

Glen Canyon Dam Adaptive Management Work Group
Agenda Item Information
May 22-23, 2008

Agenda Item

Review of FY09 Priorities and Preliminary Budget

Action Requested

- √ Feedback requested from AMWG members on the proposed priorities of the FY09 budget.

- √ Motion requested. The following motion is proposed by Grand Canyon Trust. More information on this motion is included under “Background Information,” below.

The AMWG recommends to the Secretary that if a sediment trigger is reached, then a BHBF take place in WY 2009.

The AMWG also recommends that the Secretary direct GCMRC to develop, for consideration by the TWG and AMWG, a proposal for a 2009 BHBF that builds on the recently completed BHBF science plan, and addresses the high priority research needed to answer this Strategic Science Question: “Is there a flow-only (non-sediment augmentation) operation that will restore and maintain sandbar habitats over decadal time scales?” The proposal should include the proposed sediment trigger, BHBF hydrograph, pre- and post-BHBF flows (including monthly, daily and instantaneous flow), and timing.

Presenters

Dennis Kubly, Chief, Adaptive Management Group, Upper Colorado Region, Bureau of Reclamation

J.D. Kite, Administrative Officer, Southwest Biological Science Center, U. S. Geological Survey

John Hamill, Chief, Grand Canyon Monitoring and Research Center, U. S. Geological Survey

Kurt Dongoske, Technical Work Group Chair

Previous Action Taken

- √ By AMWG:

At its August 2004 meeting, AMWG agreed to a 2-year budget and workplan development process that was recommended to them by TWG.

At its August 2007 meeting, AMWG approved the Monitoring and Research Plan that included the following Strategic Science Question (see page 21):

“SSQ 4-1. Is there a “Flow-Only” operation (i.e. a strategy for dam releases, including managing tributary inputs with BHBFs, without sediment augmentation) that will restore and maintain sandbar habitats over decadal time scales?”

√ By TWG:

At its April 8-9, 2008 meeting, TWG members reviewed the budget and raised several questions that GCMRC responded to in the attached memorandum.

Relevant Science

N/A

Background Information

Please see the attached cover memorandum and workplan for budget details.

The Grand Canyon Trust offers the following background information on its proposed motion (see “Action Requested,” above, for the motion language).

The strategic science questions for sediment include:

1. Is there a flow-only (non-sediment augmentation) operation that will restore and maintain sandbar habitats over decadal time scales?
2. Is there an optimal strategy for BHBF implementation to manage tributary inputs on an annual to inter-annual time scale?
3. What are the short-term responses of sandbars to BHBFs?

We will soon have significant additional science information regarding the short-term responses of sediment to high flows (questions two and three above). The main question that still needs to be addressed is question one above—how can the dam be operated throughout the year to rebuild and maintain sandbar habitats over time.



United States Department of the Interior
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April 17, 2008

MEMORANDUM

To: Adaptive Management Work Group

From: Chief, Grand Canyon Monitoring and Research Center, Southwest Biological Science Center, US Geological Survey, Flagstaff, Arizona

Subject: Preliminary Fiscal Year 2009 Glen Canyon Dam Adaptive Management Program Budget

Attached is the subject budget for your consideration. The draft budget was developed based on guidance provided in the:

- Monitoring and Research Plan (MRP) to Support the Glen Canyon Dam (GCD) Adaptive Management Program (AMP) which was approved by the Adaptive Management Work Group (AMWG) in August 2007, and
- Conservation Measures included in the 2007 and 2008 Fish and Wildlife Service Biological Opinions on the Shortage Criteria EIS and operation of GCD, respectively.

In addition, GCMRC discussed FY 09 budget priorities with the Budget Ad Hoc Work Group, the Technical Work Group, and the Department of the Interior agencies participating in the AMP. We considered their recommendations in the development of the preliminary budget. Attachment 2 provides our response to the comments or concerns raised by the TWG at their April 9, 2008 meeting.

The preliminary budget and work plan is based on the assumption that the FY 09 hydrograph will consist of MLFF operations including experimental steady flows in October 2008 and September 2009. An additional five days of steady flows at 8000 cfs will be needed in late May to accommodate the planned remote sensing overflight of the Colorado River. The preliminary budget does not account for a potential High Flow Experiment (HFE) in FY 09. Currently, a HFE has not been authorized for FY 09 and no funding remains in the Experimental Fund to support a HFE (all the experimental funds are committed to the current test at least through FY 09). GCMRC estimates the study costs for conducting a scaled back or "lite" version of an HFE test at approximately \$750,000.

