COMPARATIVE COST ANALYSIS

The actual cost of implementing the approved general management plan will ultimately depend on future funding and servicewide priorities over the life of the plan, as well as the ability to partner with other agencies or groups. The approval of a general management plan does not guarantee that funding and staffing needed to implement the plan will be forthcoming. Funding for capital construction improvements is not currently shown in National Park Service construction programs. It is not likely that all potential capital improvements arising from this plan will be totally implemented during the life of the plan. Larger capital improvements may be phased over several years, and full implementation of the general management plan could be many years into the future. Additionally, the National Park Service is required to maintain all new or acquired assets in a good condition so they do not fall into disrepair. New and/or expanded assets will only be provided relative to the National Park Service's ability to maintain those facilities in good condition.

Cost estimates were developed through an evaluation of capital and annual operating costs for each of the alternatives. Cost estimates presented in the General Management Plan are not used for budgeting purposes. The estimates in this section regarding the general costs of implementing the alternatives were developed based on fiscal year 2006 dollars and the Cost Estimating Guideline with Class C Cost Data: New Construction (NPS 2001a and 2006g). The National Park Service uses a broad range of costing techniques including Class A, Class B, and Class C levels of cost estimating. Class A and B estimates are based upon detailed information, and represent design and construction finances at the time of actual development activities. The capital costs estimates calculated for a General Management Plan are in the form of category "C" estimates, which are general, or order-of-magnitude, estimates. A Class D estimate was prepared to provide an order-of-magnitude estimate for a proposed visitor center for Alternatives C, D, E and F. The National Park Service facility planning model was used based upon general design and construction assumptions. The accepted industry range of Class C and D estimates is –30 percent to +50 percent. Therefore, a $1,000,000 estimate has an actual range of between $700,000 and $1,500,000.

A summary of the range of annual costs, initial one-time costs and total life cycle costs is presented in Table 4 for comparing the alternatives, with a description that follows.

Range of Annual Costs

The range of annual costs includes personnel, maintenance, and operations costs. These costs are summarized in Table 4. The park's operations costs for fiscal year 2006 were $2,837,000. Staffing costs are based on the assumption that the park will continue to expand up to the authorized 10,000 acres. The park has the authority to acquire land within its boundary and the GMP provides zoning to guide management decisions should acquisition of lands within the boundary become feasible. However, any acquisition will be based on the availability of funding and willing sellers. No acquisitions or boundary adjustments beyond the currently authorized 10,000-acre limit are proposed in this general management plan. The costs for staffing have been adjusted to address the need for additional full time employees, or equivalents, for the existing level of service and for expanded geographic responsibilities, expanded partnering responsibilities, increased levels of management and enforcement relative to the increased size of the park, and increased population of the adjacent communities.

Table 4. Cost Summary for Each Alternative

	Alternative A: No Action	Alternative B: Focus on Solitude	Alternative C: Centralized Access	Alternative D: Expanded Use	Alternative E	Alternative F
Range of Annual Costs (Includes personnel, maintenance, and operations) FY06 Operations Costs ($2,837,000)	$3,462,500 - $3,482,500 8 additional FTEs	$3,462,500 - $3,622,500 8 –10 additional FTEs	$4,324,600 - $4,484,600 18 – 20 additional FTEs	$4,633,600 - $4,793,600 20 – 22 additional FTEs	$4,621,600 - $4,781,600 20 – 22 additional FTEs	$4,599,600 - $4,759,600 20 – 22 additional FTEs
Range of Initial One-Time Costs (Includes construction, rehabilitation, general improvements).	$3.8 – $4.9 million Projects include: • Improve existing park facilities (restrooms, picnic areas, trails, parking areas, river access facilities) • Cultural resource stabilization / rehabilitation	$5.5- $7.2 million Projects include: • Improve existing park facilities (restrooms, picnic areas, trails, parking areas, river access facilities); remove facilities as appropriate • Cultural resource stabilization / rehabilitation • Develop administrative offices separate from the historic Island Ford lodge that serves as a visitor center	$20.4 - $26.5 million Projects include: • Centralized trailhead access at three hubs • Education / visitor contact station at four locations within developed zones • Improvement / addition of park facilities (restrooms, picnic areas, trails, parking areas, river access facilities) • Cultural resource stabilization / rehabilitation • Construct a new visitor center	$22.1 - $28.8 million Projects include: • Education / visitor contact station at three locations within developed zones • Expand facilities / services throughout park corridor • Cultural resource stabilization / rehabilitation • Construct a new visitor center	$20.6 - $26.8 million Projects include: • Education / visitor contact station at four locations within developed zones • Expand facilities / services throughout park corridor • Cultural resource stabilization / rehabilitation • Construct a new visitor center	$20.6 - $26.7 million Projects include: • Education / visitor contact station at four locations within developed zones • Expand facilities / services throughout park corridor • Cultural resource stabilization / rehabilitation • Construct a new visitor center
Total Life-Cycle Costs over the Life of the Plan (Includes total maintenance, operations, personnel, and capital costs over20 years, expressed in present worth)	$40.5 - $41.8 million	$42.2 - $45.5 million	$66.8 - $74.6 million	$71.8 - $80.2 million	$70.2 - $78.0 million	$69.9 - $77.7 million

Additional Assumptions:
1. The base year for all estimates is 2006 with the exception of the estimate for the new visitor center, which is a 2007 estimate.
2. The initial one-time construction costs are Class “C” estimates, developed into net and gross construction costs and inclusive of all design and supplemental services.
At this level of planning, there are many unknown factors and a contingency of 30% was added to the total cost to create the higher range of estimates.
3. Annual operating costs are inclusive of personnel, equipment, vehicles, materials and supplies, utilities, and other services.
4. Life-cycle costs reflect the present worth of all expenditures of a 20-year period at a discount rate of 7 percent.
5. A cost cannot be estimated at this time for natural resource restoration, which includes actions to address invasive exotic species, streambank restoration, and wetlands restoration.
These costs cannot be quantified due to site-specific details that are not available for a Class “C” evaluation.

