MEMORANDUM

TO: THE GLEN CANYON DAM ADAPTIVE MANAGEMENT PROGRAM
FROM: GRAND CANYON WILDLANDS COUNCIL, INC.
DATE: 21 OCTOBER 2004
RE: REVIEW OF THE GCMRC CORE MONITORING PLAN

The GCMRC Core Monitoring Plan (CMP) appears to be as well written and thorough as possible, given the time and staffing constraints of GCMRC, and we appreciate the effort represented by GCMRC's staff in producing this first draft plan. However, as scientists and environmentalists with a long-term involvement in Colorado River management and the Adaptive Management Program, we have several concerns about the plan that we hope will be considered by the AMP and GCMRC to improve this document. These concerns focus on the conceptual framework, program biases, and costs.

The CMP lacks a sound conceptual basis: as thorough it is, it is not based on clearly defined, testable scientific hypotheses that arise out of a comprehensive conceptual model of the Colorado River ecosystem. Rather, it addresses the immediate needs of stakeholders and perpetuates program biases about monitoring topics. While immediate information needs can be addressed through this plan, it does not address the need for substantially improving the existing primarily-aquatic conceptual model. A comprehensive conceptual model is needed to frame scientific hypotheses on ecosystem response to dam operations in relation to other physical, biological, and anthropomorphic factors. Monitoring data should be used to test specific hypotheses, and direct selection of what, how, and when to conduct monitoring. The present plan fails to meet the goals of the AMP's Strategic Plan, which emphasize "' ...an ecosystem management approach, in lieu of an issues, species or resources approach.' The Strategic Plan also emphasizes the importance of understanding cause and effect relationships...'(to gain) an improved understanding of the connection, if any, to dam operations, while also documenting resource status and trends'" (p. 10 of the draft Core Monitoring Plan). By focusing on what, where, how and how often managers need to know about the ecosystem (p. 11), GCMRC has apparently abandoned higher-level conceptualization about ecosystem processes. The emphasis on simply responding in a scientific fashion to stakeholder needs (p. 12), and the absence of a logical network of testable scientific hypotheses to be fed by monitoring data, means that the CMP will fail to advance scientific understanding of ecosystem functionality and processes.

GCMRC has provided the AMP with a good start on a conceptual ecosystem model that is capable of testing some hypotheses (Walters et al. 2000); however, conceptual modeling appears to have been largely abandoned by GCMRC. The existing model is an excellent example of an aquatic river ecosystem model following the River Continuum (Vannote et al. 1980); however, it stops at the water's edge and fails to incorporate terrestrial ecological concerns. Terrestrial issues are less related to upstream river ecosystem function, and are more strongly influenced in a place-based fashion by local geomorphic settings and processes. Biological processes on debris-fan complexes remain poorly addressed by the existing model, yet provide fish and wildlife habitat that supports

numerous wetland and riparian species. We argue that the CMP should be developed around a comprehensive aquatic-wetland-riparian-uplands conceptual ecosystem model, building on the initial effort and augmented with a landscape component that explores interactions between biota and local geomorphology. This process is likely to require 2 years of work on the model, and a year to integrate with the monitoring, long-term experimental, and humpback chub programs. We also recognize that FY 05-06 work scheduling is needed now. Therefore, we suggest that a serious effort be undertaken to: 1) revise and refine the Colorado River conceptual model, integrating flow-related variables with landscape-based wetland-riparian species and ecosystem modeling, as well as cultural and socio-economic variables and processes; 2) run the model using, at minimum, the data collected through the first 2-3 years of core monitoring data to see what important data streams are being captured or missed; and 3) revise the core monitoring plan in 3-5 years to bring it into alignment with the comprehensive conceptual model.

