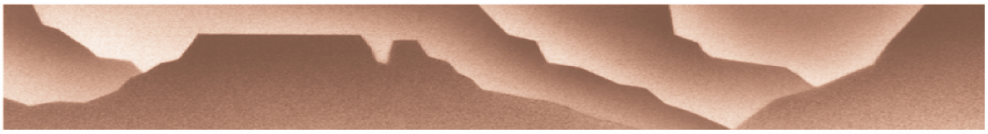
GRAND CANYON TRUST



Scoping Comments on the Long-Term Experimental Plan Environmental Impact Statement

Development of legally and scientifically defensible alternatives in the Long-term Experimental Plan (LTEP) will not be an easy task of short duration. However, park resources continue to decline under current dam operations and a change is needed now. It is critical that the LTEP alternatives consist of alternative dam operating criteria (in concert with other management actions) designed to meet the intent of the Grand Canyon Protection Act (GCPA).

In addition to the GCPA, alternatives must be consistent with the many laws and policies that govern water releases, park resources and values, and hydropower production. Because of the trade-offs inherent in managing these resources, Congress has established priorities by enacting the GCPA. The GCPA makes it clear that dam operations must be guided first by meeting the legal requirements for water delivery to the lower basin, and then by the need for protecting park resources and values. All other considerations, including hydropower production, are a lower priority.

The Colorado River Ecosystem (CRE) has been drastically altered by the presence and operation of Glen Canyon Dam and other changes, and achieving the resource objectives for the CRE will require bold action. Thankfully, there is a tremendous pool of scientific information from the CRE and other river systems that is available for developing and testing alternative dam operations and other management actions to meet the intent of the GCPA.

The Grand Canyon Trust has been involved with the management of Grand Canyon since the Trust's founding on a Colorado River trip twenty years ago. The Trust was instrumental in passage of the GCPA and has been involved in the Glen Canyon Dam Adaptive Management Program (AMP) since its inception ten years ago. As stakeholders in the AMP, and as concerned citizens, we offer our time and expertise to assist in any way possible. We fervently hope that this process can develop and implement an alternative that will demonstrate leadership in environmental stewardship, and meet the AMP's vision of, "a stewardship worthy of the Grand Canyon."

The Long-Term Experimental Plan

The intent of the Long-Term Experimental Plan, mirroring language in the GCPA, is stated in the Federal Register notice as follows (USDI 2006):

1. The purpose of the Long-Term Experimental Plan is to increase understanding of the ecosystem downstream from Glen Canyon Dam and to improve and protect important downstream resources.
2. The proposed Long-Term Experimental Plan is intended to ensure a continued, structured application of adaptive management in such a manner as to protect, mitigate adverse impact to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, including, but not limited to natural and cultural resources and visitor use, consistent with applicable Federal law.

The need for the LTEP is clear—park resources and values have continued to decline under the Modified Low Fluctuating Flows (MLFF) alternative selected in the 1995 Record of Decision (ROD) on the operation of Glen Canyon Dam. We offer the following comments.

The alternatives must be consistent with the Grand Canyon Protection Act.

The Grand Canyon Protection Act was signed into law on 30 October 1992. The GCPA states: "The Secretary shall operate Glen Canyon Dam in accordance with the additional criteria and operating plans specified in section 1804 and exercise other authorities under existing law in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established, including, but not limited to natural and cultural resources and visitor use."

The intent of the GCPA is unambiguous: to operate the dam in a manner that protects park resources and values. On the floor of the Senate, Senator McCain stated: "The erratic release of water from the dam to meet peak electric power demands [has] destroyed Colorado River beaches, and harmed other natural, cultural, and recreational resources. Somewhere along the line, we forgot our obligation to the canyon and to [t]he future generations for whom we hold it in trust. In response, I introduced the Grand Canyon Protection Act to reorder those priorities—to stop the damage and legally require the dam to be operated in a manner which will protect park resources (Congressional Record—Senate)."

Making clear Congress' intent to prioritize Grand Canyon resources over power generation, Senator McCain had the following exchange with Senator Bill Bradley on the floor of Congress. Senator McCain asked, "Is it the Senator's understanding that the

Grand Canyon Protection Act rejects the policy that power generation has any priority or primacy over protection of downstream environmental, recreation, or cultural values?"

