

AMWG – Public Outreach Ad Hoc Group

**Budget Progress Report
AMWG Meeting – Phoenix, AZ
August 12-13, 2009**



Completed Products

Phase I



Approved Fact Sheets

ADAPTIVE MANAGEMENT PROGRAM

Using Science to Manage River Resources in Grand Canyon



Adaptive Management Program Origins

The construction and operation of Glen Canyon Dam fundamentally altered the Colorado River ecosystem. Given the importance of Colorado River water to the states and economies of the Southwest, it is not surprising that there has been and remains considerable controversy over how to share this major river. As we begin the 21st century, challenges ahead over how best to manage this resource for the benefit of agricultural, municipal, industrial, tribal, environmental and recreational interests alike.

The Grand Canyon Protection Act of 1992 directed the Secretary of the Interior to manage Glen Canyon Dam in such a way as to "prevent, mitigate adverse impacts to and improve the values for which Grand Canyon National Park and Glen Canyon National Recreation Area were established." The act provided direction for the Glen Canyon Dam Environmental Impact Statement, in that all dam operations would need to be analyzed with those goals in mind.

After nearly five years of study, and more than 40 different projects undertaken by more than 15 different agencies, the record of decisions for the Glen Canyon Dam EIS was signed in 1996. The Decision specified operating parameters for Glen Canyon Dam and mandated that adaptive management of the resources in Grand Canyon be undertaken. The act stipulated that a close watch be maintained on the effects of Glen Canyon dam operations and ordered that future modifications of those operations and management actions be considered to protect and enhance the Colorado River ecosystem.

As part of this process, Interior Secretary Habbitt created a federal advisory committee composed of the numerous interests who share in the management of the river. These interests sit at what is called the Adaptive Management Work Group (AMWG). This group recommends dam operations and management actions to the Secretary of the Interior based on a wide variety of public and technical resources.

Law of the River

The following is a profile of some of the various federal and state laws, compacts, treaties and administrative actions that are presently referred to as the "Law of the River" and control river operations and the rights to the use of the Colorado River:

- **Colorado River Compact of 1922** - Apportioned the Upper and Lower Basins with the right to develop and use 7.5 million acre feet (mafd) of river water annually. The compact reserved water for future upper basin development and allowed planning and development in the lower basin to proceed.
- **Boulder Canyon Project Act of 1928** - This act authorized the construction of Hoover Dam and other irrigation facilities in the Lower Basin. Apportioned the Lower basin's 7.5 mafd among the states of Arizona (2.8 mafd), California (1.4 mafd) and Nevada (0.3 mafd).
- **Mexican Water Treaty of 1944** - Committed 1.5 mafd of the river's annual flow to Mexico.

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Historical Native Fishes of Glen and Grand Canyons

The native fishes of the Colorado River make up one of the most unique and unusual faunas found anywhere in the world. This assemblage of fish is specifically adapted to the historic environment of the Colorado River, and the species that make up this assemblage are often found nowhere other than the Colorado River Basin.

Even prior to the construction of Glen Canyon Dam, the Colorado River in Grand Canyon was dominated by introduced fish species, mostly warm water types. The construction of Glen Canyon Dam changed the river from a turbid, flood-prone, warmwater river to a perennially cold, clear river. This allowed trout, which were introduced, to flourish and expand their use of the river.

These fundamental changes to the ecosystem in which the native fish evolved is now present numerous challenges to their survival. They encounter a physiological of being a warmwater adapted fish now living in a cold environment. Introduced fishes residing in the Grand Canyon may interact with, compete with, or prey upon these native fishes. Finally, changes in the foodbase have occurred due to the presence of much clearer water than existed prior to construction of Glen Canyon Dam.

Common Native Fish in Grand Canyon - Conservation Through Adaptive Management

- **Spined Dace (*Rhinichthys aculeus*)** - This small minnow is widely distributed across the western United States. They inhabit tributaries of the Colorado River through Glen and Grand Canyons, and are not uncommon in backwaters in western Grand Canyon.
- **Bluntnose Sucker (*Catostomus commersoni*)** - Bluntnose occur throughout the upper Colorado River Basin and extend into the Lower Basin through the Little Colorado River Drainage and through Grand Canyon to Lake Mead. They are common in tributaries in Grand Canyon. An adult bluntnose may approach 20 inches in length, and can live up to 30 years.
- **Flannelmouth Sucker (*Catostomus commersoni*)** - Flannelmouth Sucker are widely distributed in the Upper Colorado River Basin, and extend into the Little Colorado River Watershed of Arizona and through Grand Canyon. An adult flannelmouth sucker may approach about 20 inches in length, and like other large suckers of the Colorado River may live up to 30 years.

