

10. THE GMP/NEPA DOCUMENT: AFFECTED ENVIRONMENT, ENVIRONMENTAL CONSEQUENCES, CONSULTATION AND COORDINATION

This chapter focuses on the major sections of a GMP/EIS or EA, excluding the alternatives (addressed in Chapter 7) and the purpose/need/foundation in the introductory chapter (addressed in Chapters 4 and 6). To satisfy NEPA requirements, a GMP/EIS or EA typically has chapters devoted to the affected environment, environmental consequences, and consultation and coordination. The chapter begins with a discussion of impact topics, which tie together all of the chapters in a NEPA document.

10.1 DETERMINING IMPACT TOPICS

Impact topics are specific natural, cultural, or socioeconomic resources or values that could be affected by implementation of any of the alternatives described in the GMP, including the no-action alternative. They may include visitor use and experience and park operations. Impacts to these resources or values must be identified, and the intensity or magnitude, duration, and timing of the effect to each resource must be disclosed in the environmental consequences section of an EIS and EA.

The analysis of the park's fundamental and other important resources and values will identify which of those resources and values might potentially be affected by decisions made in the GMP. However, the category of environmental issues and impact topics is broader than fundamental or otherwise important resources and values. NEPA requires park managers and planners to consider any aspects of the human environment that might experience a significant effect as a result of plan implementation, or that might experience an effect that is highly controversial with the public, before the plan is implemented.

A good example of a highly controversial topic is the burros at Death Valley. This exotic, feral species would not meet the criteria of being a fundamental park resource or value; it would not meet the criteria of being an important resource or value protected by federal law; but it would meet the criteria of being a resource/value that would experience a greater than negligible effect under one or more alternatives, and the potential effects would meet the criteria of being highly controversial with the public. In this example the fate of the burros would be part of a larger planning issue related to the desired condition for one or more of the park's fundamental resources or values. But the impact topics would include not only the resources or values for which desired conditions were being debated, but also the burros themselves as part of the larger "human environment." The expansion of the planning perspective to include not only those things considered to be important to the park's plan, but also those other components of the larger human environment that might inadvertently

Years ago, coal miners carried canaries with them into the mines to detect lethal gases. Today, our national parks are our ecological canaries.

— George B. Hartzog Jr., *Battling for the National Parks*, 1988

be irretrievably or irreversibly altered, are exactly the kinds of considerations that NEPA regulations are intended to address.

The environmental screening form (ESF) in Appendix 1 of *The DO-12 Handbook* and on the PEPC website, is an excellent tool for initially identifying potential impact topics beyond the park's fundamental resources and values. To ensure that particular components of the human environment are always considered during preparation of an EIS, the CEQ developed a list of mandatory topics that must be considered if they would potentially be affected by one or more of the planning alternatives. These topics include the following:

- possible conflicts between the proposed action and land use plans, policies or controls for the area concerned (including local, state, or Indian tribe) (40 CFR 1502.16, 1506.2(d)), and the extent to which the park will reconcile the conflict
- energy requirements and conservation potential (40 CFR 1502.16)
- natural or depletable resource requirements and conservation potential (40 CFR 1502.16)
- urban quality, historic and cultural resources, and design of the built environment (40 CFR 1502.16)
- socially or economically disadvantaged populations (see Environmental Justice, Executive Order (EO) 12898, for more information)
- wetlands and floodplains (100-year floodplains and 500-year floodplains where critical actions as defined in the NPS floodplain management guideline are involved) (40 CFR 1508.27)
- prime and unique agricultural lands (40 CFR 1508.27)
- endangered or threatened plants and animals and their habitats (including those proposed for listing on other state lists) (40 CFR 1508.27)
- important scientific, archeological, and other cultural resources, including historic properties listed on, or eligible for listing on, the National Register of Historic Places (40 CFR 1508.27)
- ecologically critical areas, wild and scenic rivers, or other unique natural resources (40 CFR 1508.27)
- public health and safety (40 CFR 1508.27)
- sacred sites (EO 13007)
- Indian trust resources (ECM 95-2)

In addition, CEQ provides criteria for additional impact topics, which are included in *The DO-12 Handbook*. Below are examples of some additional impact topics which are not specifically stated in the above list but are derived from the mandatory criteria and may be applicable to a GMP.

TABLE 10.1: EXAMPLES OF ADDITIONAL IMPACT TOPICS

adjacent landowners	lightscape management	soils
air quality	local economy	soundscapes
archeological resources	marine protected areas	vegetation
community service	museum collections	visitor access/accessibility
concessions	natural shoreline/coastal processes	visitor facilities
cultural landscapes	paleontological resources	visitor interpretation
essential fish habitat	park operations	visitor orientation
ethnographic resources	public health and safety	water resources
geologic resources	scenic/visual resources	wilderness
hazardous materials		wildlife
land use		

Information about potential impact topics is further refined during the planning process as a result of input from external scoping. Once the preliminary alternatives are identified, the planning team focuses more specifically on those issues that may affect resources, and on what it is about those resources that might be affected.

Impact topics need to be “measurable” (qualitatively, if not quantitatively). As a result, the list of impact topics may be shortened to only those measurable things that would actually be affected by implementation of one or more of the alternatives. These then become the impact topics for the EIS. Impact topics or affected resources that (1) are not applicable to a park, (2) would not be affected by implementation of any of the alternatives, or (3) would experience only negligible or minor effects are generally identified as topics dismissed from further analysis and are not addressed in either the affected environment or environmental consequences sections of the EIS. The rationale for dismissing an impact topic from further analysis, however, must be fully explained in the GMP and included in the administrative record.

However, the following exceptions apply to this general guidance. Resources that are addressed by additional statutes — such as cultural resources, threatened and endangered species, and floodplains and wetlands — are generally addressed if there is potential for *any* (even negligible) effect; in fact, they and other topics are sometimes addressed even if there is no potential for effect. It is up to the team (resource specialists included) to determine the depth of analysis on any particular topic. Even if the potential for impact is determined to be negligible or nonexistent, the public may think the finding is controversial, in which case the analysis should be carried forward to fully disclose why the conclusion is what it is.

Following identification of the impact topics, the planning team determines what data will be needed to adequately describe each topic’s affected environment (see section “10.2. The Affected Environment”). Describing the affected environment helps define the context in which environmental impacts will occur. For each impact topic that may experience a discernible impact, the planning team must also identify and describe the potential impacts in terms of type, context, duration, and intensity (see section “10.3. The Environmental Consequences” below).

By focusing on specific impact topics, the planning team can avoid needless descriptions in the affected environment and unnecessary analyses of environmental consequences. This can also help decision makers and the public focus on the

important issues, impact topics, and differences among alternatives. For example, while it may be interesting, it is not necessary or desirable to provide a lot of general socioeconomic information in a GMP; many subjects, such as education and community history are not germane and should not be discussed. Instead, impact topics should focus on subjects that are or may be affected by park management, such as the number of incidental business permits, vendors, concessions, and other commercial activities in a park; interpretive programs for non-English speaking visitors who live nearby; and how and to what degree the local or regional economy (lodging, supplies, jobs, etc.) is dependent on the park.

The discussion of impact topics, both those being addressed and those being dismissed, typically occurs in the introductory chapter of the GMP/EIS or EA.

10.2 THE AFFECTED ENVIRONMENT

The affected environment section of the EIS succinctly describes the existing natural, cultural, and socioeconomic resources that would be affected either directly or indirectly by implementation of any of the alternatives. The description of the no-action alternative and the affected environment together provide a baseline for later identifying the potential environmental impacts of the action alternatives. The purpose of describing the affected environment is to help define the context in which the impacts will occur, as context is one factor used in determining the significance of an impact.

Collecting accurate and adequate data on the present status (location, nature, condition, scope, size, etc.) of potentially affected natural, cultural, and socioeconomic resources is critical for the later identification and description of impacts, and such data must be available before useful NEPA analysis can begin. The list of natural, cultural, and socioeconomic resources in the ESF is a good beginning point for determining which resources to consider in describing the affected environment. In addition, CEQ requires that certain topics be considered in an EIS, if applicable (see section “10.1. Determining Impact Topics” above).