Senator Bradley replied, "Yes" and clarified by stating, "Under the Grand Canyon Protection Act, all aspects of Glen Canyon Dam operations should be governed by the goal of protecting the downstream resources so long as those operations do not interfere with the allocation, apportionment, and deliveries provided for in the Colorado River compact resources (Congressional Record—Senate)."

Completion of the Environmental Impact Statement (EIS) on the Operations of Glen Canyon Dam was mandated by the GCPA, and the Record of Decision (ROD) was signed in October 1996. The ROD was intended to implement: "… an alternative dam operating plan that would permit recovery and long-term sustainability of downstream resources while limiting hydropower capability and flexibility only to the extent necessary to achieve recovery and long-term sustainability."

Research and monitoring during the last decade of ROD operations clearly demonstrate that the current ROD flows (i.e., MLFF) do not meet the intent of the GCPA (Gloss, et al. 2005). MLFF has been implemented since 1996, and the relatively similar Interim Flows were in effect from 1991 to 1996. Throughout this time, there has been a large number of research and monitoring projects, and numerous independent and in-house reviews and assessments. Although our knowledge of the CRE is certainly incomplete, and always will be, it is clear that new operating criteria are needed. MLFF did not go far enough to "stop the damage" and bring about the predicted "recovery and long-term sustainability" of park resources and values.

The alternatives should represent a combination of annual dam operating criteria and other management actions that are designed to meet the intent of the GCPA.

The alternatives in the EIS should identify revised dam operating criteria (and other management actions) that are likely to meet the intent of the GCPA. It would be irresponsible to conduct more research and monitoring on the effects of a flawed policy decision (i.e., ROD flows). And it would be deceitful to claim that we need to maintain MLFF while we conduct more research based on the premise that we do not know enough about the ecosystem to design plausible alternatives for meeting the intent of the Grand Canyon Protection Act.

The 1996 Record of Decision initiated an adaptive management approach for dealing with the inherent scientific uncertainty in ecosystem management. As stated by Melis et al. (2006), "An adaptive management effort is based on the premise that ecosystem responses to management actions are highly complex and often unpredictable. By embracing these uncertainties and approaching management actions as experimental 'treatments,' scientific outcomes can provide new information to managers regarding the range of possibilities for achieving resource conservation objectives." MLFF is an experimental treatment that has failed to meet its objectives (i.e., the intent of the GCPA). It is now critical to use the

information gained from this test (as well as other research) to identify revised operating criteria (and other management actions) that are most likely to meet the intent of the Grand Canyon Protection Act.

The intent of the adaptive management approach in the AMP is to provide for changes in dam operations. The EIS states, "It is intended that the ROD will initiate a process of 'adaptive management,' whereby the effects of dam operations on downstream resources would be assessed and the results of those resource assessments would form the basis for future modifications of dam operations." The ROD states, "This commitment includes the establishment of an Adaptive Management Workgroup, chartered in accordance with the Federal Advisory Committee Act; and development of a long-term monitoring, research, and experimental program which could result in some additional operational changes." The charter for the Adaptive Management Program is clear that the program will provide advice and recommendations to the Secretary of Interior on how best to meet the intent of the Grand Canyon Protection Act through advice on necessary research and monitoring as well as changes in dam operations.

In addition to a large-scale field experiment (i.e., testing new operating criteria), additional information can be derived from modeling and laboratory experiments. These three approaches should occur concurrently. In particular, the ecosystem model has languished over the last several years, and it should be updated with current information.

The EIS needs to clearly identify the "park resources and values" downstream of Glen Canyon Dam that will be affected by the alternatives.

The National Park Service is required to manage for park resources and values. Furthermore, the Grand Canyon Protection Act requires the Secretary of Interior to operate Glen Canyon Dam to "protect, mitigate adverse impacts to, and improve" park resources and values. To meet the intent of the LTEP, and provide the information needed for the Secretary of Interior to select the most appropriate alternative, park resources and values need to be clearly defined and the impacts of the different alternatives needs to be assessed against park resources and values.