The existing (No Action) staffing level would increase from 32 full time employees on staff (in 2006) by 8 full time employees. These (8) are not new positions. They represent 8 full-time staff positions that are on the currently approved organizational chart and are vacant positions. Filling these positions will allow the park to fulfill current management obligations in line with the No Action alternative. There would be no new initiatives associated with these positions. These 8 positions are included in the totals for all the action alternatives. The annual costs for Alternative A would range from $3,462,500 to $3,482,500.

It is estimated that Alternative B would require an estimated 8 to 10 additional personnel to address the proposed increase in environmental restoration, cultural and historic preservation, trail monitoring, and educational outreach. Example positions to be filled would be compliance officers and resource protection rangers. The annual costs for Alternative B would therefore range from $3,462,500 to $3,622,500.

The estimated increase in staff for Alternative C would be 18 to 20 additional full time employees, or equivalents, to address education and service delivery, principally through the hub locations. New staff under this alternative would include an environmental compliance specialist, park rangers for interpretation and visitor services, maintenance employees, and a Geographic Information Systems specialist. Proposed staff would also address visitor needs at the proposed visitor center. The annual costs for Alternative C would range from $4,324,600 to $4,484,600.

The range of costs projected for Alternative D is based upon an estimated 20 to 22 additional full time employees, or equivalents, to address education and service delivery required to meet the dispersed needs of the linear park. New staff under this alternative would include resource monitoring and environmental compliance specialists, a Geographic Information Systems specialist, visitor protection rangers, and maintenance employees. Proposed staff would also address visitor needs at the proposed visitor center. For Alternative D, the annual costs would range from $4,633,600 to $4,793,600.

Alternative E, with an estimated 20 to 22 additional full time employees, or equivalents, would have an estimated cost range of $4,621,600 to $4,781,600. Alternative F would also have an estimated 2o to 22 additional full time employees, or equivalents. New staff under both of these alternatives would include resource monitoring and environmental compliance specialists, park rangers for interpretation and visitor services, a Geographic Information Systems specialist, visitor protection rangers, and maintenance employees. Proposed staff would also address visitor needs at the proposed visitor center. The annual cost range estimated for Alternative F would be from $4,599,600 to $4,759,600.

The actual cost of staffing each alternative would vary according to the government service rating, experience level, and education and professional certifications as well as the deployment of staff needed to provide minimum levels of satisfactory park services.

One-Time Costs

The range of initial one-time costs including construction, rehabilitation, and general improvements planned are outlined on Table 4 for each alternative. Alternative D would require the highest range of initial one-time costs ($22.1 to $28.8 million) due to expanded access throughout the park and the dispersed services required. Alternatives E and F have similar initial one-time costs, ranging from $20.6 to $26.8 million for each alternative to provide additional visitor education center and interpretive services and expanded park facilities/services throughout the park corridor. The range of initial one-time costs for Alternative C includes centralizing services at 3 hubs and improving other park facilities, for an estimated $20.4 to $26.5 million. The range of initial one-time costs for

Alternatives B and A is estimated at $5.5 to $7.2 and $3.8 to $4.9 million, respectively. The differences are primarily attributed to the level of costs required to maintain, restore, or improve park facilities. Alternatives C, D, E and F include the costs for building and operating a new visitor center. Although some visitor services are provided at park headquarters at Island Ford, there is no visitor center under current conditions (Alternative A) or one proposed under Alternative B.

Total Life-Cycle Costs

Table 4 lists the total life-cycle costs over the life of the plan, a 20-year period of time. The estimated Class C costs are based on costs for similar types of development in other parks provided by the National Park Service Denver Service Center. Life-cycle costs include the costs of operating buildings, the personnel required to provide park services, maintenance, and replacement costs of alternative elements, as summarized in Table 4. The total life-cycle costs range on the low end of $40.5 million for Alternative A to the high end of $80.2 million for Alternative D. The total life-cycle costs for Alternative B range from $42.2 to $45.5 million, Alternative C ranges from $66.8 to $74.6 million and Alternatives E and F range from $70.2 to $78.0 million and $69.9 to $77.7 million, respectively.

Chattahoochee River National Recreation Area Fee Program

Under the Fee Demonstration Program, fees retained by the park will be primarily dedicated to address repair and back-logged maintenance projects, including projects relating to health and safety, and for visitor services including non-personal services such as waysides and signs. Additional fee revenue will support habitat, facility improvements and natural and cultural resource preservation projects. Therefore a portion of the costs projected for the various alternatives would be funded with these revenues. Future planning for these projects would identify specific sources of funding.

It should be noted that the cost of collection for fee revenue is currently at 45% and will be further reduced over the next 5 years to 24% through the implementation of automated fee machines. These machines will allow the park to reduce the number of staff hours currently required in the collection and operation of the fee program.