Data should not be collected to describe resources that are unlikely to be affected by the proposed alternatives. The affected environment does not describe the entire existing environment — only those resources that are relevant to the decisions to be made. For example, if the alternative zoning schemes would have no effect on geology, prime or unique farmland, or threatened or endangered species and their habitat, or if any potential impacts to such resources would be negligible or minor (i.e., the impact would be at a low level of detection), those resources may be dismissed from further analysis and not described in either the affected environment or the environmental consequences sections. By focusing on specific impact topics the planning team can avoid needless descriptions in the affected environment and help decision makers and the public focus on the important differences among the alternatives.

Once alternatives, issues, and impact topics have been defined, an analysis area or boundary should be identified and described for each affected resource. These boundaries may or may not be the same as the project boundary. For example, the

analysis boundary for fish might encompass an entire watershed, whereas the analysis boundary for a rare plant species might include only an acre on the southern slope of a particular mountain. For a historic structure, the analysis boundary might be confined to the footprint of the structure itself, whereas the analysis boundary for a cultural landscape could encompass landforms, soils, vegetation, water courses, and associated cultural values and traditions. In most instances the geographic boundary of the analysis area will be the park boundary (except when discussing cumulative impacts). Two obvious examples where the analysis area will extend beyond a park's boundary are the socioeconomic environment and any areas proposed for boundary adjustments. Sometimes the boundary of the analysis area for a particular resource will also change with different alternatives. For example, the proposed locations for the construction of facilities that vary by alternative would require analyzing impacts to soils and vegetation in each location. Fully describing the affected environment usually requires knowledge about the extent of potential impacts, so the descriptions of the affected environment for each resource may be further refined as the impact analysis proceeds.

Descriptions of the affected environment should be no longer than needed to understand the effects of the proposed alternatives. Because an EIS is to be analytic rather than encyclopedic, verbose descriptions of the affected environment are no measure of adequacy. Background material, highly technical material, and less important descriptive information should be either appended, summarized, or incorporated by reference. Material to be incorporated by reference should be briefly summarized and its relevance explained, and the material itself must be reasonably available for inspection by potentially interested persons within the time allowed for comment on the draft EIS. Materials that are commonly incorporated by reference (and available as part of the project file) include other NEPA documents, lists of common plants and animals, historic resource studies, detailed air and water quality data and standards, separate scientific studies, compilations of demographic and socioeconomic data, and published works.

Reference: *The DO-12 Handbook* (sec. 2.8.A and 4.5.F)

10.3 THE ENVIRONMENTAL CONSEQUENCES

When a large-scale conceptual plan such as a GMP/EIS is prepared, the information in the impact analysis can and should be less detailed than the information in an implementation plan. In most GMP/EISs, it will be difficult to conduct the traditional impact analysis where the focus is on quantifiable impacts (the amount of acreage disturbed or the number of archeological sites affected) because of the conceptual nature of the plan. This section provides a brief overview of NEPA analysis basics, and then discusses some of the recommended methodologies for GMP-level analysis. Wherever possible, real-life examples are provided.

10.3.1 Elements of the Impact Analysis

An impact analysis requires the synthesis of existing environmental information, project and alternative descriptions, and resource impact literature. A good analysis is concise, clear, and to the point; it focuses on real environmental issues; and it uses

accurate scientific analysis. An impact analysis must describe the direct, indirect, and cumulative impacts of the alternatives on resources of concern, including the context and intensity of these impacts.

Following is a brief overview of some of the key considerations when preparing an impact analysis. For more comprehensive guidance on impact analysis, refer to the following CEQ documents: “Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act” (40 CFR 1500–1508), and “The 40 Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations” (CEQ 1980), and *The DO-12 Handbook*.

- *Direct impacts:* Effects caused by the alternatives at the same time and in the same place as the action.
- *Indirect impacts:* Effects caused by the alternatives that occur later in time or farther from the action, but are still reasonably foreseeable.
- *Cumulative impact:* The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR 1508.7)
- *Context:* The significance of an action must be analyzed from several perspectives, such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant. (40 CFR 1508.27).
- *Intensity:* Intensity refers to the severity of the effect (40 CFR 1508.27). Factors that have been used to define the intensity of effects include magnitude (relative size or amount of an effect), geographic extent (how widespread the effect might be), duration (how long the impact will last), and frequency (whether the impact is a one-time event, intermittent, or chronic). In describing the magnitude and duration, ranges rather than a fixed number may be used to better reflect the state of the knowledge and to allow for future flexibility if the action must be modified in response to other concerns.
- *Quality:* An impact can be either detrimental or beneficial.

Impact Threshold Definitions

Impact thresholds (also called impact intensity definitions) should be defined for terms describing the relative magnitude, duration, geographic extent, and frequency

of impacts. These definitions allow the reader to understand how planning team measured the context and intensity (negligible, minor, moderate, or major) of an impact. Impact threshold definitions should be quantitative when possible (e.g., numeric state standards may be used to define thresholds for water quality); otherwise, the definitions may be expressed in qualitative terms or using best professional judgment due to the conceptual nature of the alternatives and impacts. Impact threshold definitions will vary depending on the type of resource being analyzed, the condition of the resource, and the importance of the resource as an issue (as identified through scoping).

When defining impact thresholds, use the following guidelines:

- Threshold definitions should be specific enough so they are not interchangeable among several topics. The definitions should include resource/ value-specific factors (e.g., loss of individuals versus populations when analyzing wildlife impacts).
- Make sure the definitions discuss factors that can actually be measured in the analysis (e.g., it is seldom possible to analyze the effects on genetic variability in an analysis, so this factor would not be a part of the impact threshold definition).
- Make sure definitions do not overlap. Test various impact scenarios to make sure they fit only one impact level definition.
- Use parallel language in definitions. For example, if you discuss wetland functions in the definition of minor impacts, then you should discuss wetland functions for negligible, moderate, and major impacts, as well.
- Avoid mixing duration (short term vs. long term) parameters in the intensity threshold definitions — time should not be part of the definition of the intensity of the impact.
- The threshold definitions should take into account both adverse and beneficial impacts.

In cases where specific guidance about impact thresholds is provided in law, such as under section 7 of the Endangered Species Act and section 106 of the NHPA, use the language included in the acts. For example, when discussing impact thresholds for threatened and endangered species, incorporate the terms “no effect,” “not likely to adversely affect,” and “likely to adversely affect” in the impact thresholds. For cultural resources the impact threshold definitions should be consistent with 36 CFR 800.5 on determining adverse effects, tailored to the particular cultural resources in the park. (See “10.3.6. GMPs and Section 106 of the NHPA.”)

It should be noted that there is no agreed upon standard impact threshold definitions for natural or cultural resource impact topics in GMP/NEPA documents; different GMPs use different definitions. Two examples of impact threshold definitions for cultural resources and vegetation from the 2006 *Abraham Lincoln Birthplace NHS GMP/EIS* and the 2006 *Great Sand Dunes NP GMP/EIS* are included in Appendix I.1. Examples of other impact threshold definitions are available at <http://inside.nps.gov/regions/custommenu.cfm?lv=3&rgn=1026&id=5687>. For

additional information on impact threshold definitions see *The DO-12 Handbook* (sec. 4.5.G).

Cause-and-Effect Relationship

The NEPA issues identified during the scoping process focus the impact analysis. An issue statement describes the cause-and-effect relationships between actions and resources. While the issue statements *describe* the relationship between actions and resources, the impact analyses *evaluate* the relationships in terms of context and intensity (magnitude, extent, duration, and frequency of effect).

In describing impacts, the chain of cause and effect must be clear: an action causes something to happen, affecting a resource or value in some manner defined in terms of context, quality, magnitude, extent, duration, and frequency. The following example shows the chain of cause and effect:

TABLE 10.2: EXAMPLE OF IMPACT ANALYSIS

Example of Analysis for One Impact Topic (Seabird Habitat)	
Background and Methodology:	A study (Braun 1978) has demonstrated that repeated encounters with motorized vessels tend to displace some molting bird species and disrupt nesting activities, causing the birds to seek shelter at outlying lakes. Motorized vessels have caused flushing of adults from nests, which results in lowered success of egg incubation, lowered success of rearing chicks, and increased predation of chicks. This disturbance and relation can also have serious physiological effects on adult birds, stressing the birds and requiring them to expend energy from already depleted reserves. When subjected to repeated disturbances, molting seabirds and waterfowl tend to abandon sites. Therefore, any disturbance of nesting or molting birds is considered to be a major effect.
Analysis of Impact:	
The action that causes something to happen:	Under alternative A motorized vessel use would be eliminated from all sensitive seabird/waterfowl habitat in the Beardslee Islands, Adams Inlet, and Skidmore Bay.
This is what happens	Eliminating motorized vessel use would ensure that seabirds and waterfowl would be able to use this habitat for molting, nesting, and feeding without the disturbances caused by motorized vessels and associated onshore human activity.
This is the effect on the resource evaluated in terms of quality of impact, context, intensity, and duration	This action would result in a major beneficial effect on these species. The current populations would be perpetuated over the long term in all the identified habitat areas. This is especially important because the park provides the last large uninterrupted stretch of seabird and waterfowl habitat in the region.

