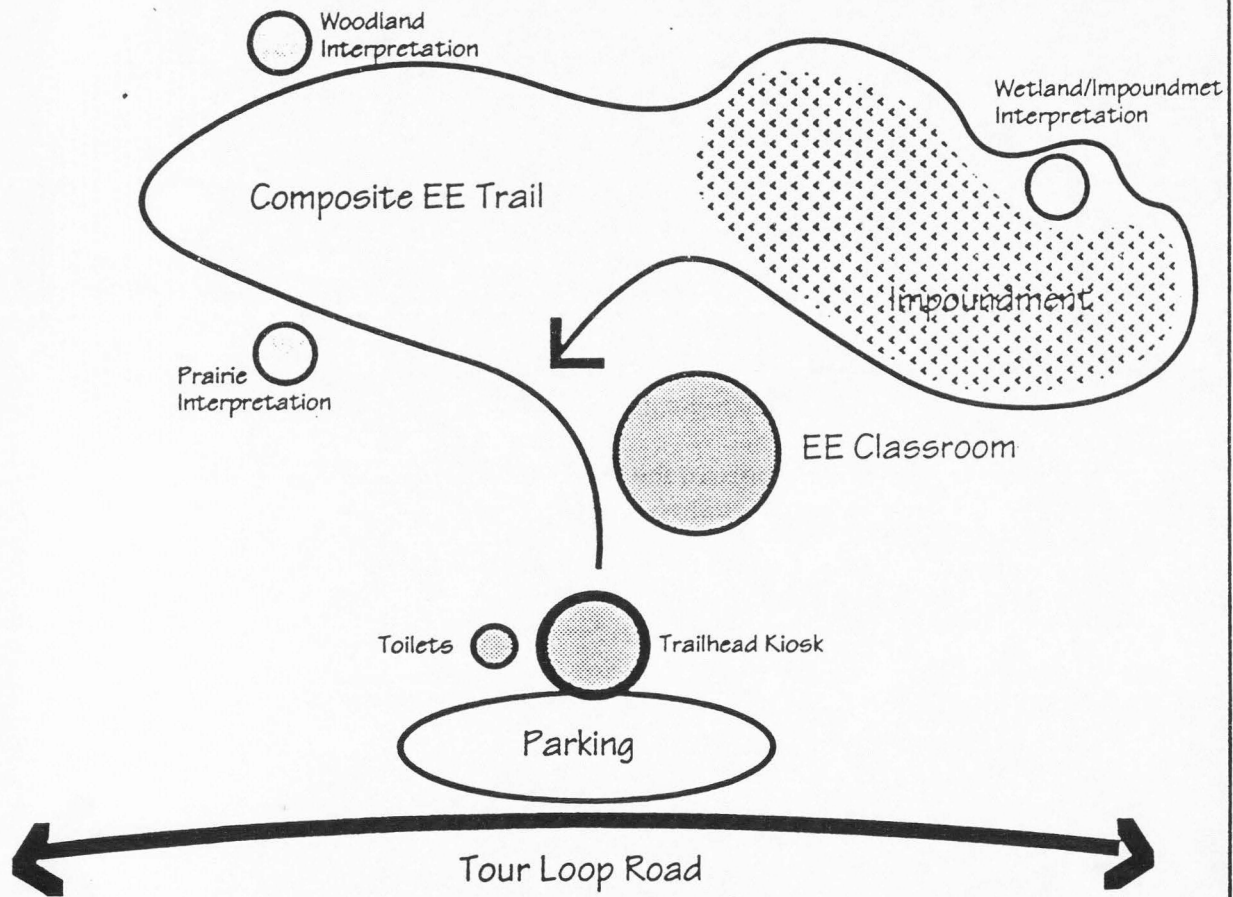
Woodland/Savanna Outdoor Classroom

Woodland/Savanna Trail

Savanna Wetland
Interpretation

Oak Savanna

Oak Savanna
Interpretation

EE Classroom
Structure

Toilets   Trailhead Kiosk

Parking

Entry Road

Trailhead

Parking organized in a "pull-off
from entry road

Entry Road

Audience Group Size	Experience	Facilities	Special Notes	EE Goal Level Emphasis	Typical Activities
PreSchool 15 - 20 kids 5-8 adults	• Sensory activities - highly tactile • Areas for high levels of activity • Highly affective • Touch-table kinds of experiences • Group oriented activities • Story hour or an area for musician to perform desirable .	• Low toilet - sink - waterfountain • Soft/padded surfaces: carpeted activity areas • Indestructible fixtures/exhibits • Activities and exhibits that are highly sensory: able to be manipulated using large motor skills • Indoor &/or outdoor running spaces • Sheltered outdoor spaces • Cubbyholes or lockers for coats, lunches, stuff • Lunch area • Place for sick kid to lie down	• Leaders have limited Environ. Ed. and Nature Background • Little gender division • Short attention span • NO reading ability • Limited content retention or interest	Major Awareness Attitude Minor Knowledge Skills Participation	• Blindfold walk • Search for fall colors • The Textures Around You • Tree Friend: Hug a Tree (Meet a Tree) • Earth Windows • What Bear Goes Where?
Early Primary (K - 2nd grade) 20 - 30 kids 1 - 3 teachers ? Parent + Aides	Similar to Preschool • Highly tactile and sensory activities • Group oriented activities • High Energy activities • Diverse, engaging programs that focus, allow for limited attention span • Areas for calm/quieting activities • Highly affective activities	Same as Preschool plus: • Can deal with higher technology, ie touch screen TVs • Teaching areas in Exhibit hall need to provide separation to control overstimulation • Story hour or an area for musician to perform desirable	• Teachers afraid of "Science" • Potential limited seasonal use during "warm" months • School concentration on reading, math and social skills • Little gender division • Family orientation • Some cognitive abilities - beginning comparisons (this feels like...) • Transition time for imagination: Increased literalization of knowledge & experiences (Lumpers to reductionists)	Major Awareness Attitude Minor Knowledge Skills Participation	Same as above

Read: Sharing Nature With Children, Joseph Cornell

Audience Group Size	Experience	Facilities	Special Notes	EE Goal Level Emphasis	Typical Activities
Middle Primary (3rd - 4th grade) 20 - 30 kids 1-3 teachers ? Aides & Parents	• Allow and encourage exploration and discovery • Highly interactive • Computer driven activities • Ready for "Field Data Collection" activities (insect netting, water sampling, active census activities, etc.) • Active outdoor games • Simulations/role playing activities • Users of Remote EE sites • "Active participation" at stops along the trail • Can deal with more outdoor experiences in less than perfect weather • Quiet reflective or "secret" opportunities	• Small group work areas • Place for data entry • "Lab" environment to look at field-collected data - scope, tables, (ID materials as part of exhibits?) • Cubbyholes or lockers for coats, lunches, personal stuff • Place for sick kid to lie down • Regular toilet facilities • Bookstore customers - lab kits, books, nets, etc. • Extensive trails • Remote EE sites collection and census materials storage (Hula-Hoops, nets, etc) • Outdoor lab equipment • Outdoor gaming area • Sheltered outdoor spaces • Picnic area, lunch area • Amphitheater • Equipment: binoculars, nets, water sampling stuff, etc.	• Can read • Higher cognitive skills • Beginning to appreciate abstractions • Better able to work as individuals/small groups • Socialized: Joiners, clubs • More "peer" oriented, less family oriented • Higher manual skills, better small motor coordination • Mysteries and exploration popular • Computer Literate • Can synthesize information and experiences	Major Knowledge Attitude Minor Awareness Skills Participation	• Owl Pellets • Musk-ox Maneuvers • Polar Bears in Phoenix • The Thicket Game • What Bear Goes Where? • Animal Game • Identification Game • Webbing - Ecological Knowledge • Eco camping • Night hikes • Bird banding

Audience Group Size	Experience	Facilities	Special Notes	EE Goal Level Emphasis	Typical Activities

