Glen Canyon Dam Adaptive Management Work Group
Agenda Item Information
May 18, 2011

Agenda Item

FY12 Budget Development and Process

Action Requested

☑ Feedback is requested from AMWG members.

Presenters

Anne Castle, Secretary's Designee, Department of the Interior
Shane Capron, Technical Work Group Chair, Western Area Power Administration
Glen Knowles, Chief, Adaptive Management Group, Upper Colorado Region, Bureau of Reclamation
Ted Melis, Acting Chief, Grand Canyon Monitoring and Research Center

Previous Action Taken

☑ By AMWG:

At its May 2010 meeting, AMWG passed the following motion by a vote of 16-1-1:

To approve the Biennial Budget Process dated March 22, 2010, with the exception of the last two sentences of section 3.7 which are deleted, and to request that the TWG forward to AMWG an evaluation of the process after the first budget cycle is completed.

Relevant Science

N/A

Background Information

Revised Budget Process

In a memo on May 4, 2011 to the AMWG, Secretary's Designee Anne Castle proposed specific revisions to the biennial budget process (adopted by AMWG in May 2010) for developing the AMP budget and recommending it to the Secretary. The revisions are intended to effectuate the goal of focusing the AMWG on policy issues rather than budget detail. The May 4, 2011, memorandum from the Secretary's Designee explaining the proposal and the rationale behind it is attached.

TWG Chair Budget Report – Shane Capron

At the January 2011 TWG meeting (Annual Reporting Meeting), GCRMC reported on its progress in implementing the FY11 workplan. GCMRC provided a written assessment for each project outlining progress, accomplishments, publications, information gained to answer Strategic Science Questions related to the project, and recommendations for the next year(s). The intent was to evaluate progress and to develop recommendations for changes to the projects.

At that meeting, TWG members identified 24 issues that warranted follow-up. Due to changes in the timing of the development of the draft budget and workplan, the TWG (and BAHG) did not

have a budget to review and consider at its March meeting. In lieu of the traditional budget meeting, the TWG was briefed by Secretary's Designee Anne Castle on the priorities DOI had established as the foundation for the 2012 Adaptive Management Program budget. She informed TWG that GCMRC was revising its budget and workplan to reflect these priorities. Given the informal nature of the discussion and process, instead of entertaining formal motions, the TWG reviewed the list of issues generated at the January Annual Reporting Meeting and provided a (different) list of 24 recommendations to GCMRC (noted in the minutes) to informally consider as they are developing the budget.

GCMRC and Reclamation have provided a memorandum describing the 2012 budget, the process used for its development, and the relationship between the budgeted science and the four Desired Future Conditions for the AMP. This memo is attached to this AIF.

TWG intends to have a BAHG conference call in early May when a reviewable budget and workplan becomes available. The BAHG will approach the budget using the following guidelines:

1. Minor issues will be discussed with GCRMC at the meeting to see if reasonable minor modifications can be made to accommodate BAHG's concerns.
2. Major issues will be discussed and raised to the TWG level if: (a) they cannot be adequately addressed informally and (b) a majority of the BAHG supports raising the issue to TWG.
3. The TWG has been asked to only raise issues to the AMWG that rise to a policy level and to determine how best to ensure that in-depth financial questions and tradeoffs are addressed at the TWG level and not elevated to the AMWG. The Chair will help to facilitate resolution of issues.

2012 Workplan – Ted Melis, Glen Knowles

In January 2011, the USGS was directed to review and revise the provisional FY 2012 Glen Canyon Dam Adaptive Management Program (GCDAMP) work plan and budget (workplan) to focus on the following Department of the Interior (DOI) priorities:

1. Compliance with the Endangered Species Act, focusing on the native fish, particularly the humpback chub (*Gila cypha*).
2. Sediment, which was an instigating factor for the Grand Canyon Protection Act.
3. Nonnative fish control downstream of the dam.
4. Recreational trout fishery immediately downstream of the dam.

In revising the workplan, the USGS Grand Canyon Monitoring and Research Center (GCMRC) evaluated each activity in the provisional workplan to determine if it met these core DOI priorities. Adaptive management program operational activities (e.g., Reclamation and USGS administrative programs, independent science reviews, etc.) were also evaluated. In addition, the workplan was modified to include socio-economic analysis activities. The resulting proposed FY 2012 workplan is described in the attached May 3, 2011, memorandum to Anne Castle from GCMRC and Reclamation.

Activities other than support for a quality adaptive management program are organized around the four Phase I Desired Future Condition (DFC) categories:

DFC #1: Colorado River Ecosystem - food base/food web, native and nonnative fish, spring habitats, riparian vegetation, quality-of-water, and sediment.

DFC #2: Cultural Resources - traditional cultural properties, archaeological and historical sites.

DFC #3: Recreation - rafting, camping, fishing, educational activities, spiritual engagement.
DFC #4: Hydropower - maintaining or increasing the dam's power-generating capacity.

The revised workplan also considers or assumes the following:

1. The 24 recommendations provided by the Technical Work Group from its March 2011 meeting.
2. Anticipated support needs for proposed experimental management and compliance efforts, including monitoring and research activities for the proposed High-Flow Experiment (HFE) Protocol and Non-Native Fish Control (NNFC) experiments proposed to begin in 2011–2012.
3. Continued monitoring of priority resources during the proposed experimental treatments for at least a decade.
4. Continued monitoring and research in support of ongoing humpback chub translocations within the Little Colorado River.
5. Completion of nearshore ecology study, which is tied to the 2008–2012 fall steady-flow testing.
6. Provision of science activities to support the Long-Term Experimental Management Plan (LTEMP) Environmental Impact Statement (EIS) efforts in 2012.

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

MAY - 4 2011

MEMORANDUM

To: Glen Canyon Dam Adaptive Management Work Group

From: Anne Castle, Secretary's Designee,
Assistant Secretary for Water and Science

Re: Glen Canyon Dam Adaptive Management Program Workplan and Budget – Technical Work Group and Adaptive Management Work Group Suggested Roles

I am writing to provide you with updated information on the development of this year's Glen Canyon Dam Adaptive Management Program (GCDAMP) workplan and associated budget. Over the past months, we have had many conversations about how the Adaptive Management Work Group (AMWG) can most efficiently utilize its time and further improve the effectiveness of the GCDAMP, consistent with the goals of the Grand Canyon Protection Act. I am acutely aware of the fact that the stakeholder groups represented on the AMWG provide top level leadership as their designated AMWG representatives, and I want to ensure that the collective knowledge, judgment, and experience of AMWG members is put to the most valuable use.

The AMWG has recognized for some time that the GCDAMP is transitioning its adaptive management process from a concentration on large-scale experimental science to more focus on management actions based on learning gained from existing and ongoing science. An important element of this transition is the refinement of the activities and priorities of the Grand Canyon Monitoring and Research Center (GCMRC), as described in my memorandum to Kate Kitchell, Mark Sogge, and Ted Melis dated March 31, 2011 that was distributed to the AMWG.

In 2010, the AMWG established a two-year non-rolling process for review of the GCMRC/Reclamation workplan and budget, partly in order to reduce the amount of time spent by the AMWG stakeholders (as well as GCMRC) on detail-level budget issues. Similarly, the excellent assessment conducted by the U.S. Institute for Environmental Conflict Resolution (USIECR) in connection with the review of the AMWG Charter notes the view expressed by many AMWG members that the AMWG has been excessively focused on the GCDAMP budget. The review concludes that the AMWG would be better utilized if the discussions were directed more toward policy consultation and conducted at a more substantive, less detailed level.

More specifically, we have had multiple discussions at AMWG meetings on the shared desire and need to avoid "getting in the weeds" on budget issues. The USIECR report also recommends, based on input from AMWG members, that the Secretary should delineate more specifically the issues on which the AMWG's advice is requested and focus the agenda on those science and policy priorities. This recommendation is fully consistent with the Federal Advisory Committee Act and its implementing regulations.[1] This memo sets forth a vision for effective utilization of the expertise of the AMWG and Technical Work Group (TWG) in connection with the AMP workplan and budget review, consistent with the factors and sentiments set forth above.

The AMWG has received the Streamlined GCMRC Biennial Workplanning Process, which was distributed with the March 31, 2011 memo on priorities. I've attached a copy of that document to this memo for your convenience and for your consideration. This proposed process and timeline reflects the priorities and transitions described above, and the implementation of the two-year non-rolling budget and planning process. It also provides target dates for workplan and budget review. As the second year of a two-year budget cycle, a full work plan would not be developed in FY2012 because second year changes would be expected to reflect only minor corrections, consistent with the process AMWG adopted on May 6, 2010 ("During the second year of the budget, a full work plan would not be developed, rather a memo from GCMRC and/or Reclamation, outlining changes to the workplan would be provided in addition to a modified budget spreadsheet.").

I recognize that it was only a year ago that AMWG approved the biennial budget process, and this proposed GCMRC Workplanning Process timeline represents additional tweaking. I believe, however, that it is consistent with the process and planning document that the AMWG approved on May 6, 2010, which was explicitly intended "to reduce the effort currently expended on the budget process while maintaining a high-quality adaptive management program." The streamlined process proposed by GCMRC is intended to make more effective use of AMWG, TWG, and Budget Ad Hoc Group (BAHG) members' time, and is also consistent with the discussions about GCDAMP policy and priorities described above.