Mitigation Measures

Mitigating measures are defined as constraints, requirements, or conditions imposed to reduce the significance of or eliminate an anticipated impact to environmental, socioeconomic, or other resource values from a proposed action. The CEQ regulations define mitigation measures in 40 CFR 1508.20 as

- (a) avoiding the impact altogether by not taking a certain action or parts of an action

- (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation
- (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment
- (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action
- (e) compensating for the impact by replacing or providing substitute resources or environments

A GMP/EIS or EA must include and analyze mitigation measures “even for impacts that by themselves would not be considered significant.” All “relevant, reasonable mitigation measures that could improve the project are to be identified,” even if they are outside the jurisdiction of the National Park Service. These measures usually are listed at the end of the alternatives chapter so that impacts are evaluated based on the mitigated alternatives. In other words, in analyzing environmental impacts, it is assumed that all of the proposed mitigation measures would be followed. The impact analysis should also examine the effectiveness of the mitigation measures.

Some mitigation measures may be specific to one alternative, while others may apply to all of the action alternatives. A number of mitigation measures that are commonly used in GMPs are included in Appendix I.3.

An important caution should be kept in mind when identifying GMP mitigation measures in an EIS or EA. Both RODs and FONSI s must identify the mitigation measures that will be implemented along with the selected alternative. A ROD or FONSI is, in some respects, a “contract” with the public, committing the agency to implementing the mitigation measures and to monitoring the results. Therefore, it is important that the agency consider budgetary projections when making this commitment. In other words, a planning team should only include a mitigation measure if it is going to be implemented by a park staff. If a mitigation measure were identified, but not followed, it could call into question the validity of the environmental analysis and possibly open the GMP to legal challenge.

Cumulative Effects

For a cumulative impact analysis the focus is on the impacts of past, present, and reasonably foreseeable future actions that are outside the scope of the plan. To understand how cumulative impacts are determined, it is helpful to think of a formula: $x+y=z$. In the cumulative analysis, x is the impact on the resource of the proposed action alone; y is the impact on the resource of other past, present, and reasonably foreseeable actions; and z is the total (or cumulative) impact when all the impacts from all of these actions are combined.

The cumulative effects analysis should include the following elements:

- A description of the other past, present, and reasonably foreseeable actions that could affect the resource (i.e., other than those actions within the scope of the plan/project) — These include NPS management actions that are occurring

outside the scope of the GMP, such as the reintroduction of an endangered species or ongoing maintenance of a road.

- A description of the impact of the past, present, and reasonably foreseeable action or actions on the resource — The impacts should be quantified whenever possible and interpreted in terms of overall intensity.
- A summary of the effects that the action alternative alone would have on the specific resource
- A description of the cumulative effects on the resource — the overall intensity of the impacts when the impacts of the past, present, and foreseeable actions are combined with the impacts of the action alternative. It is important to state how much the action alternative contributes to the overall cumulative impact intensity. In many cases an alternative action will add a very small incremental impact (beneficial or adverse) to what is already happening to a resource; that is, the impacts of the action alternative will make only a small contribution to the overall beneficial or adverse cumulative impacts.

It is often difficult to identify the cumulative impact when considering multiple actions, particularly if there are varying beneficial or adverse impacts on a resource. In these situations, identifying the cumulative impact becomes a judgment call backed up by clearly stated assumptions.

TABLE 10.3: EXAMPLE OF A CUMULATIVE IMPACT

Cumulative Impact	Past actions outside the park have resulted in extremely fragmented seabird and waterfowl nesting habitat. The local community development plan calls for an increase in beach development for recreational activities, resulting in further loss of waterfowl nesting habitat throughout the region. Adding the major detrimental impacts of past and projected future developments on waterfowl nesting habitat plus the major positive effect of eliminating motorized vessel use in the park would result in an overall minor, adverse, long-term, cumulative impact.
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In analyzing cumulative impacts for a GMP, planning teams should develop a cumulative impact scenario, which is presented at the beginning of the environmental consequences chapter. This scenario should identify which past, present, and future actions are being considered in the analysis. The scenario should also distinguish between NPS actions that are occurring (or will occur) independently of the GMP (e.g., an approved road rehabilitation project) and those that are due to non-NPS actions, either within or outside the park (e.g., actions, projects, or plans of governmental agencies, adjacent landowners, businesses).

Appendix I.2 includes some additional general considerations in analyzing cumulative impacts, and an example of the *Great Sand Dunes Draft GMP/Wilderness Study/EIS* cumulative impact scenario and the analysis of one impact topic for the preferred alternative.

Impairment Determination

The National Park Service Organic Act of 1916 states that the service

shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified . . . in such manner and by such means as will leave them unimpaired for the enjoyment of future generations

In addition to avoiding impairment, NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give NPS managers discretion to allow certain impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, so long as the impacts do not constitute impairment of the affected resources and values.

The NPS *Management Policies 2006* leave the determination of impairment to the responsible park manager and direct that an action should be considered to constitute impairment if, in the manager's professional judgment, the action "would harm the integrity of the park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values." The policies further state (sec. 1.4.5) that determining whether an impact meets this definition (i.e., would harm the integrity of the park resources or values) depends on all of the following:

- the particular resources and values that would be affected
- the severity, duration, and timing of the impact
- the direct and indirect effects of the impact
- the cumulative effects of the impact in question along with other impacts that are in existence

An impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation meets one or more of the following criteria:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park
- key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park
- identified in the park's GMP or other relevant NPS planning documents as being of significance

An impact would be less likely to constitute impairment if it is an unavoidable result (which cannot reasonably be further mitigated) of an action necessary to preserve or restore the integrity of park resources or values.

Impairment may occur from visitor activities; NPS activities in the course of managing a park; activities undertaken by concessioners, contractors, and others operating in the park; or as a result of external actions. Impairment can occur from inaction as well as action. Impairment decisions also need to be put into context. This means considering the action within the context of the purposes for which the park was established and the desired future conditions. One should also consider existing

conditions in the park, the relative impacts from activities within and outside the park, and the incremental and cumulative effect of potential impacts from a proposed or ongoing activity.

The characterization of impacts as negligible, minor, moderate, or major provides a basis for assessing whether the impact is likely or not likely to result in an impairment of park resources or values. Not all major or significant impacts under a NEPA analysis are impairments. However, all impairments to NPS resources and values would constitute a major or significant impact under NEPA. If an impact would result in impairment, the action must be modified to lessen the impact level. If the impairment cannot be avoided by modifying the proposed action, that action cannot be selected for implementation and should be dropped from further consideration.

The DO-12 Handbook requires that park planning documents present impairment findings in the environmental consequences section of the NEPA document. At the end of the discussion of impacts for each environmental resource affected by each alternative, a brief conclusion section should summarize all major findings, including whether or not resource impairment is likely to or would occur. The rationale for the impairment finding should also be included in the NEPA document. In addition, an overall impairment finding should be provided for each alternative.

The document *Interim Technical Guidance on Assessing Impacts and Impairment to Natural Resources* (NPS 2003b) provides considerable detail about impairment background, methods, tools, applicable laws and regulations, and impact and impairment examples. Specific information is provided for biological resources, watersheds, air resources, lightscapes, soundscapes, geological resources, and ecosystems. The interim impairment guidance is available at <http://www2.nrintra.nps.gov/ard/docs/nrimpaiement.pdf>. The NPS website (www.nps.gov/protect) also contains information on impairment.

GMP alternatives should not contain actions that would or could result in impairment to a park's resources or values. The planning team typically should state that any impacts that do occur would not be at a level that would constitute an impairment of the park's resources and values. However, the issue of possible impairment may not always be clear cut and may vary from case to case. It is recommended that if questions arise on this topic then the regional environmental coordinator and/or the WASO-Environmental Quality Division be consulted.