Park resources and values arise from the National Park Service (NPS) Organic Act of 1916 and subsequent statutes (e.g., General Authorities Act of 1970, "Redwoods Act" of 1978). Park resources and values are defined in the 2006 Management Policies and Director's Order #55. The 2006 Management Policies states, "The 'park resources and values' that are subject to the no-impairment standard include: the park's scenery, natural and historic objects, and wildlife, and the processes and conditions that sustain them, including, to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals; appropriate opportunities to experience

enjoyment of the above resources, to the extent that can be done without impairing them; the park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and any additional attributes encompassed by the specific values and purposes for which the park was established."

Park resources and values identified in the Management Policies are used as the foundation for the various management plans for Grand Canyon National Park (e.g., General Management Plan, Resource Management Plan, Draft Wilderness Management Plan, Colorado River Management Plan), and Glen Canyon National Recreation Area (e.g., 2005 Glen Canyon five-year strategic plan). Using these documents, it is clear that park resources and values for both Grand Canyon National Park and Glen Canyon National Recreation Area that may be affected by the alternatives include:

1. The natural distribution and abundance of natural communities and species (e.g., terrace and sand beach riparian communities, spring communities, humpback chub and other native fish).
2. Natural biological processes (e.g., genetic structure and diversity; incidence of predation, competition, diseases, parasites).
3. Natural physical processes (e.g., hydrology, water quality, sediment storage), that act upon the natural communities and species.
4. *In situ* maintenance of archeological resources.
5. Appropriate opportunities to experience enjoyment of the above resources to the extent that can be done without impairing them.

Alternatives must be targeted at conserving park resources and values.

The primary purpose of the EIS must be on developing and assessing alternatives to "protect, mitigate adverse impact to, and improve" park resources and values. It would not be appropriate to develop alternatives that may impair park resources and values.

Actions intended to favor resources that are not park resources and values may be included in an alternative only to the extent that they are compatible with conserving park resources and values. For example, generating hydropower at Glen Canyon Dam is not a park value, and cannot be favored at the expense of park resources and values, or "balanced" with park resources and values. The relative priority for generating hydropower revenues is provided by the GCPA and its legislative history. Consistent with the legislation, the intent of the 1996 Record of Decision on operation of Glen Canyon Dam is to, "…permit recovery and long-term sustainability of downstream resources while limiting hydropower capability and flexibility only to the extent necessary to achieve recovery and long-term sustainability."

Alternatives must to be consistent with the Endangered Species Act.

In accordance with the Endangered Species Act of 1973 (ESA), the alternatives need to conserve listed species *and their habitat*. The purpose of the ESA is to, "...provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved…" and to "provide a program for the conservation of such endangered species and threatened species…."

The endangered species most likely to be impacted by the alternatives is the humpback chub (*Gila cypha*). Southwestern willow flycatcher (*Empidonax traillii extimus*), and Kanab ambersnail (*Oxyloma haydeni kanabensis*) may also be impacted to some extent. In addition, there are endangered species that have been extirpated from this reach. They include: bonytail (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), and razorback sucker (*Xyrauchen texanus*).

Designated critical habitat below Glen Canyon Dam that must be conserved includes both the mainstem below the Paria River as well as the lower reach of the Little Colorado River. Humpback chub critical habitat that would be impacted by the alternatives is: 1) The lower eight miles of the Little Colorado River, and 2) the Colorado River from Nautiloid Canyon (about RM 34) to Granite Park (about RM 209). Razorback sucker critical habitat that would be impacted by the alternatives is the Colorado River and its 100-year flood plain from the confluence with the Paria River to Hoover Dam including Lake Mead to the full pool elevation. The 2006 Management Policies state that the NPS shall, "manage designated critical habitat, essential habitat, and recovery areas to maintain and enhance their value for the recovery of threatened and endangered species."