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[1] See e.g., 41 C.F.R. § 102-3.95(b): "Focus on mission. Advisory committee members and staff should be fully aware of the advisory committee's mission, limitations, if any, on its duties, and the agency's goals and objectives. In general, the more specific an advisory committee's tasks *and the more focused its activities are, the higher the likelihood will be that the advisory committee will fulfill its mission.*"

The revised draft FY2012 workplan and budget has been developed over the last two months by GCMRC and Reclamation based on input from the TWG and the DOI agencies. GCMRC and Reclamation have also developed a summary narrative describing the decision-making process for the FY2012 workplan and budget, the relationship of various budgeted activities to the priorities established, and the funding requirements of (and necessary tradeoffs for) certain additional activities that have not been budgeted but that may be of interest to the TWG and AMWG. The workplan summary is organized around the four DFCs: Colorado River Ecosystem, Cultural Resources, Recreation, and Hydropower. As explained in the memorandum, the budget also considers the 24 recommendations TWG provided following its March 2011 meeting as well as other priorities. These materials were shared with the DOI agencies in April and are being provided to the AMWG, BAHG, and TWG with the AMWG meeting materials. It should be emphasized that the workplan summary and budget overview provided to the AMWG do not reflect detailed review and subsequent feedback by the BAHG or the TWG as those processes will occur subsequent to the provision of the AMWG meeting documents. These materials are intended to allow the AMWG to focus on "big picture" issues at the May 18 meeting and provide any associated input to GCRMC, Reclamation, and TWG representatives to inform the next stages of review.

Following input from the BAHG and Science Advisors, the TWG will consider the revised FY2012 workplan and budget materials at its June meeting. That process will allow for any TWG recommendations to the AMWG on significant unresolved issues to be considered at the August AMWG meeting. I will be seeking your feedback on these proposed process changes at the May 18 AMWG meeting in order to help further refine our efforts, especially as we move toward planning for FY2013 and beyond.

This revised workplan process invests the BAHG and TWG with significant responsibility for working closely with GCMRC and Reclamation to resolve detailed or complex issues. The goal is to elevate to the AMWG only science and policy issues related to the workplan and budget and avoid detailed discussion of specific line items at the AMWG level. Consequently, I am asking the TWG members and TWG Chair to determine how best to ensure that in-depth financial questions and tradeoffs are addressed at the TWG level and not elevated to the AMWG. This will necessarily require the exercise of judgment by the TWG and TWG Chair to distinguish policy issues from budget detail. It will be necessary for TWG members to be fully prepared to discuss and resolve issues at the TWG meetings rather than waiting until the August AMWG meeting to make recommendations for program changes. The TWG Chair has the authority to guide the TWG in these discussions, and must also ensure that the BAHG and TWG review of the workplan and budget occurs in a timely manner.

As AMWG members we must all be cognizant of the need to credit the work performed by the skilled members of the TWG and BAHG, as well as GCMRC and Reclamation, and to focus our discussions on policy issues rather than budget detail. At the May 18 meeting, we will dedicate some time for discussion about the types of budget policy issues the AMWG would think appropriate to be raised by the TWG, so as to provide further guidance.

I greatly appreciate the thoughtful comments of many AMWG and TWG members on this subject and the efforts to more effectively utilize the time and expertise of the AMWG for the benefit of the entire Adaptive Management Program. I believe the proposed changes move us in a positive direction, and look forward to discussing them with you further at our upcoming meeting in Phoenix.

MEMORANDUM

TO: Kate Kitchell, Mark Sogge, Ted Melis

CC: Suzette Kimball, Mike Shulters, Deanna Archuleta, Lori Caramanian

FROM: Anne Castle, Secretary's Designee, Assistant Secretary for Water and Science

DATE: March 31, 2011

RE: Grand Canyon Monitoring and Research Center (GCMRC) Science Planning

As we discussed in my office last December, GCMRC is in the midst of a transition. With the lamentable departure of John Hamill, GCMRC will soon have a new Chief. In addition GCMRC is nearing the final year of its five-year science plan and, therefore, is beginning to consider the next five years of Grand Canyon science, and begin its science planning process. This process will inform how GCMRC proposes to commit its resources over the next few years. There are a number of factors influencing this planning process, and we have discussed the priorities for the program that will be used to focus the work of GCMRC and facilitate planning.

First, we have learned a great deal from past GCMRC science. There is a large degree of consensus around the idea that we are at a transition point between an almost wholly experimental science program and one that includes more components of management support. This is something that has been talked about for many years. The work being done now on the two EAs (HFE Protocol and non-native fish control) highlights this transition, even though the HFEs and non-native fish control remain experimental in nature. And this is what adaptive management is all about. So the science plan for GCMRC needs to reflect this course adjustment.

Second, we have had and are likely to continue to experience very limited budgets. We cannot expect any additional funding for the operation of the Adaptive Management Program and its research and monitoring component. So we have to plan very wisely to deal with this limitation.

As a result, we need to focus on priorities. We'll do that by looking at the Desired Future Conditions (DFCs), still in draft but nearing a final recommendation to the Secretary, but we also have to narrow the field because the DFCs are very comprehensive. Our first and foremost priority is compliance with the Endangered Species Act, which means focus on the native fish and particularly the humpback chub. Second, we need to focus on sediment, which was an instigating factor for the Grand Canyon Protection Act and continues to be an issue with resources downstream of the dam. That includes being able to respond if the high flow protocol goes forward and it calls for a high flow experimental release. Third, and these are competing priorities, we need science on both non-native fish control and the recreational trout fishery. These are the primary areas where I have asked GCMRC to concentrate its resources.

These priorities are largely consistent with those adopted by the Glen Canyon Dam Adaptive Management Work Group (AMWG) in August 2004. Those priorities focused on the humpback

chub, sediment, and the “best” flow regime (no specification of what resources it would be best for). In addition, the 2004 priorities posed questions about cultural resources and the operation of a Temperature Control Device (TCD). While cultural resources remain a very high priority, it is not clear that there are significant science questions involving those resources, or the TCD, that require attention at this time. These conclusions may change over the course of the next five-year plan.

It may be helpful to also explain what is not intended by establishing these priorities. First, it does not mean that long-term monitoring of core ecosystem components will not be continued. Second, it does not mean that no other issues should be considered for scientific investigation – if there are issues outside of these priorities that have widespread support and further the purposes of the Adaptive Management Program, they can be considered as well. Finally, it does not mean that we have to have new science in each of these priority areas every year. The intent behind the establishment of priorities is to enable GCMRC to better direct its limited resources and resist the Christmas tree approach to science planning.

We anticipate a two-phase process: (1) developing the FY2012 work plan and (2) following up with a five-year science plan that would be developed next year and be informed by the planning that has occurred at that point through the Long Term Experimental and Management Plan process, with the ultimate goal of integrating analysis of a long term science plan with the LTEMP as part of that process.

In developing the FY2012 workplan, I requested that GCMRC conduct a streamlined planning process that focuses on these key priorities, but also provides for TWG and AMWG input. An outline of the streamlined process is attached. The revised FY2012 workplan and a process for subsequent long-term science planning will be presented to the AMWG at the August meeting this year. The AMWG will be involved in the science plan revision process.

I appreciate GCMRC’s invaluable contributions to the Adaptive Management Program and I appreciate your willingness to re-evaluate GCMRC’s role as we tackle the challenges of the next five years.

Table 1. Approximate timelines for a streamlined process for development of a biennial workplan (BWP) and budget, plus consideration of changes to the second year of the BWP. Dates shown are estimated targets.

Month	Year-1 (development of biennial workplan & budget)	Year-2 (consideration of year-2 of biennial workplan & budget)
November	USGS produces GCMRC annual project reports document	USGS produces GCMRC annual project reports document
January	Annual reports meeting (2 days) followed by 1-day TWG meeting to review budget and provide guidance to GCMRC and BOR. TWG reviews progress in addressing Information Needs and research accomplishments.	Annual reports meeting (2 days) followed by 1-day TWG meeting to review GCMRC budget and provide guidance to USGS and BOR on any potential changes to consider for year-2 of the budget. TWG reviews progress in addressing Information Needs and research accomplishments.
February	Based on a revised Strategic Science Plan and Monitoring and Research Plan, DOI establishes/updates general work plan priorities/hydrograph assumptions and communicates those to AMWG USGS and BOR will meet will meet with the DOI Family to solicit their input on DOI priorities and major issues to be reconciled. Any disagreements will be resolved by DOI in consultation with the DOI Family	USGS initiates internal review of BWP in relation to ASWS priorities and funding constraints. Identifies proposed revisions and analyzes scenarios/implications.
March	USGS and BOR will develop an initial BWP and budget spreadsheet based on DOI priorities and input from (a) scientists and the TWG during the January Annual Reports meeting and (b) the DOI family. Initial BWP presented to ASWS.	USGS provides initial draft BWP spreadsheet for ASWS consideration.
April	USGS and BOR meet with DOI Family to discuss BWP. TWG meets to consider and provide input on the initial BWP. Unresolved issues or conflicting priorities will be resolved by DOI in consultation with the DOI Family.	USGS meets with the DOI Family to solicit input on draft BWP. USGS provides revised draft BWP and briefing to ASWS.
May	USGS and BOR provide a draft BWP to the TWG Budget Ad Hoc Group (BAHG) and Science Advisors for their review and comment.	USGS provides draft BWP to the BAHG and Science Advisors for review. TWG Budget Ad Hoc Group meets to consider and provide input on the draft BWP.
June	TWG meets to provide input on the draft USGS and BOR BWP and provide a recommendation to the AMWG.	USGS provides a final draft BWP to the TWG and Science Advisors for review. TWG meets to provide input on the final draft BWP.
July	USGS and BOR provide a final draft BWP to the AMWG for their review	USGS revises and provides final draft BWP to the AMWG for their review.
August	AMWG meets to provide input on the USGS and BOR draft BWPs and provide a recommendation to the SOI	AMWG meets to provide input on the final draft BWP and provide a recommendation to the SOI
September	Secretary of the Interior reviews the budget and work plan recommendation from AMWG.	Secretary of the Interior reviews the budget and work plan recommendation from AMWG.