The proposed budget provides for the continued implementation of a number of ongoing projects included in the approved AMP FY 08 Work Plan and Budget. General descriptions of each of the ongoing projects can be found in the MRP; more detailed descriptions are contained in the FY 08 AMP Work Plan and Budget. The budget also provides for several new starts or major

expansions of existing projects, including:

- Increased funding for implementation of the Grand Canyon archaeological site treatment plan (line 31).
- Implementation of a Near Shore Ecology Study to evaluate the importance of various near shore habitats to humpback chub recovery. This study will also be designed to address the effects of late summer–fall steady flows (as described in the Biological Opinion) on humpback chub (line 73 and line 148).
- Coldwater nonnative fishes control and associated native fishes monitoring (line 74).
- Expanded efforts to refine and further develop an integrated flow, temperature, and sediment model for the Colorado River ecosystem (line 94).
- Implementation of the recommended integrated core sediment monitoring project (combined effort related to several AMP goals, see lines 93, 99, and 115).
- Acquisition, post-processing and analysis of digital aerial imagery of the Colorado River Ecosystem (line 115).
- Compilation and analysis of existing recreation safety data (line 104).

To achieve a balanced budget, a number of projects had to be eliminated or scaled back to accommodate the increased funding being requested for the new or expanded projects noted above and for other non-discretionary increases in costs for continuing projects. These adjustments are noted in the attached spreadsheet (see line 179).

Several ongoing projects and new projects that were identified in the MRP to start in FY 08 or 09 will need to be deferred to accommodate the available funds. These include:

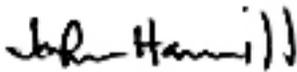
- Evaluation of the relative importance and effects of different flows on the recreation experience (originally scheduled to start in FY 08 but deferred to FY 09)
- 1973 Weeden survey revisited (FY 09)
- Quantify vegetation encroachment on campsites (FY 09)
- Evaluate geomorphic changes to archaeological sites using remotely sensed imagery (FY 09-10)
- Geomorphic model of archaeological site vulnerability (FY 09-10)
- Protocol Evaluation Panels (PEPs):
 - Lake Powell
 - Kanab ambersnail
 - Camping beaches

The proposed budget addresses all of the Conservation Measures included in the 2007 and 2008 FWS Biological Opinions that are within the purview of GCMRC. This was accomplished in part based on additional appropriations that are expected from the Bureau of Reclamation in the amount of \$110K and \$485K in FY 08 and FY 09, respectively. In addition, NPS and BOR are expected to provide separate funding for the Conservation Measure to translocate humpback chub from the Little Colorado River to several tributary streams in Grand Canyon including, Havasu Creek, Shinumo Creek, and Bright Angel Creek in FY 08 and FY 09. Since GCMRC will not be expected to lead these translocation projects, they are not addressed in the GCMRC preliminary FY 09 budget proposal.

Finally, the Monitoring and Research Plan was approved by the AMWG and the Secretary of the Interior last year with the understanding that it would be revised to reflect the results of the Long-Term Experimental Plan Environmental Impact Statement once it is finalized. Given the direction provided in the 2008 Environmental Assessment and related Biological Opinion, I believe it would be appropriate for the TWG and GCMRC to work together to update the MRP over the next 9 months to reflect that new direction. The AMWG agenda includes some time to discuss this recommendation in more detail.

After considering recommendations from the AMWG, GCMRC, consistent with our established process, will develop detailed work plans for each of the projects that will be submitted to the Budget Ad hoc Group, TWG and AMWG for final review and consideration.

Your participation in this review process is appreciated.

A handwritten signature in black ink that reads "John Hamill". The signature is written in a cursive style with a prominent "H" and "M".

JOHN HAMILL
Chief, GCMRC

Attachment (2)

cc Secretary's Designee
Technical Work Group
Executive Coordinator, Science Advisors

Attachment 2
GCMRC Responses to FY 2009 budget issues raised at
Technical Work Group meeting 9 April 2008

1. **TWG Comment:** Funding is needed to continue work in FY 09 on the synthesis of science studies conducted around the 2000 Low Summer Steady Flow (LSSF) experiment.