The 1994 Final Biological Opinion (BO) on the Operation of Glen Canyon Dam found that MLFF, "…is likely to jeopardize the continued existence of the humpback chub and razorback sucker and is likely to destroy or adversely modify designated critical habitat." Although the Reasonable and Prudent Alternative (RPA) contained in the 1994 BO requires the attainment of riverine conditions that support all life stages of endangered and native fish species, Reclamation has not made sufficient progress in their responsibility to do so (USFWS 2002). All alternatives should be designed to meet Reclamation's responsibility to attain appropriate habitat conditions for endangered fish.

In addition to Reclamation's responsibilities under the RPA, it is the responsibility of all involved Federal agencies to help craft an LTEP that will aid in the recovery of endangered species and their habitat. The ESA states, "It is further declared to be the policy of Congress that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act."

Alternatives must to be consistent with the Clean Water Act.

The alternatives must comply with all relevant provisions of the Clean Water Act (CWA), and be consistent with the Supreme Court's recent holding in S.D. Warren Co. v. Maine Board of Environmental Protection, 126 S. Ct. 1843 (2006). In the Warren case, the Court held that hydroelectric dam operation does raise a potential for a "discharge" into navigable waters of the United States, and that "[any] federal license under § 401 of the Clean Water Act requires state certification that water protection laws will not be violated." Id. at 1846.

Alternatives should be consistent with an ecosystem management approach.

The 2006 Management Policies, NPS management plans, U.S. Fish and Wildlife Service (USFWS) policy, and the AMP Strategic Plan all mandate an ecosystem management approach to managing park resources and values. For example, the 2006 Management Policies state, "Natural resources will be managed to preserve fundamental physical and biological processes, as well as individual species, features, and plant and animal communities. The Service will not attempt to solely preserve individual species (except threatened or endangered species) or individual natural processes; rather, it will try to maintain all the components and processes of naturally evolving park ecosystems, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems."

It is the policy of the USFWS to, "… develop and implement recovery plans for threatened and endangered species in a manner that restores, reconstructs, or rehabilitates the structure, distribution, connectivity and function upon which those listed species depend. In particular, these recovery plans shall be developed and implemented in a manner that conserves the biotic diversity (including the conservation of candidate species, other rare species that may not be listed, unique biotic communities, etc.) of the ecosystems upon which the listed species depend."

In the AMP Strategic Plan, Principle #4 states, "An ecosystem management approach, in lieu of an issues, species, or resources approach, will guide our efforts." Similarly, Principle #6 of the AMP Strategic Plan states, "Dam operations and management actions will be tried that attempt to return ecosystem patterns [e.g., the abundance and distribution of species and communities] and processes [e.g., hydrology, sediment flux, water quality] to their range of natural variability."

An ecosystem management approach is also appropriate for protecting archaeological resources because the priority is to protect them *in situ*. The 2006 Management Policies state, "Archeological resources will be managed *in situ*, unless the removal of artifacts or physical disturbance is justified by research, consultation, preservation, protection, or interpretive requirements."

Alternatives should represent the large-scale changes that are needed to protect park resources and values.

There have been major changes in the riparian and riverine ecosystems since the construction of Glen Canyon Dam, and there will need to be major changes in dam operations, in concert with other management activities, to restore park resources and values.

The alternatives must be bold to detect a response in the ecosystem for several reasons including: 1) data on the response of large, complex ecosystems is inherently "messy;" and 2) ecosystem processes typically need to surpass critical thresholds to elicit a change in ecosystem patterns. For example, water temperature in excess of 18^{o}C is necessary to provide rearing habitat for humpback chub (Gorman and Van Hoosen 2000). Actions that increase water temperature only a few degrees from the typical 9-10 ^{o}C dam releases obviously will not be sufficient for successful rearing to occur. In addition, several ecosystem processes may need to be altered concurrently to detect a change in an ecosystem pattern (e.g., to detect a change in native fish recruitment, non-native fish control may need to take place simultaneously with warming).

Alternatives should explicitly state the predicted outcomes for park resources and values and other resources.

Providing the predicted outcomes for each alternative allows comparison with NPS targets for ecosystem patterns and processes and facilitates the selection of the most appropriate alternative. Although the AMP Strategic Plan has not progressed to the point of identifying specific targets for park resources and values and other resources, the National Park Service has developed draft targets. In addition, the 2006 Management Policies and NPS management plans direct movement of ecosystem patterns and processes towards the generic target of "… the closest approximation of the natural condition when a truly natural system is no longer attainable."

