

AMP Strategic Plan

History of the Adaptive Management Program

When the various institutions and documents came into existence

Institution or document	Year	Purpose	
Glen Canyon Environmental Studies (GCES)	1982	GCES was initiated with a memo dated 6 December 1982 from Commissioner Broadbent to the Regional Director. The stated purpose was to: "...see how the present flow patterns impact upon the total riverine environment in the Grand Canyon and how various low-flow periods affect rafting and the fisheries resources in the river." In addition, the memo calls for "[e]nvironmental studies of the effects of the present and historic operation of Glen Canyon Dam on the vegetation, wildlife, fishery, recreation, and other environmental resources of the Grand Canyon." (Broadbent, 1982)	
Glen Canyon National Recreation Area Proposed General Management Plan	1991	The purpose of plan comes from the enabling legislation. It states that GCRA is "...to provide for public outdoor recreation use and enjoyment...and to preserve scenic, scientific, and historic features contributing to public enjoyment of the area." (NPS, 1979).	1997
Grand Canyon Protection Act (GCPA)	1992	The GCPA was enacted on 30 October 1992. It states that 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 (Grand Canyon Protection Act of 1992, 1992)."	
Biological Opinion on Operation of Glen Canyon Dam	1994	The BO is dated 21 December 1994. It states that the "biological opinion is in response to ... Reclamation's ... request ... for formal section 7 consultation, under the Endangered Species Act ... on the proposed action to operate Glen Canyon Dam according to operating and other criteria of the Modified Low Fluctuating Flow Alternative (MLFF) ... modified by memorandum dated June 17, 1994... (USFWS, 1994)."	

Glen Canyon Dam Environmental Impact Statement (GCDEIS)	1995	The EIS is dated March 1995. The purpose of the EIS was to: “determine specific options that could be implemented to minimize--consistent with law--adverse impacts on the downstream environmental and cultural resources and Native American interests in Glen and Grand Canyons (USBR, 1995).” The ROD elaborated by stating that an “[A]nalysis of an array of reasonable alternatives was needed to allow the Secretary to balance competing interests and to meet statutory responsibilities for protecting downstream resources and producing hydropower, and to protect affected Native American interests (USDI, 1996).”
---	------	---

Grand Canyon National Park General Management Plan (GMP)	1995	The GMP is dated August 1995. "The primary purpose of the plan is to provide a foundation from which to protect park resources while providing for meaningful visitor experiences (NPS, 1995)." The GMP identifies the "values for which Grand Canyon National Park ... were established." The GMP was developed from several other park plans of relevance to the AMP including the: 1988 Backcountry Management Plan, 1989 Colorado River Management Plan, and 1994 Resource Management Plan. Other plans subsequent to the GMP include the 1997 Resource Management Plan and the 1998 Draft Wilderness Management Plan.
Grand Canyon Monitoring and Research Center (GCMRC)	1995	The purpose of the Center is fulfill the directive in the GCPA for the "Establishment and implementation of a long-term monitoring and research program to ensure that Glen Canyon Dam is operated in a manner that protects the values for which the Grand Canyon National Park and the Glen Canyon National Recreation Area were created." (Deputy Assistant Secretary for Water and Power, 1995).
Record of Decision: Operation of Glen Canyon Dam (ROD)	1996	"This record of decision...documents the selection of operating criteria...as analyzed in the final Environmental Impact Statement...(USDI, 1996)." The ROD acknowledges that the Secretary must operate Glen Canyon Dam in compliance with the GCPA. Presumably, this clause was added because the GCPA was enacted in 1992, following the initiation of the EIS in 1989.
National Park Service 2001 Management Policies	2000	The 2001 Management Policies is the "basic Service-wide policy document of the National Park Service." These policies define how "the Service will meet its park management responsibilities under the 1916 NPS Organic Act 'to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.'(NPS, 2001)"
"Law of the River"		The "Law of the River" governs the distribution and management of Colorado River water. It is a collection of federal and state statutes, inter-state compacts, court decisions and decrees, contracts, an international treaty, and administrative decisions.

- Broadbent, R. 1982. Upgrading and studies of operational alternatives--Glen Canyon powerplant--Colorado River Storage Project (CRSP). Dated 6 December 1982.
- Deputy Assistant Secretary for Water and Power. 1995. Establishment of the Grand Canyon Monitoring and Research Center. Pages 2.
- Grand Canyon Protection Act of 1992. P.L. 102-575.
- NPS. 1979. Proposed General Management Plan. Glen Canyon National Recreation Area / Arizona---Utah. Dated July 1979 (reprinted August 1991). 72 Pages.
- NPS. 1995. General management plan: Grand Canyon National Park, Arizona. National Park Service. Dated August 1995. 67 Pages.
- NPS. 2001. 2001 Management Policies.
- USBR. 1995. Operation of Glen Canyon Dam. Final Environmental Impact Statement. 337 + attachments Pages.
- USDI. 1996. Record of Decision. Operation of Glen Canyon dam. Final Environmental Impact Statement. Dated 8 Oct 1996. 15 Pages.
- USFWS. 1994. Final biological opinion. Operation of Glen Canyon dam as the modified low fluctuating flow alternative on the final Environmental Impact Statement. Operation of Glen Canyon dam. USFWS, Ecological Services, Arizona State Office. Report prepared for Regional Director, Bureau of Reclamation, Salt Lake City. Report # 2-21-93-F-167. Dated 21 December 1994. 56 Pages.

Where the institutions authority derives

The authority of the adaptive management program (AMP) comes from Section 1804(c) of the GCPA, which requires the Secretary of the Interior to complete a final Glen Canyon Dam Environmental Impact Statement (FEIS) in accordance with the National Environmental Policy Act of 1969. This FEIS was published in March of 1995 and finalized by a record of decision (ROD) that was signed on October 9, 1996.

As a part of this FEIS/ROD, there were several common elements that were embodied in all of the alternatives proposed in the FEIS. One of these common elements was the concept of adaptive management.

The authority of the AMP as discussed in the FEIS (page 34) is to:

- (a) Adopt criteria and operating plans separate from and in addition to those specified in section 602(b) of the Colorado River Basin Act of 1968 and exercise other authorities under existing laws, so as to ensure that Glen Canyon

Dam is operated consistent with section 1802 and to fulfill consultation requirements of section 1804(c) of the GCPA.

and to:

(b) Establish and implement long-term monitoring and research programs and activities that will ensure that Glen Canyon Dam is operated in accordance with provisions of section 1802 and consultation requirements of section 1805(c).

The FEIS explains the role of the AMP as follows:

The AMP is not intended to satisfy all of the mandates in the GCPA. Likewise, the program is not intended to derogate any agency's statutory responsibilities for managing certain resources. The Adaptive Management Program (AMP) was developed and designed to provide an organization and process for cooperative integration of dam operations, resource protection and management, and monitoring and research information. The program would meet the purpose and strengthen the intent for which this EIS was prepared and ensure that the primary mandate of the Grand Canyon Protection Act of 1992 (GCPA) is met through future advances in information and resource management.

History of Compliance with Federal Laws

There are several laws and compacts which govern the operation of the Colorado River and the Adaptive Management Program (AMP). These are summarized in the Background section of the Guidance Document furnished to the AMWG by its chairman on 1/19/2000. The Colorado River Compact of 1922, the 1944 treaty with Mexico, the Colorado River Storage Project Act of 1956, The Colorado River Basin Project Act of 1968, along with various other compacts, court decrees, and other documents are commonly and collectively known as the "Law of the River". These are all controlling to the AMP. Additional laws that control the AMP include the legislation authorizing the Grand Canyon National Park and the Glen Canyon National Recreation Area, and the Grand Canyon Protection Act of 1992.

The Guidance Document also refers to the Secretary's role as trustee for Native American Trust resources, the National Historic Preservation Act, the National Environmental Policy Act, and the Endangered Species Act as other laws and obligations which effect the AMP.

The GCDEIS, the ROD and the subsequent operation of the AMP have all reflected the application of this large and complex body of law, compacts, treaties and other direction which controls operations of the AMP.

Section 204 of Title II of PL106-377 controls funding of AMP activities from CRSP power revenues. Operation of the AMWG is controlled by the Federal Advisory Committee Act.

One of the objectives of this Strategic Plan is to assure that all AMP activities are in compliance with the full body of law, etc., which effects this program.

Adaptive Management Philosophy Underpinning the AMP

Scientific

The history of scientific investigation in the Grand Canyon formally dates from John Wesley Powell's assessments of physical and cultural resources associated with the Grand Canyon Region in 1875. In the early part of the 20th Century, economic interests drove scientific investigation. The Colorado River represented a significant opportunity to harness extensive hydroelectric power and provide water storage for growing agriculture and urban development in the Southwest. The culmination of this interest resulted in Federal Legislation in 1956 authorizing among others the construction of Glen Canyon Dam. In 1963 Glen Canyon Dam was completed ultimately storing over 27 million acre feet of water in the newly created Lake Powell. The next major scientific effort in the Grand Canyon arose out of activities surrounding the intent to uprate and rewind the Generators at Glen Canyon Dam in 1978. That exercise culminated in the establishment of the Glen Canyon Environmental Studies in 1982. The intent of the studies was to answer criticism that started with the building of the dam and escalated when the uprate was announced. The criticism centered around the effects of dam operations on down stream resources. The studies were under the aegis of the Bureau of Reclamation(BOR) and although intended to answer questions was really not designed to do so scientifically. The studies were also compromised by unanticipated events such as floods in 1983 and 1984 which required a reassessment and the need for phase 11 to provide data unavailable under flood conditions. Phase 11 commenced in 1988 but was hardly underway when the Department of the Interior mandated the effort be elevated to an Environmental Impact Statement. This led to the employment of a Senior Scientist and a revised time line for the studies. When queried about how long the EIS would take, the scientists and principal investigators nearly unanimously replied 4 to 5 years of iterative studies. The decision was that it would be completed in eighteen months. The fact is that the EIS was completed 6 years later and the ROD was rendered in the seventh year, 1996.

This historical review leads to the conclusion that if "adaptive management" had been in place early on many of the problems and inconsistencies might have been avoided. Protocols might have been more consistent, a long term monitoring plan and a conceptual model could have been developed. Perhaps as importantly, the data collected would have been systematically synthesized, stored and incorporated into the body of knowledge necessary to make management decisions. Adaptive management should prepare for unanticipated events and provide a consistent approach to the priorities of research to be done and data collected. Failure to provide that kind of stable guidance leads to unnecessary redundancies and dollars spent. It should also provide an acceptable mix of science and policy. When either overrides the other, the product will be both questioned and questionable.

Adaptive management properly applied should keep goals prioritized and current. Emergencies such as floods or energy crises may force a temporary or perhaps permanent change, but can provide opportunities as well as problems if handled consistently and thoughtfully. It should allow sufficient elasticity to change direction with minimal impact on the ultimate goal(s).