Upper Primary (5th & 6th grade) 40 - 60 kids 2-3 teachers ? Parents	• Activities that challenge higher cognitive abilities and allow higher level abstractions
	• Understand concepts and connections
	• Opportunities to help kids understand "larger world" yet they are not cynical or jaded.
	• Data collection and Entry - Capable of semi-long periods of observation
	• Joining opportunities include Walnut Creek "Ozone Heads" kids environmental group
	• Interactive, fine motor skill activities
	• Fast paced running/Competitive games
	• Small group activities
	• Computer fantasy &/or decision games
	• Ownership in WNT Prairie
		• Wet/Dry Lab
		• Data Entry capabilities - enter field collected data
		• Eco-Net computer access for "Ozone Heads" (Upgrade dedicate phone line, computer ed)
		• Video player, cameras, simple editing facilities for recording of projects, creating teaching materials
		• Outdoor running games area
		• "Naturalists Corner" a la Smithsonian
		• Higher level equipment and storage, both at VC and Remote Sites:
		   Study skins
		   BioScopes/Microscopes
		   Nets
		   Hach Kits
		   Soil Sampling
		   Soil Borers
		   Field Guides
		   Mist Nets
		   D-Nets
		   Boots or waders
		   Plastic Unit Bins
		   Flat work storage
		   Laminated animal pics
		   Sampling Buckets
		   Aquaria
		   Baro-Propsction
		   Video Slide Show
		   Computer Projects
			• Can read and comprehend
			• Computer Literacy
			• Prime Field Trip age
			• Probably largest school user group
			• Less scheduling conflicts/ problems anticipated as compared to HS students
			• Great opportunity to infuse EE into curriculum
			• Other "non-parent" adults become important role models
			• Peer pressure emerging as a life force
			• Gender awareness
			• Still capable of fantasy and imagination
			• Massive amounts of curriculum already exists for this age category
				Major
				
				Knowledge
				Attitude
				
				Minor
				
				Awareness
				Skills
				Participation
					• Owl Pellets
					• Musk-ox Maneuvers
					• Polar Bears in Phoenix
					• The Thicket Game
					• What Bear Goes Where?
					• Animal Game
					• Identification Game
					• Webbing - Ecological Knowledge

Audience Group Size	Experience	Facilities	Special Notes	EE Goal Level Emphasis	Typical Activities
Middle School 20 - 30 kids 1-3 teachers 7 Parents	• Opportunities to connect Walnut Creek experience with "larger" issues • Role-Playing, issue oriented activities • "Real Science" activities - experiments, data collection... • Opportunities for fantasy and imagination, esp. computer driven • WCNWR staff must maintain "basic" orientation for new middle school audiences/users, as well as provide activities that build upon the expereinces that repeating users have accumulated • WTN staff = Role models • Opportunities for Values clarification activities	As for Upper Primary plus: • Presentation space - for debates, "science-fair" activities, etc. • Prairie-Fair? Restoration/Reconstruction projects, trans-discipline • Artist-in-residence, exhibit and activity areas • Access to Eco-Net -international issues • Wet/Dry Lab	• Easier to infuse EE across the curriculum for teachers • Staff needed who enjoy and understand this age group, capable of managing them • Distracted: Onset of hormonal chaos Too-cool attitude • Limited parental involvement • Scheduling conflicts (with other classes, maybe outside activities) begin • Non-family role models still important, career ideas emerging	Major Knowledge Skills Attitude Minor Awareness Participation	• Ethi-Reasoning • Attitude Skills • Owl Pellets • Knowledge • Visual Vocabulary • Knowledge, skills

Audience Group Size	Experience	Facilities	Special Notes	EE Goal Level Emphasis	Typical Activities

High School
 	
10 - 30 kids
1-3 teachers
? Parents
	• Opportunities to interact with professionals
	• "Behind-the-scenes" view of the Refuge.
	• Opportunities to assist in improving or upgrading interp. program
	• Design interactive computer programs
	• Might help with Oral History collection
	• Real experimentation and science
	• Work with, assist researchers
	• Overnight camping component
	• EcoNet computer database users
	• Opportunity to monitor changes at the Refuge over time, from primary grades up
	• Staff must maintain "basic" orientation for new audiences
	• Work projects (internships, etc)
	• Opportunities for Values clarification activities
	• Connections with "Global" issues and social importance of resources
		As listed plus:
		• Wet/Dry Lab
		• Some higher-quality equipment
		   Eckmann Dredge
		   Vegetation measuring stick
		• Computer terminals for entering data, access to Internet, Eco-Net
		• Student mentors need personal work space, could be in volunteer room
		• Video or photo equipment, recording changes at a site over time.
			• Special interest classes, students who are truly interested:
			  -Discipline or subject oriented
			  -Biology, Vo-Ag
			  -Students
			• Small class sizes
			• Repeat visitors- may return several times a year, may have been coming for many years
			• Desire EE camping component
			• Especially motivated and knowledgeable teachers
			• Opportunity for cross-disciplinary work, cooperative projects
			• HS students excellent mentors for younger students
			• Special opportunities to pull kids into NR fields thru internships, etc
				Major
				
				Skills
				Participation
				Attitude
				
				Minor
				
				Awareness
				Participation
					• The Monday Group
					• Land, Soil and You: Role Playing
					• What IS Appropriate
					• Ethi-reasoning

Audience Group Size	Experience	Facilities	Special Notes	EE Goal Level Emphasis	Typical Activities
College & University 2 - 28 kids 1 teacher	• Highly individualized • Cooperative Internships, etc.	• Appropriate "behind-the-scenes" • "Operating theatre" - observe Refuge operations, processes, insider point of view • Video presentation capabilities?? • Access to research	• Highly variable - day trips for Interp/EE class; Ecology; Restoration; Biology, to longer research visits • Programs specially tailored to specific audiences • Relatively little demand on interpretive staff time - group and teachers more self-contained, or will meet with managers/biologists		• Observe • Research projects • Long or short term involvement
Teachers 2 - 30 teachers	• Summer Research technicians • Summer curriculum writing • Teacher training workshops - facilitated by Refuge staff, mentor teachers	• Media and Resource Center • Video preview area • PC access • Bookstore • Eco-Net, other services where classroom resources are available	• Weekend workshops • In-Service training -Eisenhower money • Summer weeklong training - credit courses • Training for teachers who want to use Refuge, become Cooperative schools, etc.		
Families 2 - 10	• Watchable Wildlife • Orientation to "What's To Do On the Refuge" delivered by living person as well as by other media • Displays that use teaching/learning styles of adults and kids (everybody gets to be teacher and learner) • Experiential Learning (Wingspan wall, etc) • Balance of flat work, interactive, manipulation, etc. • Interactions with "Non-watchable wildlife"	• Guided trails, strollerable and variable lengths and difficulty • Changing tables in both restrooms • Rest areas/Picnic facilities • Quiet places for kids to throw tantrums • Kid-height and scale activities and facilities (toilets, sinks, waterfountains, etc) • Family Discovery Rooms or Naturalist activities	•See user survey for desired activities, visit times... • Tremendous variability in interest and attention span • Majority interested in spending time with family • Walking/Hiking favored activities • Outdoor "Social outings" w/ family and friends		• Special Programming Weekend subject-oriented activities directed to special audiences (ie Birds, Wildflowers, etc.) • Hunting • Drawing/Sketching • Mushrooms, wild foods • Birding • Natural dyes, early peoples skills

Audience Group Size	Experience	Facilities	Special Notes	EE Goal Level Emphasis	Typical Activities
Youth Groups 5 - 50 kids 1 - 10 adults	• Acquaint groups with learning about Prairie PLUS Stewardship • Must be FUN & interactive to hold attention ie birdbanding • Potential for overnight experiences	• Amphitheatre • Camping areas • Campfire ring • Meeting room/materials storage	•Programs designed to meet specific needs; ie Boy Scout Environ. Science badge • Opportunity to use existing organizational structure of group for marketing and communication • Especially popular with 8 - 13 year olds, fewer older kids • Typically age-segregated groups (except 4-H)		
Senior Citizens 2 - 15 adults	• Indoor programming off-season • Opportunities to share their family/prairie histories • Outdoor experiences: high quality, short duration • Special programming: Wildflower Photography with Simple Camera Elderhostel Grandparents/Kids programs	• Dependable walking surfaces indoors and outdoors • Sitting and resting areas • Waterfountains •Accessible toilet facilities • Shade and wind protection • Good bookstore	•Limited mobility • Potential source of volunteers • Patient readers, may shy away from hi-tech • Color, contrast, sound levels important	Values Attitudes Knowledge Participation	Awareness
Farmers Landowners 2 - 15 adults	•Target programs to farmers within watershed: special "Behind the Scenes at WCNWR" programs • Build feeling of ownership Family picture history artifacts Designed to engender ownership	• Comfortable places to gather and talk • Coffeepot • Times to meet at maintenance building	•Link with other agencies and organizations to build legitimacy	Attitudes Participation Knowledge	