Criteria for Review and Revisions of the Year-two Budget

In order for BWP development process to be successful in reducing the administrative burden on the USGS/GCMRC, BOR and the GCDAMP it must have clear criteria for making changes to the year-two budget. The burden of an appropriate rationale for proposing a change falls upon the proposer to make a persuasive argument. The following criteria will be used by USGS, Reclamation, and TWG in making recommendations to AMWG on changes to the year-two budget:

- Scientific requirement or merit: New information gained during the implementation of monitoring and research projects may result in a need to alter methods, scope, or timelines in the work plan or substantially alter or eliminate a project. This is a science-based need based on the experience of implementing an already approved project. This does not represent a shifting priority, but a scientific learning process which results in needed modifications to carry out the goals.

- Administrative needs: Administrative or programmatic changes may occur within the time-frame of an approved budget. Examples include the mitigation of an impact as a result of ESA consultation or tribal consultation, a change in the "overhead" charges of a federal or state agency, a significant reduction of the balance of the Colorado River Basin Fund or a failure to secure NPS permits for work in the Grand Canyon. As soon as an administrative event occurs that affects the budget, USGS (or relevant agency – such as DOI) will notify the TWG.

- New initiatives: New initiatives or modifications to projects that may or may not be based on a scientific merit must be vetted through DOI. DOI will consider whether to direct USGS/BOR to work on these new initiatives or whether to consider them during the next full budget cycle. Given that the budget will likely be fully accounted for, direction on where to locate the funds within the current budget will be requested from DOI.

Memorandum

Date: May 3, 2011

To: Anne Castle, Assistant Secretary for Water and Science, Department of the Interior

Through: Mark Sogge, Associate Regional Executive, USGS Pacific Southwest Area

From: Ted Melis, Acting Chief, Grand Canyon Monitoring and Research Center
Glen Knowles, Chief, Adaptive Management Group, Bureau of Reclamation

SUBJECT: Summary of Proposed Revisions to FY 2012 GCDAMP Workplan and Budget

In January 2011, the USGS was directed to review and revise the provisional FY 2012 Glen Canyon Dam Adaptive Management Program (GCDAMP) work plan and budget (hereafter "workplan") to focus on the following Department of the Interior (DOI) priorities:

1. Compliance with the Endangered Species Act, focusing on the native fish, particularly the humpback chub (*Gila cypha*)
2. Sediment, which was an instigating factor for the Grand Canyon Protection Act
3. Nonnative fish control downstream of the dam
4. Recreational trout fishery immediately downstream of the dam

In revising the workplan, the USGS Grand Canyon Monitoring and Research Center (GCMRC) evaluated each activity in the provisional workplan to determine if it met core DOI priorities. Adaptive management program operational activities (e.g., Reclamation and USGS administrative programs, independent science reviews, etc.) were also evaluated. In addition, the workplan was modified to include socio-economic analysis activities. The resulting proposed FY 2012 workplan is described in the following pages. Activities other than support for a quality adaptive management program are organized around the four Phase I Desired Future Condition (DFC) categories:

DFC #1 Colorado River Ecosystem - food base/food web, native and nonnative fish, spring habitats and riparian vegetation, quality-of-water and sediment
DFC #2 Cultural Resources - traditional cultural properties, archaeological and historical sites
DFC #3 Recreation - rafting, camping, fishing, educational activities, spiritual engagement
DFC #4 Hydropower - maintaining or increasing the dam's power-generating capacity

The revised workplan also considers or assumes the following:

1. The 24 recommendations provided by the Technical Work Group from its March 2011 meeting
2. Anticipated support needs for proposed experimental management and compliance efforts, including monitoring and research activities for the proposed High-Flow Experiment (HFE) Protocol and Non-Native Fish Control (NNFC) experiments proposed to begin in 2011–2012
3. Monitoring of priority resources during the proposed experimental treatments will continue for at least a decade
4. Monitoring and research in support of ongoing humpback chub translocations within the Little Colorado River will continue
5. Completion of nearshore ecology study (tied to 2008–2012 fall steady-flow testing)
6. Provision of science activities to support the Long-Term Experimental Management Plan (LTEMP) Environmental Impact Statement (EIS) efforts in 2012

Summary of Overall Efforts

The summary below includes both the GCMRC and Reclamation components of the GCDAMP. Under the revised workplan, (table1, fig. 1) the majority of activities and funds are directed to DFC #1 (Colorado River Ecosystem) and to supporting a quality adaptive management program. Projects related to Cultural Resource, Recreation and Hydropower account for approximately 9% of funding. Most funding for the Colorado River Ecosystem, Recreation, and Hydropower DFCs comes from the GCMRC budget, while most for the Cultural Resources DFC is from Reclamation (fig. 2). Two thirds of the funding for the GCDAMP support activities is associated with GCMRC.

Table 1. Funds distribution by each of the four Desired Future Conditions (DFCs) and the adaptive management program under the proposed FY 2012 workplan. The total FY 2012 budget was estimated assuming a 3% Consumer Price Index increase over FY 2011.

Desired Future Condition		**Budget**	**% of Total Budget**
1 - Colorado River Ecosystem	GCMRC	5,906,223	51.11%
	BOR	297,497	2.57%
	Total DFC 1	**6,203,720**	**53.69%**
2 - Cultural Resources	GCMRC	92,191	0.80%
	BOR	667,869	5.78%
	Total DFC 2	**760,060**	**6.58%**
3 - Recreation	GCMRC	178,798	1.55%
	BOR		0.00%
	Total DFC 3	**178,798**	**1.55%**
4 - Hydropower	GCMRC	99,717	0.86%
	BOR		0.00%
	Total DFC 4	**99,717**	**0.86%**
Support for Quality Adaptive Management Program	GCMRC	2,895,301	25.06%
	BOR	1,417,894	12.27%
	Total AMP Support	**4,313,195**	**37.33%**
Summary by Agency	GCMRC	9,172,230	79.38%
	BOR	2,383,260	20.62%
Total GCDAMP FY 2012 Funding		**$11,555,490**	**100.00%**

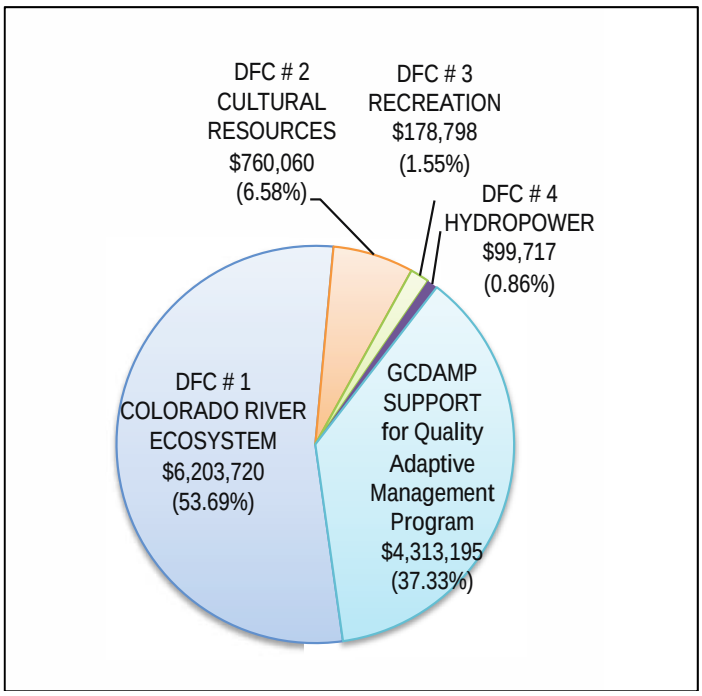

Figure 1. The proportion of total funds that would support each of the four Desired Future Conditions (DFCs) and support for a quality adaptive management program, under the proposed FY 2012 workplan. The total FY 2012 budget is estimated at $11.6M, assuming a 3% Consumer Price Index increase over FY 2011. The GCMRC costs were based on an estimated 21% burden rate.