Endangered Fishes of Grand Canyon - A Major Focus of Adaptive Management

- **Humpback Chub (*Gila cypha*)** - This endangered fish is only known from the Colorado River System, and is restricted to a few remaining populations. One of those populations resides in the Grand Canyon. It was historically widely distributed in the Upper Colorado River Basin and extended down the main stem of the Colorado River into the Lower Basin to at least current Lake Havasu. In Grand Canyon, most humpback chub are found in the vicinity of the Little Colorado River and its confluence with the Colorado River. This is a warm water species, and its spawning and recruitment appears limited in the now cold waters of the Colorado River in Grand Canyon. Spawning

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Sand Bars in the Grand Canyon

Below Glen Canyon Dam, the Colorado River winds for nearly 300 miles through gorges of Glen Canyon and Grand Canyon in one of the most pristine environments in the world. Bordering the river are thousands of sand bars that provide habitat for a fascinating variety of plants and animals, including some endangered species. Native plants and animals are actively promoted by the National Park Service, as are camping beaches and archeological features dependent upon the sand bar habitat. Dam operations and management actions impact the sand bars. The Adaptive Management Work Group develops recommendations to conserve and enhance the sand bars of Grand Canyon.

Glen Canyon Dam's Effect on Sand Bars

- **Glen Canyon Dam collects and retains 86 percent of the river's sediment in its reservoir, Lake Powell.** Glen Canyon Dam regulates the flow of water through Grand Canyon, but does not allow the passage of sediment that once built sand bars and formed an important component of the river ecosystem. The Colorado River was once known for its large annual spring floods of extremely muddy water that were "too thick to drink, too thin to plow". Now, with the settling of the sediment in the reservoir, the dam's turbines release clear water throughout the year, resulting in a sediment-deprived system. Without large annual floods in a sediment-rich river, sand bars are not restored, and vegetation once-lush continues to reduce open sand bar habitat.
- **Water releases from the dam fluctuate daily to meet electrical needs.** This fluctuation tends to erode sand bars, which can have an impact on other parts of the river ecosystem.
- **Aquatic and terrestrial ecosystems:** Together with regime instabilities in the sand, this habitat is crucial for the growth and survival of the intricate food web found along the river. Many species evolved through geologic time in this sediment-rich habitat, including the endangered humpback chub, a species still struggling to survive in what remains of its natural habitat. Backwater pools behind the sand bars are calms, warm water habitats that may prove crucial for the survival of young fish once abundant.
- **Camouflages for river visitors:** With more than 20,000 river visitors annually and river trips that last from seven to 21 days, river users need numerous and well-distributed sand bars of sufficient size for camping. A rocky, barren shore line or one exhibiting severe vegetation encroachment would make river visitation difficult, if not impossible, in this unique and greatly sought after region.
- **Archeological sites:** Many sites are located in the high sand benches of pre-dam age. Although located above the normal fluctuation level of dam releases, erosion at a number of these sites may be related to the overall decrease in sediment. Appropriate management of the remaining sediment may help preserve these archeological sites, some of which have been in place for thousands of years.

Steps Taken to Restore Sand Bars

- **Glen Canyon Dam release fluctuations:** The Adaptive Management Program continues to study various Glen Canyon Dam release fluctuation patterns designed to slow the amount of sand bar erosion and overall transport of sediment out of the Grand Canyon into Lake Mead. This could provide more dry camping area and enhance cultural sites and riparian habitat, while minimizing impacts to power generation.