Unacceptable Impacts

The impact threshold at which impairment occurs is not always readily apparent. Therefore, the NPS *Management Policies* 2006 (sec. 1.4.7.1) provided an approach to help ensure that impairment will not occur. This section of the policies provides guidance on unacceptable impacts:

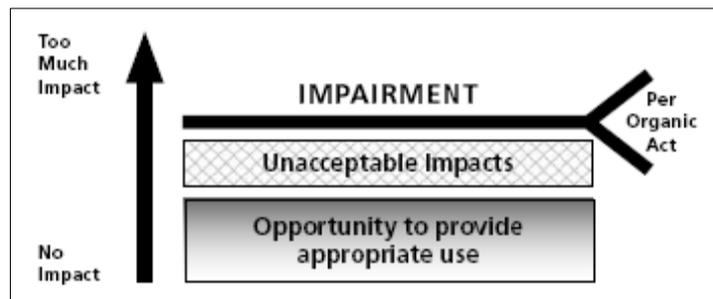
These are impacts that fall short of impairment, but are still not acceptable within a particular park's environment. Park managers must not allow uses that would cause unacceptable impacts; they must evaluate existing or proposed uses and determine whether the associated impacts on park resources and values are acceptable.

Virtually every form of human activity that takes place within a park has some degree of effect on park resources or values, but that does not mean the impact is unacceptable or that a particular use must be disallowed. Therefore, for the purposes of these policies, unacceptable impacts are impacts that, individually or cumulatively, would

- ▶ be inconsistent with a park’s purposes or values, or
- ▶ impede the attainment of a park’s desired future conditions for natural and cultural resources as identified through the park’s planning process, or
- ▶ create an unsafe or unhealthful environment for visitors or employees, or
- ▶ diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values, or
- ▶ unreasonably interfere with
 - park programs or activities, or
 - an appropriate use, or
 - the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park.
 - NPS concessioner or contractor operations or services

The following graphic illustrates the relationship between appropriate use, unacceptable impacts and impairment.

FIGURE 10.1: MANAGING FOR RESOURCE CONSERVATION



Conclusions

At the end of the discussion of impacts for each resource impact topic, a brief conclusion should summarize the impact and cumulative impact to the resource (e.g., “During the summer season, the alternative would have localized, short-term, moderate, impacts on Dall sheep, which when added to other ongoing and projected impacts would constitute regional short-term moderate impacts.”). The conclusion should also include a statement about whether the alternative would impair park resources and values. Statements in the conclusion should be supported by the evidence presented in the analysis; no new information should be brought in that is not already included in the analysis, although the conclusion may interpret impacts.

TABLE 10.4: EXAMPLE OF A CONCLUSION STATEMENT

Conclusion	This alternative would have a long-term, major, beneficial effect on sensitive seabird and waterfowl habitat in the region. This beneficial effect would be partially offset by the regional negative effects on this habitat. However, the net effect would be an increase in the amount of sensitive seabird/waterfowl habitat in the region and the provision of the only large uninterrupted stretch of such habitat in the region. No impairment of seabird/waterfowl habitat would result from this alternative.
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10.3.2 Scientific Data and Other Information

The Thomas Bill requires that data from scientific study be used for all park management decisions, including those in a GMP/EIS.

The Secretary shall take such measures as are necessary to assure the full and proper utilization of the results of scientific study for park management decisions. In each case in which an action undertaken by the Park Service may cause a significant adverse effect on a park resource, the administrative record shall reflect the manner in which unit resource studies have been considered.

Title II, Section 206, of the Thomas Bill (PL 105-391)

This is not just the law; it is good planning. Analysts should strive to make a reasoned connection between technical and scientific information and final agency action.

Ideally the data used for impact analyses in a GMP/EIS will be specific to the park; however, this is not always possible. Therefore, the analysis must often rely on data from studies conducted in similar areas or for similar situations. A literature search will produce a list of studies with findings that may be relevant to the GMP/EIS analysis. Appendix L provides a comprehensive overview of the kinds of data needed to support various kinds of planning, including general management planning, along with potential data sources.

Data also may be available for certain parts of a park but not for the entire unit. In this situation, the analysts should explain what is known about the impacts of an action in a particular area or section of the park based on existing research, then extrapolate to the entire park. For example, if research has shown that hikers are displacing moose from the Hidden Valley area of Victory National Park, it may be assumed for analysis purposes that moose are also being displaced by hikers in other valleys within the park that have similar vegetation/terrain and levels of hiker use.

Analysts should coordinate with natural and cultural resource managers to incorporate results of inventory and monitoring and to ensure that where useful and credible data have been collected and analyzed, they are applied in planning and impact analysis. Even if information necessary to analyze impacts is incomplete or unavailable, or the costs of obtaining it are exorbitant, CEQ regulations still require agencies to make a good faith effort in conducting an analysis by requiring the agencies to take the following steps (40 CFR 1502.22):

- state that such information is incomplete or unavailable

- state the relevance of that information to evaluating reasonable foreseeable significant adverse impacts on the human environment
- summarize existing credible scientific evidence which is relevant to evaluating such impacts
- evaluate such impacts based on theoretical approaches or research methods generally accepted in the scientific community

“Existing credible scientific evidence” can include data collected from monitoring the results of past actions. For example, if certain areas of a park have been closed in the past to visitor use (for safety or resource protection purposes), the findings from monitoring that situation can be used to support an analysis of impacts for similar closures proposed in the GMP/EIS. Even if no formal monitoring has been conducted, it may be possible to use anecdotal information from park staff about the effect of the existing closures.

The author(s) of the resource analysis sections of the GMP/EIS or EA should be subject matter experts. If it is not possible to have subject matter authors for all relevant topics, each analyst should meet one-on-one with park, region, and subject matter experts to discuss and determine significant impacts and other analysis information. For particularly complex or potentially significant impacts, time should be provided for peer review of the analysis by respected scientists and others with a good understanding of the resource topic. Relevant subject matter experts should have adequate opportunity to review the analysis text and provide comments.

It is important to cite the source of the data and to provide references in the GMP/EIS bibliography, even if the data are simply anecdotal observations from park staff or others.

10.3.3 Making Assumptions for the Purpose of Analysis

It is important to describe major assumptions that have been used to determine impacts.

[A]ssumptions must be spelled out, inconsistencies explained, methodologies disclosed, contradictory evidence rebutted, record references solidly grounded, guesswork eliminated, and conclusions supported in a “manner capable of judicial understanding.”

E.I. duPont de Nemours & Co. v. Train, 430 US 112 (1977)

Assumptions should be spelled out, including changes in visitor demographics, trends in popularity of various visitor activities, expected changes in technology (e.g., increase of four-stroke snowmachines over two-stroke snowmachines), possible climate and ecosystem changes as a result of global warming, etc.

For NPS GMPs, a key assumption is that the desired conditions described for each of the management zones, and the related indicators and standards, will be met or maintained. Where existing conditions do not match desired conditions or standards, a further assumption is that management will take action to remedy this.

For programmatic GMP analyses, assumptions also must be made regarding the geographic and temporal boundaries for analysis for each resource. These considerations are described under section “10.2. The Affected Environment”).

Assessing the risk of an action occurring that might have significant environmental effects (e.g., a fuel spill) also involves making assumptions. The probability of such an event occurring cannot be precisely stated and, thus, must be based on the assumptions of experts; these assumptions should be made clear in the methodology section of the analysis.

Before the planning team begins to write their impact analysis sections, it is a good idea for the team to create a list of the major assumptions that everyone should use — such as whether visitor use or a certain type of visitor activity is increasing or decreasing.

The 2005 Denali *Backcountry Management Plan / EIS* includes a good discussion of the assumptions that were used to determine impacts (see archived projects at <http://parkplanning.nps.gov/parkHome.cfm?parkId=9>).

10.3.4 Tools and Methodology for Impact Analysis

The CEQ “Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act” stipulate that

Agencies shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement.

—“Methodology and Scientific Accuracy” (40 CFR 1502.24)

The CEQ manual, *Considering Cumulative Effects under the National Environmental Policy Act* (CEQ 1997), provides several methods for analyzing cumulative effects. Although the manual focuses on the analysis of cumulative effects, many of the methods are also applicable to the analysis of individual direct and indirect impacts of a GMP alternative. Those that are most relevant to the analysis of direct and indirect impacts in a GMP/EIS or EA are presented below.

