

# Confluence of Values: The Role of Science and Native Americans in the Glen Canyon Dam Adaptive Management Program

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*We don't see things as they are, we see things as we are.*

—Anais Nin

## Abstract

Grand Canyon and the Colorado River are important places on the landscape for many Native American Tribes. The Glen Canyon Dam Adaptive Management Program (GCDAMP) is designed to employ science as a means for gathering, analyzing, and disseminating information on the condition of resources. A Western science perspective dominates this program with recognition of Native American traditional perspectives as a valued component. Analogous to a confluence of rivers, Native American traditional perspectives were initially envisioned as enhancing the Western science approach by creating a more holistic understanding of this valued ecosystem; however, this integration has not been realized. Identified barriers to effective participation by Native American stakeholders are vast cultural differences that express themselves in complex sociocultural scenarios such as conflict resolution discourse and a lack of insight on how to incorporate Native American values into the program. Also explored is the use of “science” as a sociopolitical tool to validate authoritative roles that have had the unintended effect of further disenfranchising Native Americans through

the promotion of colonialist attitudes. Solutions to these barriers are offered to advance a more effective and inclusive participation of Native American stakeholders in this program. Finally, drawing from the social sciences, a reflexive approach to the entire GCDAMP is advocated.

## Introduction

Grand Canyon and the Colorado River are important places on the landscape that are central to the traditional values and histories of many Native American Tribes. During the development of the Glen Canyon Dam Environmental Impact Statement (GCDEIS), between 1991 and 1995, the Bureau of Reclamation acknowledged the importance of integrating Native American perspectives and values into the environmental analysis equation by providing five Tribes (Hopi, Hualapai, Navajo, Southern Paiute Consortium, and the Pueblo of Zuni) with cooperating agency status. The Glen Canyon Dam Adaptive Management Program (GCDAMP) was created in 1997 as a result of the Record of Decision for the GCDEIS and is designed to employ science as a means for gathering, analyzing, and disseminating information on the condition of natural and cultural resources to the appropriate managers.

A critical examination of the past 10 years of Tribal participation in the GCDAMP reveals a failure of the program to effectively integrate Native American perspectives. Our analysis and conclusions of the GCDAMP are based on direct participation as Tribal representatives. Our participation as Tribal stakeholder representatives began during the development of the Glen Canyon Dam Environmental Impact Statement and continues in the GCDAMP at the time this paper

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was written.<sup>4</sup> In this paper, we identify several barriers to effective participation by Native American stakeholders in the GCDAMP. Identified barriers include vast cultural differences among stakeholders that express themselves in complex sociocultural scenarios and a lack of insight by program managers and scientists on ways to affirm and respond to Tribal cultural concerns.

Also explored in this paper is the concept of Western science as it exists within the GCDAMP and how science is employed as a sociopolitical tool to validate authoritative roles within the program. The heavy reliance on Western science within the program is demonstrated to have had the unintended effect of promoting the disenfranchisement of the participating Tribes from the GCDAMP through the continuation of colonialist attitudes. Solutions to these identified barriers are proposed to advance a more effective and inclusive participation by the Native American stakeholders in this program. Finally, drawing from the social sciences, a reflexive approach to the entire GCDAMP is advocated.

## Grand Canyon as Cultural Landscape

Grand Canyon and Colorado River are culturally important and represent astounding aspects of the landscape for most Americans and for individuals from across the globe. Grand Canyon has been classified as one of the seven natural wonders of the world and is also recognized as a World Heritage Site. Grand Canyon embodies a powerful and inspiring landscape that overwhelms the human senses.

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<sup>4</sup> The primary author began his involvement in this program in 1991 as the Hopi Tribe's representative to the cooperating agencies in the development of the Glen Canyon Dam Environmental Impact Statement (GCDEIS). He continued to represent the Hopi Tribe as their representative to the Technical Work Group and as the alternate representative to the Adaptive Management Work Group during the development and implementation of the Adaptive Management Program from 1996 to 2003. Mr. Dongoske also served as the Chair of the Technical Work Group for 5 years and is currently the Pueblo of Zuni's representative to the Technical Work Group. Ms. Jackson-Kelly represented the Hualapai Tribe during the development of the GCDEIS and has been the Hualapai Tribe's representative to the Adaptive Management Work Group since 1997. Mr. Bullets is the Southern Paiute Consortium's representative to the Technical Work Group and the Adaptive Management Work Group, a position that he has held since 2006. Our analysis is based on direct participant observation and data acquired over an 18-year period that extends from the development of the GCDEIS to the origination and implementation of the Adaptive Management Program.