Response: It's uncertain at this time how much funding, if any, will be needed to continue work on the LSSF synthesis in FY 09. That issue will be addressed at a workshop planned for the fall of 2008 as part of the initial review of the 2000 LSSF studies and databases. In response to the concerns expressed by the TWG, GCMRC proposes to address continued support for this project in FY 09 by including a \$40-\$50K placeholder in the FY 09 budget to implement recommendations for additional analyses from the fall workshop. In addition, GCMRC's new systems ecologist will be available to assist with additional analyses, as needed and appropriate. If additional work is not recommended, then the funds will be reallocated to another FY 09 project.
2. **TWG Comment:** Assignments and funding for the TWG chair and potentially for a TWG facilitator should be discussed further. Additional assignments/personnel would have budget implications.

GCMRC Response: We believe that a professional facilitator would improve the operation and functionality of the TWG and assist GCMRC's ability to develop a science program that is responsive to the diverse needs of the Adaptive Management Program. However, since the TWG is not under GCMRC's purview, no funding is included in GCMRC's budget to support a TWG facilitator.
3. **TWG Comment:** Renewed efforts to remove rainbow trout from the mainstem Colorado River in the vicinity of the Little Colorado River are opposed by at least one TWG member.

Response: GCMRC included this project in response to the 2008 Biological Opinion that identified this activity as a Conservation Measure and to ensure that trout population do not increase significantly and potentially threaten humpback chub. Because a majority of stakeholders support the project we propose to keep it in the budget but are open to further discussion and guidance from the AMWG.
4. **TWG Comment:** The study of near shore ecology and fall steady flows needs to be accelerated.

Response: GCMRC is proceeding with all good speed to describe, review, and implement this project through an open competitive process. Our goal is to initiate the project in the fall of 2008. We recommend that the desire to implement this work as fast as possible (which we agree with) does not out-pace the need to describe and conduct well-considered, peer-reviewed science.
5. **TWG Comment:** A tribal liaison should be hired.

Response: GCMRC will schedule a meeting with tribal representatives to discuss this proposal.

Attachment 2 (continued)
GCMRC Responses to FY 2009 budget issues raised at
Technical Work Group meeting 9 April 2008

6. **TWG Comment:** Because steady flows will be released in September and October 2008 GCMRC should schedule overflight photography during that time period instead of in the spring of 2009, as currently planned.
Response: While GCMRC desires to coordinate as much work as possible we do not support this suggestion for the following reasons:
- a. One of the important priorities for collecting overflight data is to allow for comparisons between and among years. Because overflights in prior years were conducted during 8000 cfs releases, the next overflight should be conducted at the same flow.
 - b. Previous overflights were conducted in the late spring to minimize shadows that interfere with interpretation of the imagery. In addition, the late May time frame is more appropriate for capturing vegetation data and less likely to be affected by poor weather conditions than a fall overflight schedule.
7. **TWG Comment:** Budget for an AMP Effectiveness Workshop in FY 2009 should be included.
Response: While GCMRC is supportive of such a workshop, the decision to conduct an AMP effectiveness workshop rests with the Department of the Interior.
8. **TWG Comment:** Sediment transport study should include all necessary data.
Response: GCMRC believes that abundant data are available to support and advance the sediment element of the proposed integrated flow, temperature and sediment transport modeling effort in FY 09, particularly with the ongoing sediment monitoring and following the successful implementation of the 2008 HFE.
9. **TWG Comment:** Conservation Measures from the BO should be included in the AMP budget.
Response: The BO Conservation Measures that are within the purview of GCMRC's monitoring and research mission have been included in the AMP budget. This includes evaluating the status and trends of humpback chub, translocating humpback chub above Chute Falls, evaluating the status and trends of cold water nonnatives in the LCR reach (with a removal project), continued development of a plan and methods for warm water nonnative aquatic species control, design and implementation of the near shore ecology/fall steady flows study, and monitoring Kanab ambersnail. Separate funding for other translocation projects (Havasu, Shinumo, Bright Angel) is expected from the Bureau of Reclamation and NPS and will be dealt with separately from the GCMRC budget.