The level and type of analysis completed by a planning team depends on the park; the issues and impact topics; the degree of controversy; and the time, funds, and expertise available to the planning team. The analysis methods commonly used by a GMP planning team include discussions with park staff and other experts, literature searches, and GIS analysis. The other methods listed below have been used less frequently for GMPs or not at all, but can also provide useful information. For additional information on these methods and examples of their use by multiple agencies, refer to Appendix A in the CEQ manual.

Analysis methods should be developed and tested early in the planning process, as the information they provide may be used to develop and modify alternatives, as well as to predict impacts. (See section “7.1. Information and Analysis Needed before Alternative Development.”)

Questions, Interviews, and Panels

Simple brainstorming of experts and other interested parties can be an effective technique for identifying potential effects. Information gathering can be expanded to include structured interviews with key opinion leaders, indigenous peoples, and technical experts.

A common feature of information gathering and strategizing is the use of a multi-disciplinary panel of experts. These panels can bring consensus to subjective judgments and are useful for designing the assessment method, evaluating the significance of effects, and comparing alternatives. The Delphi method, fuzzy set models, and panels are all examples of this method.

Overlay Mapping and GIS

Overlay mapping and GIS technology incorporate location information into effects analysis. Simple mapping characterizes the spatial aspects of natural and cultural resources, ecosystems, cultural landscapes, and human communities and helps set the boundaries of the analysis. Any number of resource data and zoning layers can be overlaid to determine what resources would be affected by an action in the alternative. Overlay mapping can directly evaluate effects by identifying areas where effects will be greatest. Mapping and GIS technology can also address concerns that are difficult, if not impossible, to address with other methods, such as landscape connectivity. Using GIS technology enables planners to determine the acreage of areas within management zones, and/or the acreage of areas affected by general actions (e.g., areas being proposed for wilderness in an alternative or the acreage of the park open or closed to the public, or open with restrictions).

A common map overlay approach combines thematic maps of different landscape features to rate areas or resources as to their suitability for development (“opportunities”) or risk from degradation (“constraints”). Suitability ratings can be used to express the responses of resources, ecosystems, and human communities in the absence of more sophisticated quantitative cause-and-effect models. Examples of overlay mapping can be found in the GMPs for Zion NP, Olympic NP, Hovenweep NM, Abraham Lincoln Birthplace NHS, and Colorado NM.

Trends Analysis

A trends analysis assesses the status of resources, ecosystems, and human communities over time and usually results in the graphical projection of past or future conditions. Changes in the occurrence or intensity of stress over time can also be determined.

A trends analysis can identify historical cause-and-effect relationships between stresses (actions) and resources or ecosystems. Common effects relationships can be used to predict future effects whenever the environmental conditions are similar. Historical trends may also reveal threshold points where effects become significant or qualitatively different.

Changes in the condition of resources or ecosystems can be illustrated in both simple and complex forms. A simple trends analysis might produce a line graph showing decreasing numbers of animals from annual surveys. Changes in habitat patterns might be illustrated with a series of figures, or in a three-dimensional graphic where the amount of change is portrayed on the vertical axis. Video simulations can be used to show complex changes in geographic or aesthetic resources. Time-series information from aerial photographs and satellite imagery are increasingly available for trends analyses across the United States.

Modeling

Modeling is a powerful technique for quantifying the cause-and-effect relationship leading to environmental effects. Developing project-specific models requires substantial resources and time. For this reason, effects analyses will most often use or modify existing models. The lack of baseline data or project-specific data also can limit the use of sophisticated models. Nevertheless, modeling holds considerable promise for analyzing impacts. In general, the use of models requires that an agency invest in (1) developing a given model or technique, or (2) obtaining baseline data for use in an existing model. Examples where effects are routinely modeled include

- hydrologic regime models
- soil erosion models
- sediment transport models
- species habitat models
- regional economic models
- visitor use simulation models

Models that are easily defended and generally recognized in the scientific community form the basis for most practical work under NEPA, while more sophisticated models are used on a case-by-case basis. For reader understanding, the underlying assumptions behind a model must be made explicit.

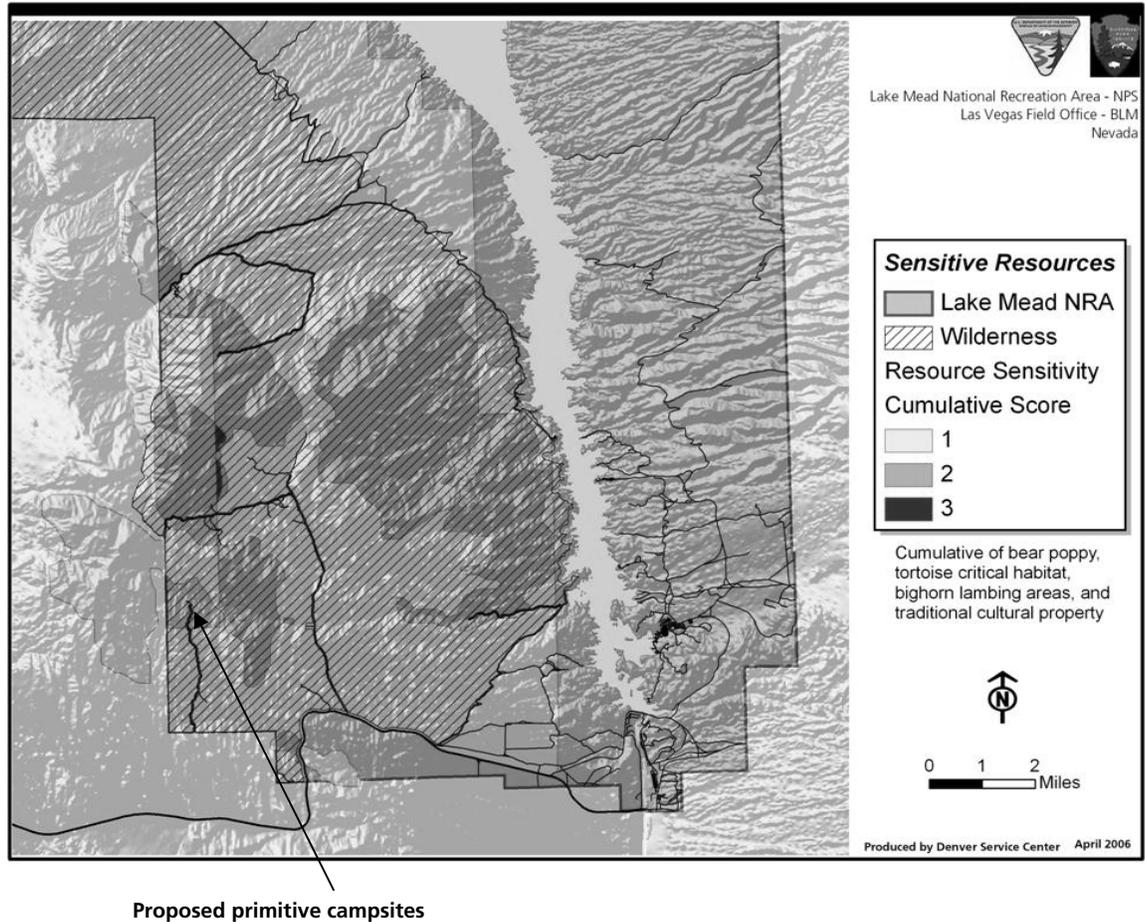
For GMPs models may be useful to analyze the impacts of allocating management zones and other GMP actions. To do this, the park could develop a model that incorporates known and assumed information about visitor use patterns and then use this model to predict the changes in use based on the alternative zone allocations and actions.

GIS and Modeling

GIS technology should be used to conduct modeling to predict and quantify potential impacts to such resources as vegetation, wildlife habitat, and cultural resources. Such “what if” modeling can be invaluable when determining the environmental consequences of proposed actions. Areas of potential impact can be delineated and the size calculated. In the hypothetical example shown below, proposed campsites would occur in designated wilderness and in an area that has two sensitive resources.

Thus the impacts of this development would have to be carefully analyzed or a different location chosen.

FIGURE 10.2: EXAMPLE OF USING GIS TO MODEL IMPACTS



GIS can be used to create viewsheds and conduct viewshed impact analysis. This technique identifies what can be seen from a specific observation point in all directions, along a linear feature such as a trail, or along a line between two points.