Audience Group Size	Experience	Facilities	Special Notes	EE Goal Level Emphasis	Typical Activities
I-80 Drive-By Visitors Family Groups 2-8 people	• Spectacular and condensed introduction to tall-grass prairies and reconstruction/ restoration activities • Variety of activities that engage the whole family • Opportunities to "air out" after or during long car travel	•Restrooms for adults, children, infants, seniors • Snack and drink opportunities • Picnic opportunities • Area for pets to be walked?	• Short length visits by non-enthusiasts • Variation in interest and attention span within groups	Major Awareness Knowledge Minor Skills Participation	
I-80 Drive-By Visitors Tour Bus 30-48 people	• Spectacular yet brief introduction to tall-grass prairies and reconstruction/restoration activities • Shorter and easier outdoor walks • Need to portray WCNWR as an active, exciting, people involving place • Charismatic megafauna will be attraction	•Restrooms available/accessible • Bookstore • Condensed indoor and outdoor experiences options needed • Some snack and drink options but not meals • Shaded, windscreened outdoor rest areas • Bus turn-around	• Cross-country travelers, often older • Short-duration visits by large groups of non-enthusiasts • Visitation concentrated during June-October	Major Awareness Knowledge Minor Skills Participation	
Adult Clubs & Organizations 20 - 50 people	• User friendly meeting space • Orientation to Walnut Creek • Opportunities to use special facilities or equipment (greenhouse, wetlab, prairie nursery) • Cosponsors of events, prairie plots • Need access to Refuge staff (staff lectures, demonstrations, etc)	• Auditorium for large group meetings or special speakers • Classroom space for meetings •Restrooms available/accessible • Bookstore • Audio-visual capabilities • Outdoor gathering area	• Identify programs that emphasize common ground with Walnut Creek (garden clubs, sportspersons groups) • Evening meetings • Cosponsored events or promotional activities will occur during the day; potential to attract new audiences	Major Knowledge Skills Attitudes Minor Awareness Participation	• Evening organizational meetings and guest speakers: "An Evening With the Whitetail" • Cosponsor public events: plant sales, lectures • Workdays: Prairie weeding, greenhouse work, historical research

Audience Group Size	Experience	Facilities	Special Notes	EE Goal Level Emphasis	Typical Activities
Special Populations					
Non-Consumptive Wildlife Oriented	• Opportunity to watch wildlife in native habitat • See bison and elk • Enjoy being outdoors	•Places to stop and observe birds and wildlife for longer periods of time • Identification materials at bookstore • Quiet areas where other visitors will not as easily disturb wildlife • Trail interpretive signage?	• Places to "pull off" walking and auto trails • Photography blinds? • Scopes at VC? • Periods of heavy use early and late in the day	Major Awareness Knowledge Skills Attitudes Minor Participation	
Consumptive Wildlife Oriented	• Bird, small game and deer hunting • Retriever dogs • Fishing?	• Blinds or seating outside • Hunting areas removed from general visitors • Places for registering take • License and permit purchase • Separate parking areas • Informational kiosks at hunting & hunting parking areas with special rules and regulations	• Training or orientation provided by Refuge • Law enforcement • Clear signage for hunters and other visitors during hunting season • Provide opportunities for people with disabilities? • Regulations to protect safety of other visitors needed	Major Awareness Knowledge Skills Attitudes Minor Participation	
Prairie Enthusiasts, Prairie Professionals	• Special tours with Biology staff • Opportunity to learn from WCNWR research • Extension service for management of existing prairies, ie. adopting remnants with TNC, etc. • Information sharing/networking for people actively involved in mngmnt/restoration	• Meeting rooms • Computer terminals/library access • Resource for prairie information • Modeling - How WCNWR did/ does it.		Major Action	

APPENDIX C

COPIES OF PERTINENT MATERIAL FROM THE RAINBOW BRIDGE NATIONAL MONUMENT

GENERAL MANAGEMENT PLAN, DEVELOPMENT CONCEPT PLAN, RESOURCE MANAGEMENT

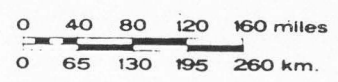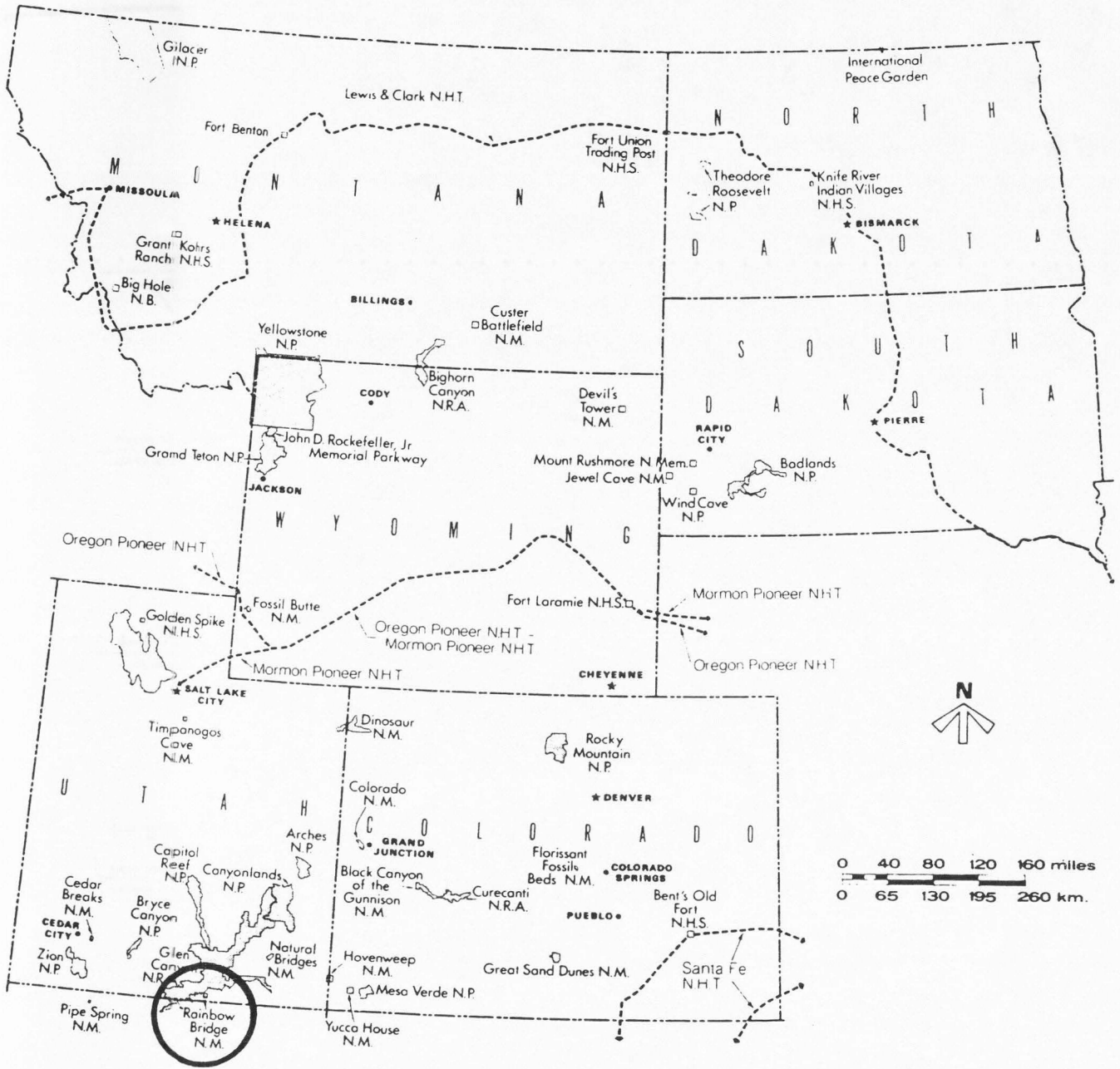PLAN, INTERPRETIVE PROSPECTUS, AND ENVIRONMENTAL ASSESSMENT (1990)

Glacier I.N.P.

Lewis & Clark N.H.T.

Fort Benton

International Peace Garden

N O R T H

Fort Union Trading Post N.H.S.

Theodore Roosevelt N.P.

Knife River Indian Villages N.H.S.

M O N T A N A

MISSOULA

★HELENA

Grant Kohrs Ranch N.H.S.

Big Hole N.B.

★ **BISMARCK**

D A K O T A

BILLINGS •

Custer Battlefield N.M.

S O U T H

Yellowstone N.P.

Bighorn Canyon N.R.A.

CODY •

Devil's Tower N.M.

D A K O T A

RAPID CITY

★ **PIERRE**

Grand Teton N.P.

John D. Rockefeller, Jr Memorial Parkway

JACKSON

W Y O M I N G

Mount Rushmore N Mem.

Jewel Cave N.M.

Wind Cave N.P.

Badlands N.P.

Oregon Pioneer I.N.H.T.

Golden Spike N.H.S.

Fossil Butte N.M.

Fort Laramie N.H.S.

