

**GLEN CANYON DAM LONG-TERM EXPERIMENTAL AND
MANAGEMENT PLAN
ENVIRONMENTAL IMPACT STATEMENT**

**DRAFT
OBJECTIVES AND RESOURCE GOALS**

The joint-lead agencies have developed a set of objectives and resource goals that have been identified for the Glen Canyon Dam Long-Term Experimental and Management Plan (LTEMP) Environmental Impact Statement (EIS):

Objectives

1. Develop an operating plan for Glen Canyon Dam in accordance with the Grand Canyon Protection Act (GCPA) 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, and in such a manner as is fully consistent with and subject to the Colorado River Compact, the Upper Colorado River Basin Compact, the Water Treaty of 1944 with Mexico, the decree of the Supreme Court in Arizona v. California, and the provisions of the Colorado River Storage Project Act of 1956 and the Colorado River Basin Project Act of 1968 that govern allocation, appropriation, development, and exportation of the waters of the Colorado River Basin.
2. Ensure water delivery to the communities and agriculture that depend on Colorado River water.

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Comment [A1]: Direct quote from 1802(a).

Comment [A2]: Direct quote of 1802(b).

Comment [A3]: Consistent with 1802(b).

3. Consider potential future modifications to Glen Canyon Dam operations and other flow and non-flow actions to protect and improve downstream resources, particularly fine sediment retention and endangered fish in Grand Canyon National Park, and the recreational experience, including the trout fishery in Glen Canyon National Recreation Area.
4. Maintain or increase Glen Canyon Dam capacity and energy generation to produce the greatest practicable amount of power and energy, consistent with improvement and long-term sustainability of downstream resources.
5. Respect the interests and perspectives of the Indian Tribes.
6. Make use of the latest science considering all relevant studies, especially those conducted since 1996.
7. Determine the appropriate experimental framework that allows for a range of programs and actions including ongoing and necessary research, monitoring, studies, and management actions in keeping with the adaptive management process.
8. Determine whether to establish a Recovery Implementation Program for endangered fish species below Glen Canyon Dam.
9. Ensure Glen Canyon Dam operations are consistent with the GCPA, Endangered Species Act (ESA), National Historic Preservation Act (NHPA), and other applicable federal laws.

Comment [A4]: Consistent with 1802(a); provides specific language about primary objectives.

Comment [A5]: Power DFC: "Glen Canyon Dam capacity and energy generation is maintained and increased, so as to produce the greatest practicable amount of power and energy, consistent with the other DFCs."

Comment [A6]: This phrase is consistent with standard expressed in the 1996 ROD for the current operations: "limiting hydropower capability and flexibility only to the extent necessary to achieve recovery and long-term sustainability."

Comment [A7]: Not explicitly stated, but consistent with cultural resource DFC.

Comment [A8]: Consistent with discussion in background section noting that "Scientific information used for the AMP process must be reliable, [and] of high quality..."

Comment [A9]: Not explicitly mentioned in DFCs; specific to LTEMP purpose and need.

Comment [A10]: Consistent with Humpback chub DFC "Achieve HBC recovery in accord with the Endangered Species Act..."

Comment [A11]: Statement of legal obligations; consistent with DFC preface.

Resource Goals

1. Archaeological and Cultural Resources: Maintain the integrity of potentially affected National Register eligible or listed

historic properties in place, where possible, with preservation methods employed on a site specific basis.

Comment [A12]: Cultural Resource DFC: "Attributes are maintained such as National Register eligibility is not compromised. These attributes will be specific to the traditionally associated peoples..."

2. Natural Processes: Restore, to the extent practicable, ecological patterns and processes within their range of natural variability, including the natural abundance, diversity, and genetic and ecological integrity of the plant and animal species native to those ecosystems.

Comment [A13]: River Recreation in GCNP DFC: "A river corridor ecosystem that matches the natural conditions as closely as possible, including a biotic community dominated in most instances by native species."

"A dynamic river ecosystem characterized by ecological patterns and processes within their range of natural variability."

3. Humpback Chub: Meet humpback chub recovery goals including maintaining a self-sustaining population, spawning habitat and aggregations in its natural range in the Colorado River and its tributaries below the Glen Canyon Dam.

Comment [A14]: HBC DFC: "Achieve HBC recovery in accord with the Endangered Species Act (ESA), the HBC comprehensive management plan, and with the assistance of collaborators within and external to the AMP."

"A self-sustaining humpback chub (HBC) population in its natural range in the CRE."

"An ecologically appropriate habitat for the HBC in the mainstem."

"Spawning habitat for HBC in the Lower Little Colorado."

"Establish additional HBC spawning habitat and spawning aggregations within the CRE, where feasible."

4. Maintain or increase Glen Canyon Dam electric energy generation, load following capability and ramp rate capability, and minimize emissions, and costs to the greatest extent practicable consistent with improvement and long-term sustainability of downstream resources.

Comment [A15]: Power DFC: "Glen Canyon Dam capacity and energy generation is maintained and increased, so as to produce the greatest practicable amount of power and energy, consistent with the other DFCs."

"Maintain the operational flexibility (including but not limited to load following capability, ramp rates, and emergency operations allowances) that enable Reclamation and WAPA to meet the system operating and other regulatory requirements ..."

"Maximize the environmental benefits of hydropower generation at Glen Canyon Dam."

"Minimize carbon emissions through hydropower generation at Glen Canyon Dam."

5. Other Native Fish: Maintain self-sustaining native fish species populations and their habitats in their natural ranges on the Colorado River and its tributaries.

Comment [A16]: Native Species DFC: "Native fish species and their habitats (including critical habitats) sustainably maintained throughout each species' natural ranges in the CRE."

6. Recreational Experience: Maintain and improve the quality of recreational experiences for the users of the Colorado River ecosystem. Recreation includes, but is not limited to, flatwater and whitewater boating, river corridor camping, and angling in Glen Canyon.

Comment [A17]: Consistent with Recreation DFC.

7. Sediment: Increase and retain fine sediment volume, area, and distribution in the Glen, Marble and Grand Canyon reaches

above the elevation of the average base flow for ecological, cultural, and recreational purposes.

8. Tribal Perspectives: Maintain the ability of traditionally associated Indian Tribes to access and use culturally important resources, and maintain culturally appropriate resource conditions.

9. Trout Fishery: Achieve a healthy high-quality recreational trout fishery in Glen Canyon National Recreation Area and reduce or eliminate downstream trout migration consistent with National Park Service fish management and ESA compliance.

10. Riparian Vegetation: Maintain native vegetation and wildlife habitat, in various stages of maturity that is diverse, healthy, productive, self-sustaining, and ecologically appropriate.

11. Water Delivery: Ensure that water delivery continues in a manner that is fully consistent with and subject to the Colorado River Compact, the Upper Colorado River Basin Compact, the Water Treaty of 1944 with Mexico, the decree of the Supreme Court in Arizona v. California, and the provisions of the Colorado River Storage Project Act of 1956 and the Colorado River Basin Project Act of 1968 that govern allocation, appropriation, development, and exportation of the waters of the Colorado River Basin.

Comment [A18]: Sediment DFC: "High elevation open riparian sediment deposits along the Colorado River in sufficient volume, area, and distribution so as to provide habitat to sustain native biota and desired ecosystem processes"
"Nearshore habitats for native fish"
"Marsh and riparian habitat for fish (food chain maintenance)"
"Cultural resource preservation"
"Maintenance of camping beaches".

Comment [A19]: Cultural Resource DFC: "Maintain the ability of traditionally associated peoples to access and use the resource in accordance with applicable law."
" Maintain culturally appropriate resource conditions based on traditional ecological knowledge, and integrate this desired condition into monitoring and management programs."

Comment [A20]: Rainbow trout DFC: "A high quality trout fishery in GCNRA..."

Comment [A21]: CRE Riparian Domain DFC:
"Native riparian systems, in various stages of maturity, are diverse, healthy, productive, self-sustaining, and ecologically appropriate."
"Native, self-sustaining riverine wetlands, and riparian vegetation and habitat, with appropriate mixture of age classes. "

Comment [A22]: Direct quote of 1802(b).