

# The Bottom Line: The Impact of the Endangered Species Act on Glen Canyon Dam Operations and Stakeholders

By Leslie James

The Endangered Species Act (ESA) is arguably the most powerful environmental law ever enacted. Since its passage in 1973, it has had far-reaching impacts on power production from federally owned multiple-purpose projects, such as the Colorado River Storage Project (CRSP). Operational changes resulting from efforts to address ESA issues impact not only power production but repayment of the federal investment in the project. While differing approaches and programs have been established in an attempt to address ESA issues at Glen Canyon Dam, operations have proved to be significant and costly.

## Background: Colorado River Storage Project

In 1956, Congress passed the Colorado River Storage Project Act to provide storage facilities for the Upper Basin states so that they could meet Colorado River Compact needs. Operated by the Bureau of Reclamation, the CRSP consists of multipurpose dams that release water to meet Colorado River Compact, municipal and industrial (M&I), and irrigation requirements. As the water is released, electric power and energy are produced to help pay for the projects. The Western Area Power Administration (WAPA) markets and transmits that electricity to preference power entities pursuant to federal law.

Costs associated with the projects are divided into reimbursable costs and nonreimbursable costs. Reimbursable costs are associated with power and water use—M&I water users pay for the costs associated with their use, irrigation users pay up to their ability to pay, and power users pay for all of the power facilities plus the irrigation features beyond the ability of the irrigators to pay. The federal government pays all nonreimbursable costs, which include environmental, recreation, and flood-control costs.

CRSP power features span six states and include five dams and associated generators, substations, and transmission lines. Two of its most notable features are Glen Canyon Dam and Flaming Gorge Dam. Glen Canyon Dam is located near Page, Arizona, and is by far the largest of the CRSP projects. Glen Canyon power features include eight generators for a total of about 1,300 megawatts (MW), which is more than 70 percent



Glen Canyon Dam.

of total CRSP generation. Flaming Gorge Dam is on the Green River, a major tributary of the Colorado River, and has three units producing about 132 MW of generation.

## ESA Impacts on Glen Canyon Dam Operations

The Glen Canyon Dam power plant generates power for municipal, industrial, irrigation pumping, and other uses. The long history of how the ESA has affected Glen Canyon's operations and power generation is fraught with high costs and operational uncertainty.

In 1978, Reclamation began upgrading those eight units at Glen Canyon Dam. With completion in 1984, generation was increased from about 1,000 MW to 1,300 MW. Full utilization of unit upgrades required maximum release of Glen Canyon to be increased from 31,500 cubic feet per second (cfs) to about 33,200 cfs. This increase raised concerns with downstream users. After discussion with stakeholders, the secretary of the interior initiated the first phase of the Glen Canyon environmental studies.

From 1982 to 1987, Reclamation undertook phase 1. These studies analyzed the impacts of raising the maximum releases on downstream resources, including impacts on the endangered humpback chub. Phase 1 did not fully explore the power and water economics of the Glen Canyon Dam, and it utilized some incorrect

assumptions as to the impacts on downstream resources.

In response to these shortcomings, the secretary directed that studies address economic impacts, particularly as they related to power, and incorporate additional data to substantiate some of the conclusions in the phase 1 report. The secretary initiated phase 2 in 1989, including the start of an environmental impact statement (EIS) on the operations of the Glen Canyon Dam. The EIS was completed, and the record of decision was signed in October 1996.

The result was far reaching: Glen Canyon operations were changed to reflect a revised flow regime, and approximately one-third of the generating capacity was lost. CRSP power revenues funded the EIS at a cost of \$104 million. An adaptive management program now addresses the operations of the Glen Canyon Dam with recommendations from a federal advisory committee, the Adaptive Management Work Group, to the secretary of the U.S Department of the Interior.

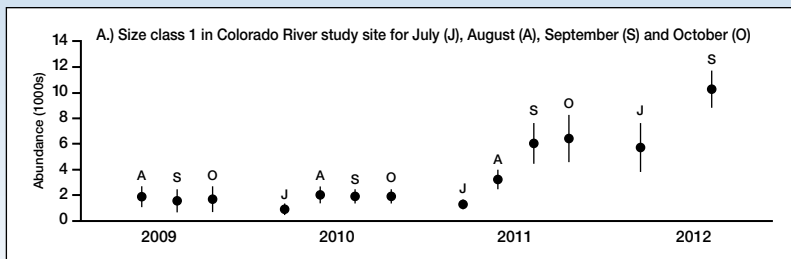
In April 2000, in response to hydrologic conditions and pursuant to a 1994 U.S. Fish and Wildlife Service (FWS) biological opinion, Reclamation undertook a low, steady flow summer experiment to learn more about how conditions affect the endangered humpback chub. The experiment included high spike flows in May and September, with low flat flows (8,000 cfs) all summer.

The low flows had a severe impact on power generation, requiring WAPA to purchase replacement power on the open market to meet contractual obligations to CRSP customers. According to a 2011 U.S. Geological Service report, the cost of this replacement power was \$26.4 million. The cost of the experiment was more than \$3 million, also funded by CRSP power revenues.

Subsequent experimentation with fall steady flows has indicated that these steady flows, which are so detrimental to power production, are not necessarily beneficial to or required by the humpback chub to improve (see accompanying chart). In fact, under the current operational regime, the Grand Canyon population of the humpback chub has continued to improve. (Charles B. Yackulic, Michael D. Yard, Josh Korman, and David R. Haverbeke, "A Quantitative Life History of Endangered Humpback Chub That Spawn in the Little Colorado River: Variation in Movement, Growth, and Survival," *Ecology and Evolution*, February 28, 2014.)

## Litigation History

In the early 2000s, the Grand Canyon Trust sued the United States in federal district court, alleging that the humpback chub recovery goals were insufficient and asking the court to require FWS to revise its goals. The court



ruled, requiring FWS to update the goals as to schedule and cost estimates.

In February 2006, the Center for Biological Diversity and other organizations sued the United States, asking the federal court to interpret the Grand Canyon Protection Act and to require Reclamation to reconconsult with FWS on a new biological opinion. In August 2006, the United States settled with the plaintiffs, precipitating the start of additional environmental documentation.

In December 2008, the Grand Canyon Trust again sued the United States, alleging, among other things, that Reclamation's current operation of the dam jeopardizes and takes the endangered humpback chub and adversely modifies its critical habitat. The district court ruled against the trust on all counts. The trust appealed, and in August 2012, the United States Court of Appeals for the Ninth District ruled in favor of the United States on all claims.

## The Costs of Compliance

Based on information provided by WAPA, through 2001, the direct costs of CRSP endangered species compliance totaled more than \$394 million. In terms of power operational impacts, a 2010 study prepared by Argonne National Labs indicates that, since implementation of the 1996 record of decision on the operation of Glen Canyon Dam, the cost of reoperation averages \$50 million per year. Beyond the costs borne by CRSP ratepayers, ESA implementation places at risk the capability of the CRSP to satisfy the growing demands for water and power in the Colorado River Basin.

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