Mormon Pioneer N.H.T.

Oregon Pioneer N.H.T. - Mormon Pioneer N.H.T.

Mormon Pioneer N.H.T.

CHEYENNE ★

Oregon Pioneer N.H.T.

★ **SALT LAKE CITY**

N

Timpanogos Cave N.M.

Dinosaur N.M.

Rocky Mountain N.P.

U T A H

Colorado N.M.

★ **DENVER**

C O L O R A D O

Arches N.P.

GRAND JUNCTION

Capitol Reef N.P.

Canyonlands N.P.

Black Canyon of the Gunnison N.M.

Curecanti N.R.A.

Florissant Fossil Beds N.M.

COLORADO SPRINGS

Bent's Old Fort N.H.S.

Cedar Breaks N.M.

CEDAR CITY •

Bryce Canyon N.P.

Glen Canyon N.R.A.

Natural Bridges N.M.

PUEBLO •

Zion N.P.

Hovenweep N.M.

Great Sand Dunes N.M.

Santa Fe N.H.T.

Pipe Spring N.M.

Rainbow Bridge N.M.

Yucca House N.M.

Mesa Verde N.P.

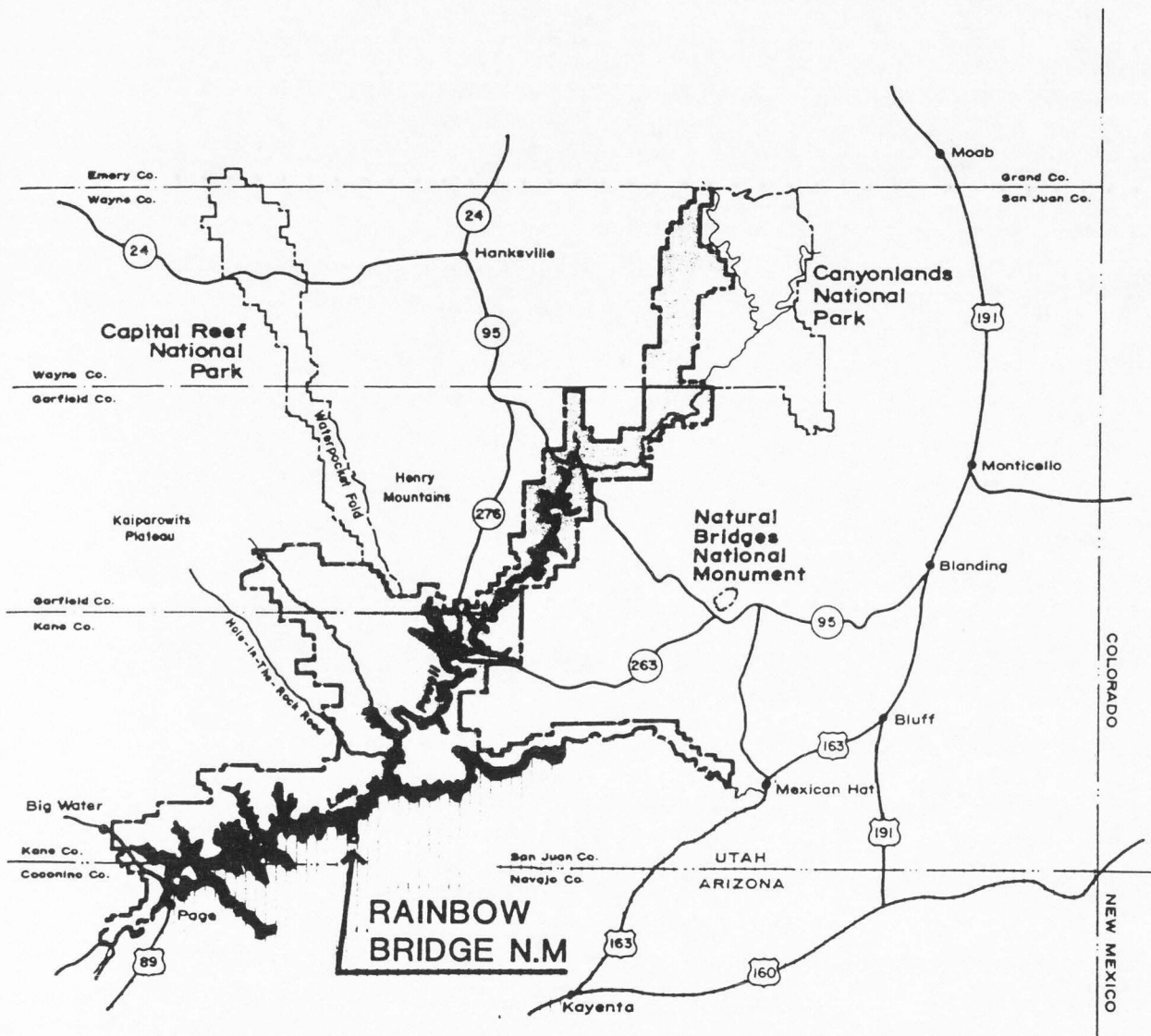| 0	40	80	120	160 miles
0	65	130	195	260 km.

Legend

• Locations of Major Cities

★ Locations of State Capitals

State Boundary Lines

National Park Service Areas
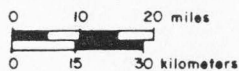
---- National Park Service Historical Trails

ROCKY MOUNTAIN REGION
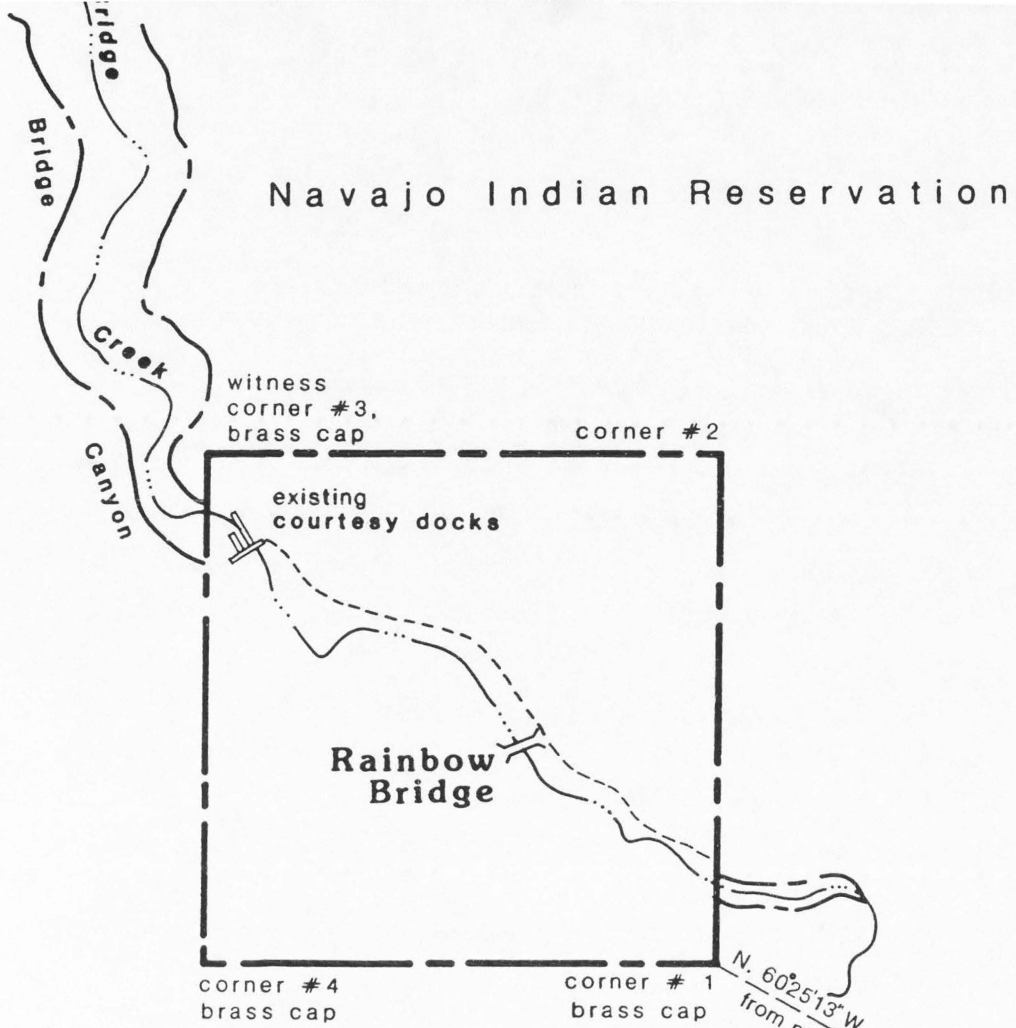National Park Service

United States Department of the Interior

2

LEGEND

☐ Glen Canyon N.R.A.