In the late 1800s, Clarence Dutton (as quoted in Worster, 2001, p. 326) described Grand Canyon most appropriately when he stated that Grand Canyon is:

More than simply two walls rising from the river, the Grand Canyon is a complex architectural wonderland some ten to twelve miles in breadth at its widest point. What nature has done here is precisely the work of an architect: chiseling, sculpting, cutting out large amphitheatres, naves, arches, and columns, leaving walls, spandrels, lintels. Hundreds of these mighty structures, miles in length, and thousands of feet in height, rear their majestic heads out of the abyss, displaying their richly-molded plinths and friezes, thrusting out their gables, wing-walls, buttresses, and pilasters, and recessed with alcoves and panels.

Nearly 100 years ago, in 1919, the beauty, diversity, and splendor of Grand Canyon and its importance as a natural and cultural jewel of the American people were formally recognized when Congress established Grand Canyon National Park. Since that time, many policies and programs have been developed to protect and preserve the diversity and unique qualities of Grand Canyon and the Colorado River ecosystem, and the GCDAMP associated with the operations of Glen Canyon Dam has become central to those efforts.

Although Grand Canyon and the Colorado River are recognized as culturally important to the greater American society, the Native American connection to this landscape existed and persevered for hundreds, if not thousands, of years before the arrival of Europeans (Schwartz, 1965; Euler and Taylor, 1966; Euler and Chandler, 1978; Schwartz and others, 1979, 1980, 1981). Native Americans relation to this vast place and their resultant knowledge of this landscape and environment are the product of a long temporal and intimate association, including having to depend upon and survive within this landscape. Given the brevity of this article, a full account of the cultural importance of Grand Canyon and the Colorado River to each of the Native American Tribes that participates in the GCDAMP is not possible. Presented below is a brief general summary of Grand Canyon's importance to participating Native Americans.

## Grand Canyon and the Native American Tribes

According to multiple Tribal creation accounts, Grand Canyon is the place of origin and emergence into this the fourth world. The Colorado River, the canyons, the land, the middle of the river, and the springs, seeps, and tributaries to the river are essential to the well being, survival, and the collective and individual identities of many of the participating Tribes. As such, these Tribes are entrusted with the responsibility to care for the natural environment and the resources contained within Grand Canyon and their traditional homelands (Hualapai Tribe and Stevens, 1998; Austin and others, 2007).

For many members of these Tribes, the Colorado River and the components of the ecosystem are regarded as living entities infused with conscious spirit. All of these elements in and around the canyons are accorded powers of observation and awareness. The Colorado River itself is regarded as an important conscious living being that has feelings and is expressive of calmness and anger. The river can offer happiness, sadness, strength, life, sustenance, and the threat of death. According to many of the Tribal beliefs, if a land and its resources are not used in an appropriate manner, the Creator will become disappointed or angry and withhold food, health, and power from humans.

Even though the current reservation lands of some of the participating Tribes are located far from Grand Canyon, these Tribes still maintain very strong ties with Grand Canyon, the Colorado River, and the Little Colorado River because of their origin and migration narratives. Traditional narratives describe the locations of shrines and sacred areas and explain why Grand Canyon is sacred. The daily prayers of many Native Americans incorporate specific locations, including sacred areas, shrines, springs, and other places of religious significance within Grand Canyon (Hart, 1995; Stoffle and others, 1995; Hualapai Tribe and Stevens, 1998). The animals, birds, rocks, sand, minerals, and water in Grand Canyon all have special meaning to the Native American people.