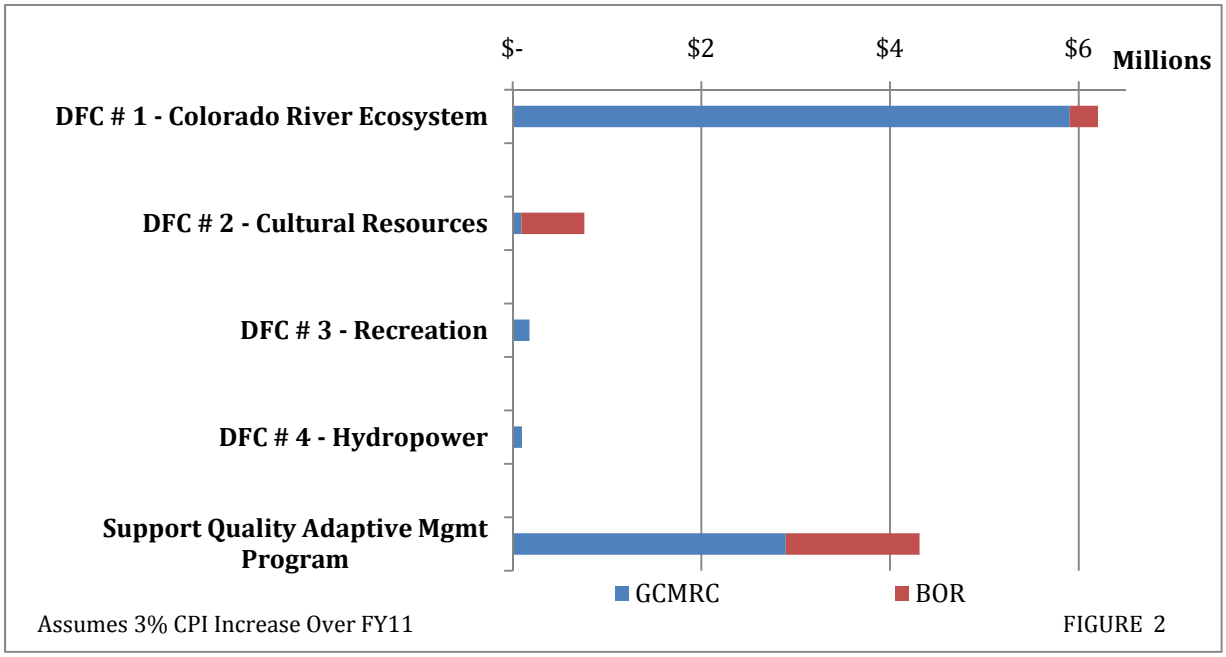

Figure 2. Proposed FY 2012 Reclamation (BOR) and GCMRC funding within each DFC category and for support of quality adaptive management program.

Desired Future Condition 1: Colorado River Ecosystem

Proposed Changes

Proposed workplan activities related to the Colorado River Ecosystem DFC align well with DOI resource priorities (fig. 3). Although not identified as specific priorities, aquatic food base/food web studies and some terrestrial vegetation monitoring are included in the workplan to support native/nonnative fish and recreation priorities, respectively. Key points are:

- Endangered species/native fish monitoring and research is increased by $258K (12%)
- Support for experimental nonnative fish control trips in Grand Canyon is increased by $130K (16%)
- Funding for continued monitoring of the Lees Ferry fishery is decreased slightly ($7.5K; -3%)
- Support for ongoing quality-of-water and sediment monitoring is decreased slightly ($48K; -2%)
- Food web monitoring is increased by $73K (22%)
- Vegetation monitoring is decreased by $76K (-49%)

Overall Financial Impact of Proposed Changes: The proposed budget increases expenditures $300K, from $5.9M to $6.2M.

Implications

The proposed changes ensure that (1) 2008–2012 fall steady-flow testing studies are supported sufficiently to complete reporting requirements; (2) monitoring and research associated with endangered species (humpback chub and Kanab ambersnail) continue, with some increased support for native/nonnative fish monitoring; (3) proposed nonnative fish control is sufficiently funded; (4) flow, quality-of-water, and sand-storage monitoring are sufficient to support the proposed HFE protocol; and (5) monitoring of the Lees Ferry fishery is continued as originally proposed.

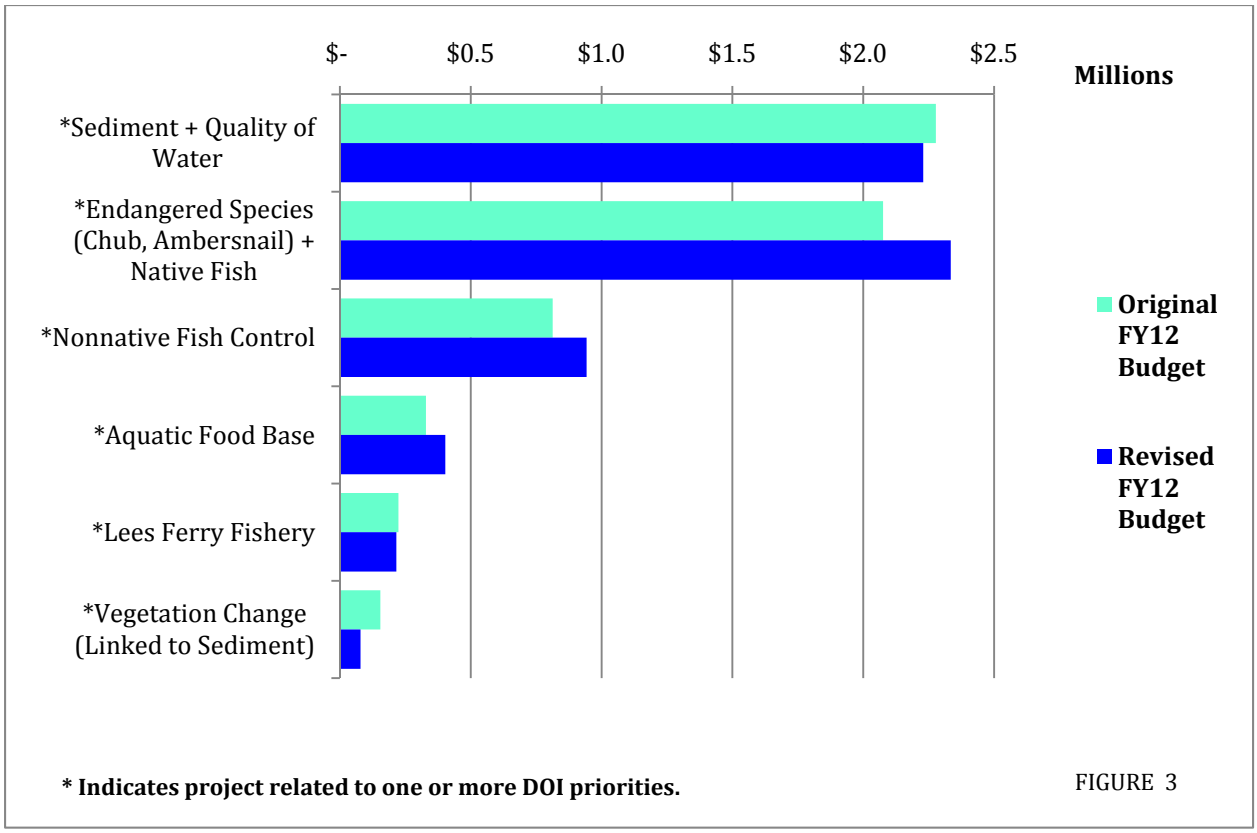

Figure 3. Comparison of GCDAMP activities in support of Desired Future Condition #1 (Colorado River Ecosystem) under the provisional ("original") and revised FY 2012 workplans.

Desired Future Condition 2: Cultural Resources

Proposed Changes

Under the proposed workplan, tribal resource monitoring and Programmatic Agreement activities supported by Reclamation remain unchanged. However, the planned implementation of GCMRC-based monitoring of archaeological sites would be restricted to Glen Canyon National Recreation Area and would not occur in Grand Canyon National Park (GRCA). Note that cultural resources were not identified by DOI as a current science priority for GCMRC, and that the majority of funding for this DFC is associated with Reclamation. Key points are:

- Tribal resource monitoring is unchanged
- Programmatic Agreement and treatment plan are unchanged
- Implementation of GCMRC-based archaeological site monitoring is decreased by $267K (-75%)

Implications

Under the revised workplan, the field-based archaeological site monitoring protocol recently developed by GCMRC will be initiated within Glen Canyon National Recreation Area as a proof-of-concept application for LiDAR-based field monitoring. This monitoring will not occur at GRCA sites as originally planned. However, the originally planned level of Reclamation and National Park Service (NPS) support for tribal resource monitoring and implementation of the treatment plan under the Programmatic Agreement will occur in FY 2012. In addition, GCMRC and NPS are working together to explore synergies in their cultural resource programs, and to determine whether analyses of historical and recent aerial imagery can be used to monitor post-HFE windborne sand availability at sites in GRCA.

Overall Financial Impact of Proposed Changes: The proposed budget decreases expenditures $267K, from $1M to $760K.