From a science perspective, failure of the present program and the CMP to consider and evaluate reference sites perpetually hampers progress on understanding ecosystem function. While this lack is acknowledged (p. 8), the plan does virtually nothing to rectify this fundamental scientific oversight. Examination of reference sites in upstream reaches (i.e., Cataract Canyon) and in tributaries would substantially reframe the argument that Glen Canyon Dam is the source of all environmental problems in Grand Canyon. We recommend that the CMP include analysis of reference sites to serve as scientific controls, and we recommend that the AMP embrace the concept of reference sites to improve its management of Glen Canyon Dam and the Colorado River ecosystem in Grand Canyon.

We also detect little flexibility or contingency planning in this document. As time passes and data are acquired, we expect GCMRC to improve and modify its monitoring methodologies and efforts. The plan should reflect this process more thoroughly. For example, in a recent TWG presentation, several years of terrestrial monitoring data erroneously showed that more bird species are encountered in smaller patches of riparian vegetation. This finding is at odds with the science of biogeography, and it demonstrates that the point-sampling methodology used in Grand Canyon for the past decade is not delivering valid data to the AMP. Hopefully, this methodological shortcoming is not occurring in other GCMRC monitoring efforts, but such presentations erode the credibility of the overall program. The core monitoring plan should evaluate both the accuracy and the credibility of its methodologies and results, and needs the flexibility to change in response to new analyses, as well as unanticipated ecosystem changes.

The draft CMP has essentially eliminated avian monitoring without justification. Avian monitoring data in Grand Canyon are one of the best and longest data strings in the program, and unjustified elimination of this portion of the program further brings home the issue that the CMP needs to be based on a comprehensive ecosystem model, rather than the whims of researchers or staff.

It is important that the CMP consume no more than the original estimate of 40-60% of the budget. This will ensure enough of the budget remains for experimental actions and associated monitoring, research topics that arise over time, program administration, and program needs that change.

The results of the CMP are planned to be reported in the State of the Colorado River Ecosystem (SCORE) report on a biennial basis. The SCORE report should be the vehicle for advising stakeholders and the public on the responses of the Colorado River ecosystem to AMP actions. Ideally, we would like to see, on the GCMRC website, graphs of ecosystem variables trending through time, with transparent connectivity through to the actual data sets used to construct those graphs. These data should be updated annually. However, GCMRC has apparently unilaterally decided to produce a costly, high color, hard copy SCORE report every 5 years as a way of advertising its success. We are concerned that this decision means that the reporting program will now be supporting at least three GCMRC positions in perpetuity, and that the SCORE report will consume AMP budget but not be regularly available. Therefore, we request that GCMRC reconsider its options and management of the SCORE reporting process, forego the hard-copy 5 year report, and focus on putting an annually updated report onto the internet. This is more in keeping with the needs and spirit of scientific adaptive management, as stakeholders and the public are interested in the state of the ecosystem, rather than information that may be 2 or more years old. The savings generated by not producing the hard copy document should offset the costs of annual versus biennial reporting.

We have always advocated for open, independent, competitive bidding of monitoring and research in Grand Canyon, and have been rather continuously dismayed at the lack of concern for this process in GCMRC programs in recent years. The draft CMP does little to ensure open, competitive bidding and peer-review of core monitoring RFPs. Therefore, we reiterate our concern that open, competitively bid, and unbiased peer-review of RFPs will provide the most reliable scientific data for this monitoring program, and that the draft plan be revised to fully embrace that philosophy.

With the above modifications, we view this CMP as a reasonable draft plan. Provided the budget can be maintained at <60% of the overall program budget, a strong commitment is made to refinement of the conceptual ecosystem model, contingency and evaluation planning is included, and a strong commitment to open, independent, peer-reviewed RFPs and program reports are included, it may be useful until it can be reviewed in the context of that comprehensive conceptual foundation. We encourage GCMRC to undertake the most dynamically scientific approach reasonable, so that this plan can provide data that tests key hypotheses on ecosystem responses to the dam, and result in more creative thought on ecosystem structure, interactions, and linkages.