It is also essential to provide the predicted outcome for other resources including non-native species (e.g., tamarisk (*Tamarix spp*.), rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), catfish (*Ictalurus punctatus*), New Zealand mudsnails (*Potamopyrgus antipodarum*), quagga mussels (*Dreissena bugensis*), etc.), hydropower (e.g., capacity, generation, and revenue), and non-use values. The inclusion of a thorough non-use values analysis is especially critical.

Alternatives should focus primarily on priority park resources and values.

There is no end to the potential research that could be conducted on park resources and values. The priority, however, should be on park resources and values that are declining (e.g., sediment, humpback chub, and archaeological resources). Focus on improving these

three resources may have a positive influence on several other park resources and values as well.

Sediment

The overall mass balance of sediment in Grand Canyon is negative due to a reduction in mainstem sediment supply and an increase in sediment transport. The majority of the sediment supplied to the CRE was historically derived from the watershed above the dam. That sediment is now being trapped in Lake Powell. The rate of sediment transport in the CRE has increased due to clear water releases from Glen Canyon Dam and the high daily fluctuations in dam releases as compared to pre-dam conditions.

The alternatives should attempt to:

1. Maintain a positive mass balance of sediment in Marble and Grand canyons over annual and longer time periods.
2. Provide the sediment distribution needed to restore near-shore native fish habitat and native sand beach community.
3. Determine whether sediment augmentation can significantly mitigate for the reduced sediment supply (by supplying sediment for building beaches and near-shore habitat, and providing a level of turbidity that may increase the survival of native fish in the mainstem).

Humpback chub

The distribution and abundance of humpback chub has been sharply curtailed. Historically, the vast majority of humpback chub in the Grand Canyon area probably occurred in the Colorado River mainstem throughout Marble and Grand Canyons, and in the Little Colorado River within the Little Colorado River Canyon. Humpback chub probably also occurred to a limited extent in the mainstem above Marble Canyon and below Grand Canyon, in the Little Colorado River as far upstream as Grand Falls, and (at least seasonally) in tributaries other than the LCR.

Today, humpback chub are distributed mainly in the LCR and LCR inflow reach, and the abundance of humpback chub has declined. Although monitoring data only go back as far as 1989, the population has decreased from perhaps 12,000 adults in 1989 to about 5,000 today. Although the decline in distribution and abundance is certainly due to several factors, the main factors are probably the loss of mainstem spawning and rearing habitat, and an increase in predation rates.

The alternatives should attempt to:

1. Restore an abundant and widely distributed population of humpback in the mainstem.
2. Provide mainstem flow and sediment conditions that are likely to provide appropriate near-shore spawning and rearing habitat.

3. Provide the combinations of reservoir level, flow regime, and Temperature Control Device (TCD) operation that are likely to result in temperatures needed for native fish rearing.
4. Provide the level of non-native species (e.g., trout, catfish) control that is likely to allow native fish rearing in the mainstem.

Archaeological resources

Archaeological resources are often located in the terrace zone and have survived throughout the years by being buried in sediment. Although incipient gullies (naturally formed by runoff during thunderstorm events) have always had the potential to erode archaeological sites, gully erosion was historically counteracted by infilling from aeolian (i.e., wind) transport of high and dry sediments deposited during flood events.

Today, archaeological resources are being lost at an increased rate in Grand Canyon. The supply of high and dry sediment needed for aeolian transport has been reduced mainly because these deposits are no longer being created by flood events during sediment-enriched conditions. In addition, beach sediments have been colonized by vegetation (e.g., tamarisk) that reduces aeolian transport rates.

The alternatives should attempt to:

1. Preserve, *in situ*, all archaeological resources.
2. Provide the high and dry sediment needed to counteract arroyo formation (through subsequent wind transport).