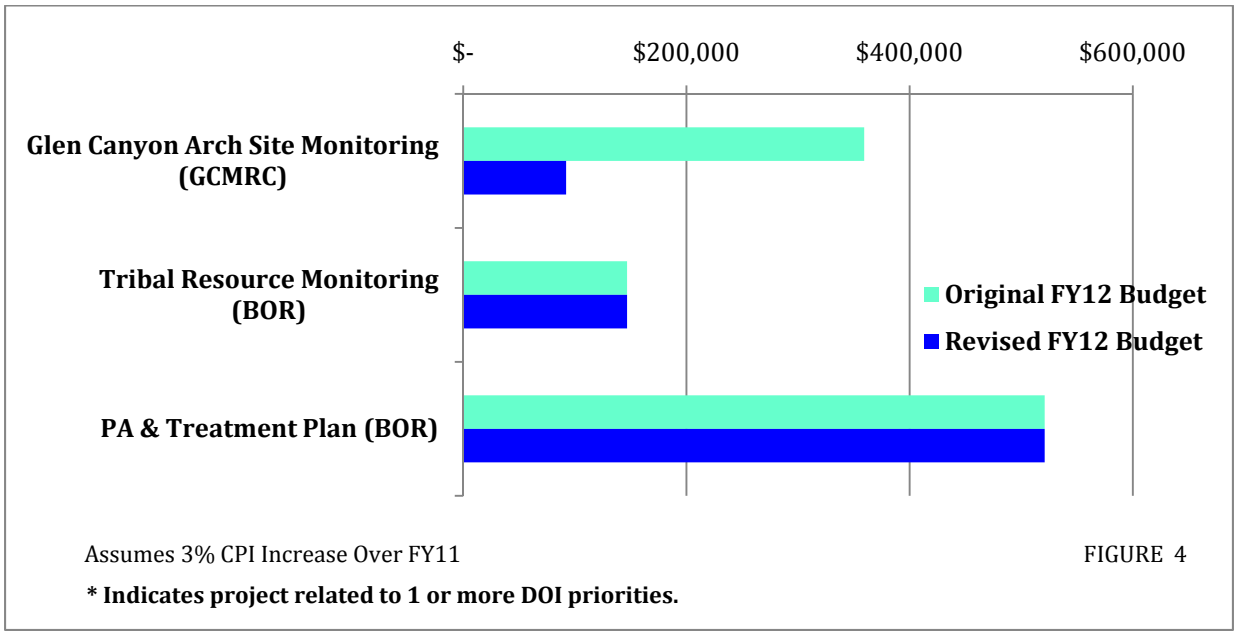

Figure 4. Comparison of GCDAMP activities in support of Desired Future Condition #2 (Cultural Resources) under the provisional ("original") and revised FY 2012 workplans.

Desired Future Condition 3: Recreation

Proposed Changes

The proposed workplan substantially increases research on Lees Ferry sport fishery recreational values, while continuing to support monitoring of recreational campsites and development of the campsite GIS atlas (fig. 5). The key points are:

- Lees Ferry recreation values research is increased by $81K (400%)
- Support for campsite monitoring is decreased by $8K (-20%)
- Stable support for completing the campsite GIS atlas

Implications

The revised workplan increases research into the recreational values in the Lees Ferry tailwater to (1) provide partial salary support for an economist to assist with developing requests for proposal (RFPs) and to coordinate recreational-use values studies, and (2) fund competitive RFPs in support of the recreation valuation project. The remainder of the economist's salary and efforts will be associated with Power-related activities (see Power, DFC 4, page 7). It is likely that an outside entity will be contracted to conduct a formal survey of recreational users of the Lees Ferry sport fishery about their preferences, but scoping efforts are ongoing to focus the proposed research. The revision also reduces the budget for campsite monitoring by 20% by eliminating support for the Grand Canyon River Guides Adopt-A-Beach Program. The campsite GIS atlas project, which compiles, maintains, and analyzes a variety of current and historical campsite data, remains largely unchanged in the proposed budget.

Overall Financial Impact of Proposed Changes: The proposed budget increases expenditures $73K, from $106K to $179K.

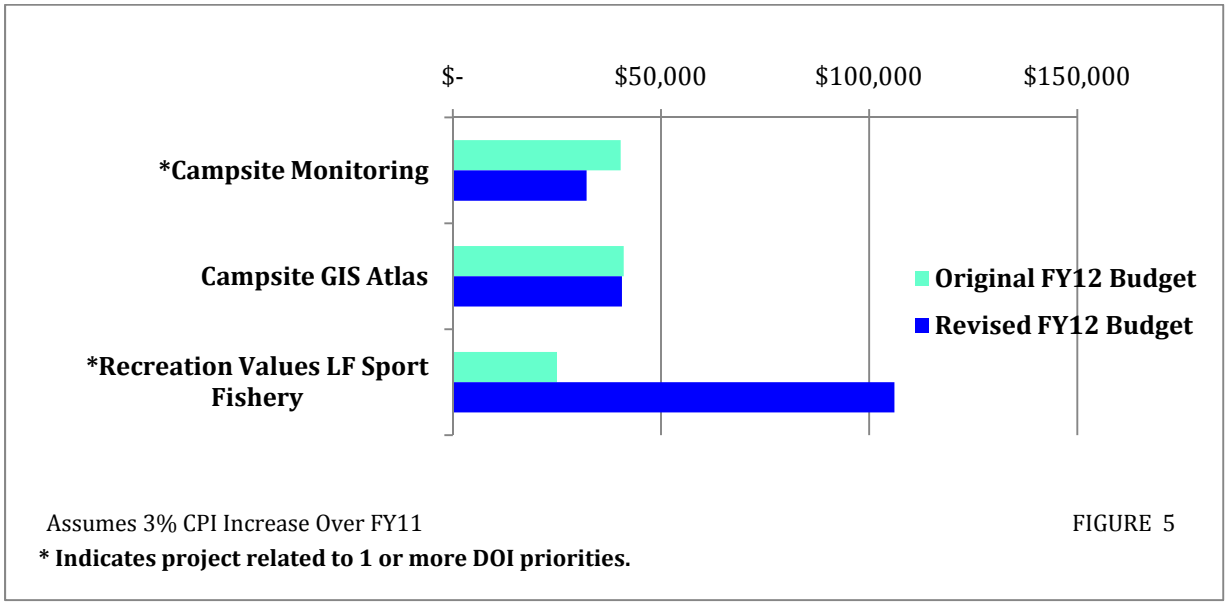

Figure 5. Comparison of GCDAMP activities in support of Desired Future Condition #3 (Recreation) under the provisional ("original") and revised FY 2012 workplans.

Desired Future Condition 4: Hydropower

Proposed Changes

Under the proposed workplan, funding is realigned and increased (fig. 6) to support an economist position to facilitate hydropower-related studies. The key points are:

- Overall, the budget is increased by $80K (400%) from $20K to $100K in order to partially support a position to coordinate hydropower-related economic studies managed by GCMRC

Implications

The economic aspects of dam operations are important considerations in evaluating alternatives and understanding the relative costs and benefits of adaptive management actions. To date, GCMRC has not developed in-house expertise in the field of economics. Under the revised workplan, the hydropower-related budget is expanded to include partial funding to bring in new economics expertise to assist with developing RFPs and coordinate economic studies conducted by the Western Area Power Administration (or other entities) on hydropower modeling and economic forecasting under varying flow regimes. The proposed change creates a position to provide GCMRC with electrical hydropower economics expertise, either through a direct hire or through partnership with an outside organization. Note that this economist will also coordinate Lees Ferry recreation-use economic studies (see Recreation, DFC 3, page 6).

Overall Financial Impact of Proposed Changes: The proposed budget increases expenditures $80K, from $20K to $100K.

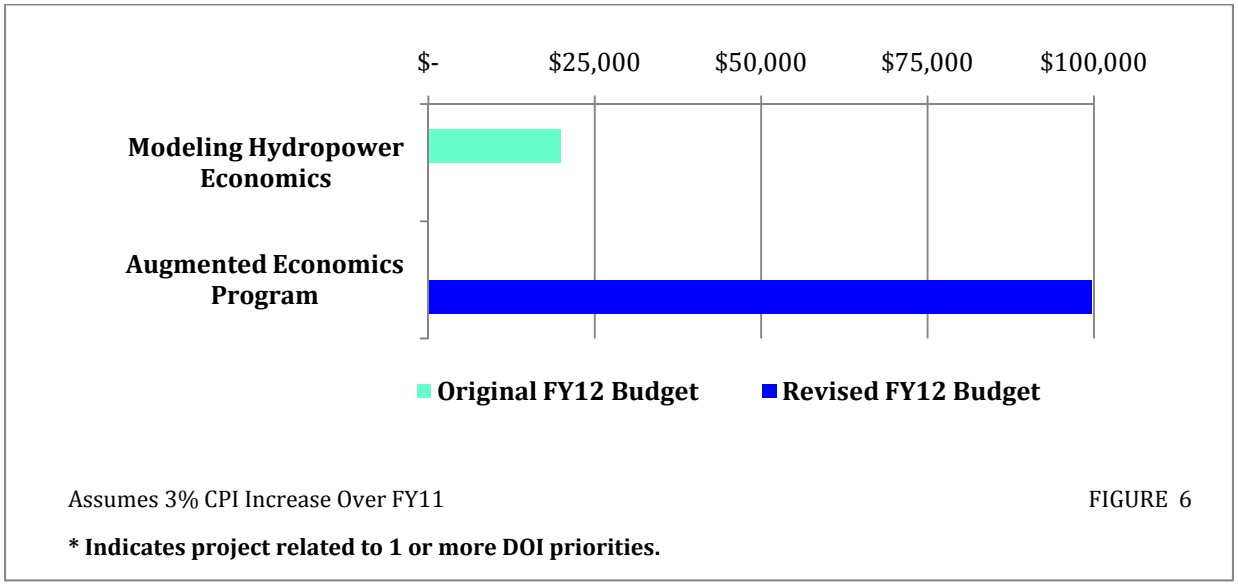

Figure 6. Comparison of GCDAMP activities in support of Desired Future Condition #4 (Hydropower) under the provisional ("original") and revised FY 2012 workplans.