Table 5 presents actual revenues from the various fee programs from fiscal years 2003 to 2006, and Table 6 presents projected fee revenue through fiscal year 2012.

Table 5. Revenue Generated from Park Fee Programs, 2003 to 2006

FEE RECEIPTS:	**ACTUAL**			
TYPE	**FY03**	**FY04**	**FY05**	**FY06**
Annual & Daily Park	$529,744	$455,384	$498,655	$521,420
Golden Age Passport	$3,480	$3,020	$3,440	$4,660
National Park Pass	$800	$1,250	$1,268	$1,300
Golden Eagle Hologram	$100	$120	$105	$90
TOTAL	**$534,124**	$459,774	$503,468	$527,470

Table 6. Projected Fee Revenue, 2007 to 2012

FEE RECEIPTS:	PROJECTED						
TYPE	**FY07YTD**	**FY07**	**FY08**	**FY09**	**FY10**	**FY11**	**FY12**
Annual & Daily Park	$319,178	$ 580,000.00	$ 650,000.00	$ 660,000.00	$ 665,000.00	$670,000.00	$675,000.00
Golden Age Passport	$3,740	$5,800	$6,000	$6,500	$6,700	$6,800	$7,000
National Park Pass	$400	$1,700	$3,500	$4,000	$4,200	$4,300	$4,500
Golden Eagle Hologram	0	$0	$0	$0	$0	$0	$0
TOTAL	$327,058	$587,500	$659,500	$670,500	$675,900	$681,100	$686,500

MITIGATION MEASURES COMMON TO ALL ACTION ALTERNATIVES

Mitigation involves measures taken to avoid, reduce, or minimize potentially adverse impacts. It is a key concept in resource management planning. Here, it provides a means for accommodating visitor interactions and park operations with natural and cultural resources and their tolerances for disturbances.

Mitigation and best management practices are regularly used to ensure that the park's natural and cultural resources are protected and preserved for future visitors without impairment. In the legislation creating the National Park Service, Congress charged it with managing lands under its stewardship "in such manner and by such means as will leave them unimpaired for the enjoyment of future generations"(NPS Organic Act, 16 United States Code 1). As a result, the National Park Service routinely evaluates and implements mitigation whenever conditions occur that could adversely affect the sustainability of park resources.

Mitigation was included throughout the formulation of the alternatives included in this general management plan. Table 7 provides a summary of mitigation measures proposed for the action alternatives. Measures taken to protect natural resources include siting new facilities in previously disturbed areas while also avoiding sensitive resources whenever feasible to avoid causing new impacts. Boardwalks, fences, signs, and similar measures would be used to route people away from sensitive resources, such as wetlands or riparian habitats or historic resources, while still permitting access to important viewpoints. Wetland and sensitive riparian habitats would be delineated by qualified specialists and clearly marked before construction work proceeded. In addition, all action alternatives would include development and implementation of a resource stewardship strategy, a fisheries management plan, a collections management plan, flow studies, a commercial services plan, and an integrated trail system study, which would provide direction for use of mitigative measures.

Construction zones would be identified and fenced with temporary fencing or a similar material prior to any construction activity. The fencing would define the construction zone and confine activity to the minimum area required. All protection measures would be clearly stated in construction specifications, and workers would be instructed to avoid areas beyond the fencing. Measures to control dust and erosion during construction could include the following: watering dry soils; using silt fences and sedimentation controls; stabilizing soils during and after construction with specially

Table 7. Summary of Mitigation Measures Associated with the Action Alternatives

Impact Category	Mitigation Measures
Water Resources and Aquatic Resources	Best management practices would be implemented to control the amount and quality of runoff. These would include erosion control measures such as type C silt fencing in slopes greater than 3 percent, mulching, sedimentation ponds, and use of cocoa fiber and seeding of native vegetation. Monitoring for invasive species would be conducted. Restoration efforts would include site specific mitigative measures. Resource stewardship strategies, flow studies, and a fisheries management plan would be developed and implemented. Development and implementation of other plans would provide preferences for mitigative measures. Increased levels of partnering and coordination would help increase awareness, help institute watershed management practices and improve conditions.
Floodplains and Wetlands	Floodplains and wetlands would continue to be protected by conducting individual environmental assessments for any construction project directly or indirectly affecting wetlands and/or floodplains. Best management practices would also be employed.
Terrestrial Ecological Resources	Completing environmental assessments prior to construction, minimizing tree clearing, avoiding sensitive upland forested areas, and controlling the presence and distribution of invasive species, would be practiced. Use of public education materials, revegetation of disturbed areas with native plants, erosion control measures, and barriers to control potential impacts on plants from trail erosion or unauthorized trails.
Rare, Threatened, and Endangered Species	Efforts to document and protect these species populations currently present in the park would be completed. Restoration and /or monitoring plans would be developed as warranted. Plans include methods for implementation, performance standards, monitoring criteria, and adaptive management techniques.
Prime Farmlands	Conducting an environmental assessment, developing detailed mapping, and/or instituting best management practices would result in minimization or avoidance of impacts.
Archeological Resources	Avoidance and minimization of potentially adverse effects on archeological resources would be achieved during a site-specific environmental assessment by: (1) identification of resources that could potentially exist on each site by completion of archeological field surveys and reports; and (2) completion of data recovery and preservation actions on proposed construction sites where archeological resources are identified. A resource stewardship strategy would also be prepared. If, during construction, any previously unknown archeological resources are discovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy would be developed in accordance with 36 CFR Part 800.13. In addition to data recovery and preservation, mitigation could also include other measures such as site burial.