☐ Navajo Indian Reservation

VICINITY MAP

RAINBOW BRIDGE NATIONAL MONUMENT

UNITED STATES DEPTARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

N

0   10   20 miles

0   15   30 kilometers

3

118 | 80,005−A
OCT. 88 | RMRO

Navajo Indian Reservation

Bridge

Creek

Canyon

witness
corner #3,
brass cap

corner #2

existing
courtesy docks

Rainbow
Bridge

corner #4
brass cap

corner #1
brass cap

N. 60°25'13" W., 7 mi 67.87 ch.
from mile post 179, Utah-Arizona
state line Proc. 1043-May 30, 1910

Navajo Indian Reservation

legend

— — monument boundary

— — Glen Canyn Canyon
N.R.A. boundary

- - - - - - - trail

N

| 0 | 1000 | 2000 feet |
| 0 | 304.8 meters | |
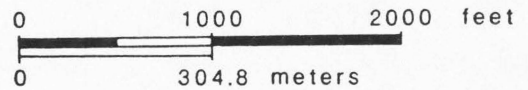
Boundary Map
Rainbow Bridge National Monument
T.43S.,R.8E., Section 1

U.S. Dept. of the Interior - National Park Service

7

118 | 80,006
July 85 | RMRO

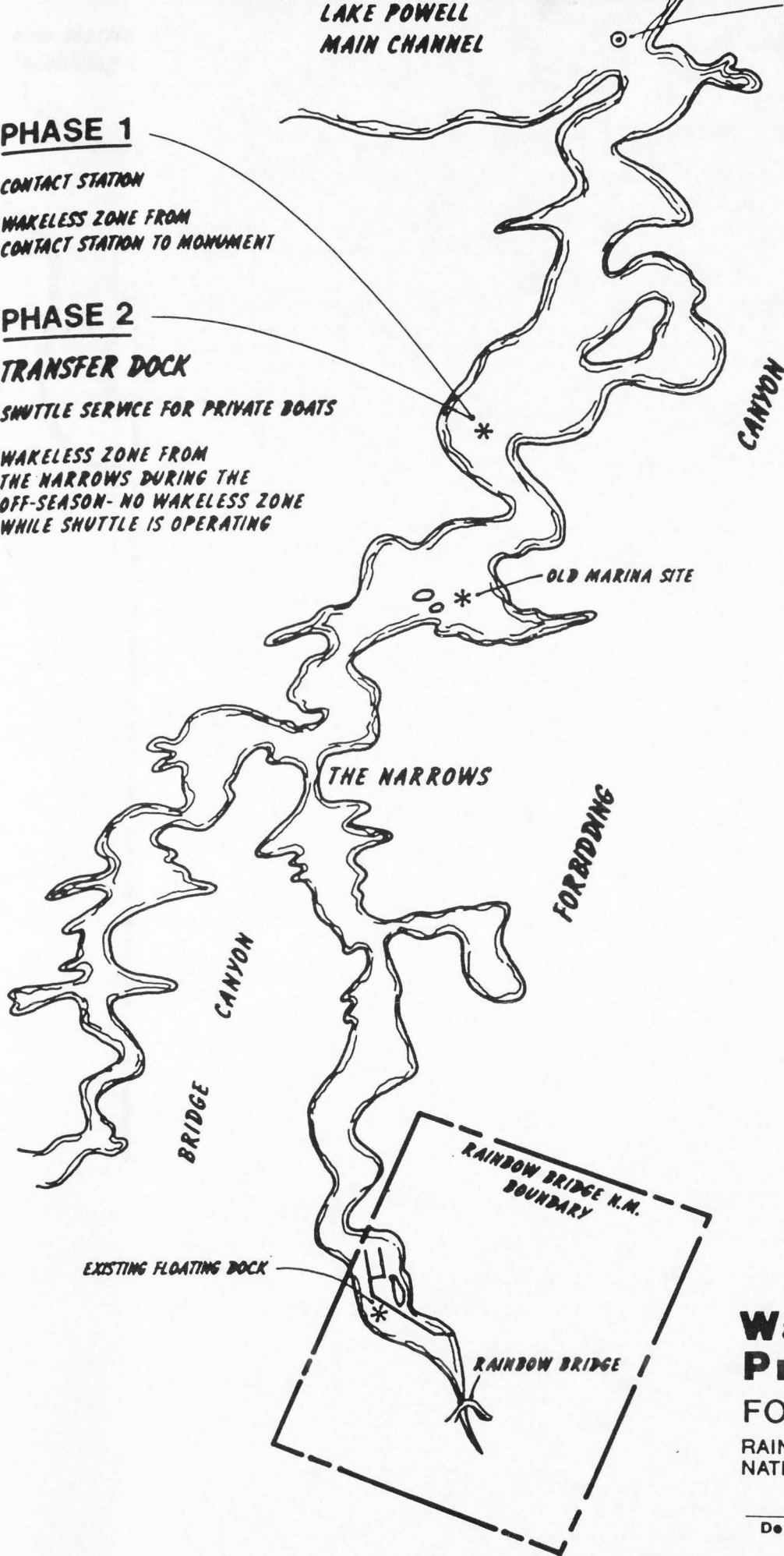LAKE POWELL
MAIN CHANNEL

ELECTRONIC
NOTIFICATION
DEVICE

PHASE 1

- CONTACT STATION
- WAKELESS ZONE FROM
CONTACT STATION TO MONUMENT

PHASE 2

TRANSFER DOCK

- SHUTTLE SERVICE FOR PRIVATE BOATS
- WAKELESS ZONE FROM
THE NARROWS DURING THE
OFF-SEASON- NO WAKELESS ZONE
WHILE SHUTTLE IS OPERATING

CANYON

*

OLD MARINA SITE

*

THE NARROWS

FORBIDDING

BRIDGE   CANYON

RAINBOW BRIDGE N.M.
BOUNDARY

EXISTING FLOATING DOCK

*

RAINBOW BRIDGE

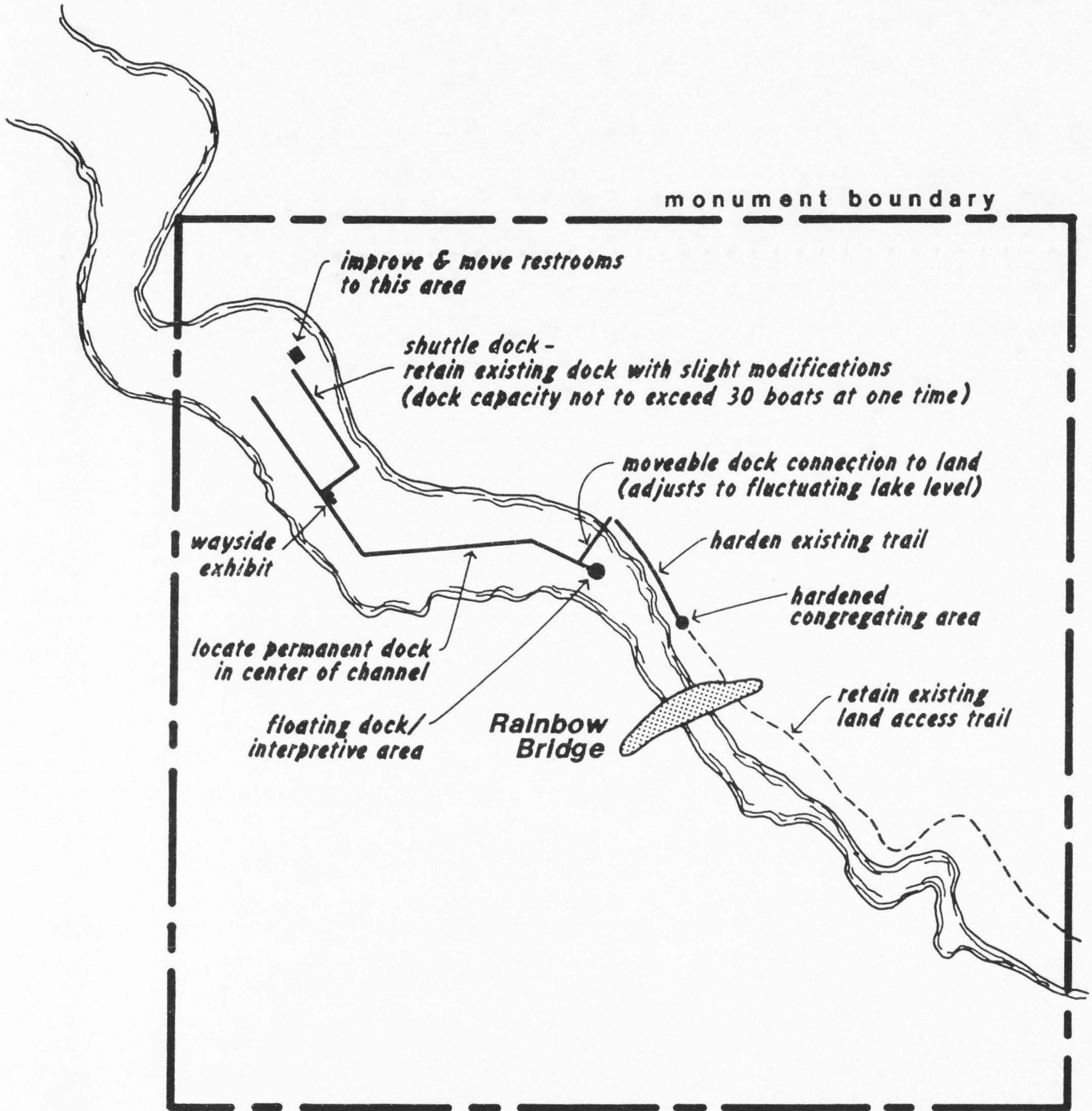## Water Access
Proposal
FORBIDDING CANYON