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List of Fact Sheets

- Adaptive Management Program Origins
- Adaptive Management Program Purpose and Goals
- Who We Are
- Cultural Resources
- Current Status of Resources in the Grand Canyon
- Endangered Species
- Historical Native Fishes of Glen and Grand Canyons
- Hydropower and the Adaptive Management Program
- Colorado River Storage Project
- Lees Ferry Trout Fishery
- Recreational River Rafting
- Sand Bars in the Grand Canyon
- Glen Canyon Dam Temperature Control Device



Logo & Tagline


















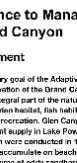
















***“Using Science to Manage River
Resources in Grand Canyon”***

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Using Science to Manage River Resources in the Grand Canyon

Sediment

A primary goal of the Adaptive Management Program is the conservation of the Grand Canyon's sand and the sediment which is an integral part of the natural resources. Sediment is important for riparian habitat, fish habitat, production of archaeological sites and for recreation. Glen Canyon Dam captures the mainstem river sediment supply in Lake Powell. Experimental flood releases from the dam were conducted in 1992 and 2006 to determine if sand would accumulate on beaches and increase the total area and volume of sandy shoreline.























New sand that was deposited during the 1960 release was not sustained. The 2004 experimental indications have shown that some sediments can be stored if the flows are timed to make use of sediment enriched conditions that to low large tributary floods.

















Cultural Resources

The Grand Canyon Protection Act specifies cultural resources as a subcategory of the Grand Canyon ecosystem. These resources include:

- Archaeological sites including living places, agriculture fields, trails, ceremonial locations, inscriptions and testaments. These places are related to the ancestors of Native Americans including the Hopewell, Navajo, Pueblo, and the Zuni.
- Historical resources are related to mining, scientific study, and river development, including mines, houses, inscriptions and boats.
- Cultural or societal resources include the plants, animals, water, geography, sounds, smells and spaces that have value to society.



The main goals of its cultural resources monitoring program are to document site impacts and evaluate the need for site protection measures. One protective measure is the installation of rock and gravel check dams to help control erosion at archaeological sites.



Trout Fishery

Lone Ferry, the 16.0-mile stretch of the Colorado River between Glen Canyon Dam and the beginning of Marble Canyon, is a recreational "blue ribbon" trout fishing area. Anglers from around the world come to Lone Ferry to fish for rainbow trout in this large, swift-flowing river. Because of reliable flows of cold water ranging from 45 - 90 degrees, and abundant aquatic food, the river has the capacity to maintain a remarkable trout fishery in the desert. During its history, this productive fishery produced huge rainbow trout ranging from 18 - 30 pounds.

This trout fishery is one of the values associated with the Glen Canyon National Recreation Area, and its maintenance is among the goals of the Adaptive Management Program.

Native Fish

The decline of the native fish population is a focus of the Adaptive Management Program's monitoring and research activities. Included are:

- Conducting high river experiments to conserve sediment important to native fish habitat.
- Evaluating fish proposed to move down releases through a selective withdrawal structure.
- Removing non-native fish that grow up below fish.
- Monitoring the effects of these actions to identify causes and effect relationships and track native fish population trends.

Removal of Non-Native Fish

A four-year-long experiment is being conducted to determine if removal of non-native fish, mainly rainbow trout, will result in an increase in the survival of native fish. The fish are removed with electrical shock and netting. The technique is then made into a tool.

River Rafting and Recreation

With the completion of Glen Canyon Dam in 1963, regulation of water flows established conditions favorable for river rafting in Marble Canyon. In 1976, the ongoing possibility of river rafting resulted in the need to regulate water use in order to protect the river environment and the quality of the river experience. Today, "using the flow" is a month-long annual recreation experience.




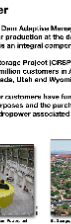
The Adaptive Management Program incorporates goals for the needs of river recreation, including conservation of the many popular beaches in the Grand Canyon.

Hydropower

The **Great Geyser Basin Adaptive Resource Management Program** aims to offset hydropower production at the dam. The program recognizes that hydropower is an integral component of the region's economy.

Colorado River Storage Project (CRSP) power is sold to non-profit entities with low million customers in Arizona, Colorado, New Mexico, Nevada, Utah and Wyoming.


Since 1983, power customers have funded over \$275 million for environmental purposes and the purchase of replacement power for the lost hydropower associated with environmental flow restoration.


Birds

The Grand Canyon ecosystem provides important habitat to wintering, migrant, and breeding birds. More than 30 species have been recorded breeding along the river in the study area. Detailed research since the 1970s has shown that there are four distinct flow-related effects upon the riparian breeding bird community. The primary challenge has been an increase in vegetation in areas that were once riparian.