Support for a High-Quality Adaptive Management Program

Proposed Changes

The proposed workplan reduces some adaptive management operational support activities (fig. 7) and redirects those funds to science activities that fall under DFCs #1, #3, and #4. The key points are:

- Data Acquisition, Storage, and Analysis (DASA) is reduced by $160K (-16%)
- Science planning (decision support) and implementation is increased by $74K (14%)
- Support for independent review is reduced by $84K (-37%)
- Reclamation's support for tribal participation and compliance documents is unchanged
- Support for Reclamation and GCMRC science leadership, support, and administrative activities is decreased by $44K (-3%)

Implications

The revised workplan will focus more of the GCMRC's Data Acquisition, Storage & Analysis (DASA) program's attention on change-detection analyses of 2002, 2005, and 2009 digital imagery in order to complete reporting on terrestrial resources of GCDAMP concern along river shorelines (campsites, vegetation, cultural sites, etc.). Although GCMRC total salary expenditures are reduced in DASA, there will be continued emphasis on improving public web interface and data access. The workplan revision will also increase science planning activities (including support for long-term experimental management planning through use of decision-support workshops and modeling), but does so at the cost of reduced support for independent review by the Science Advisors. Independent review needs continue to be evaluated for the workplan during FY 2011 and may be adjusted further as need is refined.

Financial Impact of Proposed Changes: The proposed budget decreases expenditures $215K, from $4.5M to $4.3M.

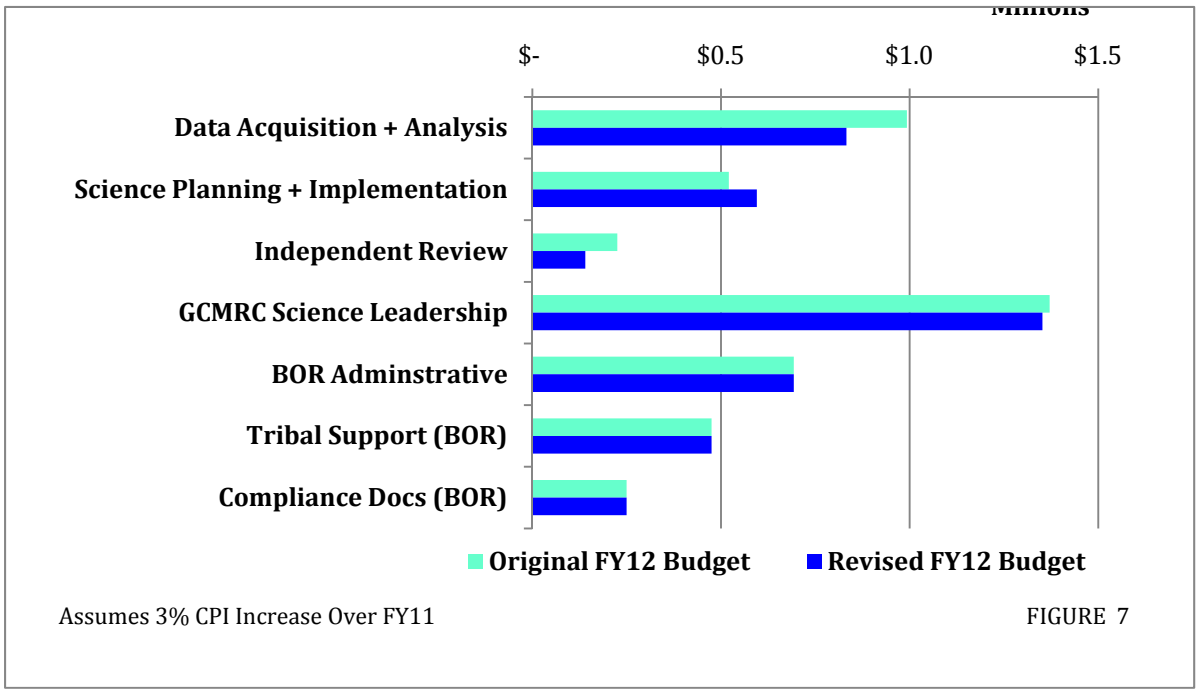

Figure 7. Comparison of GCDAMP activities in support of a high-quality adaptive management program under the provisional ("original") and revised FY 2012 workplans.

ADDENDUM:

FY 2012 GCMRC Support for the LTEMP EIS

A significant part of GCMRC's FY 2011 ongoing program and proposed FY 2012 workplan activities can support upcoming EIS efforts by Reclamation and the National Park Service. Approximately $5.5M of the proposed FY 2012 program involves the following activities that would help inform the EIS:

- Staff participation in the LTEMP EIS process, including input and review of draft documents, plus modeling support
- GCMRC 2012-2017 Monitoring and Research Plan (for post-EIS monitoring)
- State of the Colorado River Ecosystem (SCORE) report (new and completed in FY 2012)
- Nearshore-ecology study report (FY 2011–2012; completed in FY 2012)
- Socioeconomic studies: Hydropower (FY 2011–2012; new in FY11) and Recreation (FY 2011–2012; new in FY 2011)
- Humpback chub population estimates based on Age-Structure Mark-Recapture (ASMR) modeling (FY 2011–2013)
- Sandbar modeling to evaluate effects of flow regimes (FY 2011–2013)
- Ecosystem modeling (FY 2011–2013)
- Various monitoring activities, including monitoring of sandbars and sand storage, sediment flux, aquatic food base, trout in the Lees Ferry reach, fish in the mainstem and Little Colorado River, rainbow trout movement, and riparian vegetation (FY 2011–2013)
- Analysis of sandbar and sediment-flux data (FY 2011–2013)
- Monitoring of campsites and cultural resources (FY 2011–2012)
- Technical support activities, including database and GIS support, and image analysis and change detection (FY 2011–2013)
- Publication of High Flow Experiment Synthesis (USGS circular 1366) and supporting USGS Fact Sheets on rainbow trout early life-stage survival and experimental nonnative fish removal results

Although not included in the proposed FY 2012 workplan, GCMRC has the capability to continue or augment existing activities, or conduct new ones, to provide additional LTEMP EIS support. Redirecting currently anticipated funds to any of the items listed below would result in reducing or eliminating ongoing or proposed activities. Therefore, additional funding would be required to conduct these activities.

- System-scale sand modeling to evaluate systemwide sandbar effects of flow regimes (FY 2012–2013; $90K per year)
- Map topography/bathymetry of Lees Ferry Reach by collecting blue-green LiDAR data (FY 2012 for $100K)
- Workshops for science-based alternatives using structured decision making (FY 2012 for $85K)
- Multi-dimensional, nearshore temperature modeling (active in FY 2011; continue into FY 2012 and 2013 for $12K and $13K, respectively)
- Analyze legacy imaging data – DEM/orthorectification (FY 2012 for $107K; FY 2013 for $110K)
- Science Advisor Support for review of the draft LTEMP EIS (FY 2012–2013; $30K per year)

Descriptions of Projects in FY12 GCDAMP (GCMRC/BOR) Workplan

DFC 1: Colorado River Ecosystem

Project in FY12 GCMRC/BOR Workplan	Project Description	Original FY12 Budget	Revised FY12 Budget	Change
DFC 1, Sediment				
Water Quality Monitoring of Lake Powell and the Glen Canyon Dam Tailwaters (Ongoing) BIO 7.R1.12	USGS monitors water quality of Lake Powell and forebay and tailwaters of Glen Canyon Dam in collaboration with the National Park Service and Bureau of Reclamation. The data are used by the Bureau of Reclamation to calibrate and verify a water-quality model (CE-QUAL-W2) of Lake Powell.	188,063	146,708	-41,355
Integrated Quality of Water Monitoring (downstream of GCD) (Ongoing) PHY 7.M1.12	Project monitors water quality (suspended sediment, turbidity, streamflow, temperature, dissolved oxygen, pH, salinity) at six locations along the Colorado River between Glen Canyon Dam and Lake Mead. Data are used to link dam operations to downstream resource conditions and track the sand budget for scheduling high flows.	1,002,389	1,005,955	3,566
Modeling Support & Temperature Models (Ongoing) PHY 7.R3.12	Project creates tools to predict the sand budget for use in scheduling high flows. New work in FY 2012 will be directed toward development of an eddy-deposition model to improve the ability to connect sand-budget predictions provided by the current model with sandbar response. This project may also create tools to predict mainstem water temperatures.	142,944	171,002	28,058
Integrated Long-term Monitoring of System-Wide Changes in Sediment Storage (Ongoing) PHY 8.M2.12	Project monitors a subset of sandbars and long-term changes in sand storage through repeat bathymetric and total station mapping of the Colorado River channel to evaluate effectiveness of dam operations, including if high flows achieve resource objectives related to sand bars and sediment storage.	479,183	500,280	21,097
Logistics Base Costs (See each project for project related logistics costs) (Ongoing) SUP 12.S1.12	Project provides complete logistical support for the 25 to 40 annual research, monitoring, and tribal river trips conducted annually through Grand Canyon by GCMRC. The project supports logistical support staff salaries, vehicles, equipment, and transportation.	213,153	209,461	-3,692
Survey & Control Network Operations (Ongoing) SUP 12.S2.12	Project provides spatial reference and survey support to various GCMRC projects. Under the proposed budget scenario for FY 2012, support is provided mainly to PHY 8.M2.12. Support is also provided to campsite monitoring, Kanab ambersnail monitoring, aquatic food base, and remote sensing projects.	251,265	195,329	-55,936
		$2,276,997	**$2,228,735**	**-$48,262**

Project in FY12 GCMRC/BOR Workplan	Project Description	Original FY12 Budget	Revised FY12 Budget	Change
DFC 1, ESA & Native Fish				
LCR Fish Monitoring (Ongoing) BIO 2.M1.12	Through a cooperative agreement with USGS, USFWS has conducted mark-recapture and monitoring activities in the lower 13.57 km of the Little Colorado River since 2000. The primary objective is to monitor for annual changes in the spring and fall abundances of humpback chub ≥ 150 and ≥ 200 mm, respectively. Data are used to generate and update the Age-Structured-Mark-Recapture (ASMR) model developed at GCMRC.	595,001	594,538	-463
HBC Translocation & Monitoring Above Chute Falls (Ongoing) BIO 2.M3.12	Through a cooperative agreement with USGS, USFWS leads a monitoring effort of translocated humpback chub above Chute Falls and in a short stretch of the Little Colorado River (13.57 to 14.1 km). Translocations have been conducted for conservation purposes. Monitoring data are used in the Age-Structured-Mark-Recapture model developed by GCMRC.	135,696	131,103	-4,593
Monitoring Mainstem Fish (Ongoing) BIO 2.M4.12	Through a cooperative agreement with USGS, the Arizona Game and Fish Department leads a monitoring effort of native and nonnative fish abundance and distribution in Marble and Grand Canyons.	539,107	453,566	-85,541
Remote PIT Tag Reading (Ongoing) BIO 2.R13.12	Project evaluates new methods that minimize handling of fish but allow measurement of fish movement, particularly juvenile humpback chub, in the Little Colorado River and its confluence with the mainstem.	147,597	123,198	-24,399
Near Shore Ecology / Fall Steady Flows (FY08--FY12) BIO 2.R15.12	Through a cooperative agreement with USGS, the University of Florida is evaluating 1) whether steadier flows during fall increase survival rates of juvenile native and nonnative fish and 2) to what extent physical habitat structures, such as sandbars and backwaters, are used by young fish. This study supports the experimental flows described in the Biological Opinion and implemented during 2008-12.	423,475	353,004	-70,471
Biometrics & General Analysis Staff Position (Ongoing) BIO 2.R19.12	This budget item provides funding for a Research Statistician who supports the overall aquatic and physical science research of GCMRC, and the stock assessment of native fish in Grand Canyon (BIO 2.R7.12).	154,738	135,281	-19,457
Stock Assessment of Grand Canyon Native Fish (Ongoing) BIO 2.R7.12	Project produces annual estimates of size and capture rates of humpback chub and other native fish in Grand Canyon. Data are incorporated into Age-Structured-Mark-Recapture (ASMR) model every three years.	59,528	69,266	9,738
Mainstem juvenile HBC monitoring (including Marble Canyon sampling) NEW COST (NNFCF); informs removal decisions in LCR BIO 2.Rxx	Project replaces the field effort of the near shore ecology project (BIO 2.R15.12) by determining juvenile humpback chub survival in the mainstem below the confluence with the Little Colorado River. The field work will also include sampling in Marble Canyon for rainbow trout that are marked in Lees Ferry associated with project BIO 2.E18.12.	0	453,192	453,192

Project in FY12 GCMRC/BOR Workplan	Project Description	Original FY12 Budget	Revised FY12 Budget	Change
Monitor Kanab Ambersnail (FY12--Ongoing) BIO 5.M1.12	Through a cooperative agreement with USGS, the Arizona Game and Fish Department leads a monitoring effort of the abundance and distribution of the Kanab ambersnail and its habitat at Vasey's Paradise.	20,684	20,684	0
		$2,075,826	**$2,333,832**	**$258,006**
DFC 1, Nonnative Fish Control				
Detection of Rainbow Trout Movement from the Upper Reaches of the Col River below Glen Canyon Dam (FY11--FY12) (PBR & Tagging) BIO 2.E18.12	Project collects information on the movement of rainbow trout between the Paria River (RM 1) and Badger Rapid (RM 8) to determine the feasibility of removing rainbow trout from this reach as an alternative to removal from the area near the confluence with the Little Colorado River.	453,028	454,378	1,350
Nonnative Control Plan Science Support (Ending) BIO 2.R17.12	Project evaluates threats from nonnative fish to native fish and develops plans to control the species that pose the greatest threat. Project scheduled to be completed March 2011.	62,512	0	-62,512
Nonnative Fish Control Contingency Fund BIO 2.Rxx	Money set aside to support nonnative fish removal at the confluence with the Little Colorado River.	0	191,126	191,126
Nonnative Fish Suppression Contingency Fund BOR BUDGET	None provided.	271,460	271,460	0
Experimental Funds Carryover - to be held by BOR BOR BUDGET	None provided.	26,037	26,037	0
		$813,037	**$943,001**	**$129,963**
DFC 1, Food Base				
Aquatic Food Base Monitoring (Ongoing) BIO 1.M1.12	Project monitors key food items to track overall aquatic food availability to determine if humpback chub and other native fish are food limited. In FY 2012, algae and invertebrate production will be monitored monthly at Lees Ferry and Diamond Creek and monitoring will be expanded to include the confluence with the Little Colorado River, where the largest population of humpback chub in the basin is found.	329,349	402,773	73,424
		$329,349	**$402,773**	**$73,424**
DFC 1, Lees Ferry Fishery				
Monitoring Lees Ferry Fish (Ongoing) BIO 4.M2.12	Through a cooperative agreement with USGS, the Arizona Game and Fish Department leads a monitoring effort of nonnative rainbow trout and whirling disease in the Lees Ferry reach.	223,710	216,170	-7,540
		$223,710	**$216,170**	**-$7,540**

Project in FY12 GCMRC/BOR Workplan	Project Description	Original FY12 Budget	Revised FY12 Budget	Change
DFC 1, Vegetation				
Vegetation Mapping (Ongoing) BIO 6.M1.12	Project evaluates the areal extents of riparian vegetation classes (woody and marsh/wetland vegetation) among the major habitat zones in the Colorado River ecosystem, and how they change over time in response to dam operations. Terrestrial vegetation contributes to above-ground primary productivity, arthropod densities, and associated food resources for terrestrial and aquatic vertebrates. Riparian vegetation also provides culturally important plant species.	61,063	61,169	106
Vegetation Transects (Ongoing) BIO 6.M2.12	Same as BIO 6.M1.12.	93,682	18,040	-75,642
		$154,745	**$79,209**	**-$75,536**
Total DFC 1		**$5,873,664**	**$6,203,720**	**$330,054**

DFC 2: Cultural Resources

Project in FY12 GCMRC/BOR Workplan	Project Description	Original FY12 Budget	Revised FY12 Budget	Change
Glen Canyon Arch Site Monitoring (GCMRC) Was CUL 11.R1.12; now CUL 11.xx.12	This project quantifies and tracks trends in the archaeological site conditions using LiDAR to measure indicators of stability and physical change that can be linked to potential effects of dam operations. In FY 2012, monitoring efforts will be limited to the Glen Canyon Reach upstream of Lees Ferry.	359,362	92,191	-267,171
Tribal Resource Monitoring (BOR) BOR BUDGET	None provided.	146,856	146,856	0
PA & Treatment Plan (BOR) BOR BUDGET	None provided.	521,013	521,013	0
		$1,027,231	**$760,060**	**-$267,171**
Total DFC 2		**$1,027,231**	**$760,060**	**-$267,171**

DFC 3: Recreation

Project in FY12 GCMRC/BOR Workplan	Project Description	Original FY12 Budget	Revised FY12 Budget	Change
Campsite Area Monitoring (Ongoing) REC 9.R1.12	Project measures changes in space available for camping by conducting annual surveys of a subset of sandbars between Lees Ferry and Diamond Creek. These surveys are conducted concurrently with the sandbar surveys of project PHY 8.M2.	40,298	32,107	-8,191
Analyze Campsite Data in the GIS Atlas (FY07--FY12) REC 9.R3.12	Project compiles and analyzes current and historical campsite data to track changes in overall campsite size, distribution, and quality on a system-wide basis over decadal time scales.	41,059	40,601	-458
Evaluate Recreation Values and Visitor Experience Quality in the Glen Canyon Reach (FY11--FY12) REC 9.R4.12	Project develops a survey instrument and collects data to measure and monitor angler and other recreational visitors perceptions related to the quality of the sport fishery and other recreational attributes in the Glen Canyon to Badger Creek reach. Project scope is still being determined, but is also likely to include assessment of economic value of the sport fishery and other recreational attributes of the reach.	25,000	106,090	81,090
		$106,357	**$178,798**	**$72,441**
Total DFC 3		**$106,357**	**$178,798**	**$72,441**