RAINBOW BRIDGE
NATIONAL MONUMENT

118	80,017
Dec.89	RMRO

new shuttle dock at
Forbidding Canyon

improve & move restrooms
to this area

shuttle dock -
retain existing dock with slight modifications
(dock capacity not to exceed 30 boats at one time)

moveable dock connection to land
(adjusts to fluctuating lake level)

wayside
exhibit

harden existing trail

hardened
congregating area

locate permanent dock
in center of channel

floating dock/
interpretive area

Rainbow
Bridge

retain existing
land access trail

Proposal
Rainbow Bridge National Monument
U.S. Dept. of the Interior – National Park Service

118 | 80,014
Dec.89 | RMRO

development zone

natural zone

outstanding natural feature subzone

recreation and resource utilization zone (Lake Powell)

monument boundary
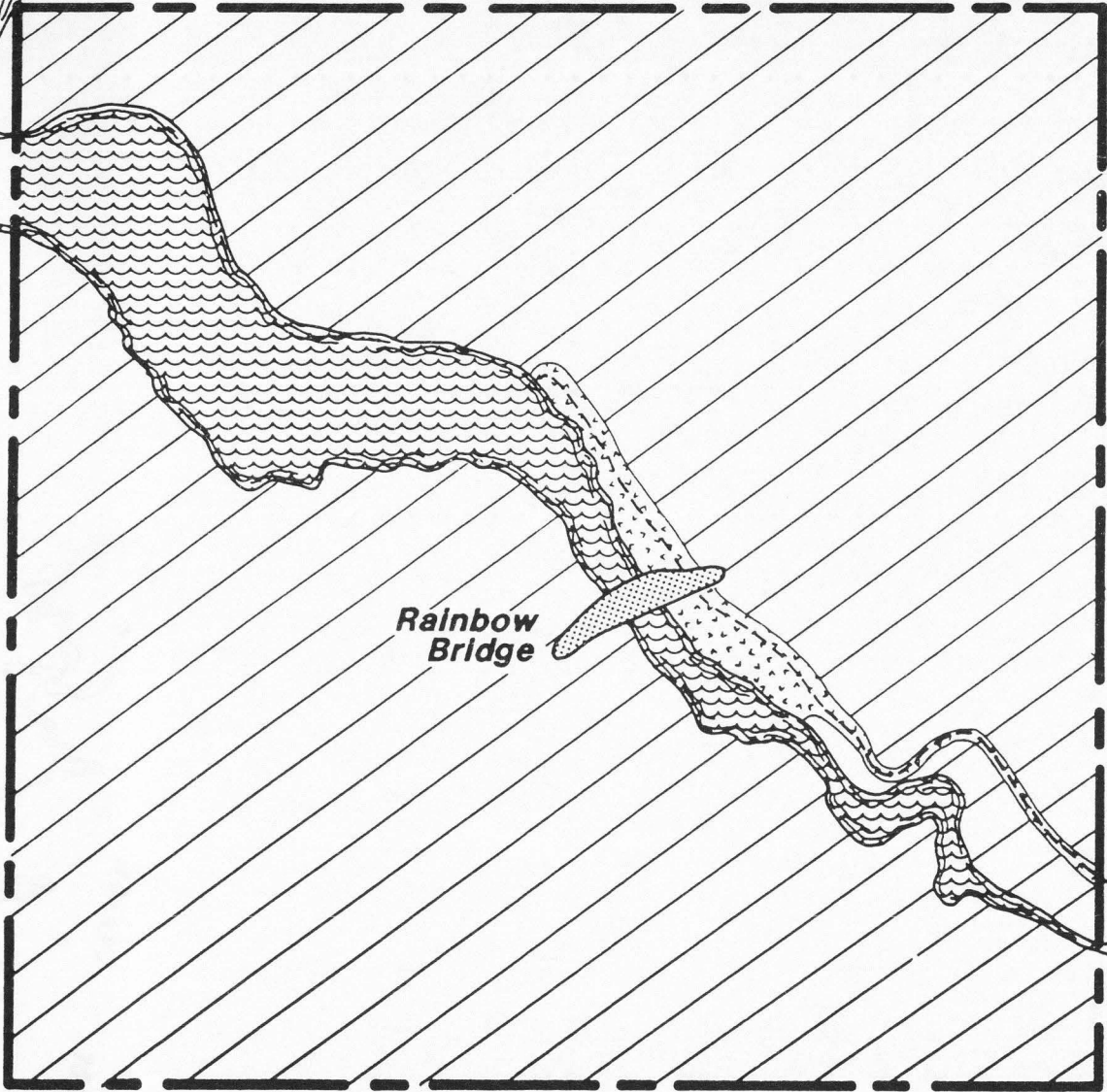
Rainbow Bridge

Management Zoning
Rainbow Bridge National Monument
U.S. Dept. of the Interior — National Park Service

28

LAKE POWELL
MAIN CHANNEL

CANYON

OLD MARINA SITE

*

THE NARROWS

FORBIDDING

WAKELESS ZONE
FOR ALL BOATS

BRIDGE

CANYON

RAINBOW BRIDGE N.M.
BOUNDARY

MODIFIED FLOATING DOCK

RAINBOW BRIDGE

Water Access
Alternative A
FORBIDDING CANYON

RAINBOW BRIDGE
NATIONAL MONUMENT

118	80,015
Dec.89	RMRO

improve & move restrooms
to this area

new slip design
expand dock capacity within existing physical
space constraints (dock capacity not to exceed
25 boats at one time)

tour boat
dock

te/public
oat dock

moveable dock connection to land
(adjusts to fluctuating lake level)

harden existing trail

hardened
congregating area

locate permanent dock
in center of channel

floating dock/
interpretive area

Rainbow
Bridge

retain existing land
access trail

Alternative A
Rainbow Bridge National Monument
U.S. Dept. of the Interior – National Park Service