The foresight and uniqueness of creating the Grand Canyon Monitoring and Research Center puts the AMP program well ahead of other programs. It provides a consistent PF99 scientific community with established protocols and the presumed operating efficiencies of an "in-house" technical center. Allowing the Center to be independent yet close at hand provides the AMWG the luxury of making necessary course changes with minimal loss of time and expense. It should also minimize policy/science conflicts.

The last piece of the Adaptive Management "team" that will hopefully span and connect the diverse members is the Science Advisory Board (SAB). It is anticipated they will provide the unbiased, non-conflicted oversight the program must have.

Management

Federal and State management agencies have delegated responsibilities for many of the resources downstream of Glen Canyon Dam. Authorities for these agencies are typically contained in statute.

From these statutes, agencies develop policies which interpret and implement the statutes. Government agencies rely on these statutes and policies as they make decisions. The degree to which public input is considered varies between agencies and depends on each situation, and is often linked to NEPA compliance on proposed actions. The general concept of adaptive management brings greater external interaction into agency decision making, both from the general public and scientists.

In the GCDAMP, formal recommendations are made to the Secretary of the Interior regarding dam operations and other management actions needed to comply with the GCPA. The Secretary then responds to these recommendations through actions of the agencies under her/his delegating authority. In this particular process, the management agencies that have been delegated decision making responsibility are part of the FACA group making the recommendations. Thus, implementation of these recommendations by a Federal agency depends on internal discussions between the management agency and the Secretary's office. In some cases, if the management agency concurs with the recommendation, it may implement it directly, as a result of the agency's delegated authority. The Guidance Document contains additional thoughts on the interaction between management agencies and the AMP.

How the two are integrated

The entities primarily responsible for integration of science and management in the Glen Canyon Dam Adaptive Management Program (GCDAMP) are the Grand Canyon Monitoring and Research Center (GCMRC) and the Technical Work Group (TWG). As identified in the Glen Canyon Dam Operations Environmental Impact Statement, the GCMRC is responsible for developing the annual monitoring and research plan, managing and coordinating all adaptive management and research programs, and managing all data collected as part of those programs. Thus, GCMRC oversees contracts with scientists, who assess the resources, and integrates the scientific information for communication to the TWG. To assure that its protocols are appropriate and sufficient for assessing status and trends, GCMRC periodically convenes Protocol Evaluation Panels (PEP), comprised of external peer reviewers. Reports of PEP findings are provided to both GCMRC and TWG for their evaluation. If the recommendations are agreed upon, changes in research and monitoring protocols are made. The TWG, which is comprised of technical representatives of all the entities comprising the GCDAMP, communicates information from scientists and GCMRC to administrative members of the GCDAMP who sit on the Adaptive Management Work Group. A Scientific Advisory Board, comprised of eminent scientists from outside the GCDAMP, provides advice to all levels of the GCDAMP and serves as an oversight body whose responsibility is to assess the quality of science and the integration of that science into management recommendations through the adaptive management process.

How the Management of One Resource Affects Other Resources

The individual-resource management approach that is prevalent in resource management today cannot be applied to the Colorado River ecosystem in Grand Canyon. The complex interdependence of resources that together comprise the ecosystem becomes manifest when management of one resource or species produces unexpected effects on another resource. When human-based resources are factored into the mix, the complexity of the system becomes even more evident. All resources must be considered and managed as a whole in order to produce a desirable – and sustainable – result.

The Colorado River ecosystem is full of examples of resource interdependence. Perhaps the most illustrative example comes from the planning of the experimental Beach Habitat Building Flow (BHBF) in 1996. This experimental flow was designed to test the hypothesis that flows greater than power plant capacity (which is approximately 31,000 cfs) would mobilize sediment stored in the river channel and deposit it on the river banks at a stage that would not be vulnerable to erosion by river flows at normal operating levels. However, in designing and scheduling the experimental flow, the effects of the higher flow on a whole suite of biological factors, from aquatic food base to endangered Kanab ambersnail to food source and nesting habitat for endangered Southwest Willow Flycatcher to the timing of seed release and potential spread of the nonnative tamarisk trees had to be considered. Similarly, the effects of higher flows on the stability of cultural sites had to be assessed. Recreation at higher flows – both recreational boating and trout fishing in the 15 miles below Glen Canyon Dam – would potentially be impacted, and the timing and the magnitude of the flows would influence the level of impact that would be expected. Some of the effects of the experimental flow would be

positive and some would be negative. The challenge to the resource managers and decisionmakers was to maximize the positive impacts while minimizing the negative ones.

Future management decisions must always understand the interdependence of resources, and seek to understand the potential effects on non-targeted resources when designing and implementing management actions on targeted resources.

Geographic Scope of the Program

A discussion of scope of the AMP is set forth in a letter dated February 19, 2000 from Steve Magnussen wherein he cites a January 11, 2000 Guidance Document (*Glen Canyon Dam Adaptive Management Program AMWG FACA Committee Guidance*) prepared by DOI Solicitor Scott Loveless. As stated in the Guidance Document, “The key to the scope of AMWG’s responsibilities is whether a specific desired resource effect downstream of the dam can be achieved through some manipulation of dam operations. Under the present ROD, the upper limit of planned release level is 45,000 cfs.”

The AMP scope is limited in its magnitude by the ability of dam operations to be manipulated to achieve a specific desired resource effect downstream. This is complicated by the fact the dam and immediate downstream areas occur on the Colorado River at approximately the mid-point between the river’s origin in the Rocky Mountains and its terminus in the Gulf of California. Many activities, facilities and conditions on the river occur both up- and downstream of the planning area that significantly influence attainment of AMP goals but over which the AMP has little or no control. Despite these limits, there is a need to conduct the AMP so that, to the extent possible, the AMP provides recommendations that are necessary to determine efficacy of the EIS preferred alternative to meet its intended purpose to “protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established...” (*Grand Canyon Protection Act of 1992*). This is the scope of the AMP.

In addition, the AMWG may offer recommendations to other agencies for other actions unrelated to dam operations (but which complement the AMP process) to achieve this goal. These proposals “will be funded separately, and do not deter from the focus of the Act.” (*AMWG Charter*). Such linkages with other areas “should be made on a case-by-case basis, considering ecosystem processes, management alternatives, funding sources, and stakeholder interests.” (*Downstream: Adaptive Management of Glen Canyon Dam and the Colorado River Ecosystem, National Research Council 1999*). In these instances, the **geographic interest** of the AMP is nearly limitless and may include all parts of the Colorado River watershed (e.g., on issues related to water quality, fish, other aquatic species), the southwest (e.g., on issues related to Native Americans), the southwestern United States and Central America (e.g., on issues related to neotropical song birds), etc. Although the **geographic interest** of the AMP with influences on these downstream resources is much larger and must be taken into account when considered relevant, the AMP must focus its energies and finances on understanding the effects of dam operations

on downstream resources. Therefore, the **geographic scope** of the AMP planning area is defined upstream and downstream as follows:

- The planning area extends from the forebay of Glen Canyon Dam downstream to the western boundary of Grand Canyon National Park at Grand Wash Cliffs on Lake Mead.

Also, the **geographic scope** of the AMP planning area is defined laterally as follows:

- The planning area extends to an inundation level of 33,200 cfs for purposes of managing hydropower operations and 45,000 cfs when managing additional flows from four jet bypass tubes (upper limit of planned releases in the ROD). USBR considers this to be the “normal maximum release capacity of the dam, due to considerations for spillway protection” since “Passing greater than 48,000 cfs through the dam requires use of the spillways, which can lead to degradation of the concrete spillway lining.” (USBR *Discussion Paper on Operation of Glen Canyon Dam during spring runoff periods, within the Constraints of the 1968 Colorado River Basin Project Act and the 1992 Grand Canyon Protection Act, 1997*).

Roles and Responsibilities

Organizational Components of the AMP

The GCDEIS calls for the establishment of the AMP to assess the effects of the Secretary's actions on downstream resources. The critical entities in the AMP include: the Secretary and his/her designee, the Adaptive Management Work Group (AMWG), the Technical work Group (TWG), the Grand Canyon Monitoring and Research Center (GCMRC), and the Independent Review Panel(s) (IRPs). These are shown in Figure 1 from the GCDEIS.

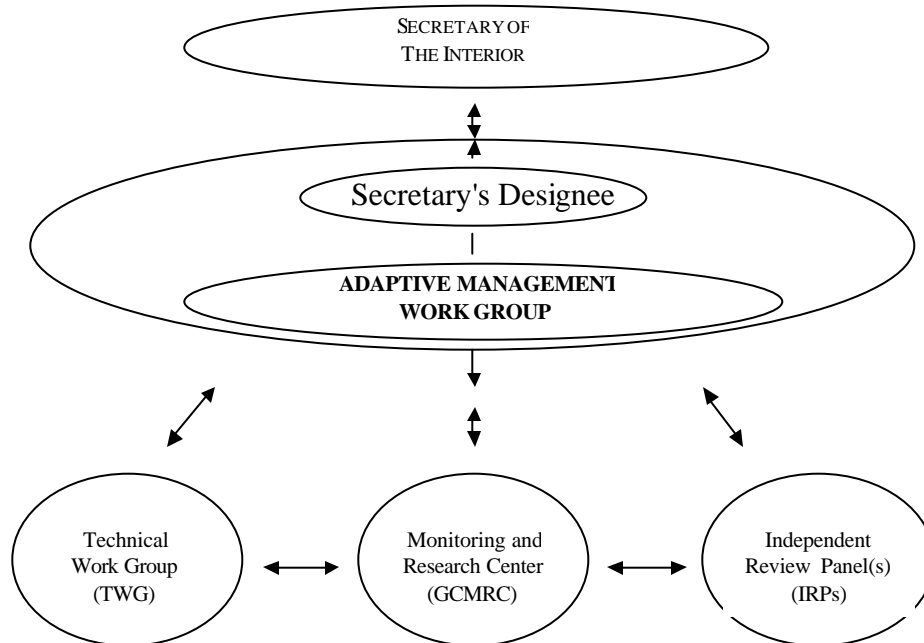


Figure 1. Organizational components of the Glen Canyon Dam Adaptive Management Program.

The AMWG and TWG include representatives from Federal and state resource management agencies, Native American tribes, and a diverse set of other private and public stakeholders. The Secretary of the Interior under the Federal Advisory Committee Act appoints AMWG members. The roles for the specified entities in the AMP were originally defined in the GCDEIS (pgs. 34-38) as follows:

Secretary's Designee

- Serves as the Secretary's principal contact for the AMP and as the focal point for issues and decisions associated with the program.
- Chairs the AMWG.
- Responsibilities include ensuring that the DOI complies with its obligations under the GCPA and ROD for the GCDEIS.

- The designee reviews, modifies, accepts or remands the recommendations from the AMWG in making decisions about any changes in dam operation and other management actions.

Adaptive Management Work Group (AMWG)

- Provides the framework for AMP policy, goals, direction and priorities.
- Develops recommendations for modifying operating criteria and other resource management actions.
- Facilitates coordination and input from interested parties.
- Reviews and forwards the annual report to the Secretary and his/her designee on current and projected year operations.
- Reviews and forwards annual budget proposals.
- Ensures coordination of operating criteria changes in the Annual Operating Plan for Colorado River Reservoirs and other ongoing activities.