## An Evaluation of Tribal Involvement in the Glen Canyon Dam Adaptive Management Program

Today, the Hualapai, Hopi, Navajo, and Zuni Tribes and the Southern Paiute Consortium are recognized as legitimate participants in the GCDAMP and have representatives to the Adaptive Management Work Group (AMWG) and the Technical Work Group (TWG).<sup>5</sup> The importance of Tribal participation in the GCDAMP was recognized by the stakeholders during the development and adoption of the GCDAMP's strategic plan. The strategic plan contains a vision and mission statement that recognizes Grand Canyon as homeland to Native American Tribes and a special place that contains properties of traditional cultural importance to Native Americans. It also acknowledges the "trust" responsibility of the Federal government to these Native American Tribes and recognizes their sovereign status and management authority.

The strategic plan also delineates 12 goals for the natural and cultural resources that are the focus of the GCDAMP. Management goal 11 addresses the preservation, protection, and management of cultural resources for the inspiration and benefit of past, present, and future generations. The recognition of past generations in this management goal is the acknowledgment by the program of the active on-going dynamic spiritual relationship contemporary Native American people have with their ancestors. Goal 11 also recognizes that the spirits of these ancestors still inhabit specific places (e.g., archaeological sites) within Grand Canyon. Accompanying management objectives 11.2 and 11.3 recognize the importance of maintaining and protecting places and resources of traditional cultural importance to Native Americans and ensuring unrestricted access to these places by Native American religious practitioners.

Management goal 12 seeks to maintain a high-quality monitoring, research, and adaptive management program that incorporates meaningful Tribal participation. Management objective 12.5 seeks to attain and maintain effective Tribal consultation through the inclusion of Tribal values and perspectives in the GCDAMP. Management objective 12.6 seeks to attain meaningful Tribal participation in management activities, research, and long-term monitoring to meet the Tribal interests to ensure that Tribal values are incorporated into the scientific activities of the GCDAMP and that Tribal interpretations are considered. Both of these management objectives are directly linked to the vision and mission statement discussed previously.

Even though the GCDAMP recognizes the importance of integrating Tribal involvement, a review of the past 10 years of research and monitoring programs indicates a rapidly declining role for the Tribes. At the inception of the GCDAMP there was significantly more Tribal involvement in research and monitoring projects than there has been during the past 5 years. For example, the Southern Paiute Consortium conducted event-specific research on dam impacts and developed a place and resource monitoring program and a corresponding educational outreach program for Paiute elders and youth (Stoffle and others, 1995; Seibert and others, 2007). The Hualapai Tribe conducted research and monitoring of places and resources between 1996 and 2003, including ethnobotanical research associated with the high-flow experiment that took place in 1996.

A sincere effort by Grand Canyon Monitoring and Research Center (GCMRC) to integrate Tribal perspectives into its terrestrial ecosystem monitoring program was put into effect between 1999 and 2002. This collaborative effort was not successful, because integration assumed that Tribal perspectives could be integrated into a framework defined and directed by the tenets of Western science. Moreover, GCMRC's inclusive intent was seriously constrained by the scientific perspective, which relies on credible, objective (i.e., numeric) data intended for model generation and a clear lack of understanding of Tribal perspectives (Austin, 2007).

<sup>5</sup> The Havasupai Tribe was invited to participate in the development of the Glen Canyon Dam Environmental Impact Statement and to participate in the resultant Glen Canyon Dam Adaptive Management Program; however, they declined to actively participate on the basis of cultural and financial reasons.

## Sociocultural Barriers to Effective Tribal Participation

Since GCMRC's failed attempt to integrate Tribal perspectives into the terrestrial ecosystem monitoring, there have been no further efforts at Tribal integration. The absence of a defined Tribal component in the current GCDAMP science program and a progressive decline in effective Tribal voices within the AMWG and TWG are attributable to a number of sociocultural factors. We submit several sociocultural barriers that exist within the GCDAMP that are actively limiting or marginalizing effective Tribal participation.

Cultural differences in communication present at the AMWG and TWG tables act as a barrier to effective integration. Here, Tribes are expected to communicate and act in the style of Western scientists and managers even though the Tribal representatives generally do not share the same cultural and (or) educational background of the majority of stakeholder representatives. Tribal representatives have expressed their discomfort with what they call the "bigger language of English" that dominates the TWG and AMWG meeting venues. Tribal representatives have articulated how they perceive non-Native Americans as expecting them to respond to words that are not normally employed by Tribal people. Some Tribal representatives have also expressed a feeling of condescension and intimidation associated with "bigger language of English" usage (Austin, 2007).