LAKE POWELL
MAIN CHANNEL

CANYON

CONTACT STATION — *

OLD MARINA SITE — *

FORBIDDING

THE NARROWS

WAKELESS ZONE
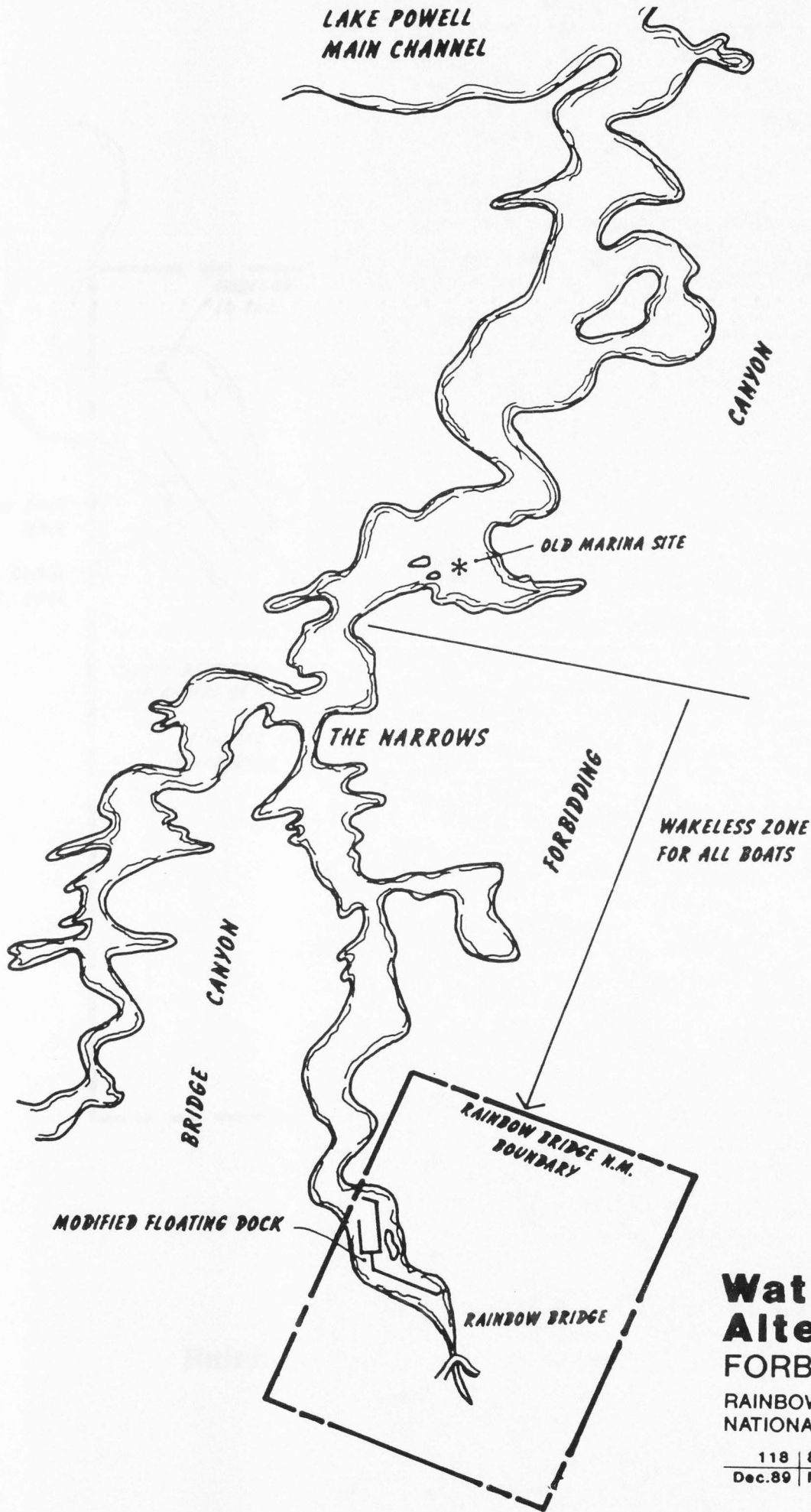FOR ALL BOATS

BRIDGE   CANYON

RAINBOW BRIDGE N.M.
BOUNDARY

EXISTING FLOATING DOCK

RAINBOW BRIDGE

**Water Access
Alternative B**
FORBIDDING CANYON
RAINBOW BRIDGE
NATIONAL MONUMENT

118 | 80,016
Dec.89 | RMRO

new slip design –
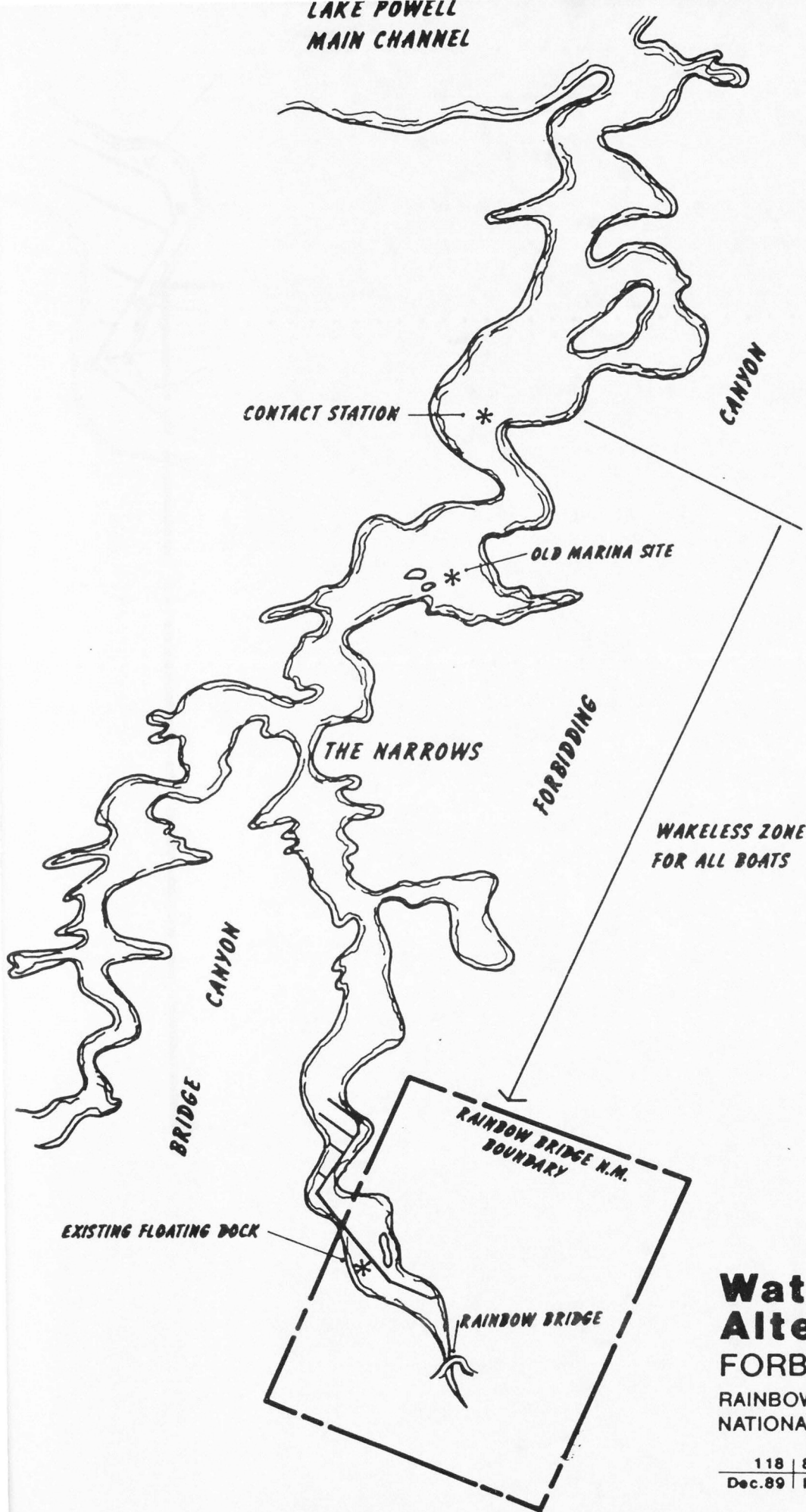move dock outside monument boundary to seperate boating from
monument (dock capacity not to exceed 42 boats at one time)

new restroom & storage facility

monument boundary

administrative boat dock

new wayside exhibit area outside monument
boundary to control visitors/visitor activities

extend floating
dock walkway

moveable dock connection to land
(adjusts to fluctuating lake level)

harden existing trail

hardened
congregating areas

locate permanent dock
in center of channel

floating dock/
interpretive area

Rainbow
Bridge

retain existing
land access
trail

no development
under the bridge

Alternative B
Rainbow Bridge National Monument
U.S. Dept. of the Interior – National Park Service