**DRAFT ESTIMATED BUDGET
for the USBR and USGS GCMRC GCDAMP FY 2009
Revised April 3, 2008**

	A	B	C	D	E	F	G
			ID	Project Descriptions	Approved BOR FY08 Budget	BOR Estimated FY09 Budget - Revised 04/03/08 (3% CPI over FY08)	Comments
1							
2	Reclamation Administration Power Revenue Under Cap Funded Projects						
3			A	Adaptive Management Work Group			
4			1	Personnel Costs	158,958	163,726	
5			2	AMWG Member Travel Reimbursement	16,651	17,150	
6			3	Reclamation Travel	13,765	14,178	
7			4	Facilitation Contract	25,700	26,471	
8			5	POAHG Expenses	52,942	54,530	
9			6	Other	7,597	7,825	
10				Reclamation AMWG Subtotal	275,612	283,880	<i>FY09 Represents a 3% increase over FY08</i>
11			B	Technical Work Group			
12			1	Personnel Costs	72,635	74,814	
13			2	TWG Member Travel Reimbursement	22,833	23,518	
14			3	Reclamation Travel	16,834	17,339	
15			4	TWG Chair Reimbursement	23,474	24,179	
16			5	Other	2,171	2,236	
17				Reclamation TWG Subtotal	137,947	142,085	<i>FY09 Represents a 3% increase over FY08</i>
18			C	Other			
19			1	Compliance Documents	271,003	50,000	Reduced per D. Kubly during BAHG Conference call 3/26/08; savings of \$229,134 will be applied to Canyon Treatment Plan, Line 31.
20			2	Administrative Support for NPS Permitting	113,300	116,699	
21			3	Contract Administration	33,321	34,320	
22			4	Experimental Carryover Funds - to be held by BOR	500,000	500,000	FY09 Experimental funds (\$500K) are committed to the FY08 and FY09 HFE evaluation; See GCMRC Line 153; 3/26/08 reduced from \$515K to \$500 per D.Kubly - \$15K to go against Canyon Treatment Plan, Line 31.
23			5	Integrated Tribal Resources Monitoring	136,210	140,296	
24			6	USFWS HBC Genetics Mgmt Plan	0	-	
25				Other Subtotal	1,053,834	841,315	<i>FY09 Represents a 20.2% decrease over FY08</i>
26				Reclamation Administrative Subtotal	1,467,393	1,267,281	<i>FY09 Represents a 13.6% decrease over FY08</i>

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	A	B	C	D	E	F	G
27			D	Programmatic Agreement Cultural Resources		-	
28			1	Reclamation Administration	57,354	59,075	
29			2	NPS Support for Archaeological Site Assessment	-	-	
30			3	NN & GLCA Treatment Plan and Implementation	-	-	
31			4	Canyon Treatment Plan and Implementation	300,000	500,000	Increased to \$500K per BAHG conference call on 3/26/08. NPS support (\$73,500) included for involvement in treatment plan; \$73,500 in logistical support provided by NPS.
32			Programmatic Agreement Subtotal		357,354	559,075	<i>FY09 Represents a 56.5% increase over FY08</i>
33			Reclamation Power Revenue Under Cap Program Subtotal:		1,824,747	1,826,356	<i>FY09 Represents a .09% decrease over FY08</i>
34							
35			Reclamation Appropriated Funded Projects				
36			HCA	Development of a LCR Management Plan	-	-	
37			Tribal Consultation				
38			A	Cooperative Agreements with Tribes			
39			1	Hopi Tribe	95,000	95,000	
40			2	Hualapai Tribe	95,000	95,000	
41			3	Navajo Nation	95,000	95,000	
42			4	Pueblo of Zuni	95,000	95,000	
43			5	Southern Paiute	95,000	95,000	
44			6	DOI Handling Fee	-	-	
45			Tribal Consultation Subtotal		475,000	475,000	
46			Reclamation Appropriated Projects Subtotal:		475,000	475,000	<i>FY09 Represents a 0% increase over FY08</i>
47							
48			BUREAU OF RECLAMATION TOTAL AMP PROGRAM COSTS:		2,299,747	2,301,356	<i>FY09 Represents a 0.07% increase over FY08</i>
49							

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	A	B	C	D	E	F	G
	GCMRC Project ID	Status	Funding Emphasis	Project Descriptions	Approved FY08 Budget (inc. CPI Increase)	Proposed FY09 Budget - Gross (inc. Burden)	Comments
50							
51	U.S. Geological Survey - Biological Resource Division - GCMRC - Power Revenues Under Cap Funded Projects						
52							
53	GOAL 1 - FOOD BASE						
54	BIO 1.R1.09	O	CRD	Aquatic Food Base (FY07--FY09)	513,630	516,797	Cooperative agreement modification to Univ of Wyoming of \$256K.
55	BIO 1.R4.09	N	CRD	Impacts of Various Flow Regimes on the Aquatic Food Base (FY08-FY09)	72,700	73,922	
56	SUB-TOTAL GOAL 1:				586,330	590,719	<i>FY09 Represents a .75% increase over FY08</i>
57	GOAL 2 - NATIVE FISHES						
58	BIO 2.R1.09	O	CRD	LCR HBC Monitoring Lower 15km (HBC Population Est; Ongoing)	407,680	446,210	BOCM. USFWS burden rate @ 17%. Incl. 5% increase for FWS
59	BIO 2.R2.09	O	CRD	LCR HBC Monitoring Lower 1,200m; Ongoing)	73,088	55,477	BOCM. AGFD burden rate @ 31% on labor only
60	BIO 2.R3.09	O	CRD	HBC Monitoring Above Chute Falls; Ongoing)	79,652	74,412	BOCM. USFWS burden rate @ 17%. Includes translocation and 5% increase for FWS
61	BIO 2.R4.09	O	ORD	Monitoring Mainstem Fishes (includes Diamond Down; Ongoing)	518,436	523,148	BOCM. AGFD burden rate @ 31% on labor only
62	BIO 2.R#.09	N	ORD	Backwater Seining (FY09 - FY10)	-	-	Anticipate incorp. into NSE; Refer to Table of Deferred Projects, Line 181.
63	BIO 2.R5.09	O	ORD	Nonnative Control Planning (FY07--FY10)	109,016	62,904	BOCM. Half time personnel moved to Bioenergetics Project.
64	BIO 2.R6.09	O	ORD	Nonnative Control Pilot Testing (FY07--FY10)	121,579	109,006	BOCM. Below Diamond Creek only; focus on catfish.
65	BIO 2.R7.09	O	CRD	Stock Assessment of Native Fish in Grand Canyon (FY07--Ongoing)	41,392	50,358	BOCM. ASMR update
66	BIO 2.R8.09	O	CRD	Abundance Estimation Procedures (FY07-- FY08)	41,392	-	
67	BIO 2.R9.09	O	CRD	Bioenergetics Modeling (FY07--FY10)	41,392	94,903	BOCM. Includes half time from NN Planning Project
68	BIO 2.R11.09	O	CRD	Native Fishes Habitat Data Analysis (FY07--FY10)	28,944	23,896	
69	BIO 2.R12.09	O	CRD	Trammel Net Effects (FY07--FY09)	38,458	-	
70	BIO 2.R13.09	O	CRD	Remote PIT Tag Reading (FY07--FY09)	34,624	106,078	
71	BIO 2.R14.09	O	CRD	Test Sonic Tags (FY07--FY09)	76,365	-	Deferred in FY09; Refer to Table of Deferred Projects, Line 180.
72	<i>Sub-total Goal 2 without New Initiatives:</i>				<i>1,612,019</i>	<i>1,546,392</i>	<i>FY09 Represents a 4.1% decrease over FY08</i>
73	BIO 2.R#.09	N	CRD	Near Shore Ecology / Fall Steady Flows - New Initiative	-	26,831	BOCM Total project is \$511,831 of which \$26,831 is funded by AMP power revenues under cap and \$485,000 is funded by BOR appropriations. See Line 148.
74	BIO 2.R#.09	N	TBD	Mainstem Coldwater NN Control/Native Monitoring	-	100,821	BOCM. Includes RBT pop. est. for LCR reach and native fish monitor. Single trip.
75	SUB-TOTAL GOAL 2:				1,612,019	1,674,044	<i>FY09 Represents a 3.8% increase over FY08</i>