Strongly correlated with the discomfort associated with the use of the "bigger language of English" is the argumentative nature of many of the exchanges that take place during stakeholder meetings. Tribal representatives have expressed their discomfort with the volume and acerbity with which communication takes place and the propensity for interruptions that undermine one's ability and willingness to participate (Austin, 2007). Direct confrontation is considered impolite and inappropriate behavior within the cultural contexts of the participating Tribes and constrains the Tribal representatives' willingness to "speak up more" in meetings.

Another identified sociocultural barrier to effective Tribal participation is the uncertainty of managers on how to effectively respond to concerns and values expressed by Native American Tribal representatives. This was poignantly demonstrated when several of the Tribes expressed concern about the mechanical removal of nonnative fish at the confluence of the Colorado River and Little Colorado Rivers. These Tribes expressed their disapproval of taking of life that was associated with the planned removal and destruction of thousands of rainbow (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*) as an experiment to control their predation of native fishes.

The Tribes also expressed concern about the location where this experiment was going to take place because the confluence of the Colorado and Little Colorado Rivers represents fertility and life and is considered sacred. One

Tribal representative expressed his concern that the proposed mechanical removal would produce an "aura of death" over this sacred place (Leigh Kuwanwisiwma, Hopi Cultural Preservation Office, oral commun., 2002). The solution offered by managers was to provide the Hualapai Tribe with the processed trout remains to be used as fertilizer in Hualapai gardens. No solution was offered regarding the concern about the location. The conflict of cultural values expressed by the Tribe's objection to the "taking of life" associated with the implementation of this experiment was never sufficiently addressed by the program. Today, the mechanical removal is implemented regularly at the confluence of the Colorado and Little Colorado Rivers as a management action without further consideration of those expressed core Tribal concerns and values.

An additional example of sociocultural barriers underscores the deficiency of the program in effectively dealing with Tribal issues. The 2000 Protocol Evaluation Panel (PEP) of the GCDAMP cultural resources program recommended the development of a Tribal consultation plan. The panel emphasized that this plan should entail more than just improved coordination; a Tribal consultation plan would require Federal agencies and Tribes to agree to a process for communicating, coordinating, resolving differences, acknowledging roles and responsibilities, and establishing government-to-government relationships (Doelle, 2000). The development of the Tribal consultation plan began in 2001 and has been through various iterations; however, after 7 years and 14 drafts the plan has yet to be finalized or implemented. The extended delay in finalizing the Tribal consultation plan is symptomatic of the program's ineffectiveness and lack of ability to meaningfully integrate Native Americans.

## Science as a Sociopolitical Tool

At the foundation of the GCDAMP is the role science plays in elucidating the integrated nature of the Colorado River ecosystem and a core belief that the Western science perspective is the only legitimate form of knowing the ecosystem. At the heart of this science program is a positivist approach to understanding the ecosystem that visualizes an unproblematically objective world presumed knowable via epistemologically transparent schemes of explanation (Whiteley, 2002). This perception of the world is rooted in the core Judeo-Christian philosophical perception of man's relationship to nature.

The GCMRC is the science provider for the GCDAMP and in that role it is ascribed an authoritative voice in ascertaining the condition of the ecosystem. The GCMRC employs science as a means for evaluating the health of the Colorado River ecosystem and the efficacy of management paradigms. The GCMRC also employs the concept of science tautologically as a rhetorical device for validating its authoritative role and justification of budgetary decisions.

As Ogden (2008) demonstrates for the Everglades, science when it becomes institutionalized can take on a life of its own and often is applied to meet the bureaucratic mandates of an agency. In the GCDAMP, resource goals have been bureaucratized into a set of scientific research and monitoring activities that structure the ways in which the ecosystem is comprehended and acted on. Within this context, Native American perspectives of the ecosystem are de-legitimized and marginalized in favor of the continued promotion and acquisition of scientific knowledge that supports the science program's philosophical underpinnings, self-interest, and authority.