49

monument boundary

dock-capacity 20 boats

restroom

graffiti sites

1300' of floating
dock & walkway

Rainbow
Bridge
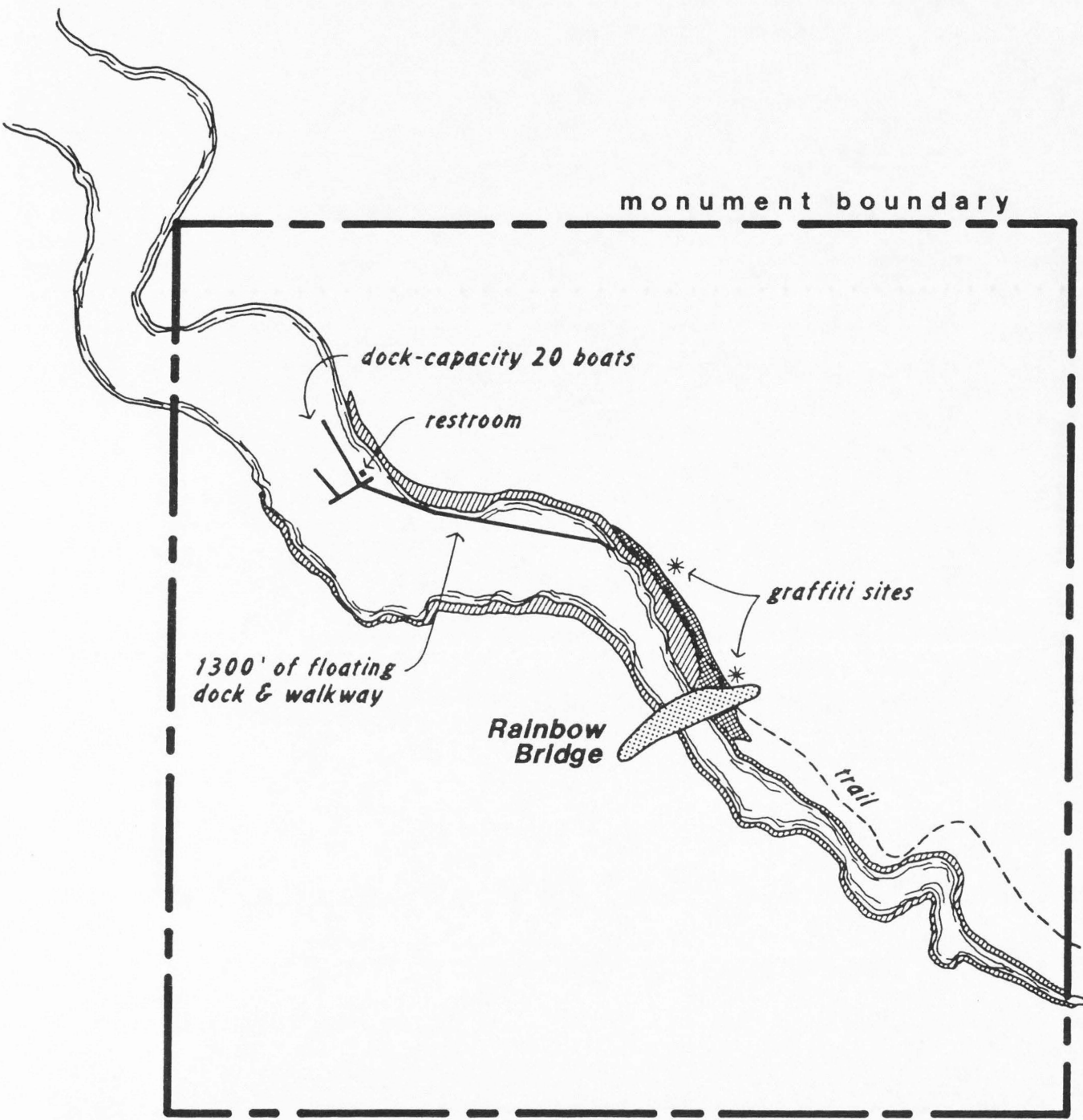
trail

salt cedar
(Tamarix ramosissima)

area impacted by
off−trail visitor use

Existing Conditions
Rainbow Bridge National Monument
U.S. Dept. of the Interior − National Park Service

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APPENDIX D

COPIES OF PERTINENT MATERIAL FROM THE WARM SPRINGS NATIONAL FISH HATCHERY

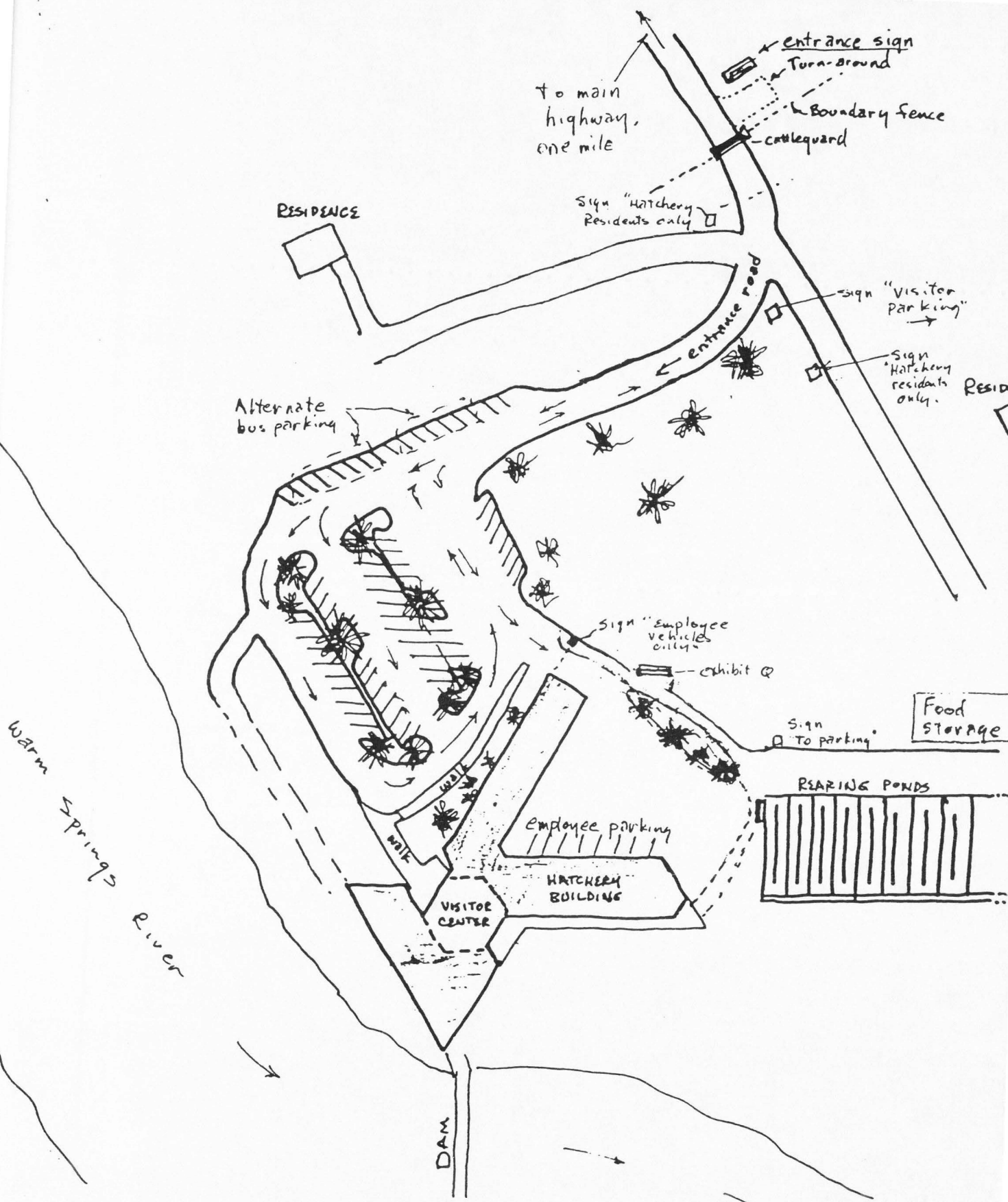PUBLIC USE DEVELOPMENT PLAN (1980)

Illustration 2. Design for approximately 60 visitor cars and entrance sequence.

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TO PARKING

FOOD
BUILDING

Ⓠ OTHER SALMON OF THE PACIFIC NORTHWEST

PARKING

Ⓟ REARING POND
FISH IDENTIFICATION

REARING YOUNG SALMON (Pg. 46) Ⓞ

REARING PONDS

HATCHERY BLDG. - NON VISITOR PART

INTRO TO Ⓐ
COLUMBIA RIVER
FISHERIES (Pg. 19)

WALK

Ⓘ MOSAIC TITLE INTERPRETATION (Pg. 38)

REST ROOM

Ⓗ INDIAN CULTURE AND SALMON (Pg. 32)

WALK

Ⓚ SCIENTIFIC MONITORING (Pg 35)

Ⓜ INFANTS NEED (Pg. 42)
EXTRA CARE

VISITOR
CENTER

BALCONY

SCENE FROM THE PAST (PAGE 22) Ⓒ

Ⓑ
SALMON MONOLITH

INCREASED FISHING (PAGE 22) Ⓓ

Ⓛ FISH BANNER DAM LADDER (Pg. 43)

Ⓝ SPAWNING (Pg. 46)

DECLINING SPAWNING GROUNDS (PAGE 22) Ⓔ

Ⓙ ADULT SPAWNING SALMON (Pg. 38)

POLLUTION (PAGE 22) Ⓕ

BALCONY

Ⓖ SALMON WATER NEEDS (Pg. 26)

N

INTERPRETATION
DISPLAY SEQUENCE

EXHIBIT TITLES — PAGE REFERENCE