Species of Concern




Least Ashed Flycatcher
 • 1990s: 100% of the population was in the Grand Canyon
 • 2000s: 100% of the population was in the Grand Canyon
 • 2010s: 100% of the population was in the Grand Canyon




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
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River Water Temperature

In 1954 the Fish and Wildlife Service issued a biological opinion recommending this Bureau of Reclamation study the feasibility of modifying the operation of the dam by adding a selective withdrawal structure to control lower temperatures. The goal would be to provide the right combination of cold and warm water released from the reservoir to protect the humpback chub, and also protect the trout fishery.



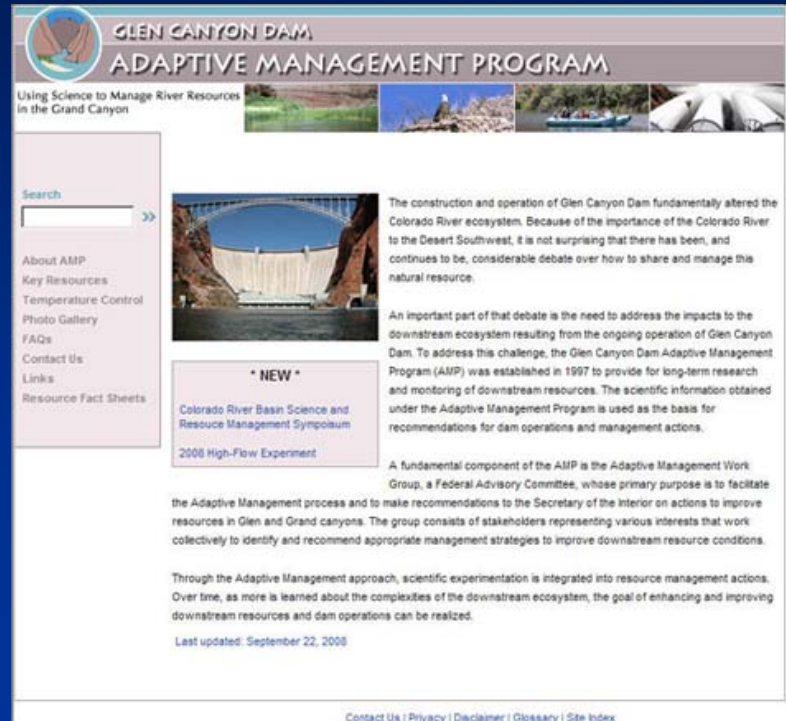

Why is the Adaptive Management Program important?

Finding balance between the operation of Glen Canyon Dam and the requirements of downstream measures will continue to drive the work of the Adaptive Management Program. The many values of Grand Canyon must be protected while maintaining the significant benefits of Glen Canyon Dam to millions of people living in the seven Colorado River Basin states.

Issues we study today will likely take many years to resolve, and new concerns will certainly arise. That's why the Department of the Interior is committed to, and places a high priority on, the long-term adaptive management process to address the complex challenges that exist in Glen and Grand Canyons.

Public Outreach Website



Site address: www.gcdamp.gov

Proposed Products

Phase II

FY 2010 & 2011



Phase II – Proposed Products

- ✓ **Science Status Updates**
- ✓ **Retractable Banner Display (in process)**
- ✓ **Tribal Outreach Materials**
- ✓ **Media Kit Folders (in process)**
- ✓ **Video B-roll Kits (in process)**
- ✓ **Trade Show Participation**
- ✓ **Guide Resource Materials**
- ✓ **Media Events**
 - ☐ **Science Day**
 - ☐ **News Media Tour**
 - ☐ **Translocation Efforts**
- ✓ **Educational Materials**



Proposed New Fact Sheet Topics

- High Flow Test
Overview (in process)
- Monitoring of Native Fish
- Tribal Values
- Non-native Fish Suppression
- Fall Steady Flows