All of these factors have contributed to the dominance of the Judeo-Christian perception of the world within the science program, which has had the unintended consequence of promoting antiquated colonialist attitudes toward Native Americans. These attitudes are a peculiar paradoxical blend of romanticized perception of Native Americans as the "noble savage" in the Rousseauian sense and at the same time antithetically perceiving them as a conquered people removed from the landscape as the result of a history of American Western expansionism. This explanation is offered not as an indictment of the GCDAMP, but as a possible rationale for the contradictory way in which the Tribes have been unsuccessfully included in this program.

## Steps to a Holistic Integration

The dominance of science in the GCDAMP, to the exclusion of other valid forms of knowing the world, is in part the inability of the program to recognize that the fundamental differences between the dominant Anglo-American culture and Native American cultures lie not only in the acquisition of knowledge but also in the broader world views about what can be known about the world, who has the right to know it, and what is the proper place of humans in relation to nature (Austin, 2007). For an effective adaptive management program, differences in perception of and relating to the ecosystem must be more than just acknowledged. These differences must be embraced by the program with openness toward meaningful integration through validation.

This holistic integration can be accomplished through embracing Native American traditional knowledge in its complex forms composed of distinctive political and social perspectives rooted in a shared history, distinct ethical and cosmological knowledge, and a local knowledge of the ecosystem (Austin, 2007). The intimate ecological knowledge that the Tribes possess about the Colorado River ecosystem provides the authority and significance for their understanding and relating to this important place. This ecological knowledge is embedded in hundreds of years of directly relating to and living within the ecosystem, knowledge which has been passed on from generation to generation. The efficacy of the transmission and reliability of traditional knowledge has been

well documented for ecology (Berkes, 1999), history (Whiteley, 2002), and ritual (Cushing, 1896; Bunzel, 1932).

Tribal knowledge about ecosystems is increasingly recognized as equivalent to scientific knowledge and is increasingly valued. As Hobson (1992, p. 2) points out:

Often overlooked is the fact that the survival of aboriginal peoples depended on their knowledge, their special relationship with the environment, and their ways of organizing themselves and their values. Traditional knowledge was passed on from generation to the next. Today, aboriginal peoples are aware that they must integrate traditional knowledge into the institutions that serve them; it is essential to their survival as a distinct people, and it is the key to reversing the cycle of dependency which has come to distinguish aboriginal communities.

Traditional knowledge about the ecosystem is based then on empirical observations that are accumulated over generations providing an important diachronic perspective. Embodied within this perspective is an intuitive component that is based on observing natural resource patterns and relationships that are interpreted and integrated through the ethical and moral values and cosmological knowledge of the culture.

Accomplishing the holistic integration of Native American traditional knowledge into the GCDAMP necessitates a paradigm shift in the current science program toward an openness and willingness to accept traditional knowledge of the ecosystem on an equal basis as Western science generated knowledge. The past tendency of scientists and managers has been to reject Tribal traditional knowledge as anecdotal, non-quantitative, without method, and unscientific. For this perspective to change, a corresponding recognition that effective integration involves the sharing of power and decisionmaking by managers is essential.

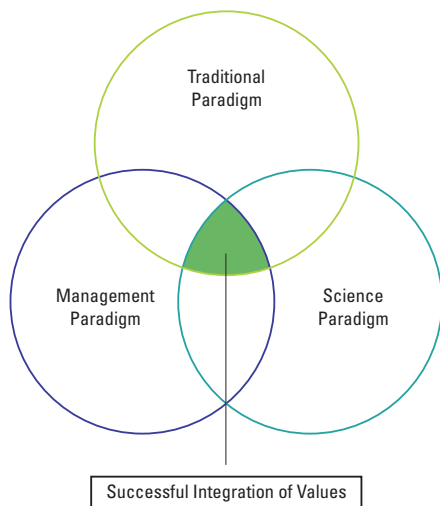
A critical part of this paradigm change involves the acknowledgment by the science program that inherent in any interpretation of data and the resultant development of explanations about the ecosystem are developed through biased cultural lenses of managers and scientists. Cultural bias permeates the GCDAMP; it affects how resource data are interpreted, how knowledge is generated and defined, and how power for decisionmaking is ascribed and shared. Too little attention has been paid within the GCDAMP to developing effective mechanisms for bringing in and incorporating the knowledge and interests of Native peoples. For example, conspicuously absent from most discussions of Colorado River ecosystem management, especially for a place that is widely perceived to be a wilderness, are the poignant historical narratives of displacement, depopulation, and suffering that describe how this place came to be without humans and how the affected populations should be integrated into processes that are based in large part on assumptions that they or their

ancestors are irrelevant to the ecosystem today (Austin and others, 2007).