DFC 4: Power

Project in FY12 GCMRC/BOR Workplan	Project Description	Original FY12 Budget	Revised FY12 Budget	Change
Evaluate the Suitability of the GTMax Model for Modeling Economic Implications of Power Generation under Current and Future Dam Operations and Conduct Initial Analyses (FY11--FY13) HYD 10.R2.12	Project evaluates suitability of the GTMax and other potential models for assessing economic impacts of different dam-operating scenarios in FY11, with ongoing effort as needed in FY12 (but with originally proposed funds shifted to support new initiative described below).	19,867	0	-19,867
New initiative for economics needs (revision of HYD 10.R2) – also supports DFC 3 HYD 10.xx.12	Project includes partial funding for an economist to work with GCMRC to assist in developing RFPs and providing oversight of economic studies that may be conducted by WAPA or other entities on hydropower modeling and economic forecasting under varying flow regimes.	0	99,717	99,717
		$19,867	**$99,717**	**$79,850**
Total DFC 4		**$19,867**	**$99,717**	**$79,850**

Support of Adaptive Management Program

Project in FY12 GCMRC/BOR Workplan	Project Description	Original FY12 Budget	Revised FY12 Budget	Change
DASA				
Quadrennial Remote Sensing Overflight (Ongoing) DASA 12.D1.12	Aerial photography for change analysis is conducted every four years, with the next scheduled overflight in FY 2013. Funds are set aside in intervening years to help pay for the next data-collection effort.	82,273	84,000	1,727
Grand Canyon Integrated Oracle Database Management System (Ongoing) DASA 12.D2.12	Project compiles all point data collected from ground-based studies into project-specific Oracle databases, maintains the databases, and works with the GIS Support project to develop internet access of archived data. The project also provides tools for the analysis of these data.	132,697	143,623	10,926
Library Operations / Scanning Support (Ongoing) DASA 12.D3.12	Project maintains all reports produced in support of the GCDAMP and any report relevant to the GCDAMP in hardcopy and digital forms; the digital forms are accessible from the internet. The library also houses all copies of the image and topographic data that have been collected for the Grand Canyon, which will be accessible through the internet within a year. The project is also working on converting some historical aerial photographic film to digital format.	40,051	40,049	-2
GIS Support for Integrated Analyses and Projects, GIS Lead (Ongoing) DASA 12.D5.12	Project compiles all spatial data either collected from ground-based studies or vector data generated from any source material and ingests the data into ArcMap coverages. This project also maintains the databases, works to develop internet access of archived databases, and works to provide GIS tools for the analysis of these data.	329,713	324,849	-4,864
Integrated Image Analysis and Change Detection (Ongoing) DASA 12.D9.12	Project plans and coordinates airborne image acquisition for the entire river corridor every 4 years and analyzes the resulting image data to provide a consistent, calibrated image mosaic. The project produces periodic change-detection databases that provide maps of changes throughout the river corridor.	254,975	86,896	-168,079
Program Planning & Management (Ongoing) ADM 12.A2.12	DASA Program Manager's technical oversight and implementation of Remote Sensing change-detection studies (camp sites, vegetation, cultural sites, etc.)	153,187	153,187	0
		$992,896	**832,604**	**-$160,292**
Science Planning + Implementation				
Support and Enhancement of Ecosystem Modeling Efforts (FY08--FY12) PLAN 12.P1.12	Project provides advisory assistance to GCMRC scientists and cooperators on data-analysis methods and model-integration of physical and biological data. Recent efforts have focused on aquatic ecosystem, but FY12 effort is proposed to scope potential for developing a terrestrial (landscape) ecosystem sub-model that could eventually be integrated with aquatics model(s).	114,381	149,591	35,210

Project in FY12 GCMRC/BOR Workplan	Project Description	Original FY12 Budget	Revised FY12 Budget	Change
Update of Knowledge and SCORE Report (FY11--FY12) PLAN 12.P4.12	The report will document evaluations of various experimental treatments relative to the resource goals of the GCDAMP and resource responses to flow and non-flow treatments. Treatments to be evaluated include different flow experiments (MLFF, LSSF, HFE, etc.), mechanical removal of nonnative fish, and translocation of humpback chub and Kanab ambersnail.	96,826	110,647	13,821
2012 Colorado River Basin Science and Management Symposium (Quadrennial) ADM 12.A6.12	Support for helping to plan and co-sponsor the second Colorado River Basin Science and Management Symposium. This is a forum for exchanging information and facilitating cohesive research, monitoring, data sharing, and adaptive management strategies among the four adaptive management programs in the Basin.	0	25,000	25,000
Program Planning & Management (Ongoing) ADM 12.A2.12	Portion of salary of Sociocultural, Biological & Physical/Modeling Program Managers, plus half of Deputy Chief's salary that directly supports science planning & implementation of GCMRC science project activities.	309,825	309,825	0
		$521,032	**$595,063**	**$74,031**
Independent Science Reviews				
Independent Reviews (Ongoing) ADM 12.A4.12 (A)	Supports independent peer review for proposals received by GCMRC through a panel process. This project also supports Protocol Evaluation Panels (PEP) of GCMRC projects and methods. In FY 2012, PEPs are scheduled for campsite and sediment monitoring.	35,556	18,150	-17,406
Coordination and Review of Services Provided by Science Advisors (Ongoing) ADM 12.A4.12 (B)	Project supports the Science Advisors, who review scientific and planning documents and advise GCMRC on a range of scientific issues and questions. In FY 2012, the Science Advisors will include 4 to 6 senior scientists, primarily from universities. Review needs in FY12 include draft MRP and FY12-13 workplan, at a minimum. Budget may need to be revised as FY12 needs are further defined.	189,722	122,446	-67,276
		$225,278	**$140,596**	**-$84,682**
GCMRC Science Leadership				
Administrative Operations (Ongoing) ADM 12.A1.12 (A)	Project provides support for budgetary oversight and tracking, including cooperative and interagency agreements, and publications and outreach services.	269,572	290,223	20,651
Administrative Operations - GSA Vehicle Costs (Ongoing) ADM 12.A1.12 (B)	Leasing and operation of GSA vehicles used to conduct fieldwork and other GCMRC business.	67,458	77,576	10,118
Administrative Operations - Interior Vehicle Costs (Ongoing) ADM 12.A1.12 (C)	Purchase and operation of vehicles used to conduct fieldwork and other GCMRC business.	34,114	39,231	5,117
Program Planning & Management (Ongoing) ADM 12.A2.12	Budget item for funding of the portion of salaries and travel of GCMRC's Program Managers, plus all of the Chief's and Logistics Program Manager's	760,430	697,941	-62,489

	salaries and travel, specific to program planning and management			
Project in FY12 GCMRC/BOR Workplan	**Project Description**	**Original FY12 Budget**	**Revised FY12 Budget**	**Change**
AMWG/TWG Meeting Travel Funds (Ongoing) ADM 12.A3.12	Travel expenses for GCMRC employees who travel to AMWG and TWG meetings.	21,180	30,250	9,070
GCMRC Component of SBSC Sys Admin Support (Ongoing) (IT Support) ADM 12.A5.12	Budget item for funding technology support provided by SBSC, including computer security, systems administration, and Web site support and development.	218,518	191,817	-26,701
		$1,371,272	**$1,327,038**	**-$44,234**
BOR Administrative				
AMWG Personnel Costs BOR BUDGET	None provided.	181,659	181,659	0
AMWG Member Travel Reimbursement BOR BUDGET	None provided.	17,953	17,953	0
AMWG Reclamation Travel BOR BUDGET	None provided.	14,572	14,572	0
AMWG Facilitation Contract BOR BUDGET	None provided.	27,709	27,709	0
AMWG POAHG Expenses BOR BUDGET	None provided.	57,079	57,079	0
AMWG Other BOR BUDGET	None provided.	8,190	8,190	0
TWG Personnel Costs BOR BUDGET	None provided.	88,590	88,590	0
TWG Member Travel Reimbursement BOR BUDGET	None provided.	24,618	24,618	0
TWG Reclamation Travel BOR BUDGET	None provided.	18,148	18,148	0
TWG Chair Reimbursement BOR BUDGET	None provided.	25,310	25,310	0
TWG Other BOR BUDGET	None provided.	2,340	2,340	0
Administrative Support for NPS Permitting BOR BUDGET	None provided.	92,885	92,885	0
Contract Administration BOR BUDGET	None provided.	41,064	41,064	0
Programmatic Agreement Reclamation Administration BOR BUDGET	None provided.	61,815	61,815	0
*NPS Permitting with BOR Appropriated Funds BOR BUDGET	None provided.	30,962	30,962	0
		$692,894	**$692,894**	**$0**
BOR Tribal Support				
Financial Agreements - Hopi Tribe BOR BUDGET	None provided.	95,000	95,000	0
Financial Agreements - Hualapai Tribe BOR BUDGET	None provided.	95,000	95,000	0
Financial Agreements - Navajo Nation BOR BUDGET	None provided.	95,000	95,000	0

Project in FY12 GCMRC/BOR Workplan	Project Description	Original FY12 Budget	Revised FY12 Budget	Change
Financial Agreements - Pueblo of Zuni BOR BUDGET	None provided.	95,000	95,000	0
Financial Agreements - Southern Paiute BOR BUDGET	None provided.	95,000	95,000	0
		$475,000	**$475,000**	**$0**
BOR Compliance Documents				
Compliance Documents BOR BUDGET	None provided.	250,000	250,000	0
		$250,000	**$250,000**	**$0**
Total Support of Adaptive Management Program		**$4,528,371**	**$4,313,195**	**-$215,174**

Total All DFCs + Support of Adaptive Management Program		**$11,555,490**	**$11,555,490**	**$0**