Technical Work Group (TWG)

- Develops with GCMRC criteria and standards for monitoring and research programs and provides periodic reviews and updates of these.
- Develops resource management questions (i.e., information needs in response to the AMWG management objectives) for the design of monitoring and research programs by GCMRC.
- Provides information as necessary for preparing annual resource reports and other reports as required by the AMWG.
- Reviews strategic plans, annual work plans, long-term and annual budgets, and other assignments from the AMWG.

Grand Canyon Monitoring and Research Center (GCMRC)

- Supports the Secretary's designee and the AMWG.
- Responsible for developing the annual monitoring and research plans, managing adaptive management research programs, and managing all data collected as part of those programs.
- Develops research designs and proposals for implementing monitoring and research identified by the AMWG.
- Manages monitoring and research on resources affected by dam operations.
- Administers research proposals through a competitive contract process, as appropriate.
- Coordinates, prepares, and distributes technical reports and documentation for review and as final products.
- Coordinates review of the monitoring and research program with independent review panel(s).
- Prepares and forwards technical management recommendations and annual reports, as specified in section 1804 of the GCPA to the TWG.

Independent Review Panel(s) (IRPs)

- Responsible for periodically reviewing resource specific monitoring and research programs and for making recommendations to the AMWG and GCMRC regarding monitoring, priorities, integration, and management.
- Provides objective and unbiased annual reviews of the GCMRC monitoring and research program.
- Provides technical advice as requested by the GCMRC or AMWG.
- Provides science assessments of proposed research plans and programs, technical reports and publications and other program accomplishments, as requested.
- Conducts a five-year review of GCMRC monitoring and research protocols.

Institutional Scope – What the Program Influences or is Influenced By

Annual Operating Plan

The Annual Operating Plan (AOP) process was designed by the Department of Interior (DOI), Bureau of Reclamation to project future Colorado River system reservoir contents and downstream releases for the upcoming water year based on three levels of forecasted inflow. This DOI process is conducted with input from the Colorado River work group, NGO's and other members of the public in accordance with the "Criteria for Coordinated Long-Range Operation of Colorado River Reservoirs" (Operating Criteria) and Sections 1802(b) and 1804(c) of the Grand Canyon Protection Act of 1992 (Public Law 102-575, GCPA).

Individual reservoir operations are projected based on site-specific responsibilities and opportunities for "appropriate consideration of uses of the reservoirs for all purposes," as suggested by the Operating Criteria. However, releases must be governed in accordance with the "Law of the River."

As a part of this AOP process, the decision on releases for the Lower Division States must be made in accordance with a "surplus," "normal" or "shortage" determination. Releases must also meet treaty delivery obligations to the Republic of Mexico.

The GCPA reaffirmed the separation of its authorization for releases from Glen Canyon Dam from those mandated by the Operating Criteria. Section 1804(c) of the GCPA requires "separate from and in addition to" reporting of the releases from Glen Canyon Dam power plant as controlled by (1) the AOP process, i.e. monthly volumes and monthly distributions, from (2) those of daily releases under the jurisdiction of the GCPA. Because hydrologic conditions will vary from any assumptions utilized in the AOP process, the AOP-projected reservoir operations and streamflow releases will be subject to monthly revision during the runoff season to accommodate hydrologic realities.

Programmatic Agreement

The Programmatic Agreement regarding Operations of the Glen Canyon Dam (PA) is a legally-binding document among the Advisory Council on Historic Preservation, the Bureau of Reclamation, The Arizona State Historic Preservation Officer, the National Park Service, the Havasupai Tribe, the Hopi Tribe, the Hualapai Tribe, the Kaibab Paiute Tribe, the Navajo Nation, the San Juan Southern Paiute Tribe, the Paiute Indian Tribe of Utah, and the Zuni Pueblo (see Appendix XX). The PA evidences the Bureau of Reclamation's and the National Park Service's fulfillment of their responsibilities under Section 106 of the National Historic Preservation Act. It is anticipated that Western Area Power Administration and the Grand Canyon Monitoring and Research Center will be added as signatories in the near future.

The PA has stipulations which include: 1) identification and evaluation of all cultural resources within the area of potential effects; 2) develop a plan for monitoring the effects of the Glen Canyon dam operations on historic properties and for carrying out remedial actions to address the effects of ongoing damage to historic properties; and 3) write an historic preservation plan.

PA signatories provide input to TWG members. As the TWG needs cultural resource information, it uses the PA signatory group as the primary source. However, TWG and AMWG do not oversee PA activities. Rather they are considered as interested parties to decisions made by the PA signatories. Only through the budget process do TWG and AMWG have a direct effect on PA activities.

Some of the AMP processes or activities are used to help fulfill responsibilities under the PA. For example, cultural resource monitoring trips have been combined with other scientific trips to obtain expertise or save money. Also, GCMRC's data base will be used to maintain cultural resource information, and the LIDAR maps will be used to map the area of potential effect.

AMP activities are intertwined with PA responsibilities. Many AMP activities can impact cultural resources. These include: different flow and release regimes, recovery of species or habitat, recreational use, and scientific monitoring. However, some of these activities are outside of the PA, but would still fall under the National Historic Preservation Act.

Biological Opinion

Section 7(a)(2) of the Endangered Species Act of 1973, as amended, requires that any action a Federal agency authorizes, funds, or carries out must not jeopardize the continued existence of any listed species or adversely modify designated critical habitat. Regulations containing the procedures for implementing the ESA are found at 50 CFR Part 402 entitled Interagency Cooperation - Endangered Species Act of 1973, as Amended; Final Rule. In brief, to comply with the ESA an evaluation of the affects of any discretionary federal action must be conducted by the action agency in conjunction with informal consultation with the Fish and Wildlife Service. For minor activities this can be limited to verbal communication. For a larger or more complex action, or for any

major construction activity as defined (which includes operational changes), the action agency is required to prepare a biological assessment. The BA describes the action, and evaluates the affect to each species which may be present in the action area by comparing the current condition of the population and habitat to what it is expected to be during and following the action. Determination is limited to no affect = none at all, positive, negative or neutral, or, may affect = any affect, positive, negative or neutral. May affect can be further qualified with determination of likely or not likely to adversely affect.

Any may affect determination triggers formal consultation which may result in Service concurrence with a 'not likely to adversely affect' call, or a biological opinion. Once consultation is requested, the Service has 90 days to render an opinion and an additional 45 days to write the opinion. Often the opinion is delivered in less time than allowed by the regulations. When the Service determines that the proposed action will jeopardize the continued existence of the species by appreciably reducing the likelihood of both survival and recovery of the species in the wild by further reducing its number, reproduction or distribution (the jeopardy threshold) they prepare a biological opinion (BO which must contain a reasonable and prudent alternative (RPA). An RPA must be: within the jurisdiction of the action agency, technologically and economically feasible, be consistent with the original intended purpose of the project, and one which the Service believes will remove jeopardy. The BO must also contain an incidental take statement if any take is expected to occur, reasonable and prudent measures, and term and conditions designed to reduce take, and address adverse modification of designated critical habitat. The BO can contain conservation measures, conservation recommendations and other topics as well. Normally, the Service first prepares a draft BO. The period of time the draft is under review does not count toward the 135 days. Consultation is between the action agency, an applicant if there is one, and the Service. If there is an affect on tribal lands or waters the tribes must be consulted. Once the action agency receives the draft BO they may chose to share the document with other stakeholders. (See March 1988 Consultation Handbook, FWS).

The BO is the Service's recommendation to the action agency. Consultation is concluded when the action agency responds to the Service accepting the BO as written, or, describing if and how they will implement the BO. Once this commitment has been made action agency is responsible for implementing the agreed to RPA or to re-consulting. Any commitments made by Reclamation would be of higher priority than discretionary actions.

In short, the ESA effects the AMP (theoretically) through: 1) the requirement to consult with the Service on any discretionary action which may affect listed species or adversely modify designated critical habitat prior to taking the action and the statutory time frames (maximums) and, 2) through commitments Reclamation makes to conserve species in response to RPAs in BOs. The determination of affects has been delegated by law to the Secretaries of the Interior and Commerce, who carry out this legislative mandate through the Service and the National Marine Fisheries Service, respectively.

National Park Service Activities

(To be drafted by NPS)

Operation of CRSP Power System

Glen Canyon Dam houses an electrical generation station which is tied to a vast system of generators, transmission lines and delivery points in the Western United States, Canada and Mexico. Moreover, its legally obligated to provide electricity to wholesale electrical customers and others in the West. The US Bureau of Reclamation operates Glen Canyon Dam in close coordination with Western Area Power Administration. Western markets the electrical power produced here and owns and operated the Federal transmission system which delivers the electricity.

Long-term Firm Electrical Power:

Under the authorizing legislation for the Colorado River Storage Project, Federal dam operators are required to produce “the greatest practicable” amount of long-term firm power at Glen Canyon Dam. Furthermore, these operators are required to integrate the operation of Glen Canyon Dam with the other CRSP powerplants and other Federally-owned electrical powerplants.

Western’s long-term contracts for electricity are with small municipalities, rural electrical cooperatives, federal defense facilities and other federal and state institution and with indian tribes. This power is sold strictly in the CRSP market area which are the upper Colorado River basin states.

Long-term firm electrical power has been marketed according to a marketing plan established by Western. The contracts for electricity made possible under this plan end in 2024. Western is obliged to deliver electricity in the amounts specified in these contracts. This can be supplied by the CRSP generators or Western may purchase some of this power from other generators. The contract amount can be adjusted every 5 years to take into account changing circumstances or resources.

Other Electrical Services:

Operation for a Federal Load Control Area:

Western operates two load control areas that are electrically tied to Glen Canyon Dam. A load control area is a geographical area assigned to a controller to monitor electrical demand and generation and make sure that they “match” on a moment-by-moment basis. This is referred to as “regulating”. These load control areas are named WACM and WALC. Currently, Glen Canyon Dam generation can change by up to 1,000 cfs to adjust to these “swings” in demand. The contribution by Glen Canyon dam to these two load control areas are evenly divided. Western’s Operation Center in Phoenix, Arizona sends a “regulation” signal every few seconds directly to the Glen Canyon

Reserve Sharing Groups

Reserves are required by electrical production and distribution companies to serve as a “back-up” in case of events. The existence of reserves minimizes the possibility of

interruption of electrical service. Western has contractual agreements with two reserve sharing groups. Reserve sharing groups are formed to share the “damage” caused by generator and transmission outages, transmission overloads and other emergencies or unplanned events.

For the two reserve sharing groups, Western is obligated to provide up to 70 Megawatts of power from one or more of the CRSP powerplants. Typically, Glen Canyon Dam has provided the bulk of this service.