A recommended first step toward effecting this paradigm shift is the development of a stronger social science component to the program administered by the GCMRC. Currently, the cultural resource program administered by the GCMRC is focused on the present condition of archaeological sites located along the Colorado River corridor and how current climatic conditions adversely impact or contribute to their preservation. In addition, the cultural program includes a recreation component that seeks to monitor and improve the recreational experience associated with non-Indian users of the Colorado River through Grand Canyon. Noticeably lacking in this cultural program is the integrated contributions that the disciplines of anthropology, sociology, psychology, and Native American studies can bring to this program. The integration of these disciplines would afford the program the tools to work toward the development of a holistic integration of Native American perspectives and values into the GCDAMP. Through the application of the tools that these disciplines can bring to the GCDAMP, a process for respectfully addressing and resolving conflicts of cultural values that arise within the program can be developed. Additionally, this process would allow for these conflicts to be addressed in a timely manner and thereby hopefully reduce feelings of disenfranchisement by a stakeholder group and the potential for litigious responses.

## Confluence of Values

As noted above, the confluence of the Colorado and Little Colorado Rivers is a very important and significant place to the participating Tribes because of its literal and symbolic representation of fertility and life. The confluence is employed



**Figure 1.** Confluence of values within the Glen Canyon Dam Adaptive Management Program.

here as a metaphor to represent the fertility of knowledge and the beneficial outcomes that would result from the merging of diverse paradigms (i.e., scientific and traditional knowledge) for knowing the Colorado River ecosystem. Submitted for consideration is the view that this confluence is represented by three intersecting and overlapping circles of a Venn diagram (fig. 1). One circle represents the management paradigm of the GCDAMP, another circle represents the scientific paradigm about the Colorado River ecosystem, and the third circle represents the traditional paradigm of the participating Tribes regarding the Colorado River ecosystem, including their moral, ethical, and cosmological perspectives. The portions of the circles that overlap and intersect represent the successful merging of these three paradigms within the GCDAMP.

This image of the confluence of values depicts a successful program of collaboration that recognizes, accepts, and seeks to integrate the diverse perspectives that scientific knowledge, Tribal traditions, and management represent. The future of working collaboratively with Native Americans within the GCDAMP rests on an honest understanding and appreciation of the diverse perspectives that have been presented above and a willingness to develop good faith communication channels between scientists, managers, and Native peoples that will only benefit the GCDAMP. When done correctly, the intersection of these competing paradigms provides an avenue for multiple views of the Colorado River ecosystem that can only enhance our understanding and appreciation of this important place.

## Reflexive Approach to the GCDAMP

Finally, drawing from the social sciences, we advocate for a reflexive component of the GCDAMP. Reflexivity is an act of self-reference where examination or action “bends back on,” refers to, and affects the entity instigating the action or examination. In brief, reflexivity refers to circular relationships between cause and effect. A reflexive relationship is bidirectional; with both the cause and the effect affecting one another in a situation that renders both functions causes and effects. Reflexivity is related to the concept of feedback and positive feedback in particular.

As applied to the GCDAMP, we believe there is utility in examining the internal social dynamics of the program and the interaction among participating groups. Specifically, we believe that it is important to examine and understand the power and gender relationships that exist within the AMWG and TWG and how these affect discourses among the stakeholders and the recommendations they generate. Moreover, a reflexive analysis should examine the dynamics of cultural differences that are operant within this program, some of which have been presented above. Through the examination of these cultural differences, a clearer understanding of the role the dominant cultural bias plays within the program and how that bias impacts and directs the program’s perspective on ecosystem resources and data can be achieved. To this end, we

encourage the planning and implementation of the GCDAMP effectiveness workshop, but that it should be expanded to include this reflexive component.

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