Table 10.5 indicates other modeling that can be done to analyze impacts of a specific development or an alternative.

TABLE 10.5: EXAMPLES OF GIS IMPACT ANALYSIS MODELS

Analysis	Possible Inputs
Indicate potential impacts on suitable habitat for sensitive species	Habitat delineations
Indicate anticipated visitor circulation patterns and possible congestion points	Roads, trails, attraction points, entrance and egress to an area
Impacts on resources from development	Soils, slope, floodplains, sensitive resources
Illustrate impacts on a viewshed from proposed development	Digital Evaluation Model (DEM), viewpoint data

Ecosystem Analysis

An ecosystem or watershed approach to environmental analysis can demonstrate the interconnectedness of park resources and values. Ecosystem principles involve three basic concepts: (1) taking a “big picture” or landscape-level view of ecosystems; (2) using a diverse suite of indicators, including community-level and ecosystem-level indices; and (3) addressing the myriad interactions among ecological components that are needed to sustain ecosystem functioning.

Constructing precise models of ecosystem structure and function usually exceeds the capabilities of NEPA practitioners. However, considerable progress has been made in applying the principles of ecosystem analysis to analyzing effects by extending considerations beyond species to the ecosystem and by looking at landscape-scale processes such as habitat fragmentation, watershed processes, abundance or density of habitats, habitat proportion, patch size and perimeter-to-area ratios, amount of edge, etc.

Social Impact Analysis

Social impact analysis deals with the social meanings of a change from the different perspectives of various affected groups. One method of measuring the social meaning of a change is to formally or informally tap the knowledge of opinion leaders within an affected group, such as American Indians or others with cultural ties to an area, to determine the values they assign to each change. Ethnographers can be very useful in conducting social impact analyses.

10.3.5 Sustainability, Long-Term Management, and Impact Analysis

Considerations of the long-term impact and the effect of foreclosing future options should also be addressed in a GMP/EIS because these are ideas that Congress put forward as the purpose of both NEPA (sec. 101(b)) and the NPS Organic Act. The environmental consequences section of each alternative must also include a section that focuses on the following discussions. (Note: This requirement applies to an EIS, but not to an EA.)

The Relationship between Local Short-Term Uses of the Environment and the Maintenance and Enhancement of Long-Term Productivity (NEPA 102(c)(iv))

This section explores whether any long-term management possibilities, or the productivity of park resources, are being traded for the immediate use of land. Will taking action in this case in combination with other actions have an impact on a particular ecosystem? Is the action being taken something that will affect future generations — is it a sustainable action that can continue over the long-term without environmental problems?

Any Irreversible and Irretrievable Commitments of Resources (NEPA 102(c)(v))

An impact is irreversible if it cannot be changed over the long term or is permanent. An effect is irreversible if the resource cannot be reclaimed, restored, or otherwise returned to its condition prior to disturbance. For example, a proposal to rehabilitate a cultural feature (building) involving construction adjacent to habitat for nesting birds may have irreversible impacts on the birds if they abandon the nests and do not return to nest. An irretrievable commitment of resources is a loss of something that, once gone, cannot be replaced. Some cultural resource specialists prefer the term irretrievable over irreversible when describing impacts to cultural resources. For example, if the park chose to avoid potential irreversible impacts to the birds, and deterioration of the building continued, the loss of the building's cultural significance and integrity would be irretrievable (something that could not be returned, or retrieved, in the future). It is less important to worry about the "right" category than it is to be thorough in the disclosure to the public of any long-term, permanent effects to park resources.

Following are two more examples of discussions of irreversible and irretrievable commitments of resources:

TABLE 10.6: EXAMPLES OF IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Sequoia/Kings Canyon NP GMP/EIS
<p>The loss of soils and wildlife habitat would continue, primarily in areas of concentrated use and development. Limited amounts of nonrenewable resources from local previously impacted areas, such as rock, would be reused in park operations and construction projects.</p> <p>Cultural resources that were removed or allowed to molder would be irreversible and irretrievable. Decisions related to the method of removal or treatment would be determined in consultation with the state historic preservation officer, and all resources would be fully documented as a mitigation strategy.</p> <p>The removal of some hydroelectric facilities would result in the irreversible and irretrievable loss of historic facilities associated with the Kaweah no. 3 hydroelectric power generation system.</p>
Dry Tortugas NP GMP/EIS
<p>Although the risks of resource impacts would be further reduced by the management actions proposed under this alternative, instances of irreversible or irretrievable commitments of natural or cultural resources might occur. For example, removing artifacts from a shipwreck or disturbing significant associated archeological resources would compromise the information potential of the site and result in an irreversible commitment of resources. Significant sites contain unique data that cannot often be replicated or recovered once lost or disturbed.</p> <p>Proposed management actions would contribute to resource protection and preservation and would be expected to minimize the occurrence of irreversible or irretrievable impacts.</p> <p>Limited amounts of nonrenewable resources would be used for construction projects and park operations, including energy and materials. These resources would be basically irretrievable once they were committed.</p>

Any Adverse Impacts that Could Not Be Avoided (NEPA 102(c)(ii))

If the action will result in major impacts that cannot be fully mitigated or avoided, these impacts should be described in this section. Focus this section on major impacts.

10.3.6 GMPs and Section 106 of the NHPA

Section 106 of the NHPA (16 USC 470 et seq.) requires federal agencies to take into account the effects of their actions on historic properties and to afford the appropriate state historic preservation officer (SHPO) or tribal historic preservation officer (THPO), as well as the Advisory Council on Historic Preservation (ACHP) as necessary, a reasonable opportunity to comment on those actions before they are implemented. Historic properties are properties that are listed on the National Register of Historic Places or that meet the criteria for listing. In the National Park Service historic properties are cultural resources classified as archeological resources, prehistoric or historic structures, cultural landscapes, and ethnographic resources.

The consultative and review process mandated by section 106 is outlined in ACHP regulations issued in “Protection of Historic Properties” (36 CFR 800). According to the regulations, the section 106 process

seeks to accommodate historic preservation concerns with the needs of Federal undertakings through consultation among the agency official and other parties with an interest in the effects of the undertaking on historic properties, commencing at the early stages of project planning. The goal of consultation is to identify historic properties potentially affected by the undertaking, assess its effects and seek ways to avoid, minimize or mitigate any adverse effects on historic properties

—36 CFR 800.1[a]

The section 106 regulations do not require that historic properties be preserved, but the regulations do require that their historic or prehistoric values be considered in weighing the benefits and costs of implementing federal actions in order to determine what is in the public interest. The goal of the section 106 process is to make sure that historic preservation is fully considered in all federal actions, and the practical effect of the regulations is to encourage agencies to seek ways to avoid or minimize harm to historic properties.

The section 106 process provides a forum for consultation and discussion. The process for review and consultation should not be seen as a method for seeking approval for a planning direction, but rather as a mechanism for helping formulate one. Because the section 106 process is intended to facilitate decision making, the National Park Service must consult with knowledgeable and concerned parties outside the agency about its proposed actions, and it must recognize historic properties important to local communities as well as to the nation as a whole.

Under NEPA federal agencies also have broad responsibilities to identify the potential impacts of their proposed actions on the human environment, which includes historic properties. Although NEPA and the NHPA are separate authorities, the section 106 process encourages federal agencies to coordinate section 106 compliance with NEPA requirements. As a result, the general management planning team should determine its obligations under section 106 as early as possible in the general management planning process. The team should plan appropriately for agency and public involvement, identify historic properties and their significance, and analyze potential impacts to historic properties in such a way that the purposes and requirements of both statutes can be fulfilled in a timely and efficient manner.

If during either the analysis of potential impacts to historic properties or consultations with the SHPO or THPO and associated Indian tribes, the potential impacts to historic properties are identified as adverse, the planning team should identify measures in the GMP to avoid, minimize, or mitigate such impacts. A binding commitment to such mitigation must be incorporated in the ROD or FONSI, and a memorandum of agreement or programmatic agreement for purposes of section 106. Because the ROD or FONSI cannot be signed without knowledge of potential impacts to cultural resources and the identification of appropriate mitigation measures, consultations with the SHPO or THPO and the ACHP regarding the GMP must be complete prior to its signing.