Table 7. Summary of Mitigation Measures Associated with the Action Alternatives (continued)

Impact Category	Mitigation Measures
Historic Buildings, Structures, and Objects	These resources would be afforded enhanced protection and preservation through systematic integrated inventory, research, and preservation programs in cultural resource and/or historic resource zones as well as a resource stewardship strategy. Rehabilitation of historic structures and cultural landscapes would occur, with some historic structures being returned to their original uses and others being rehabilitated and adaptively reused in accordance with park resource values. Efforts would be made to avoid adverse impacts to cultural resources by identifying historic properties prior to an undertaking, avoiding effects to historic properties where possible, and by using visual screens and/or sensitive designs that are compatible with historic resources. Studies carried out in advance of undertakings to identify historic properties and assess effects will comply with the requirements of Sections 106 and 110 of the NHPA, 36 CFR 60, 36 CFR 800, and National Park Service Director's Order 28 and 28A: Archeology. Mitigation measures may include data recovery of identified National Register eligible archeological sites and documentation of built resources in accordance with Historic American Buildings Survey/Historic American Engineering Record standards. If, during construction, any previously unknown resources are discovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed in accordance with 36 CFR Part 800.13.
Transportation	Mitigative measures related to transportation features in the park are addressed under other impact topics, and include development and implementation of best management practices during construction and operation of transportation related facilities, including trails, bridges, roads, and parking areas. Traffic calming studies would be considered during development of site specific environmental assessments to address transportation related impacts. Use of sustainable materials and minimization of impervious surfaces would be used where practical. An integrated trails study would be completed and implemented that would identify standard mitigation measures for trail construction and maintenance (pedestrian, equestrian, and bicycle). Coordination with neighboring communities in the vicinity of hubs (Alternative C), organizations and neighborhoods along the corridor (Alternatives D, E and F) would serve to develop communication networks to address park transportation concerns, increase awareness and minimize/avoid adverse effects associated with overcrowding of parking areas and congestion (for example, reduction of individual vehicular trips to parking areas). Use of shuttles and alternative transportation solutions during special events would continue to be used for all alternatives to minimize localized, short-term adverse impacts to local traffic.
Visitor and Community Values	Additional interpretive activities, educational and outreach activities would promote understanding among park visitors. Developing partnerships and increasing the level of coordination would aid connectivity and promotion of shared facilities and programs.

designed fabrics, certified straw, or other materials; covering haul trucks; and revegetating disturbed areas with native species as soon as possible after construction, with measure taken to avoid introduction of invasive species.

Standard noise abatement measures would be implemented during park operations and construction activities. These measures could include: scheduling activities to minimize impacts, use of the best available noise control techniques, use of hydraulically or electrically powered tools, and keeping distance from sensitive uses or resources.

Following completion of construction activities, all areas of disturbed soils and vegetation would be regraded and revegetated as soon as possible. Natural topographic features would be restored to the extent possible using excavated soils from other park projects, and native species would be used in all revegetation efforts. Restoration efforts would be maximized by using salvaged topsoil and native vegetation and by monitoring revegetation success for several growing seasons as appropriate. Undesirable species would be monitored and control strategies initiated if needed. For all action alternatives, mitigation actions would occur prior to construction to minimize immediate and long-term impacts to rare, threatened, and endangered species. Surveys would be conducted for such species as warranted. Facilities would be sited and designed so as to avoid adverse effects to such species whenever possible. If avoidance is infeasible, adverse effects would be minimized and compensated for, as appropriate, and in consultation with appropriate resource agencies.

Efforts would also be made to avoid adverse impacts to cultural resources by identifying historic properties prior to an undertaking, avoiding effects to historic properties where possible, following the Secretary of the Interior's Standards for Archeology and Historic Preservation and by using visual screens and/or sensitive designs that are compatible with historic resources. Studies carried out in advance of undertakings to identify historic properties and assess effects will comply with the requirements of Sections 106 and 110 of the National Historic Preservation Act, 36 CFR 60, 36 CFR 800, and National Park Service Director's Order-28 and 28A: Archeology. Mitigation measures, in consultation with the Georgia State Historic Preservation Office, may include data recovery of identified National Register eligible archeological sites and documentation of built resources in accordance with Historic American Buildings Survey/Historic American Engineering Record standards. If, during construction, any previously unknown archeological resources are discovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented and an appropriate mitigation strategy developed in accordance with 36 CFR Part 800.13.

The National Park Service will conduct additional background research, resource inventory, and national register evaluations where information about the location and significance of cultural or natural resources is lacking. Results of site specific studies are incorporated into planning and compliance documents. Whenever possible, projects would be located in previously disturbed or existing developed areas and designs would be completed that avoid known or suspected resources of concern.

SELECTING THE PREFERRED ALTERNATIVE

The National Park Service uses a decision-making system called Choosing by Advantages to select a preferred alternative in the general management planning process. Choosing by Advantages was originally developed by Jim Suhr, author of *The Choosing by Advantages Decisionmaking System*. This decision-making system is based on determining the advantages of different alternatives for a variety

of factors. The fundamental rule in this system is that sound decisions must be based on the importance of advantages.

One of the greatest strengths of this system is its fundamental philosophy: decisions must be anchored in relevant facts. This minimizes the subjectivity in the decision-making process and makes the decision as objective as possible. For example, the question "Is it more important to protect natural resources or cultural resources?" is "unanchored"; it has no relevant facts on which to make a decision. Without such facts, it is impossible to make a defensible decision. The Choosing by Advantages system instead asks us to decide which alternative gives the greatest advantage in protecting natural resources and cultural resources. To answer this question, relevant facts would be used to determine the advantages that the alternatives provide for both kinds of resources. For example, we may have facts that show that two alternatives disturb or restore equal amounts of vegetation, so neither alternative would be more advantageous than the other in protecting natural resources. On the other hand, we may have relevant facts that show that one alternative would disturb five known archeological sites, while the other alternative would disturb only one. This alternative, then, would be more advantageous since it provides natural resource protection (equal to the other alternative) and also provides the greatest advantage for cultural resources.

The planning team used the Choosing by Advantages system to select Alternative F as the preferred alternative for this Final document as the National Park Service's proposed action. Details of the Choosing by Advantages workshop conducted to make this decision are provided in Appendix D.

The first step in the CBA process is to decide the factors that will be used in the decision. For the Chattahoochee River National Recreation Area, the planning team selected the following three factors:

1. Protect Cultural and Natural Resources
    a. Protects and enhances water quality
    b. Preserves and enhances biodiversity
    c. Preserves and enhances cultural resources
2. Provide for Visitor Enjoyment
    a. Provides visitor services and recreational opportunities
    b. Provides interpretive and educational opportunities
    c. Provides access for a variety of users
3. Improve Efficiency of Park Operations
    a. Extent to which the alternative benefits operational efficiency and effectiveness

The planning team discussed each alternative for each factor and reached a consensus regarding how each factor should be characterized for each of the 6 alternatives under consideration, including the no-action (continue current management policies and strategies) alternative. In addition, cost estimates for each alternative were considered in this process.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

According to Council on Environmental Quality regulations implementing the National Environmental Policy Act, and the National Park Service National Environmental Policy Act guidelines (*Director's Order #12*), an environmentally preferred alternative must be identified in environmental documents. Section 101(b) of the National Environmental Policy Act identifies the following six criteria to help determine the environmentally preferred alternative:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.

2. Ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.

3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.

4. Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choices.

5. Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.

6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The environmentally preferred alternative would cause the least damage to the biological and physical environment, and would best protect, preserve, and enhance historical, cultural, and natural resources. Alternative E is the environmentally preferred alternative in its ability to best meet the six national environmental criteria as described in the paragraphs that follow.

1. Alternative B would best protect the environment by limiting the level and intensity of use of the built environment. The amount of acreage in developed zones and natural area recreation zones would be less than other alternatives. In addition, the river solitude zone would be provided and greater focus would be placed on the restoration of natural resources, with a lower potential for new facilities. All other alternatives would fulfill this criterion to a lesser degree through protection of known natural and cultural resources located in the park.

2. Each of the alternatives would meet criterion 2 by providing visitors with safe, healthful, productive, esthetically and culturally pleasing surroundings. Under Alternative A, there would be increased challenges to meet and maintain such conditions, however because staffing and funding levels would not be expected to change dramatically. For example, the diversity of educational opportunities would continue to be limited, and the park's ability to respond to the ever-increasing demand to address compliance issues with regard to natural and cultural resource protection would continue to be a challenge. Alternatives E and F would allow more diverse types of use than the other alternatives, increased staffing, as well as increased potential for river access and boating and other types of access throughout the park, thereby creating increased opportunities to enjoy more of the park. Therefore, Alternatives E and F would better serve criterion 2.

3. Overall, Alternatives E and F would allow for the widest range of beneficial uses of the environment and to observe and appreciate resources with a minimum of inadvertent or unintentional damage. In comparison between Alternatives E and F, Alternative E would have more acreage zoned as rustic zone, compared to Alternative F, thereby allowing for less of a hardened landscape, less acreage zoned where facility development is appropriate, and less of a facilitated experience. In addition, the opportunities for the built environment are lower in Alternative E than F, with Alternative F having a higher percentage of acreage zoned developed zone and natural area recreation zone and, for these reasons, it is estimated that there would be less inadvertent or unintentional damage under Alternative E than F. Alternative F, however, provides increased access for a greater variety of park visitors than Alternative E.

   Based on public input on action Alternatives B and C, restricting the type of boat use (motorized versus nonmotorized) in the river solitude zone would be too limiting for many visitors. Alternative D provides for expanding and distributing access throughout the park, including newly acquired parcels, thereby providing the widest opportunity for increased and diverse visitor experiences. Compared to other alternatives, the emphasis would be more on social experience than solitude. New facilities would be developed or existing facilities would be refurbished, and connectivity to existing neighborhoods would be optimized. However, Alternative D would be more dependent on the successful development of public/private partnerships than would other action alternatives and there would be a higher potential for inadvertent or unintentional damage to natural and cultural resources compared to all other alternatives.

   There is no discernable difference across Alternatives D, E and F when comparing the level of risk of health or safety, particularly when evaluating the potential increase in park personnel available to respond or provide assistance to visitors. Staffing levels would be similar for Alternatives D, E and F, two fewer new staff members would be proposed under Alternative C, and Alternative B would have the least new staff additions compared to all the action alternatives.

   In summary, Alternatives E and F would best meet the objective of this criterion.

4. Each of the alternatives preserve important historical, cultural and natural aspects of our national heritage and maintain, wherever possible an environment which supports diversity and variety of choice. In terms of access to areas that may allow greater choice in the fulfillment of this experience, Alternatives E and F offer a greater variety of recreational opportunities to explore the park through diverse means and accessibility than Alternatives A, B, C and D. Alternatives B, C and D limit the type of river access and use while Alternatives E and F provide additional choice in type of use and access while also providing additional opportunities for interpretive experiences and education.

5. Alternatives D, E and F provide additional opportunities for use of existing and new facilities along the corridor, compared to Alternatives A, B, and C. Facilities would be centralized in Alternative C. Alternative D provides the greatest degree of flexibility for locating facilities, and the greatest potential for related adverse effects. Each of the action alternatives provide equal opportunity for commercial services to operate in the future, however, Alternatives E and F provide more opportunities for river services due to fewer river use restrictions in place without the river solitude zone. (A commercial services plan would also be prepared in the future). Alternatives E and F balance resource use and visitor conditions, given the distribution of zones for each alternative, and river access and type of river use are the same for both alternatives (i.e. boating and fishing are appropriate in all park waterways). Opportunities for sharing park resources are similar under both Alternatives E and F, with differences described under criterion 3.

6. Alternative B would best meet this criterion, as it would improve renewable resource conditions for wildlife and vegetation. All other alternatives would maintain existing conditions or result in localized reductions in the quality of renewable resources through construction and subsequent alteration or loss of habitat. Where new facilities are constructed, sustainable design principles would be used where applicable. None of the alternatives proposes a long-term change in use of depletable resources; therefore, no discernable difference exists between the alternatives for this factor.

Some specific actions under Alternative B may achieve similar, or in some cases greater, levels of protection for certain cultural and natural resources than under Alternatives E and F. Yet, based on potential resource and visitor impacts and on proposed mitigation for impacts to natural and cultural resources, Alternative E best meets the six criteria as defined above. Whereas Alternative F integrates resource protection with greater opportunities for an appropriate range of visitor use, Alternative E, however, provides an advantage for the protection of cultural and natural resources while concurrently attaining the widest range of beneficial uses of the environment without degradation or other undesirable and unintended consequences.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES

A summary of environmental consequences is provided in Table 8 that shows each alternative's potential effects by impact topic. Detailed descriptions of the context, intensity, and duration of impacts, called thresholds, are provided in Chapter 4 Environmental Consequences.

Table 8. Summary of Impacts of the Alternatives

Impact Category	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Natural Resources						
Water Resources	*Direct and indirect effect:* ***Long-term and short-term, minor to moderate, adverse***. *Cumulative effect:* ***Long-term and short-term, moderate to major, adverse***.	*Direct and indirect effect:* ***Long-term and short-term, minor, beneficial.*** *Cumulative effect:* ***Long-term and short-term, moderate, adverse***.	*Direct and indirect effect:* ***Long-term and short-term, negligible, adverse.*** *Cumulative effect:* ***Long-term and short-term, moderate, adverse***.	*Direct and indirect effect:* ***Long-term and short-term, minor adverse.*** *Cumulative effect:* ***Long-term and short-term, minor to moderate, adverse***.	*Direct and indirect effect:* ***Long-term and short-term, negligible to minor, adverse.*** *Cumulative effect:* ***Long-term and short-term, minor to moderate, adverse***.	***Same as Alternative D.***
Aquatic Resources	*Direct and indirect effect:* ***Long-term and short-term, minor to moderate, adverse***. *Cumulative effect:* ***Long-term and short-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term and short-term, minor, beneficial.*** *Cumulative effect:* ***Long-term and short-term, moderate, adverse***.	*Direct and indirect effect:* ***Long-term and short-term, negligible, adverse.*** *Cumulative effect:* ***Long-term and short-term, moderate, adverse***.	*Direct and indirect effect:* ***Long-term and short-term, minor adverse.*** *Cumulative effect:* ***Long-term and short-term, minor to moderate, adverse***.	*Direct and indirect effect:* ***Long-term and short-term, negligible to minor, adverse.*** *Cumulative effect:* ***Long-term and short-term, minor to moderate, adverse***.	***Same as Alternative D.***
Wetlands	*Direct and indirect effect:* ***Long-term and short-term, moderate, adverse***. *Cumulative effect:* ***Long-term and short-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term and short-term, minor, beneficial.*** *Cumulative effect:* ***Long-term and short-term, moderate, adverse***.	*Direct and indirect effect:* Long-term and short-term, negligible, adverse. *Cumulative effect:* ***Long-term and short-term, moderate, adverse***.	*Direct and indirect effect:* ***Long-term and short-term, minor adverse.*** *Cumulative effect:* ***Long-term and short-term, minor to moderate, adverse***.	***Same as Alternative C.***	***Same as Alternative D.***

Table 8. Summary of Impacts of the Alternatives (continued)

Impact Category	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Floodplains	*Direct and indirect effect:* ***Long-term and short-term, moderate, adverse****.* *Cumulative effect:* ***Long-term and short-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term and short-term, minor, beneficial.*** *Cumulative effect:* ***Long-term and short-term, moderate, adverse****.*	*Direct and indirect effect:* ***Long-term and short-term, negligible, adverse.*** *Cumulative effect:* ***Long-term and short-term, moderate, adverse****.*	*Direct and indirect effect:* ***Long-term and short-term, minor adverse.*** *Cumulative effect:* ***Long-term and short-term, minor to moderate, adverse****.*	***Same as Alternative C.***	***Same as Alternative D.***
Terrestrial Ecological Resources	*Direct and indirect effect:* ***Long-term and short-term, moderate, adverse****.* *Cumulative effect:* ***Long-term and short-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term and short-term, minor to moderate, beneficial.*** *Cumulative effect:* ***Long-term and short-term, moderate, adverse****.*	*Direct and indirect effect:* ***Long-term and short-term, negligible, adverse.*** *Cumulative effect:* ***Long-term and short-term, moderate, adverse****.*	*Direct and indirect effect:* ***Long-term and short-term, minor to moderate, adverse.*** *Cumulative effect:* ***Long-term and short-term, minor to moderate, adverse****.*	***Same as Alternative C.***	***Same as Alternative D.***
Rare, Threatened or Endangered Species	*Direct and indirect effect:* ***Long-term, minor, adverse.*** *Cumulative effect:* ***Long-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term, minor to moderate, beneficial.*** *Cumulative effect:* ***Long-term, minor to moderate, adverse.***	*Direct and indirect effect:* ***Long-term, negligible, adverse.*** *Cumulative effect:* ***Long-term, minor to moderate, adverse.***	*Direct and indirect effect:* ***Long-term, negligible to minor, adverse.*** *Cumulative effect:* ***Long-term, minor to moderate, adverse.***	***Same as Alternative C.***	***Same as Alternative D.***

Table 8. Summary of Impacts of the Alternatives (continued)

Impact Category	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Prime Farmland	*Direct and indirect effect:* ***Long-term and short-term, negligible, adverse.*** *Cumulative effect:* ***Long-term and short-term, minor, adverse.***	*Direct and indirect effect:* ***Long-term and short-term, negligible, beneficial.*** *Cumulative effect:* ***Long-term and short-term, minor, adverse.***	***Same as Alternative B.***	*Direct and indirect effect:* ***Long-term and short-term, minor, adverse.*** *Cumulative effect:* ***Long-term and short-term, minor, adverse.***	***Same as Alternative B.***	***Same as Alternative D.***
Cultural Resources						
Archeological Resources	*Direct and indirect effect:* ***Long-term, minor to major, adverse, and long-term, minor, beneficial.*** *Cumulative effect:* ***Long-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term, negligible to minor, adverse, and long-term, moderate beneficial.*** *Cumulative effect:* ***Long-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term, negligible to minor, adverse, and long-term, moderate beneficial.*** *Cumulative effect:* ***Long-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term, moderate, adverse, and long-term, moderate beneficial.*** *Cumulative effect:* ***Long-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term, negligible to minor, adverse, and long-term, moderate to major beneficial.*** *Cumulative effect:* ***Long-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term, minor, adverse, and long-term, moderate to major, beneficial.*** *Cumulative effect:* ***Long-term, moderate to major, adverse.***
Cultural Landscapes, Historic Buildings, Structures and Objects	*Direct and indirect effect:* ***Long-term, minor to major, adverse.*** *Cumulative effect:* ***Long-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term, negligible to minor, adverse, and long-term, major, beneficial.*** *Cumulative effect:* ***Long-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term, negligible to minor, adverse, and long-term, major beneficial.*** *Cumulative effect:* ***Long-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term, minor to moderate, adverse, and long-term, moderate beneficial.*** *Cumulative effect:* ***Long-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term, negligible to minor, adverse, and long-term, moderate to major beneficial.*** *Cumulative effect:* ***Long-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term, minor, adverse, and long-term, moderate to major, beneficial.*** *Cumulative effect:* ***Long-term, moderate to major, adverse.***
Transportation						

Table 8. Summary of Impacts of the Alternatives (continued)

Impact Category	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Vehicular / Traffic-Related Effects	*Direct and indirect effect:* ***Long-term, negligible, adverse.*** *Cumulative effect:* ***Long-term, moderate, adverse.***	*Direct and indirect effect:* ***Long-term, negligible, adverse.*** *Cumulative effect:* ***Long-term, moderate, adverse.***	*Direct and indirect effect:* ***Long-term, minor to moderate, adverse.*** *Cumulative effect:* ***Long-term, moderate, adverse.***	*Direct and indirect effect:* ***Long-term, moderate, adverse.*** *Cumulative effect:* ***Long-term, moderate, adverse.***	***Same as Alternative D.***	***Same as Alternative D.***
Availability, Management, and Connectivity of Trails	*Direct and indirect effect:* ***Long-term, minor to moderate, adverse.*** *Cumulative effect:* ***Long-term, minor to moderate, adverse.***	*Direct and indirect effect:* ***Long-term, negligible, beneficial.*** *Cumulative effect:* ***Long-term, negligible, beneficial.***	*Direct and indirect effect:* ***Long-term, minor to moderate, beneficial.*** *Cumulative effect:* ***Long-term, minor to moderate, beneficial.***	*Direct and indirect effect:* ***Long-term, moderate, beneficial.*** *Cumulative effect:* ***Long-term, moderate, beneficial.***	***Same as Alternative D.***	***Same as Alternative D.***
Effect on an Individual's Decision to Walk or Ride a Bicycle to the Park	*Direct and indirect effect:* ***Long-term, negligible, adverse.*** *Cumulative effect:* ***Long-term, minor, beneficial.***	*Direct and indirect effect:* ***Long-term, moderate, adverse.*** *Cumulative effect:* ***Long-term, minor, adverse.***	*Direct and indirect effect:* ***Long-term, minor to moderate, beneficial.*** *Cumulative effect:* ***Long-term, minor to moderate, beneficial.***	*Direct and indirect effect:* ***Long-term, moderate, beneficial.*** *Cumulative effect:* ***Long-term, moderate, beneficial.***	***Same as Alternative D.***	***Same as Alternative D.***

Table 8. Summary of Impacts of the Alternatives (continued)

Impact Category	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Visitor Experience and Community Values						
Visitor Experience	*Direct and indirect effect:* ***Long-term, moderate, adverse.*** *Cumulative effect:* ***Long-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term, moderate to major, beneficial*** effect for those who prefer solitude. ***Long-term, moderate to major, adverse*** effect for those who prefer a more facilitated experience. *Cumulative effect:* ***Long-term, moderate, adverse.***	*Direct and indirect effect:* ***Long-term, minor to moderate, beneficial.*** *Cumulative effect:* ***Long-term, moderate, beneficial.***	*Direct and indirect effect:* ***Long-term, moderate to major, adverse*** effect for those who prefer solitude. ***Long-term, moderate to major, beneficial*** effect for those who prefer a more facilitated experience. *Cumulative effect:* ***Long-term, moderate, beneficial.***	*Direct and indirect effect:* ***Long-term, moderate, adverse*** effect for those who prefer solitude. ***Long-term, moderate to major, beneficial*** effect for those who prefer a more facilitated experience. *Cumulative effect:* ***Long-term, moderate, beneficial.***	*Direct and indirect effect:* ***Long-term, moderate to major, adverse*** effect for those who prefer solitude. ***Long-term, moderate to major, beneficial*** effect for those who prefer a more facilitated experience. *Cumulative effect:* ***Long-term, moderate, beneficial.***

Table 8. Summary of Impacts of the Alternatives (continued)

Impact Category	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Recreational Opportunity	*Direct and indirect effect:* ***Long-term, moderate, adverse.*** *Cumulative effect:* ***Long-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term, moderate to major, beneficial*** effect for those who value solitude and less diverse types of recreation. ***Long-term, moderate to major, adverse*** effect for those who prefer more diverse, active types of recreation. *Cumulative effect:* ***Long-term, moderate, adverse.***	*Direct and indirect effect:* ***Long-term, minor to moderate, beneficial*** for the majority of park visitors. ***Long-term, moderate to major, adverse*** effect on visitors who prefer access for motorized boating throughout the park. *Cumulative effect:* ***Long-term, moderate, beneficial.***	*Direct and indirect effect:* ***Long-term, moderate to major, adverse*** effect for those who value solitude and less diverse types of recreation. ***Long-term, moderate to major, beneficial*** effect for those who prefer increased access and diverse opportunities for recreation, including motorized boating. *Cumulative effect:* ***Long-term, moderate to major, beneficial.***	*Direct and indirect effect:* ***Long-term, moderate, adverse*** effect for those who value solitude and less diverse types of recreation. ***Long-term, moderate to major, beneficial*** effect for those who prefer more facilitated experiences and diversity of use. *Cumulative effect:* ***Long-term, moderate to major, beneficial.***	*Direct and indirect effect:* ***Long-term, moderate to major, adverse*** effect for those who value solitude and less diverse types of recreation ***Long-term, major, beneficial*** effect for those who prefer facilitated experiences and diversity of use. *Cumulative effect:* ***Long-term, major, beneficial.***
Traditional Character of the Park	*Direct and indirect effect:* ***Long-term, moderate, adverse.*** *Cumulative effect:* ***Long-term, moderate to major, adverse.***	*Direct and indirect effect:* ***Long-term, moderate, beneficial.*** *Cumulative effect:* ***Long-term, moderate, adverse.***	*Direct and indirect effect:* ***Long-term, major, beneficial*****.** *Cumulative effect:* ***Long-term, minor to moderate, beneficial.***	*Direct and indirect effect:* ***Long-term, major, beneficial, and long-term, minor to moderate adverse.*** *Cumulative effect:* ***Long-term, minor to moderate, beneficial.***	*Direct and indirect effect:* ***Long-term, major, beneficial, and long-term, minor, adverse.*** *Cumulative effect:* ***Long-term, minor to moderate, beneficial.***	*Direct and indirect effect:* ***Long-term, major, beneficial, and long-term, minor to moderate adverse.*** *Cumulative effect:* ***Long-term, minor to moderate, beneficial.***

Table 8. Summary of Impacts of the Alternatives (continued)

Impact Category	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E	Alternative F
Park Operations	*Direct and indirect effect:* ***Long-term, moderate, adverse***. *Cumulative effect:* ***Long-term, moderate adverse.***	*Direct and indirect effect:* ***Long-term, negligible, beneficial***. *Cumulative effect:* ***Long-term, moderate, adverse.***	*Direct and indirect effect:* ***Long-term, moderate, beneficial***. *Cumulative effect:* ***Long-term, moderate, beneficial.***	*Direct and indirect effect:* ***Long-term, negligible, adverse.*** *Cumulative effect:* ***Long-term, negligible, adverse.***	*Direct and indirect effect:* ***Long-term, negligible, beneficial***. *Cumulative effect:* ***Long-term, negligible, adverse.***	***Same as Alternative E.***

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