Guide Materials

How to Structure Answers: <p>State Message</p> <p>Support it</p> <p>Elaborate it</p>	Bridging and Deflecting <p>Reporter's Question</p> <p>BRIDGE</p> <p>Test Message Track</p> <p>Step One: 1 Acknowledge or 2 Refute</p> <p>Step Three: Test Message Track</p> <p>Possible Bridges: "Let's look at it from a broader perspective..." "There is an equally important concern..." "Let's not lose sight of the underlying problem..."</p>	Communicate With Power Message Developer® <p>Two One Steps...</p> <p>Two Two Steps...</p> <p>Two Three Steps...</p>	Communicate With Power® 2000 Encountering the Media® Wallet Card By Barry McLoughlin McLoughlin Multimedia Publishing For information call: In North America: Call: 1-800-663-3800 Fax: 1-609-463-9277 Outside North America: 613-230-9235 Fax: 613-230-2630 Email: communicate@molmedia.com Visit our web site: www.molmedia.com Ottawa, ON, Canada; Washington, D.C.; Princeton, NJ.
Relaxation Exercises Breathe slowly & deeply for 5 minutes. Massage your face, neck and hands. Shake your hands loosely. Stomp your feet. Pull in your stomach, lean against a wall; then breathe out through your teeth for 2 minutes. Sip cool water. Psyche yourself up: "I am going to have an interesting dialogue about a fascinating subject."	Interview Plan Issue: Goals: * * Theme: Core Message 1: Specific Messages * * Core Message 2: Specific Messages * * Core Message 3: Specific Messages * *	Interview Plan cont'd Positioning Statement: Quotable Quotes: 1. 2. 3. Examples, Analogies, Illustrations, Facts: 1. 2. 3.	Questions to Ask the Reporter on Initial Contact Your name again? Representing what media outlet? What is it about? What particular aspect are you focusing on? or, How are you approaching the story? or, What's triggering your story? Are you speaking to others? How much do you know about our organization (or the subject)? May I FAX some background information to you? Your FAX number? What is your deadline? May I call you back in an hour? (30 minutes? 10 minutes?) What is your phone number?

Wallet card

- Profile AMP research activities for handout to Grand Canyon visitors
- 50,000 wallet cards

Ammo can info

- Laminated fact sheets

Media Kit Folder




Example: For illustration purposes only

Educational Materials - Grant



Example: For illustration
purposes only

Media Event – Science Day



Colorado River Basin Science and Resource Management Symposium

Coming Together:

Coordination of Science and Restoration Activities for the Colorado River Ecosystem

November 18-20, 2008
Doubletree Resort Hotel
5401 N. Scottsdale Road
Scottsdale, AZ

This symposium will promote the exchange of information on research and management activities related to the restoration/conservation of the Colorado River and its major tributaries from the headwaters to the U.S./Mexico border. This 2-1/2 day symposium will feature plenary sessions as well as concurrent technical sessions, vendors and poster sessions.

Conference Sponsors:

- U.S. Geological Survey – Southwest Biological Science Center*
- Glen Canyon Dam Adaptive Management Program*
- U.S. Fish and Wildlife Service*
- Upper Colorado River Endangered Fish Recovery Program*
- Lower Colorado River Multi-Species Conservation Program*
- Bureau of Reclamation*
- National Park Service*
- Colorado River Fish and Wildlife Council*
- Water Education Foundation*

Program Highlights

Multiple programs to restore and conserve the Colorado River's native species and habitat have evolved independently since 1980 – programs that have had a major impact on water management and conservation efforts. These programs have many common goals and objectives, but there has been no formal opportunity for the exchange of information among these programs. This basin-wide symposium will provide scientists, stakeholders, land and resource managers, and decision-makers the opportunity to learn about these various programs and exchange ideas and data enhancing the effectiveness of these programs – and their success in restoring and conserving the river's ecosystem.

Plenary and Technical Session Topics Include:

- ▶ Status and trends of aquatic resources, including native and nonnative fishes
- ▶ Climate change and long term drought: how will it affect restoration efforts?
- ▶ Adaptive management and collaborative management decision making
- ▶ Instream flow management and protection (including dam operations and reservoirs)
- ▶ Nonnative fish management and restoration
- ▶ Integrating recreational fisheries with native fish conservation
- ▶ Monitoring program design and effectiveness
- ▶ Native fish propagation, stocking genetic management
- ▶ Sediment conservation and management
- ▶ Societal values and Native American perspectives
- ▶ Riparian habitat monitoring and restoration

More information on this symposium – including a secure, on-line registration form – is available at www.watereducation.org

General Program Support Activities



Special Events & Media Coordination



Media Relations - March 2008 High Flow Test

Public Meetings Support



Experimental Flows