Suggested Tools and Methodology for Integrating NHPA Section 106 Requirements with NEPA

Following the steps outlined below is an effective way to integrate NHPA section 106 requirements with NEPA, and to ensure that the planning team fully meets NPS obligations under both section 106 and NEPA.

Suggested Tools	Methodology
<input checked="" type="checkbox"/> At the outset of the GMP process, request from the SHPO or THPO known information on historic properties in the park, and solicit any preservation concerns from the SHPO, THPO, and ACHP.	Consultation should be undertaken as early as possible in the planning stages of every GMP. The GMP process should also include, at a minimum, opportunities for the SHPO or THPO to provide information and raise concerns during the issues analysis phase and during the development of preliminary alternatives. Site visits may also be helpful.
<input checked="" type="checkbox"/> Consult with Indian tribes, local governments, and the interested public.	<p>The planning team should be especially mindful of consulting with traditionally associated peoples (those whose cultural systems or ways of life are associated with park resources and values, and they predate park establishment). Traditionally associated peoples may include park neighbors, traditional residents, and former residents who remain attached to the park area despite having relocated. Examples of traditionally associated peoples include American Indians in the contiguous 48 states, Alaska Natives, African Americans at Jean Lafitte, Asian Americans at Manzanar NHS, and Hispanic Americans at Tumacacori NHP.</p> <p>Consultation is an exchange of ideas, not simply an exchange of information. It is the process of seeking, discussing, and considering the views of others and, where feasible, seeking agreement with them on how historic properties should be identified, considered, and managed. Thus, it should be initiated early in the planning process. Also, consultation should encompass the broader effort to maintain ongoing communication with all public and private entities who are interested in or affected by the park's historic preservation activities.</p>

Suggested Tools	Methodology
<input checked="" type="checkbox"/> Ensure that the most current information is available to inform decision making.	The identification and understanding of historic properties is an ongoing process. As time passes, events occur or scholarly and public thinking about historical significance changes. Thus, even if a park was completely surveyed for historic properties of all types in the past, the prehistoric or historic values of those properties may require reconsideration if many years have passed since the survey was completed. It may be necessary to re-evaluate historic properties based upon new or changed information.
<input checked="" type="checkbox"/> Determine in consultation with the SHPO or THPO if there is enough information available to complete section 106 consultation during the GMP process or if additional consultation will be required.	<p>Generally, a timely point to confer with the SHPO or THPO about individual actions in a GMP is during the development of preliminary alternatives. The proposed actions can then be categorized according to whether there is sufficient information to complete the section 106 process or whether further consultation after approval of the GMP will be required due to insufficient information. If the planning team has adequately identified and evaluated historic properties, and sufficient information is available to adequately apply the criteria of effect and adverse effect in the ACHP regulations (36 CFR 800.5), consultation on a given action can be completed during general management planning; the final GMP then includes documentation of this consultation.</p> <p>Due to the increasingly conceptual nature of GMPs, specificity regarding the identification and treatment of historic properties, as well as the potential impacts to such properties, may be lacking; the GMP team may be unable to complete section 106 consultations for many, if not most, of the actions described in the plan. Therefore, the final GMP should also include a list of the proposed actions on which further consultation is necessary, and the stage of future planning where further consultation is likely to occur. Because different SHPOs and THPOs prefer to see such information provided in different formats, the planning team should check with the appropriate SHPO or THPO before spending a lot of time on detailed charts and analyses.</p> <p>If major changes occur after release of the draft GMP/EIS, such as the development of a new preferred alternative, the planning team must confer with the SHPO or THPO and ACHP about those changes before preparing the final EIS.</p>
<input checked="" type="checkbox"/> Include a statement in the affected environment on the status of the park's cultural resource inventory and needs for additional cultural resource information, plans, or studies required before any action can be implemented.	Incomplete or unavailable information should be discussed in accordance with the guidance provided under section "10.3.2. Scientific Data and Other Information."

Special Planning Considerations for Potential Adverse Effects to National Historic Landmarks

A national historic landmark (NHL) is a place where significant historical events occurred, where prominent Americans worked or lived, that represent those ideas that shaped the nation, that provide important information about our past, or that are outstanding examples of design or construction. Such a landmark is designated by the secretary of the interior for its exceptional value or quality in illustrating or interpreting the heritage of the United States.

The NHPA (sec. 110(F)), the ACHP regulations (36 CFR 800), and the NPS *Management Policies 2006* require that special consideration be given to NHLs during planning and that steps be taken to minimize any harm to NHLs to the maximum extent possible. More specifically, the NPS *Management Policies 2006* (sec. 5.2) state that when proposed undertakings may adversely affect national historic sites, national battlefields, and other predominantly cultural units of the national park system that were established in recognition of their national historical significance, superintendents will provide opportunities for the same level of review and consideration by the ACHP and the secretary of the interior that the ACHP regulations require for undertakings that may adversely affect national historic landmarks (36 CFR 800.10). For a park that is a national historic site or national battlefield, or that was established primarily for its national historical significance, or that contains a NHL, the planning team should make every attempt to minimize harm to the relevant cultural resources by consulting broadly before developing GMP alternatives. If it appears that any or all of these alternatives may have an adverse effect on such resources, the superintendent must take the following steps:

- Notify the relevant regional director of consultation underway related to the NHL, etc.
- Determine if the proposed alternative constitutes impairment in accordance with the NPS Organic Act and the provisions of NPS *Management Policies* (see www.nps.gov/protect).
- Forward the proposed alternative and impairment determination to the regional director for review and comment, prior to initiating consultation under 36 CFR 800 with the applicable SHPO/THPO and the ACHP.
- Together with the regional director, identify and select, where feasible, alternatives to avoid or minimize potential adverse effects or eliminate impairment. The analysis of these alternatives must focus on actions that will minimize harm to the NHL and advance a preservation outcome, to the maximum extent possible.

When the superintendent and the regional director agree on an alternative that avoids adverse effects and does not constitute impairment, the superintendent will proceed to consult with the SHPO/THPO in accordance with 36 CFR 800 and the current “Servicewide Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers.”

If the SHPO and/or THPO does not concur with the NPS finding of *no adverse effect*, the superintendent shall notify the regional director; the NPS federal preservation officer (FPO), who is usually the regional associate director for cultural resources; and the ACHP in accordance with 36 CFR 800.10(b).

If the superintendent and the regional director cannot identify an alternative that would avoid an adverse effect and/or impairment, they shall notify the FPO and continue to consult to identify alternatives to avoid or minimize potential adverse effects or eliminate impairment. If no alternative can be identified to eliminate the determination of impairment, the alternative shall not proceed; the FPO shall notify the director of this outcome.

If an alternative is identified that eliminates the determination of impairment, the FPO shall notify the director of the intent to proceed with consultation with the applicable SHPO/THPO and the ACHP on the finding of an effect or an adverse effect. Unless the director objects, the superintendent will proceed with consultation in accordance with 36 CFR 800. If the SHPO/THPO or the ACHP disagrees with the proposed mitigation, the superintendent will consult with the regional director, FPO, and director on an appropriate response. If consultation results in development of a memorandum of agreement, the superintendent will submit the document to the regional director, the FPO, and the director for review and comment. Execution for the National Park Service of the final memorandum of agreement shall be by the director. The superintendent must provide copies of all project communications to the regional director and the FPO.

Adverse Impacts to Historic Properties and Potential Impairment of Park Resources and Values

The ACHP regulations (36 CFR 800.5(a)(1)) define an adverse impact to a historic property as one that may

alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the national register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the national register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

Not every adverse impact results in impairment, only those adverse impacts that meet one of the criteria for impairment (see the discussion of impairment in section 10.3.1).

Reference: *The DO-12 Handbook* (sec. 2.7.D and 4.5.E.9).