Emergency Service:

Western calls upon Glen Canyon Dam and other CRSP dams to respond to a variety of electrical system emergencies. These emergencies and the response to them by Western and Reclamation are a requirement of all participating members of the Western Systems Coordinating Council (WSCC). These are described in the EIS for the operation of Glen Canyon Dam and are authorized in the Record of Decision. Further details on the emergency exception criteria are contained in an agreement between Western and Reclamation. Generally, these emergencies are related to transmission line and generation outages. During these emergencies, the operating limitations on Glen Canyon Dam contained in the ROD are exceeded.

List of Guiding and Relevant Documents

Laws and Agreements

Law of the River synopsis

Colorado River Compact, November 24, 1922

Colorado River Storage Project Act, April 11, 1956

Colorado River Basin Project Act, September 30, 1968

Long-Range Operating Criteria, 1970

Long-Range Operating Criteria, October 30, 1992

National Environmental Policy Act (Section 7 consultation)

Grand Canyon Protection Act, October 30, 1992 and Legislative History

National Historic Preservation Act (Sections 106 and 110)

Programmatic Agreement on Cultural Resources, August 30, 1994

Historic Preservation Plan

Endangered Species Act

36 CFR 2.5 (research and specimen collection in National Park Service areas)

Record of Decision, Glen Canyon Dam Final Environmental Impact Statement. 10/25/96

BOR-WAPA Operating Agreement

Biological Opinions

Final GCD EIS (included by reference)

Rebecca Tsoi article on trust responsibility

Glen Canyon Dam Operating Criteria

Operating Criteria for Glen Canyon Dam In Accordance with the GCPA, 2/24/97
Operating Guidelines Associated with Glen Canyon Dam Operating Criteria 7/7/97
Operating Criteria and other Operating Parameters (C. Palmer 7/97)
Annual Operating Plans

Protocols and Procedures – How the AMP Works

Charter

The current charter of the AMP is attached as an appendix. This charter was recently renewed as a formal FACA committee for an additional 2 years.

Operating Procedures of AMWG and TWG

Attached as appendices are the current operating procedures of the AMWG and the TWG. These have been formally recommended by these two groups, and are in harmony with the AMP charter. They serve to give formal structure to AMP meetings.

Tribal Consultation and Coordination

Federally recognized Indian tribes are domestic dependent nations, and the legal relationship between the federal government and tribes is one as set forth in the Constitution of the United States, treaties, statutes, Executive orders, and court decisions. Indian tribes have a guaranteed right to self-govern and to exercise inherent sovereign powers over their members and reservations. The United States government works with Indian tribes on a government-to-government basis to address issues concerning Indian tribal self-government, trust resources, and Indian tribal treaty and other rights. Tribal trust resources include land and natural resources either on or off Indian reservations and other assets, retained by, or reserved by or for Indian tribes held by the federal government in trust and are protected by a fiduciary obligation on the part of the United States.

In order to establish regular and meaningful consultation and collaboration with Indian tribal governments various Executive Orders, Secretarial Orders and Memorandums have been issued over the last eight years. Some of these include Executive Order 13084 Consultation and Coordination with Indian Tribal Governments signed May 14, 1998 and reissued on November 6, 2000; Executive Order 13007 Indian Sacred Sites signed May 24, 1996; Secretarial Order 3175 Department of the Interior Responsibilities for Indian Trust Resources signed November 8, 1993; (now Department manual release 303 DM 2); Secretarial Order 3206 American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act signed June 5, 1997; Memorandum for the Heads of Executive Departments and Agencies - Government-to-Government Relations with Native American Tribal Governments signed April 29, 1994.

To ensure the fulfillment of the Federal Indian trust responsibility the Department of the Interior has established policies and procedures for government-to-government

consultation with federally recognized Indian tribes and tribal members for the identification, conservation, and protection of American Indian trust resources, trust assets, or tribal health and safety. Indian trust assets are values derived from land resources including surface water and groundwater, natural vegetation and wildlife, and air quality. Any potential impacts from Federal actions or activities to tribal trust assets must be properly addressed between the affected tribe and the appropriate Federal agency prior to any disturbance to such resources.

How Compliance (ESA and NHPA) is Integrated into the AMP

Every management action by the GCDAMP is assessed for necessity of compliance with the Endangered Species Act (ESA) and the National Historic Preservation Act (NHPA). Bureau of Reclamation, as the agency taking the action to modify dam operations, is the lead Federal agency on these actions. In the case of ESA, Reclamation first determines whether previous consultations with Fish and Wildlife Service will cover the action. If the answer is no, Reclamation defines the geographic scope of the proposed action and requests from the Service the federally listed species thought to be in or nearby the project area. Reclamation then writes a biological assessment, with the assistance of GCMRC and other GCDAMP members, and identifies whether the proposed action may affect or will affect listed species. The biological assessment is transmitted to the Service for concurrence. The Service then renders a biological opinion which either concurs with Reclamation's assessment or provides a reasonable and prudent alternative. Reclamation then reviews the biological opinion and communicates its decision to the Service on if, and how, the proposed action will be conducted.

BOR's NHPA compliance for dam operations follows the three stipulations of the Programmatic Agreement: identification and evaluation of historic properties; monitoring to determine effect; and adoption of an historic preservation plan which will describe a process to resolve adverse effects of dam operations on historic properties. Decisions are made by consensus among the PA signatories with the TWG and AMWG acting as the public interested in historic preservation, and with the TWG and AMWG also having some budgetary oversight and input.

Calendar

Budget Development Process

(To be provided by Cliff Barrett, including timeline for developing the AMP budgets)

Annual Report to Congress

As authorized by the GCPA, each year the AMP prepares a report to be transmitted to Congress. The report includes actions taken to meet the mandates of the GCPA, both dam operations and other management actions.

The report also serves to provide an update on the status of the resources addressed by the GCPA. The annual SCORE report prepared by GCMRC provides valuable input to this report.

SCORE Report

Monitoring results should be made available to the adaptive managers as soon as possible, but no later than six months after each sampling period; however, scientists should be entitled to reserve access to collected data for at least one year after the close of the most relevant reporting period before it is released to the public, to allow sufficient time for publication in peer-reviewed scientific journals.

A comprehensive reporting of change and trends among all resources being monitored is planned through GCMRC's preparation of the annual State of the Colorado River Ecosystem Report, which will be electronically accessible to managers and the public.

Annual Science Plan

(From GCMRC strategic plan)

Request for Proposal Process

As recommended by the NRC (1996), GCMRC will utilize a competitive proposal solicitation process open to government employees, public-section contractors, and universities through an open Request for Proposals (RFPs). Monitoring and research projects will be selected on the basis of their support of scientific capability and merit, submission timeliness on previous work (as evaluated through an independent, objective and unbiased peer review process), management objectives and information needs, demonstrated capabilities of proposers, and cost effectiveness. Following the selection of proposals, appropriate procurement mechanisms (i.e., grants, contracts, cooperative agreements) will be utilized for supporting selected projects. Most cultural resources programs, falling under the Secretary's trust responsibilities, will be subjected to the same review protocol with a decision point only under after required revision.

GCMRC's commitment to ensuring the high quality of the scientific information produced by its programs highlights the importance of peer review at all levels of GCMRC scientific activities. GCMRC is committed to the use of scientific peer review and is drafting a set of peer review guidelines to describe the level of review received by all GCMRC proposals, programs, publications, and other products; and clearly convey the unambiguous standard of scientific objectivity and credibility followed by GCMRC.

These guidelines for scientific peer review will ensure that GCMRC matches the level of peer review to the nature of the proposal, program, publication or other product being reviewed, and describe the selection of qualified scientific peers, independence of the review process, and the inclusion of external (i.e., outside GCMRC) reviewers in the scientific peer review process.

In general, following approval by the AMWG of the long-term monitoring and research strategic plan, an annual monitoring and research program will be completed and approved each year in April. After approval of the annual monitoring and research plan, RFPs will be issued. Proposals will be screened by the program managers for their responsiveness to the RFP and all qualified proposals will undergo an independent and objective scientific peer review. Awards will be made on the basis of the results of peer review, along with the program manager's evaluation of project relevance, and technical contracting requirements.

Environmental Scan

(In addition to the following paragraphs, this portion of the Strategic Plan will be expanded with additional ideas and comments from both inside and outside the AMP)

Internal Strengths and Weaknesses

Unquestionably, the greatest strength of the AMP program is also its source of greatest conflict. Virtually all of the recognized stakeholders sit or are represented at the AMWG table. In the nearly five years of its existence, I am unaware of anyone coming forward claiming his views are not represented. However, with such divergent views assembled in the same room, disagreements and conflict are unavoidable. The validity of the diverse views is unquestioned. The problems lie in adequately addressing all of the needs and desires in a limited time structure and with a limited budget. One can look at the United Nations or the Tower of Babel to illustrate the breadth and depth of potential conflicts. Strangely, many of the differences have been resolved with minimal pain inflicted. Whether that has been luck or professionally skillful mediation is debatable.

One strength has also exposed a potentially glaring weakness. The obvious advantage of being blessed with an "in house" science center(GCMRC) with acceptable biases has made it clear that there must be some technical oversight of their activities. Part of the original AMP design was that the Technical Work Group(TWG) might in part fill that role. Assuming the rest of that design were in place, the Science Advisory Board(SAB), logically, oversight would not be a problem. Unfortunately, the SAB is just now coming on board and the TWG is insufficiently technically grounded to provide that kind of guidance. As a result the TWG for lack of something better to do, mires themselves in policy debates that minimize what technical expertise exists. It is fervently hoped that the SAB will provide the TWG with the

necessary technical advice and guidance that will allow them to serve in the capacity originally intended. It is also hoped that over time the TWG will attract additional technically qualified members.

From a scientific point of view you should avoid changing two significant elements of a process or it will be nearly impossible to determine which change triggered the result. Failing to heed that advice we have for the for-see-able future capped the budget of the Science Center and have now included the responsibilities of the Biological Opinion and the Programmatic Agreement to their list of assigned tasks. Compounding this complication is the fact that DOI agencies have a unilateral responsibility for those two programs. Only they can expand or diminish those programs, yet they have become an unintended responsibility of the AMP with no legal authority to act. If either or both of those programs require less funding, it would inure to the benefit of the AMP program. If they require additional funding it would be at the expense of the needs of other stakeholders until alternate means of funding are discovered.

We have recently embarked on a change in monitoring protocols for fish with minimal discussion of the potential impacts of doing so. Again, had the SAB been on board, we would have had the opportunity to hear agreement or divergent views of that action. Since the center as a matter of policy incorporates independent peer review of significant changes in protocols one is left to wonder whether this change is insignificant or an oversight. More importantly it opens the door to a discussion of “process” which will be addressed separately. If not it would be appropriate to include it here.

The first two iterations of the Management Objectives(Mos) and Information Needs(Ins) were accomplished without the benefit of comment by the SAB. In a peer review by the National Academy of Sciences(Downstream) they suggested that the number of Mos were too prodigious to accomplish the desired goals within the confines of available time and budget. The only effort to prioritize the MO's was done with inadequate participation and scientific oversight..

The scientific focus of the AMP is immeasurably better than its predecessor GCES as is the breadth of participation by interested parties. In a dynamic system such as the Colorado River it is unreasonable to expect significant results in such a short time. There is a sense, however, that the AMP program, though occasionally flawed, is on the right track. With perseverance it could be the model for addressing environmental concerns adaptively.

External Threats and Opportunities

Adaptive management is founded on the process of learning through experimentation. Whether experiments are advisable or not will always differ in the minds of stakeholders who undertake varying amounts of risk with the outcome as it may affect the status quo. Whenever disagreement arises, there is the ever present threat that outside interests will interpret the disagreement as a failure of the program and of the adaptive management

process. Legal maneuvering and litigation can easily undermine the foundation of adaptive management, which by its nature of bringing people of disparate interests together, relies on trust to succeed.

It is very difficult for any environmental management program to succeed without a secure source of funding. Thus, any threats to the future of GCDAMP funding, which at present comes almost exclusively from hydropower revenues, could seriously undermine the program. The prospect for such threats is real, particularly in a period of energy shortages and high cost, and is exacerbated by the fact that many of the hydropower recipients live at great distance from the Grand Canyon.

Another external threat to the GCDAMP, which is largely under the control of program members, is that the public will not agree with their vision for the future of Glen and Grand canyons. Program members must ensure that in their desire to come together in a shared vision of the future of these resources they do not inadvertently exclude the public from this vision. A well organized, multi-faceted public outreach program is the best means to combat this threat.

It is said that behind every threat lies an opportunity, and this may well be true of the GCDAMP. A recent Congressional cap on power revenues for the program has set in motion actions by members to seek appropriated funds and other sources of revenue. For this effort to be successful, GCDAMP members would have to work together closely and with a common purpose. A successful outcome, however, would undoubtedly bring members together with a sense of satisfaction for an accomplishment that would help to secure the future of their shared vision.

The ultimate opportunity of the GCDAMP is to create and bring to fruition a vision of the future Colorado River in Glen and Grand canyons with which a wide variety of stakeholders can identify. For the first 30 years of its existence, Glen Canyon Dam was operated largely to meet two demands: water delivery and hydropower. With the advent of the Grand Canyon Protection Act, the Record of Decision of dam operations, and the formation of the GCDAMP we have before us the prospect of true multiuse management of the dam. In our transition we must change our mindset. The dam must become a tool in the hands of humans with a shared vision of the future, a tool that in conjunction with other management devices can fulfill that vision and maintain it as a legacy for future generations.

Legal Sideboards within which the AMP Operates

(To be provided by John Shields)

Cultural and Social Diversity Issues

The AMP incorporates a variety of partners or stakeholders to achieve the end goals or management objectives described above. In selecting the AMP goals and objectives, and in the implementation of this strategic plan, the Glen Canyon Dam AMP explicitly

endorses and utilizes the plurist approach to adaptive management defined by Borrini-Feyerabend et al. (2000):

“Pluralism is a situation in which autonomous and independent (inter-dependent) groups freely interact and collaborate on management issues on the basis of different views, interests and ‘entitlements.’”

Of course, application of a pluristic approach to the Glen Canyon Dam AMP is based not only on the principles of adaptive management, but also on the Federal Advisory Committee Act which explicitly calls for a plurality of voices and viewpoints to assist federal agencies in decision-making. AMP stakeholders have been selected to include different categories of organizations, institutions, and individuals, ranging from federal and state government officials, Indian tribal members and representatives, private individuals, and non-governmental organizations. These organizations and individuals have been selected for their diversity of views and interests. While the number of stakeholders and official AMP members is small, they have been selected to represent a cross-section of the American public, and to represent the views of the public with respect to Glen Canyon Dam issues. The strength of the AMP lies in bringing these differing voices and views to the management process.

Constraints and Barriers to Achieving Goals

Reasonable goals set by reasonable people are achievable, but never without overcoming the constraints and barriers that create the challenge in the first place. Constraints are conditions or forces of impact where barriers are hurdles or obstacles that must be overcome. Constraints to achieving the goals of the Adaptive Management Strategic Plan come from three sources: legal constraints, financial constraints, and the constraints imposed by the laws of nature. Barriers to be overcome by the AMP are the barriers inherent in the mission of the AMP, in the AMP multi-stakeholder process, and in the difficult physical challenges posed by the CRE.

Legal constraints include meshing the Law of the River and the ROD with the various legal mandates and missions of state, federal, and local organizations. There are, also, state and federal laws and regulations to comply with, separate from the Law of the River, including ESA and the NHPA to name two. The application of the AMP is legally constrained to the defined limits of the CRE. Also, litigation has in the past and will probably continue in the future to periodically constrain AMP decisions, actions, or participants. The controversial nature of the AMP makes the potential for litigation significant. These legal constraints must be considered and satisfied to accomplish the AMP goals.

Financial constraints are imposed by the budgetary limitations of agencies funding participation in the AMP. Monitoring and research for endangered species is an expensive proposition due to the scarcity of the target resource. Adding remote and difficult access conditions increases costs tremendously. Also, any management action taken is likely to have a negative financial impact on one stakeholder resource or another.

Nevertheless, annual budgets must be adhered to while applying best efforts to accomplish program goals. Inherently, knowledge and progress are acquired in small increments, while the funding is expended in large blocks. Few sources, other than state and federal funding, are available. Fiscal responsibility and efficiency must be the rule in accomplishing the AMP goals.

Natural constraints are those that limit the success of the most well thought out monitoring, research, and management efforts. The processes that formed the Grand Canyon and set the stage for its flora and fauna are still at work and will continue regardless of our temporary influence. Erosion will continue to create and eliminate sediment deposits; water years will continue to cycle on an unknown schedule; some species will decline in abundance as others increase their presence; the CRE will continuously adapt to “present” conditions. Within species, seasonal, annual, and decadal population variability is a response to environmental cues, few of which are within our control. In trying to accomplish the program goals, the AMP must recognize its limited capability to manage the natural processes that occur heedless of our efforts.

The inherent barriers of mission are antecedent resource condition, time, and political viability. Accomplishing strategic plan goals are steps forward from existing conditions. The state of some resources is, however, a function of conditions pre-dating the creation of the AMP and its precursors. Overcoming pre-existing conditions, such as the presence of nonnative species in the CRE, is the challenge such barriers present to achieving the AMP goals. Passage of time for any critically affected resource is a barrier of concern from two aspects. First, the rejuvenation of some rare biological resources may become impossible as their abundance drops below viability thresholds over time. Secondly, the continuance of the AMP is in the end a function of public support. Political viability of the Program may wane with changes in administration or the prominence of other issues of public concern. The growing energy crisis in some western states is one such issue that may gain some precedence over AMP issues. As time progresses with only incremental advances in accomplishing strategic plan goals, the possibility of being overtaken to some degree by external events or changes in public attitude increases.

Barriers of a multi-stakeholder process include the time, effort, and expenditure required to attain consensus on progressive steps proposed by any committee numbering more than four or five representatives. Decisions resulting from group discussions involve wide-ranging opinions on critical and contentious issues. Even with common goals, the interpretation of those goals can vary, the approach to attainment may differ, and the conditions for application of goal based management actions could be in dispute. Compromise to reach consensus can be viewed as an incremental loss to all stakeholders. Endangered species goals are especially vulnerable in a consensus-based process. With such barriers inherent in the process, “win-win” scenarios are difficult to find and hard fought when discovered. The AMP will have to be a patient process to overcome such barriers and achieve the strategic plan goals.

The sheer physical difficulty of trying to accomplish strategic plan goals in remote and harsh environments like the Grand Canyon poses significant barriers to the AMP. Access

is limited and for some resources, is only seasonal. The resources of concern are, generally, few and far between or clumped and vulnerable. Rare and precious resources are extremely difficult to sample effectively and nearly impossible to accurately trend over any reasonably short time frame. The “best scientific information available” to make management decisions may be very broad in scope, but thin as veneer in depth of understanding and consistency. Consistent, meaningful data points are not only physically difficult to collect, but may require decades of data to be sufficient for interpretation of resource responses to management actions. Achieving AMP goals will require tactical innovation and dedicated persistence to manage around such barriers.

Action Plan – What, Who, When and How

(The Action Plan will be developed after the completion of the MO’s)

Plan for Periodic Review

The Adaptive Management Program (AMP) was implemented as a result of the Record of Decision on the Operation of the Glen Canyon Dam Final Environmental Impact Statement (1996?) and to comply with consultation requirements of the Grand Canyon Protection Act (Public Law 102-575) of 1992. The AMP provides a process and organization to ensure the use of scientific information in decision making concerning Glen Canyon Dam operations and the protection of affected resources. The AMP is organized as a Federal Advisory Committee called the Adaptive Management Workgroup with additional groups providing technical advice and information such as the Technical Workgroup (TWG), a monitoring and research center, and independent review panels.

The AMP Strategic Plan is a guidance document for the AMWG and the Secretary of the Interior to provide a clearer picture of the downstream ecosystem that is to be managed by the appropriate landowners and input from interested stakeholders by the establishment of specific goals, management objectives (MO’s) and information needs (IN’s) through a shared vision and mission statement and guiding principles.

It is recommended that validation of the goals, management objectives, and information needs should be reviewed at the beginning of every other fiscal year by the AMWG with input from others involved in the AMP. This is to ensure that the strategic plan is appropriately updated in order to validate whether the long-term monitoring and research programs and the operating criteria need to be changed and if we are accomplishing the AMP’s vision and mission for the Colorado River ecosystem.

The TWG as the technical arm of the AMWG is charged with the actual periodic review of the strategic plan to ensure adjustments are made, if needed. Any Ad Hoc groups could be established to assist with such a review. If changes are needed to the strategic plan, including any of the goals, MO’s, or IN’s, then recommendations from the TWG will be made to the AMWG for approval to proceed with such changes.

The validation process should be completed within 6 months of the beginning of the fiscal year that the periodic review takes place.

**Glen Canyon Dam Adaptive Management Work Group
Federal Advisory Committee**

CHARTER

Official Designation: Glen Canyon Dam Adaptive Management Work Group.

Scope and Objectives: The Committee will provide advice and recommendations to the Secretary of the Interior relative to the operation of Glen Canyon Dam in accordance with the additional criteria and operating plans specified in Section 1804 of the Act and to the exercise of authorities under existing laws in such a manner as to protect, mitigate adverse impacts to, and improve the values for which Grand Canyon National Park and the Glen Canyon National Recreation Area were established, including but not limited to the natural and cultural resources and visitor use.

The Secretary of the Interior is implementing the Grand Canyon Protection Act (Act) of October 30, 1992, embodied in Public Law 102-575. The Act calls for implementation of long-term monitoring, research, and experimental programs and activities. As part of long-term monitoring, the Secretary's Record of Decision (ROD) mandated development of an Adaptive Management Program (AMP). The AMP provides for monitoring the results of the operating criteria and plans adopted by the Secretary and research and experimentation to suggest appropriate changes to those operating criteria and plans.

The AMP includes an Adaptive Management Work Group (AMWG). The AMWG will facilitate the AMP, recommend suitable monitoring and research programs, and make recommendations to the Secretary as required to meet the requirements of the Act. The AMWG may recommend research and monitoring proposals outside the Act which complement the AMP process, but such proposals will be funded separately, and do not deter from the focus of the Act.

Duration: It is the intent that the AMWG shall continue indefinitely, unless otherwise terminated by the Secretary.

Agency or Official to Whom the Committee Reports: The AMWG reports to the Secretary through the Secretary's designee who shall serve as the chairperson and Designated Federal Official of the AMWG. In the absence of the Chairperson, a senior level Interior representative will act as Chairperson for the AMWG.

The Secretary's designee shall be responsible for preparation of meeting agendas and scheduling meetings of the AMWG. The Secretary's designee shall attend and chair all meetings of the AMWG. The Secretary's designee will also be responsible for sending a formal summary report after each Advisory Committee meeting directly to the Secretary of the Interior with copies of subject summary report to be provided to all AMWG members.

Bureau Responsible for Providing Necessary Support: The logistical and support services for the meetings of the AMWG shall be provided by the Bureau of Reclamation (Reclamation).

Estimated Annual Operating Costs: The operating costs are estimated at \$200,000 annually for the establishment and support of the AMWG. This includes costs for required staff support, Reclamation staff and AMWG members, and expenses incurred in the recording and reproduction of meeting minutes, reports, notices, etc.

Description of Duties: The duties or roles and functions of the AMWG are in an advisory capacity only. They are to:

- a. Establish AMWG operating procedures.
- b. Advise the Secretary in meeting environmental and cultural commitments of the Record of Decision.
- c. Recommend the framework for the AMP policy, goals, and direction.
- d. Define and recommend resource management objectives for development and implementation of a long-term monitoring plan, and any necessary research and studies required to determine the effect of the operation of Glen Canyon Dam on the values for which the Grand Canyon National Park and Glen Canyon National Recreation Area were established, including but not limited to natural and cultural resources, and visitor use.
- e. Review and provide input on the report required in Section 1804 (c)(2) of the Act to the Secretary, the Congress, and the Governors of the Colorado River Basin States. The report will include discussion of dam operations, the operation of the AMP, status of resources, and measures taken to protect, mitigate, and improve the resources defined in the Act.
- f. Annually review long-term monitoring data to determine the status of resources and whether the AMP Strategic Plan goals and objectives are being met. If necessary, develop recommendations for modifying the GCDEIS ROD, associated operating criteria, and other resource management actions pursuant to the Grand Canyon Protection Act.
- g. Facilitate input and coordination of information from stakeholders to the Secretary to assist in meeting consultation requirements under Sections 1804 (c)(3) and 1805 (c) of the Act.
- h. Monitor and report on compliance of all program activities with applicable laws, permitting requirements, and the Act.

Allowances for Committee Members (compensation, travel, per diem, etc.) While engaged in the performance of official business at AMWG and AMWG sub-group meetings (regular, ad hoc, and Protocol Evaluation Panel meetings) away from home or their regular places of business, all AMWG members or AMWG sub-group members shall, upon request, be reimbursed for travel expenses in accordance with current Federal travel regulations.

Estimated Number and Frequency of Meetings: The AMWG is expected to meet biannually. The Secretary's designee, who will serve as the Designated Federal Official, may call additional meetings as deemed appropriate. Fifteen members must be present at any meeting of the AMWG to constitute a quorum.

In accordance with FACA, a notice of each meeting of the AMWG shall be published in the Federal Register at least 15 days prior to the meeting advising the date, time, place, and purpose of the meeting. If it becomes necessary to postpone or cancel an announced meeting, a subsequent notice shall be published in the Federal Register as early as possible and shall explain the reasons for the postponement or cancellation. A news release for each meeting, postponement, or cancellation shall also be provided to selected major newspapers in Arizona, California, Colorado, Nevada, New Mexico, Wyoming, and Utah. News releases shall also be provided to agencies and organizations expressing interest in publishing meeting announcements in newsletters.

In accordance with FACA, all meetings of the AMWG shall be open to the general public. Any organization, association, or individual may file a written statement or, at the discretion of the AMWG, provide verbal input regarding topics on a meeting agenda in accordance with FACA.

Termination Date: It is the intent that the AMWG shall continue indefinitely, unless otherwise terminated by the Secretary. The committee is subject to the provisions of the Federal Advisory Committee Act (FACA), 5.U.S.C. Appendix 2, and will take no action unless the charter filing requirements of section 9 of FACA have been complied with. The Committee is subject to biennial review and will terminate 2 years from the date the charter is filed, unless, prior to that time, the charter is renewed in accordance with Section 14 of the FACA.

Committee Membership: Members of the AMWG to be appointed by the Secretary shall be comprised of:

- a. Secretary's Designee, who shall serve as chairperson for the AMWG.
- b. One representative each from the 12 cooperating agencies associated with the EIS:
 - (1) Bureau of Reclamation
 - (2) Bureau of Indian Affairs
 - (3) U.S. Fish and Wildlife Service
 - (4) National Park Service
 - (5) Western Area Power Administration
 - (6) Arizona Game and Fish Department
 - (7) Hopi Tribe
 - (8) Hualapai Tribe
 - (9) Navajo Nation
 - (10) San Juan Southern Paiute Tribe

- (11) Southern Paiute Consortium
- (12) Pueblo of Zuni

c. One representative each from the seven basin States:

- (1) Arizona
- (2) California
- (3) Colorado
- (4) Nevada
- (5) New Mexico
- (6) Wyoming
- (7) Utah

d. Two representatives each from:

- (1) Environmental groups
- (2) Recreation interests
- (3) Contractors who purchase Federal power from Glen Canyon Powerplant

Members will be appointed to the AMWG by the Secretary, with input and recommendations from the cooperating agencies, States, tribes, contractors for Federal power from Glen Canyon Dam, environmental representatives, and other stakeholders. To be eligible for appointment to the AMWG, a person must (a) be qualified through education, knowledge, or experience to give informed advice on water supply, diversion and delivery facilities, and their operation and management, or the environmental aspects of such operation; and (b) have the capability to constructively work in a group setting toward a common objective of structuring a mechanism for program implementation.

Members of the AMWG will be appointed for a 4-year term. At the discretion of the Secretary, members may be reappointed to additional terms. Vacancies occurring by reason of resignation, death, or failure to regularly attend meetings will be filled by the Secretary for the balance of the vacating member's term using the same method by which the original appointment was made. The Secretary, may at his discretion, initiate a new term where the remaining term of the vacancy is less than 2 years. Failure of an organization to be represented at two consecutive meetings will substantiate grounds for dismissal. The Chairperson will make the final determination in dismissing a member.

To avoid conflict of interest issues arising from entities, including Federal agencies, having representatives on the AMWG and also submitting responses to request for proposals to perform work, the Federal procurement process shall be strictly adhered to. While members of the AMWG may give advice to the Secretarial Designee, all decisions in the procurement process shall be made by Federal procurement officials free of influence from AMWG members.

Subgroups: The committee may establish such workgroups or subcommittees as it deems necessary for the purposes of compiling information, discussing issues, and reporting back to the AMWG.

Authority: The Grand Canyon Protection Act (Act) of October 30, 1992, embodied in Public Law 102-575, directs the Secretary of the Interior (Secretary), among others, to operate Glen Canyon Dam in accordance with the additional criteria and operating plans specified in section 1804 of the Act and to 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 the Glen Canyon National Recreation Area were established, including but not limited to the natural and cultural resources and visitor use. The Secretary shall implement this section in a manner fully consistent with and subject to Section 1802 of the Act. Section 1805 of the Act calls for implementation of long-term monitoring programs and activities that will ensure that Glen Canyon Dam is operated in a manner consistent with that of Section 1802.

Secretary of the Interior

Date signed

Date Filed

GLEN CANYON DAM
ADAPTIVE MANAGEMENT WORK GROUP
OPERATING PROCEDURES

FOREWARD

The Grand Canyon Protection Act (Act) of October 30, 1992, (Public Law 102-575) directs the Secretary of the Interior (Secretary) to establish and implement long-term monitoring programs and activities that will ensure that Glen Canyon Dam is operated in a manner consistent with that of section 1802" of the Act. The monitoring programs and activities shall be established and implemented in consultation with the Secretary of Energy; the Governors of the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming; Indian tribes; and the general public, including representatives of academic and scientific communities, environmental organizations, the recreation industry, and contractors for the purchase of Federal power produced at Glen Canyon Dam. In order to comply with the consultation requirement of the Act, the Glen Canyon Dam EIS recommended formation of a Federal Advisory Committee. To fulfill this requirement, the Glen Canyon Dam Adaptive Management Work Group (AMWG) was established. The AMWG Charter imposes the following criteria: (1) the AMWG shall operate under the Federal Advisory Committee Act (Public Law 92-463); (2) the Chairperson shall be designated by the Secretary; (3) the Secretary's Designee, shall also serve as the Designated Federal Official under the Federal Advisory Committee Act; (4) the Bureau of Reclamation will provide the necessary support in taking accurate minutes of each meeting; and (5) the AMWG shall continue in operation until terminated or renewed by the Secretary of the Interior under the Federal Advisory Committee Act.

OPERATION

1. Meetings. The AMWG is expected to meet semiannually. The Secretary's Designee may call additional meetings as deemed appropriate. A minimum of one meeting will be held annually. All meetings shall be announced by notice in the Federal Register and by news release to local newspapers.

Fifteen members must be present at any meeting of the AMWG to constitute a quorum.

Robert's Rules of Order will be generally followed, except that some flexibility will be allowed as needs dictate.

The Bureau of Reclamation is responsible for arranging meetings and for other duties associated with operation of the AMWG. They will arrange for meeting location, provide staff for the Designee, minutes, Federal Register Notices and other operational requirements of the AMWG.

Meetings of the AMWG will be held in Phoenix, Arizona, to allow for better travel accessibility for the members as well as provide greater opportunity for the public to attend.

2. Chairperson. The Chairperson will be the Secretary's Designee, who will preside over the meetings of the AMWG. In the absence of the Chairperson, the Chairperson will appoint an alternate. The Chairperson will designate an alternate who is an employee of the Department of the Interior. The Chairperson or designated alternate must be present before a meeting of the AMWG may convene. The Chairperson or his alternate is authorized to adjourn an AMWG meeting at any time.

3. Members. Membership shall follow the guidelines in the AMWG Charter. Members of the AMWG will be designated by the Secretary of the Interior. They shall serve for a term of four years. Members may be re-designated to serve for more than one term.

4. Alternate Committee Members. Each AMWG member may designate an alternate to serve for the same term as the member. Alternates must be identified to the Chairperson in writing. If the alternate is to represent the member at any AMWG meeting, the member will so notify the chairperson 1.5 days prior to such meeting. Alternates must meet the same qualifications as the member. Alternates will have authority to participate in AMWG business, including quorum and voting privileges. Representation by an alternate does not satisfy the minimum personal attendance requirement of the member as described in the Charter. A list of members and alternates shall be maintained and made available to AMWG members.

5. Agenda. At least 30 days prior to any meeting of the AMWG, a draft of the proposed agenda and related information will be sent to the group members. Members shall review the agenda and return comments and proposed agenda items to the Designee within two weeks of the agenda mailing date. The final agenda will be sent to the members 15 days prior to the meeting. The Secretary's Designee shall approve the agendas.

6. Voting. The maker of a motion must clearly and concisely state and explain his or her motion. Motions may be made verbally or submitted in writing in advance of the meeting. Notice of motions to be made by any member of the AMWG should be announced in the Federal Register and presented on the agenda. Motions may be proposed by any member in meetings where they are related to an agenda topic. After a motion there should be presentations by staff followed by a discussion and a call for questions. The public will be given opportunity to comment during the question period as allowed by the Chairperson. Any member of the public asked to address the AMWG, shall have a minimum of two minutes to comment. The Chairperson can limit the total time allowed to the public for comments. Comments shall address the motion and not be repetitive to presentations, group discussions or other comments previously presented. The motion must be fully documented for the minutes and restated clearly by the Chairperson before a vote is taken.

The group should attempt to seek consensus but, in the event that consensus is not possible, a vote should be taken. Voting shall be by verbal indication or by raised hand. Approval of a motion requires a two-thirds majority of members present and voting. The views of any dissenting member or minority group shall be transmitted to the Secretary along with the majority recommendation. Voting shall occur only with the formal meetings of the group.

7. Minutes. Detailed minutes of each meeting will be kept. The minutes will contain a record of persons present and a description of pertinent matters discussed, conclusions reached, and actions taken on motions. Minutes shall be limited to approximately 5-15 pages. The corrections and adoption of the minutes will be by vote of the AMWG at the next subsequent meeting. The Secretary's Designee shall approve all minutes. The Bureau of Reclamation is responsible for recording and disseminating minutes to AMWG members within 60 days of the subject meeting.

9. Public Involvement. No later than 15 days prior to each meeting of the AMWG or any subcommittee thereof, a notice will be published in the Federal Register. Meetings will be open to the public and advertised in local newspapers. Interested persons may appear in person, or file written statements to the AMWG. Public comments can be on any issue related to operation of the Glen Canyon Dam. A specific time for public comment will be identified in the agenda. Advance approval for oral participation may be prescribed, and speaking time may be limited. Minutes of the AMWG meetings and copies of reports submitted to the AMWG will be maintained for public review at the Bureau of Reclamation's Upper Colorado Regional Office in Salt Lake City, Utah, and at the Library of Congress in Washington, D.C. They will also be posted to the Bureau of Reclamation web site (www.uc.usbr.gov/amp).

10. Payment of Travel. Members of the AMWG may receive compensation for travel expenses under current Federal regulations. Alternates representing the official committee member may also receive compensation for travel expenses.

11. Open/Closed Meetings. If any member proposes discussion of a sensitive issue felt to require a closed session, he or she should so state in a proposal submitted to AMWG members in sufficient time to include it in the agenda published in the Federal Register Notice announcing the next meeting. A closed executive session may be held during a regular meeting, but should be used rarely. Any sensitive cultural issues will require consultation with Native Americans prior to meeting.

Telephone conference meetings must have a notice in the Federal Register 15 days prior to the call. There must be adequate opportunity for the general public to listen to the conference call.

The AMWG may conduct business outside of formal meetings through telephone polls conducted by the Chairperson or his/her designee. In emergency situations, telephone polls can be requested by the AMWG member to act on clearly defined written motions for AMWG approval. Following approval by the Chairperson, a telephone poll will be conducted within seven working days. During a telephone poll, all members will be contacted and requested to vote. Approval of a motion requires a two-thirds majority of all members voting. The Chairperson is responsible for documenting in writing how each member voted and distributing the record to all AMWG members.

12. Reports and Record Keeping. The Annual Report (AR) required by the Grand Canyon Protection Act shall be written by the AMWG. The State of the Natural and Cultural Resources in the Colorado River Ecosystem report developed by the Grand Canyon Monitoring and

Research Center will be attached to the AR and shall contain information on the condition of the resources impacted by the operation of Glen Canyon Dam. The AR shall be concise, containing critical resource issues and recommendations to the Secretary on future dam operations.

AMWG staff will supply GSA the required information to complete the summary report for Federal Advisory Committees.

13. Committee Expenses and Cost Accounting. An accounting of the expenses for operation of the AMWG shall be maintained by Reclamation. Expenses and other information will be submitted to GSA as required by FACA. Committee expenses are limited to approximately \$154,000 annually.

SUB-GROUPS

1. Formation. The AMWG may form sub-groups in order to facilitate the mission of the AMWG as identified in the Act and the AMWG Charter. Sub-groups will be formed for completion of specific tasks or for specified periods of time. Sub-group members will be named by the members of the AMWG. Upon formation of a sub-group, the Chairperson of the AMWG, with the advice of AMWG members, will approve nominated members to serve on the sub-group. Effort shall be made to keep sub-groups small. Sub-groups will be formed or dissolved by a vote of the AMWG.

2. Requirements. Sub-groups may choose their chairperson from among the AMWG named sub-group members. The chairperson of any sub-group may convene group meetings at his or her discretion. Sub-groups may develop their own operating procedures. Sub-group meetings must follow requirements of FACA, except they need not be chartered and members need not be appointed by the Secretary. One standing sub-group or subcommittee of the AMWG will be the Glen Canyon Dam Technical Work Group (TWG). The TWG membership shall consist of one representative names from each organization represented in the AMWG, with the exception that two members from the National Park Service representing the Grand Canyon National Park and the Glen Canyon Recreational Area, and one representative from the US Geological Survey. All sub-groups will elect their own officers. Names of all sub-group members will be announced to the AMWG at regular meetings and will be attached to the minutes. Sub-group members may designate alternates subject to approval of the Designee and the AMWG.

3. Charge. Sub-groups will receive their charges from the AMWG. Sub-groups will work only on issues assigned them by the AMWG. They will not be empowered to follow other issues on their own. They are encouraged to submit issues to the AMWG they feel worthy of consideration and discussion, but the AMWG must approve work on all new issues. The AMWG may require the sub-groups to develop plans and direct them to come to a consensus or majority opinion at their discretion. Sub-groups shall determine their own operating procedures, which must be reduced to writing and included with the AMWG and sub-group records.

4. Reporting. Sub-groups will report at least annually to the AMWG at the request of the Chairperson. Sub-groups shall report only to the AMWG. They shall provide information as necessary for preparing annual resource reports and other reports as required for the AMWG.

5. Ad Hoc Groups. Ad hoc groups shall consist of members of the sub-group only. These groups may meet to discuss assignments from the sub-group. Ad hoc meetings will not require Federal Register notices. Minutes are recommended but, not required. Ad hoc groups shall report only to the main body of the sub-group. On a case-by-case basis, the AMWG will provide direction to the subgroups on the flexibility they have in forming Ad hoc groups.

Adopted by vote of the TWG on _____ In Phoenix, Arizona.

Approved: _____

Chairperson

Date

rev. 00jul06

GLEN CANYON DAM TECHNICAL WORK GROUP OPERATING PROCEDURES

FOREWORD

The Grand Canyon Protection Act (Act) of October 30, 1992, (Public Law 102-575) directs the Secretary of the Interior (Secretary) to establish and implement long-term monitoring programs and activities that will ensure that Glen Canyon Dam is operated in a manner consistent with that of section 1802 of the Act. The monitoring programs and activities shall be established and implemented in consultation with the Secretary of Energy; the Governors of the States of Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming; Indian tribes; and the general public, including representatives of academic and scientific communities, environmental organizations, the recreation industry, and contractors for the purchase of Federal power produced at Glen Canyon Dam. In order to comply with the consultation requirement of the Act, the Glen Canyon Dam EIS recommended formation of a Federal Advisory Committee and a Technical Work Group. To fulfill this requirement the Glen Canyon Adaptive Management Work Group (AMWG) was established. The AMWG held their first meeting on September 10-11, 1997 and officially formed the Glen Canyon Technical Work Group (TWG) as a subgroup. This group is comprised of technical representatives who represent the various stakeholders on the AMWG. The TWG shall perform those tasks charged to them by the AMWG. Additional responsibilities of the TWG are to develop criteria and standards for monitoring and research programs; provide periodic reviews and updates; develop resource management questions for the design of monitoring and research by the Grand Canyon Monitoring and Research Center; and provide information, as necessary, for preparing annual resource reports and other reports, as required, for the AMWG. The TWG shall comply with all regulations of the Sunshine Act and the Federal Advisory Committee Act pertaining to sub-committees. (See 41 CFR 101-6.10 Federal Advisory Committee Management). Staff resources for the TWG shall be provided by the Grand Canyon Monitoring and Research Center and Reclamation.

OPERATION

1. Meetings. - TWG meetings will be held quarterly or more frequently as required. Where possible meetings will be scheduled 2-3 months in advance. Information will be provided to all interested parties. The Bureau of Reclamation (Reclamation) will be responsible for submitting meeting notices to be published in the Federal Register 15 days prior to meetings. Federal register notices may provide information on up to 3 meetings at a time. The Chairperson will draft a reminder meeting notice to the TWG members and the staff will distribute it at least 10 days prior to the meeting. Meeting format will be in accordance with these Operating Procedures. Sixteen members must be present at any meeting of the ~~AMWG~~ TWG to constitute a quorum.

2. Officers. - The TWG will elect its own officers. The Chairperson will be elected for a 1-year term and selected by a vote of the TWG. The elected chairperson shall have the option of appointing an alternate member to represent the stakeholder for the term of the chairperson, however, the stakeholder shall have only one vote. With the recommendation of the TWG, compensation for the chairperson may be provided from Adaptive Management Program (AMP) funds. A Vice-chair will be selected to assist the Chairperson and will be an employee of Reclamation to ensure requirements of federal regulations are met and to provide assistance. Reclamation and GCMRC will provide staff and meeting resources. Reclamation shall be responsible for, and shall assure compliance with, the applicable federal regulations including those referenced above. The Chairperson shall be elected in the ~~December~~ summer July meeting of the TWG or the first meeting prior to the ~~first calendar~~ start of the fiscal year meeting of the AMWG TWG. ~~The new Chairperson will take office at the first meeting of the TWG following the first meeting of the AMWG of the year.~~ The term of the TWG Chairperson will be October 1 - Sept. 30. The current chairperson will serve until the new chairperson takes office.

Chair responsibilities:

Attend all TWG and AMWG meetings when possible.

Facilitate TWG meetings by leading discussions, arranging for an outside facilitator when required, and inviting input from TWG members, technical experts, and the public.

Organize or disband Ad Hoc task groups per TWG direction.

Ensure recognition of consensus or voting on decision items as appropriate, including development of minority opinion papers when consensus cannot be reached.

Present overview of TWG activities and recommendations at AMWG meetings.

Vice-Chair responsibilities include:

Attend all TWG and AMWG meetings when possible.

Assist the chairperson in facilitating the TWG meetings, ensuring that action items, responsible parties, and future agenda items are summarized and reviewed with the group by close of meeting.

Contact speakers, ad hoc committee chairpersons, and other contributors at least three weeks before the next TWG meeting to review assignments and determine how much time should be allotted for their presentations.

Prepare draft agenda for next meeting and provide review copies by E-mail to co-chairperson, GCMRC program managers, and speakers about three weeks before the next meeting. Finalize agenda and send to co-chairperson two weeks before meeting.

Track and coordinate contributions of products for TWG/AMWG review with stakeholders, GCMRC, ad hoc groups, and others.

Ensure complete meeting preparations (meeting room, motel, audio visual equipment, recording of minutes, etc.)

Review and distribute TWG products to AMWG.

3. Grand Canyon Monitoring and Research Center (GCMRC)

Develop GCMRC planning documents for TWG review.

Provide scientific opinions, documents, presentations, and reviews of TWG documents.

Develop research designs and proposals for implementing monitoring and research identified by the AMWG, including draft budget estimates.

Provide scientific information and updates to the TWG for all resources of concern identified in the EIS. Coordinate, prepare, and distribute technical reports and documentation for review and as final products.

Prepare and forward technical management recommendations and annual reports as specified in Section 1804 of the GCPA to the TWG.

4. Members. - The TWG membership shall consist of one representative named from each organization represented in the AMWG, with the exception of two members from the National Park Service representing the Grand Canyon National Park and the Glen Canyon Recreational Area, and one representative from the U.S. Geological Survey. The TWG organizational membership was nominated by the AMWG, with the USGS representative having been nominated by the Secretary's Designee. Members were selected by the respective organizations' representatives. A list of TWG members will be distributed to the AMWG at regular meetings. TWG members may designate alternates.

5. Alternate Committee Members. Alternates shall be designated by TWG members. Members can designate an alternate for any TWG or Ad Hoc group meeting they will be unable to attend, or for which the alternate is better prepared to represent the organizations' interests. Alternates shall sign-in on the attendance sheet noting that they are the alternate to the official member. The officially designated alternate, in the absence of the member, is allowed to fully participate and vote in TWG meetings without prior notification and be counted in the quorum.

6. Agenda. - Members, and others, requesting an item be added to the agenda should notify the Chairperson in writing (by mail, fax, or E-mail) at least 15 days prior to the meeting. The following information should be provided with each request: a discussion topic or title, the nature of the topic (e.g., sharing of information, discussion of an issue, or a proposed action), name(s) of the presenter(s), total amount of time required for presentation, and any other relevant points for meeting planning. The agenda will be finalized when the schedule is filled or when the pre-meeting briefing documents are distributed. Requests received after the agenda is finalized may be considered under new business (time permitting), or may have to be postponed until a future meeting. An agenda

will be prepared and approved by the Chairperson and forwarded to the TWG meeting recorder. The meeting recorder will distribute the final agenda (by e-mail and/or by other means) to the TWG members and others on the distribution list. Reclamation is responsible for compliance with federal regulations. Reclamation will include in the Federal Register Notice: meeting dates, times, location, and a list of meeting agenda items.

7. Guidelines for Discussions. - The following ground rules will guide all discussions while the meeting is in session: Members will endeavor to arrive, return from breaks, and depart the meeting on schedule. Any person needing to continue private discussions after the meeting has been called to order will take their business outside the conference room. Members, alternates, and visitors wishing to address the TWG will wait to be recognized by the Chairperson or designated discussion leader before speaking. Speakers will make their points succinctly and yield the floor to the next speaker, waiting to again be recognized for rebuttals. Comments are to be applicable to the motion and not repetitive to presentations, group discussion or other comments previously presented. Discussions of new or unrelated business will be postponed until the appointed time on the agenda.

8. Voting. - The maker of a motion must clearly and concisely state and explain their motion. Motions may be made verbally or submitted in writing in advance of the meeting. Motions may be proposed by a member in meetings where they are related to an agenda topic. After a motion and a second to the motion there shall be presentations by staff, where they are necessary or desired. Presentations shall be followed by discussion and a call for questions. The public will be given opportunity to comment during the question period as provided for in these operating procedures. Any member of the public who has asked to address the TWG, shall be provided a reasonable time to comment. The Chairperson may limit the total time allowed to the public for comments. Comments shall be applicable to the motion and not be repetitive of prior presentations, group discussions, or other comments. The motion shall be fully documented for the minutes and restated clearly by the Chairperson before seeking a determination of consensus or a vote is taken.

Consensus is the desired result. All reasonable efforts will be made to bring the group to a consensus decision or recommendation, including, for example, formation of ad hoc groups. If consensus cannot be achieved, a vote will be taken on motions and recommendations to be forwarded to the AMWG. Only members of the TWG or their alternate may vote. A majority

recommendation will go forward along with a minority opinion report (containing the alternate recommendation and identification of who constitutes the minority). Ad hoc groups consisting of the dissenting members may be formed as needed to prepare minority opinions. Each appointed TWG representative is expected to explain and/or clarify issues to their respective AMWG member.

Recommendations to the TWG or AMWG will be summarized in report form, will contain relevant background material on the issues, and will include a brief summary of previous discussions related to the issue (e.g., ad hoc group or TWG discussions). Requests for actions associated with a briefing document will be posed as a specific written recommendation that can be approved as written, approved with modification, or not approved. Reports and recommendations forwarded to the AMWG will be identified as having been approved through consensus of the entire TWG, except when a minority opinion is submitted to the Chairperson in writing prior to the agreed date for forwarding TWG recommendations to the AMWG (generally 60 days before the next AMWG meeting). Members subscribing to the minority opinion will be listed in the minority report, which shall follow the same format outlined above for the consensus or majority report. The TWG Chairperson may invite a representative of the minority group to present the minority opinion to the AMWG.

9. Ad Hoc Groups and Meetings. - Ad hoc groups can be formed by the TWG as needed with membership consisting of TWG members and alternates only. Groups may invite technical advisors outside the TWG membership to assist on some issues. These groups may meet to discuss assignments from the TWG. Ad hoc meetings will not require federal register notices. Minutes are recommended, but not required. Ad hoc groups shall report of their deliberations and findings to the TWG. Presentations of findings from Ad Hoc groups may be given by individual members of the group. Ad hoc groups shall report only to the main body of the TWG. The AMWG may provide direction to the TWG on the flexibility they have in forming ad hoc groups. Ad hoc groups shall be formed by the consensus or vote of the TWG and shall terminate as soon as the assigned task is completed.

10. Minutes, Reports, and Record Keeping. - Minutes will be recorded by TWG staff support from Reclamation. Minutes will address the key topics of the TWG meetings including proposals, motions, voting/approval of motions, majority/minority opinions, public comments, presentations, findings from ad hoc groups, and other pertinent information. Minutes will not be a complete transcript of the discussions. An audio tape recording of the meeting will be kept for each meeting. The corrections and adoption of the minutes will be reached by consensus of the TWG at the following meeting.

Minutes, attachments, agendas, and materials for upcoming TWG meetings will be distributed according to the schedule below:

A. Submittal of materials for upcoming TWG Meetings.

<u>15 Business Days Prior to TWG Mtg:</u>	<u>Responsible Person</u>	<u>Submit To</u>
_Agenda items	Committee Members	Chairman
_Materials for duplication & dist.	Committee Members	Staff

TWG members responsible for materials for an upcoming meeting shall forward them to the designated staff member in time to be included with the distribution which will occur 10 days prior to the meeting. Materials may be provided via e-mail or hard copy. Where copies of material are not provided to the designated staff member in time for normal distribution, the person or organization will be responsible for making their own copies and bringing them to the meeting. They may either: (1) e-mail, fax or other means; (2) duplicate prior to and distribute at the meeting. Staff, members, and public providing materials for distribution at the meeting should bring at least 40 copies. Meeting documents distributed at the meeting are to be provided first to the meeting recorder, TWG members, and the GCMRC Chief. Copies of all handouts will be placed in a designated location for official visitors and the public. If action is anticipated to be taken on or as a result of that material, all reasonable effort will be made to provide those materials to the members in advance of the meeting. In the event materials are not provided in advance of the meeting, action on this topic may be delayed at the Chairperson's discretion. Individuals making presentations at TWG meetings shall notify TWG staff of any special audio visual equipment or supply needs at least two weeks before the meeting.

A mailing list containing members' mailing addresses, phone numbers, fax numbers, and E-mail addresses, as appropriate, will be maintained and distributed as needed. Updates will be prepared and the list re-distributed as appropriate. A copy of the roster of TWG members or alternates attending any meeting of the TWG shall be attached to the minutes, and shall include a list of all others in attendance.

B. Meeting material distribution to TWG members

<u>10 Calendar Days Prior to TWG Meeting:</u>	<u>Responsible:</u>
_Minutes and attachments from the previous meeting	Staff
_Agenda for the upcoming meeting	Staff
_Materials needed for the upcoming meeting	Staff

E-mail, regular mail, or other means shall be used for the distribution.

Reclamation will be responsible for reports and distribution of materials to AMWG, and providing copies of information to the Library of Congress. The TWG shall assist GCMRC in preparation of the draft Annual Report to Congress pursuant to the Grand Canyon Protection Act.

Minutes, documentation from meetings, and reports shall be made available to the public at the Library of Congress in Washington, D.C. and the Upper Colorado Regional Office of the Bureau of Reclamation in Salt Lake City, Utah.

11. Arranging meetings and other duties associated with operation of the TWG. - Where possible, meetings will be scheduled 2-3 months in advance. All meetings shall also have a Federal Register Notice published 15 days or more in advance of any meeting. Meeting locations will be determined by the group in a preceding meeting. The staff will arrange meeting rooms and audio visual equipment, and block a number of hotel guest rooms. Meeting rooms will be arranged so that each of the 26 TWG members can be seated around the table. Alternates representing an absent TWG member should take their place at the table. Additional seating will be provided around the margin or rear of the room for alternates who are attending with the member, for official visitors and for the general public.

12. Public, Visitors, and Open and Closed Meetings. - All meetings are open to the public. It is not anticipated the group will require closed sessions unless a provision is made to do so. Only members of the TWG or their alternate may participate in discussions of the group. Appropriate staff of Reclamation and the GCMRC shall provide pertinent information from their organization to respond to questions or make presentations when approved by the group. The public will be allowed to comment after discussion of each agenda item requiring a decision of that group and at the end of the TWG meeting or as provided in the agenda. Each person will be given up to 10 minutes to address the TWG members at the time specified on the agenda for public comment. Greater consideration will be given to individuals submitting discussion issues and/or requesting time in advance of the meeting to the Chairperson. The Chairperson will control adherence to the time limit so the meeting is not unduly prolonged. Each speaker will be expected to provide their name and affiliation for the meeting minutes. The Chairperson will accept written comments from the public, and will allow their distribution if copies are available for all members (40 copies required). Written comments will be attached to the meeting minutes if they are identified with the name, address, and affiliation of the provider.

Adopted by vote of the TWG on _____, Phoenix, Arizona.

Approved: _____
Chairperson

Date

Updated: 2/13/01