Other park resources and values

Although the focus of the LTEP should be on the high priority resources, opportunities to simultaneously gather information that would aid in the eventual restoration of lower priority park resources and values should not be overlooked. Park resources that would benefit from additional research include extirpated species (e.g., river otter (*Lutra canadensis*), razorback sucker (*Xyrauchen texanus*), Colorado pikeminnow (*Ptychocheilus lucius*), bonytail (*Gila elegans*)), terrace zone riparian communities (i.e., Old High Water Zone), and water quality (e.g., mercury, salinity, selenium).

Alternatives must not allow the impairment of park resources by the trout fishery.

The alternatives must strive to eliminate the possibility of impairment. Recreational trout fishing is allowed in the park units only so long as it does not impair park resources and values. The 2006 Management Policies are clear that, “when there is a conflict between conserving resources and values and providing for enjoyment of them, conservation is to be predominant.” Currently, the trout fishery is probably impairing native fishes through competition and predation.

Regardless of the whether impairment is occurring, the alternatives should not seek to improve trout habitat, even in the Lee's Ferry reach. The 2006 Management Policies make it clear that, "[h]abitat manipulation for harvested species … will not include the artificial manipulation of habitat to increase the numbers of a harvested species above its natural range in population levels."

Alternatives must not include actions that are inconsistent with park values.

The alternatives should not include actions to test the efficacy of management actions such as hatchery augmentation and "grow-out" ponds because they are contrary to park values (e.g., use of an ecosystem approach to management, and maintenance of the natural genetic structure and diversity) and USFWS policy (USFWS and NOAA 2000). In addition, these actions can also negatively affect behavior of released fish and introduce novel diseases and parasites.

Similarly, it would not be appropriate to "test" the effects of changes in dam operating criteria for increasing hydropower capacity, generation and/or revenues. For example, increasing the ramping rates that are currently allowed under the ROD would increase hydropower revenues, but it would not be appropriate to expend the time and energy on "testing" the effects of ramping rates while so many park resources and values are in poor condition. However, testing operating criteria that is thought to meet the intent of the GCPA and result in an increase in hydropower revenues clearly would be consistent with the GCPA.

The GCT/GCRG and an "RPA" alternative should be evaluated in the EIS.

The EIS should represent the full range of alternatives for meeting the intent of the GCPA. Two alternatives that should be considered are the AMP's "Alternative B" and an alternative that mirrors the 1994 Reasonable and Prudent Alternative (USFWS 1994).

The Grand Canyon Trust and Grand Canyon River Guides suggested what became known as Alternative B in the Adaptive Management Program. Alternative B was based upon the RPA and modified in part to reflect the results of research and monitoring since the RPA was developed. It also represents an approach to identify the period of time that stable flows are required to support spawning and rearing in the mainstem.

The Grand Canyon Monitoring and Resource Center analyzed the effects of Alternative B and the other AMP alternatives on park resources (GCMRC 2006). Although we sympathize with the difficulty in conducting the analysis given the amount of time and level of detail provided, we believe that the benefits to park resources and values from Alternative B was minimized in this analysis. Regardless, Alternative B was still predicted to be much more favorable for park resources and values than the other alternatives.

The RPA calls for the, “[a]ttainment of riverine conditions that support all life stages of endangered and native fish species….” To achieve this, the RPA requires, in part, the testing of Seasonally-Adjusted Steady Flows (SASF). The RPA states, "[a] program of experimental flows will be carried out to include high steady flows in the spring and low steady flows in summer and fall during low water years (releases of approximately 8.23 maf) to verify an effective flow regime and to quantify, to the extent possible, effects on endangered and native fish. Studies of high steady flows in the spring may include studies of habitat building and habitat maintenance flows. Research design and hypotheses to be tested will be based on a flow pattern that resembles the natural hydrograph…."

The testing of SASF was to be initiated in 1997, and if the Service later concluded that sufficient progress was not being made in testing these flows, then SASF was to be implemented during spring through fall (April to October) beginning in 1998. Unfortunately, in violation of the RPA, no comprehensive test of SASF flows has been implemented despite low water years occurring in 2001-2006, Reclamation has not made sufficient progress in their responsibility to do so (USFWS 2002), and SASF has not been implemented during April to October as intended.

The science underpinning the RPA and Alternative B has been well known for many years (e.g., Angradi, et al. 1992, Clarkson, et al. 1994, Valdez and others 2000), and additional research and synthesis (Melis, et al. 2006) has only further confirmed the validity of this approach. There is no excuse to further delay a robust test of steady flows.

Alternatives should consider alterations of the current annual and monthly release volumes.

Alternatives should utilize the inherent flexibility in the Colorado River compact for designing water releases. The compact does not require a particular annual release volume, but rather, it requires that the “…states of the upper division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-feet for any period of 10 consecutive years reckoned in continuing progressive series beginning with the 1st day of October next succeeding the ratification of this compact.” In addition, there are no legal requirements mandating particular monthly release patterns over a given year.

Monthly and annual release volumes could be designed to help manage sediment, near-shore habitat stability, temperature, spawning cues, etc. In addition, mimicking the natural variability in annual and monthly releases may be a useful tool in managing against non-native species that are adapted to the flow and temperature regime in the post-dam environment.

Alternatives should consider implications of reduced inflows to Lake Powell.

Alternatives should anticipate the predicted reduction in Lake Powell inflows. The reduced inflows are likely to have a significant impact not only on release volumes, but also on the

water quality of the releases. Water quality parameters that could be affected include temperature, nutrients, heavy metals, salinity, and dissolved oxygen. Although water quality has not been a major concern in the past, these forthcoming changes could have profound impacts on both human and ecosystem health in the CRE.

The NPS should be designated as a joint lead agency.

Although impairment issues are relevant regardless of whether NPS is a co-lead in developing the EIS or merely a cooperating agency, we strongly recommend having NPS serve as a joint lead agency for the following reasons:

1. The dam is located within the Glen Canyon National Recreation Area.
2. Park resources and values downstream of the dam in Glen Canyon National Recreation Area and Grand Canyon National Park are strongly influenced by dam operations (e.g., flows and water temperature).
3. Several of the non-flow actions being considered in the EIS will be undertaken by NPS (e.g., Bright Angel weir), or require concurrence by NPS (e.g., non-native fish removal, translocation, etc.).
4. The National Park Service has the expertise in evaluating whether the decision on the experimental plan will lead to a derogation of park resources and values.
5. The 2006 Management Policies state, "The Service cannot conduct or allow activities in parks that would impact park resources and values to a level that would constitute impairment. To comply with this mandate, park managers must determine in writing whether proposed activities in parks would impair natural resources."
6. The courts and the Council on Environmental Quality have expressly sanctioned the joint lead approach in situations where more than one agency is integrally involved in a project.

The need to comprehensively address park resources and values strongly supports designating the National Park Service as a joint lead agency.

The Adaptive Management Program should not manage the experiment.

Testing of the selected alternative should not be dependent upon decisions by the Adaptive Management Work Group. Although the AMWG clearly should be continuously apprised of monitoring and research results, decisions on implementing components of the test should be determined by criteria in the EIS rather than left to the political whims of the AMWG.

Although important monitoring and research has been conducted since the beginning of the AMP, the program itself is a failure. The failure is amply illustrated by monitoring results that demonstrate a declining trend in several park resources and values since the program began, and either a token response by the AMWG, or no response at all. Recently, despite

a recommendation by the Technical Work Group in favor of a crucial test of a BHBF, the AMWG recommended against it, and Interior accepted that recommendation. The failure of the program is not from a lack of monitoring and research, it is from an unwillingness to "adapt" to opportunities and information in a manner consistent with the GCPA.

Summary

It is critical that the LTEP alternatives consist of alternative dam operating criteria (in concert with other management actions) designed to meet the intent of the Grand Canyon Protection Act while being consistent with other laws including those regarding water delivery, endangered species, cultural resources, wilderness, and water quality. The alternative selected as best meeting these criteria should then be tested for the appropriate number of years to achieve the desired level of confidence in the results.

The LTEP provides a very public opportunity for Interior and the responsible agencies to rectify the on-going failure to meet the intent of the Grand Canyon Protection Act. To do this, the LTEP must be intellectually honest, legally defensible, scientifically credible, and reflect the high value the public places on the integrity of the natural, cultural, and recreational resources in our National Parks.

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