10.4 FORMATTING THE ENVIRONMENTAL CONSEQUENCES CHAPTER

There are a number of ways to format the environmental consequences chapter of a GMP/EIS. One of the most effective ways, in keeping with the CEQ regulations, is to

organize the impacts by alternative then by topic. Another common way is to organize the information first by impact topic, then by alternative. This approach is more useful when there are relatively few differences in impacts among the alternatives, eliminating unnecessary duplication of text. Both approaches are shown in Table 10.7

TABLE 10.7: TEMPLATES FOR THE ENVIRONMENTAL CONSEQUENCES CHAPTER

Impacts by Alternative	Impacts by Topic
Methodology for Analyzing Impacts and Impact Thresholds Impact Topic 1 Methodology for Analyzing Impacts Impact Thresholds Impact Topic 2 Same as above Alternative A Impact Topic 1 Analysis of Direct and Indirect Impacts Analysis of Cumulative Impacts Conclusion and Impairment Finding Impact Topic 2 Analysis of Direct and Indirect Impacts Analysis of Cumulative Impacts Conclusion and Impairment Finding Relationship between Local Short-Term Uses and Long-Term Productivity Irreversible or Irretrievable Commitments of Resources Adverse Impacts that Cannot Be Avoided Alternative B Same as above Alternative C Same as above	Impact Topic 1 Methodology for Analyzing Impacts Impact Thresholds Alternative A Analysis of Direct and Indirect Impacts Analysis of Cumulative Impacts Conclusion and Impairment Finding Alternative B Analysis of Direct and Indirect Impacts Analysis of Cumulative Impacts Conclusion and Impairment Finding Impact Topic 2 Same as above Relationship between Local Short-Term Uses and Long-Term Productivity Alternative A Alternative B Irreversible or Irretrievable Commitments of Resources Alternative A Alternative B Adverse Impacts that Cannot Be Avoided Alternative A Alternative B

Further Sources of Information:

CEQ, “Regulations for Implementing the National Environmental Policy Act” (40 CFR 1500-1508), “The 40 Most Asked Questions Concerning CEQ’s National Environmental Policy Act Regulations,” and *Considering Cumulative Effects under the National Environmental Policy Act* (1997)

National Park Service, *The DO-12 Handbook* (2001b)

Shipley Associates, *How to Write Quality EISs and EAs* (1992)

10.5 CONSULTATION AND COORDINATION

The last chapter in a GMP/NEPA document typically addresses consultation and coordination that has occurred throughout the planning process. This chapter provides a brief history of public involvement, including public meetings and newsletters, as well as public notifications such as press releases. (However, the chapter does not discuss the planning issues in detail, which are presented in the purpose of and need for action in chapter 1.) A section should also document consultations with

other agencies, officials, and organizations. In particular, consultations should be documented with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service regarding section 7 of the Endangered Species Act, the state historical preservation office over section 106 of the NHPA, the state coastal zone management office regarding section 307 of the Coastal Zone Management Act, and Native Americans .

10.5.1 List of Reviewing Agencies and Recipients

This chapter also includes a list of the recipients of the document. This list should include all public officials, agencies, organizations, and individuals (if fewer than three pages) receiving a copy of the plan. A typical way to list these recipients by categories:

- congressional delegation
- federal agencies
- Native American tribes and agencies
- state elected officials
- state agencies
- local and regional governmental agencies
- organizations and businesses
- libraries
- media
- individuals (depending on the number of individuals)

10.5.2 Comments on a Draft GMP/EIS

If a final GMP/EIS is being prepared, a new section should summarize what happened during the public review of the draft EIS, documenting the record of public comments and public, agency, and organizational meetings. A summary of written and oral comments should be provided. It also may be desirable to include a section that discusses the major changes that were made to the draft GMP/EIS. Another optional section is to provide clarifications of commonly raised public concerns on the draft document if the public comments reflected inaccurate information, misperceptions, or confusion.

This chapter must include copies of all governmental agency letters, substantive comments from others that were received on the draft GMP/EIS, and responses to those comments. It is important to review oral comments, as well as written comments, in determining which comments require an agency response. Chapter 12 addresses the ways to respond to substantive and nonsubstantive comments.

Reference: *The DO-12 Handbook* (sec. 4.5.H and 4.6.A and B)

10.5.3 Future Compliance Requirements Following GMP Implementation

A GMP may propose actions that require additional compliance before the actions can occur. Although some of these actions may have been generally assessed in the environmental consequences, many details probably have not been identified (e.g., precise location, design, and size of a facility), which requires additional analysis. State and/or federal permits and additional consultations may also be required before a new facility can be built or an action implemented. If there are important additional compliance measures that need to be taken after a GMP is implemented, and/or there are a large number of compliance actions that are needed, it is worth noting this in a section in the “Consultation and Coordination” chapter.

Among the topics that may need additional compliance are

- development of facilities, preparation of a future wilderness study, or specific resource management such as eradication of a nonnative species or restoration of a wetland (NEPA requirements)
- actions or facilities that may affect a federally listed threatened and endangered species (sec. 7 of the Endangered Species Act)
- actions or facilities that may affect essential fish habitat (Magnuson-Stevens Act)
- actions or facilities that may affect water resources such as wetlands, or discharge, dredging or placement of fill materials into waters of the United States (sec. 404 permit from the U.S. Army Corps of Engineers, a sec. 401 water quality certification)
- an undertaking that could potentially affect cultural resources either listed on or eligible for listing on the National Register of Historic Places (sec. 106 of the NHPA)
- a proposal that involves federal rulemaking (per the Administrative Procedures Act and NEPA)
- actions that affect concessions (concession contracting)
- commercial services (commercial use authorization required under sec. 418 of the National Park Service Concessions Management Improvement Act of 1998)

Additional permits also may need to be granted by the park unit before certain actions can occur.

10.6 GMP/NEPA DOCUMENT APPENDIXES AND REFERENCES

As noted in *The DO-12 Handbook* (sec. 4.5.I), appendixes in a GMP/NEPA document should include important supporting materials. They are not intended to be a data bank or library of all materials relating to the park. “They should contain only major substantiating data, essential relevant descriptions of environmental components, important professional reports, and copies of major legislative and executive docu-

ments, agency agreements, or other information necessary for a complete use of . . . [the GMP/NEPA document] for analytical/decision-making purposes.”

Two appendixes usually included in GMP/NEPA documents are

- the park’s enabling legislation or establishing executive order
- consultation letters with other agencies (e.g., U.S. Fish and Wildlife Service, the state historic preservation office)

Other appendixes that may be included are:

- key agency memoranda of agreement/understanding
- list of classified structures
- floodplains or wetlands statements of findings
- analysis of proposed boundary adjustments
- scientific names of plants and animals discussed in the plan
- description of how the GMP was developed
- development of the preferred alternative
- cost estimates for the GMP alternatives
- wilderness study and recommendation
- wild and scenic river evaluation
- analysis of user capacity/selection of indicators and standards
- state and federally listed plant and wildlife species in the park
- summary of legislative history; list of pertinent laws and executive orders
- NPS policies and mandates relating to the park
- biological assessment
- local zoning ordinances
- summary of transportation studies

A GMP/NEPA document also includes a section on references. A bibliography and an index of key words are required elements for an EIS under CEQ regulations. *The DO-12 Handbook* (sec. 4.5.I) also states that a glossary should be included — although this is considered an optional section (as is a list of acronyms). *The DO-12 Handbook* (sec. 5.4.H) also states that a bibliography, glossary of terms, and acronyms should be included in an EA.

The bibliography (also called references or references cited) should include complete citations for all the sources cited in the document, including Internet sources and personal communications. It may also include selected references that are not directly cited but that are important references for the plan/NEPA document. References may be organized either in alphabetical order by author, or grouped by

topic. For details on the format for citations, see the 2005 *DSC Editing Reference Manual* (NPS 2005c).

A list of preparers is a required section in an EIS and is recommended in an EA. Under CEQ regulations (40 CFR 1502.17) and *The DO-12 Handbook* (sec. 4.5.H.2), an EIS must list the persons primarily responsible for preparing the document and their qualifications (the planning team). This list should include both park staff and others who participated in the development of the plan (e.g., DSC planners, consultants). The section should list for the primary authors, the sections they were responsible for, and their expertise, experience, and professional disciplines. Typically for GMP/EISs the list of primary authors includes their professional title, how many years a person has worked for the National Park Service and/or other federal agencies, their degrees, and primary responsibilities in the planning effort. Individuals who have subsequently retired or left their positions should also be noted.

Here is an example of what typically would be included for a park planning team member:

Jane Smith, Cultural Resource Specialist. B.A., M.A. (Historic Preservation); 15 years with the National Park Service; responsible for review of cultural resource-related sections, including description of cultural resources, and assessing impacts on those resources.

The list of preparers can also list other important contributors, such as park, regional, and WASO staff, advisory council members, and publication services staff (e.g., editors, graphic specialists). However, it is not necessary to identify the qualifications for these individuals.

Notes: