Glen Canyon Dam Adaptive Management Work Group
Agenda Item Information
August 24-25, 2010

Agenda Item

GCMRC Cultural Program Update

Action Requested

✓ Information item.

Presenter

This item will be on the agenda as an informational write-up only with no presentation. However, time will be set aside for questions with regard to this item as well as other informational write-ups.

Previous Action Taken

N/A

Relevant Science

✓ See "Background Information for the relevant research or monitoring on this subject:

Background Information

For more information, contact Helen Fairley, GCMRC Cultural Program Manager, hfairley@usgs.gov, 928.556-7285.

Cultural Monitoring Research and Development Project: 2010 Project Status and Plans
After a delay due to NPS permitting concerns in FY2008 and FY2009, GCMRC resumed fieldwork on Phase I of the Cultural Monitoring Research and Development (R&D) Project this year. In April 2010, USGS staff from GCMRC and Menlo Park, CA completed terrestrial lidar surveys at six sites in the upper reaches of the canyon (AZ C:5:31, AZ:C:13:006, AZ C:13:99, AZ C:13:336, AZ C:13:321, and AZ C:13:009(B)). The sites targeted for lidar mapping this year include several of the same sites previously evaluated for topographic change in 2006-2007. In addition, GCMRC is applying lidar at some previously unmapped sites to expand the baseline dataset and explore the utility of lidar for mapping physical changes in archaeological structures, surface artifacts, and biological soil crusts – all of which are important indicators of archaeological site stability and change. GCMRC plans to conduct a second trip in September 2010 that will incorporate some additional sites and conclude field data collection for Phase I of this project.

Two chapters in the recently published Proceedings of the November 2008 "Coming Together" Science and Resource Management Symposium deal with various components of the cultural monitoring R&D project: a chapter by Fairley and Sondossi describes the theoretical ecosystem framework that guides the entire project, and a chapter by Draut and others summarizes findings related to effects of HFE on sediment transport at several of the monitored archaeological sites. Several additional reports will be forthcoming from this project in the months ahead. Another Open-File Report (OFR) will be published in the near future that documents the 2009 weather data

and extends the evaluation of effects of the 2008 HFE at select sites in the CRE. In addition, the virtual shoreline GIS analysis conducted by Sondossi and Fairley in 2009 will be published as an OFR by the end of this year. Other reports forthcoming in FY2011 include an OFR summarizing results of repeated surveys at sites in the Palisades area between 1996-2008, an OFR on the results of the 2010 field (lidar) work, a journal article summarizing results of the geomorphic assessment study led by Pederson and Obrien in 2006-2007, and a synthesis of Phase I results. A complete list of publications and reports relating to this project is included below.

Phase II, scheduled to begin in spring of 2011, will initiate the pilot monitoring phase of this project. GCMRC has established a cooperative agreement with Dr. Francis Smiley of NAU to assist with the selection of a stratified random sample of sites to be monitored during Phase II. The sample will be stratified to ensure that it represents the full range of site types and geomorphic settings in the Colorado River ecosystem. The pilot program, anticipated for FY2011-2013, will allow GCMCR to refine the sample size that is optimal for characterizing ecosystem-wide site conditions, given the wide diversity of site types and geomorphic conditions in the CRE, and work out logistical issues related to monitoring a broader cross-section of archaeological sites located throughout the CRE.

Prior to initiating the pilot monitoring phase, GCMRC has committed to host a geomorphic workshop and a tribal monitoring integration workshop. The geomorphic workshop previously scheduled for August 5-6, 2010 was postponed to the late fall or early winter due to scheduling conflicts of a key cooperator. The geomorphic modeling workshop will bring together a small group of geomorphologists, along with interested resource managers and stakeholders, to review and discuss the status of existing geomorphic data related to the Holocene deposits in the Colorado River corridor. (Most archaeological sites of interest to the AMP are situated in the Holocene deposits.) The group will also identify appropriate geomorphic models to help structure and inform the future monitoring program, as recommended by the Legacy Monitoring Data Review panel in its 2007 report to the TWG. GCMRC is pleased to note that Dr. Michael Barton from ASU has agreed to participate in the workshop, along with Dr. Jack Schmidt, Dr. Robert Webb, Dr. Joel Pederson, Dr. Nina Kilham, and several others. AMWG members interested in attending the geomorphic workshop should email Helen Fairley (hfairley@usgs.gov).

The workshop to discuss integration of tribal, NPS, and GCMRC cultural site monitoring programs is also tentatively proposed for fall or early winter 2010. Reclamation is interested in having GCMRC host this workshop in conjunction with another workshop that will be sponsored by Reclamation to discuss integration of tribal perspectives in the future archaeological site treatment program. More information about both of these workshops will be forthcoming later in the year, after the TWG Cultural Resources Ad Hoc Group and Programmatic Agreement signatories have had an opportunity to meet and discuss possible approaches and desired outcomes for these workshops.

Cultural Monitoring R&D Project: Summary of Publications, Unpublished Reports, Posters and Oral Presentations

Publications

Collins, B.D., Brown, K.B., and Fairley, H., 2008. Evaluation of Terrestrial LIDAR for Monitoring Geomorphic Change at Archaeological Sites in Grand Canyon National Park, Arizona: U.S. Geological Survey, Open File Report 2008-1384, 60 p. [http://pubs.usgs.gov/of/2008/1384/].

Collins, B.D. and Kayen, R., (2006). Applicability of Terrestrial LIDAR Scanning for Scientific Studies in Grand Canyon National Park, Arizona, U.S. Geological Survey, Open File Report 2006-1198, 27p, Menlo Park, California, [http://pubs.usgs.gov/of/2006/1198/].

Collins, B.D., Minasian, D., and Kayen, R., 2009. Topographic Change Detection at Select Archaeological Sites in Grand Canyon National Park, Arizona, 2006-2007: U.S. Geological Survey, Scientific Investigations Report 2009-5116, 97p. [http://pubs.usgs.gov/sir/2009/5116/].

Draut, A.E., Andrews, T., Fairley, H.C., and Brown, C.R., 2009, 2007 Weather and aeolian sand-transport data from the Colorado River corridor, Grand Canyon, Arizona: U.S. Geological Survey Open-File Report 2009-1098, 110 p. [http://pubs.usgs.gov/of/2009/1098/].

Draut, A.E., Hazel, J.E. Jr., Fairley, H.C., and Brown, C.R., 2010, Aeolian reworking of sandbars from the March 2008 Glen Canyon Dam high flow experiment in Grand Canyon, *In* Melis, T.S., Hamill, J.F., Coggins, L.G., Jr., Grams, P.E., Kennedy, T.A., Kubly, D.M., and Ralston, B.E., eds., Proceedings of the Colorado River Basin Science and Resource Management Symposium, November 18-20, 2008, Scottsdale, Arizona: U.S. Geological Survey Scientific Investigations Report 2010-5135, p. 325-331.

Draut, A.E., Sondossi, H.A., Hazel, J.E. Jr., Andrews, T.A., Fairley, H.C., Brown, C.R., and Vanaman, K.M., 2009, 2008 weather and aeolian sand-transport data from the Colorado River corridor, Grand Canyon, Arizona: U.S. Geological Survey Open-File Report 2009-1190. [http://pubs.usgs.gov/of/2009/1190/].

Draut, A.E., Sondossi, H.A, Dealy, T.P., Hazel, J.E. Jr., Fairley, H.C., and Brown, C.R., In press, 2009 weather and aeolian sand-transport data from the Colorado River corridor, Grand Canyon, Arizona: U.S. Geological Survey Open-File Report 2010-XXXX.

Fairley, H.C. and Sondossi, H., 2010, Applying an Ecosystem Framework to Evaluate Archaeological Site Condition along the Colorado River in Grand Canyon National Park, Arizona, *In* Melis, T.S., Hamill, J.F., Coggins, L.G., Jr., Grams, P.E., Kennedy, T.A., Kubly, D.M., and Ralston, B.E., eds., Proceedings of the Colorado River Basin Science and Resource Management Symposium, November 18-20, 2008, Scottsdale, Arizona. U.S. Geological Survey Scientific Investigations Report 2010-5135, p. 333-341.

Unpublished Reports

Leap, L., n.d., Fiscal Year 2007 Report for Interagency Agreement between National Park Service, Grand Canyon National Park, and the U.S. Geological Survey, Grand Canyon Monitoring and Research Center to Collaborate in the Development of Long-Term Monitoring Protocols for Archaeological Resources of the Colorado River Corridor in Grand Canyon that may be Affected by the Operation of Glen Canyon Dam. Draft report submitted October 3, 2008 to U.S. Geological Survey Grand Canyon Monitoring and Research Center, Flagstaff.

O'Brien, G. and Pederson, J., 2009, Geomorphic Attributes Of 232 Cultural Sites Along The Colorado River In Grand Canyon National Park, Arizona. Final report dated July 20, 2009. Submitted by Department of Geology, Utah State University, Logan, to U.S. Geological Survey, Grand Canyon Monitoring and Research Center, Flagstaff.

O'Brien, G. and Pederson, J., 2009, Gully Erosion Processes and Parameters at Six Cultural Sites Along the Colorado River in Grand Canyon National Park, Arizona. Final draft report dated July 20, 2009, submitted by Department of Geology, Utah State University, Logan, to U.S. Geological Survey, Grand Canyon Monitoring and Research Center, Flagstaff.

Oral Presentations and Posters

Collins, B.D., Kayen, R., Minasian, D., and Fairley, H., 2008, Terrestrial Lidar Topographic Change Monitoring At Archaeological Sites Along The Colorado River Corridor Of Grand Canyon National Park, Arizona. Oral presentation at *Coming Together: Coordination of Science and Restoration Activities for the Colorado River Ecosystem Conference*, November 19, 2008, Tempe, Arizona.

Collins, B.D., 2008, Topographic Change Detection Monitoring Using Terrestrial Lidar at Archaeological Sites in the Colorado River Corridor of Grand Canyon National Park, Arizona, *Eos Trans.* AGU, 89(53), Fall Meet. Suppl., Abstract G52A-04, Invited Presentation.

Draut, A. E. Hazel, J. E. Jr., Fairley, H. C., and Brown, C. R., 2008, Aeolian Reworking Of Sediment Deposits From The March 2008 Grand Canyon High-Flow Experiment. Poster presented at *Coming Together: Coordination of Science and Restoration Activities for the Colorado River Ecosystem Conference*, November 19, 2008, Tempe, Arizona.

Fairley, H.C. and Sondossi, H., 2008, Applying an Ecosystem Framework to Evaluate Archaeological Site Condition along the Colorado River in Grand Canyon National Park, Arizona. Poster presented at *Coming Together: Coordination of Science and Restoration Activities for the Colorado River Ecosystem Conference*, November 19, 2008, Tempe, Arizona.

O'Brien, G. and Pederson, J., 2008, Soil infiltration, shear strength, and gully erosion measured along the Colorado River – what is responsible for the erosion of cultural sites? Poster presented at *Coming Together: Coordination of Science and Restoration Activities for the Colorado River Ecosystem Conference*, November 19, 2008, Tempe, Arizona.