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	GCMRC Project ID	Status	Funding Emphasis	Project Descriptions	Approved FY08 Budget (inc. CPI Increase)	Proposed FY09 Budget - Gross (inc. Burden)	Comments	
50								
76	GOAL 3 - EXTIRPATED SPECIES							
77	07.3.00	NA	NA	None Identified	-	-		
78					SUB-TOTAL GOAL 3:	-	<i>Not Applicable</i>	
79	GOAL 4 - RAINBOW TROUT							
80	BIO 4.M1.09	O	COR	Monitoring Lees Ferry Trout (Ongoing)	135,072	117,299	Includes RBT removal and pop. Est for LCR reach and native fish monitor. Single trip.	
81	BIO 4.E1.09	O	LTE	Monitoring Rainbow Trout Redds & Larvae (FY07)	-	-	Work conducted under HFE Science Plan in FY 08 and 09	
82					SUB-TOTAL GOAL 4:	135,072	117,299	<i>FY09 Represents a 13.2% decrease over FY08</i>
83	GOAL 5 - KANAB AMBERSNAIL							
84	BIO 5.R1.09	O	CRD	Monitor Kanab Ambersnail (FY95--FY10)	34,340	22,618	BOCM. Incl. AGF monitor and GCMRC pers 10 days	
85					SUB-TOTAL GOAL 5:	34,340	22,618	<i>FY09 Represents a 34.1% decrease over FY08</i>
86	GOAL 6 - SPRINGS / RIPARIAN							
87	BIO 6.R1.09	O	CRD	Vegetation Mapping (FY07--FY10)	108,785	119,796		
88	BIO 6.R2.09	O	COR	Vegetation Transects (FY07--FY10)	89,686	38,629	Utilize carry forward from 08 in 09 for cooperators; Refer to Carryover Table located at end of this table, Line 191.)	
89	BIO 6.R3.09	O	CRD	Vegetation Synthesis (FY07--FY10)	68,485	69,255		
90					SUB-TOTAL GOAL 6:	266,956	227,680	<i>FY09 Represents a 14.7% decrease over FY08</i>
91	GOAL 7 - QUALITY-OF-WATER							
92	BIO 7.R1.09	O	CRD	Water Quality Monitoring Lake - Powell & Tailwaters (FY07--FY09)	-	-	Funded under separate agreement; refer to table below, Line 144.	
93	PHY 7.M1.09	O	COR	Integrated Quality-of-Water Monitoring (Downstream of GCD; FY07--Ongoing)	883,024	920,740	This represents 1 of the 4 longterm core monitoring protocols for sediment; see Lines 99 and 115 .	
94	PHY 7.R2.09	N	CRD	Integrated Flow, Sediment Transport and Temperature Modeling of the CRE (FY09 - 10)	-	125,663	\$194,323 will be funded w/carryover funds from FY07 and FY08 (refer to Carryover Table located at end of this table, Line 192.)	
95	PHY 7.R1.09	O	CRD	Modeling Support Linked with Integrated Quality-of-Water Monitoring (FY07--FY08)	116,877	-	Refer to new initiative, above	
96					SUB-TOTAL GOAL 7:	999,901	1,046,403	<i>FY09 Represents a 4.6% increase over FY08</i>

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	GCMRC Project ID	Status	Funding Emphasis	Project Descriptions	Approved FY08 Budget (inc. CPI Increase)	Proposed FY09 Budget - Gross (inc. Burden)	Comments
50							
97	GOAL 8 - SEDIMENT						
98	PHY 8.M1.08	N	COR	Longterm Monitoring of Changes in Sediment Storage - See project, below	130,929	-	FY08 monitoring effort deferred due to HFE, see Line 192.
99	PHY 8.M1.09 / PHY 8.M2.09	N	COR	Integrated Longterm Monitoring of System Wide Changes in Sediment Storage	-	305,648	TOTAL PROJECT: \$305,648. Funding includes 97,850 (95K x 1.03) from Goal 9 - Sand Bar and Campable Area Monitoring (Line 102). This represents 2 of the 4 longterm core monitoring protocols for sediment; see Lines 93 and 115.
100	SUB-TOTAL GOAL 8:				130,929	305,648	<i>FY09 Represents a 133.5% increase over FY08</i>
101	GOAL 9 - RECREATIONAL EXPERIENCE						
102	REC 9.R1.09	O	CRD	Sand Bar and Campable Area Monitoring (FY07--FY11); Funds moved to Goal 8 in FY09	146,778	54,438	Move 97,850 (95K x 1.03) to Goal 8, Integrated Longterm Monitoring of System Wide Changes in Sediment Storage (Line 99).
103	REC 9.R3.09	O	CRD	Compile Campsite Inventory and GIS Atlas (FY07--FY09)	86,179	-	Deferred in FY09; Refer to Table of Deferred Projects, Line
104	REC 9.R4.09	D	CRD	Compile and Analyze Existing Safety Data	-	25,992	Previously deferred in FY08.
105	REC 9.R5.09	D	CRD	Evaluate Relation between Flows and Recreation Experience (FY08 - FY09)	-	-	Deferred in FY09; Refer to Table of Deferred Projects, Line 183.
106	SUB-TOTAL GOAL 9:				232,957	80,430	<i>FY09 Represents a 65.5% decrease over FY08</i>
107	GOAL 10 - HYDROPOWER						
108	HYD 10.M1.09	O	CRD	Monitor Power Generation and Market Values under Current and Future Dam Operations (FY07--Ongoing)	18,998	19,360	
109	SUB-TOTAL GOAL 10:				18,998	19,360	<i>FY09 Represents a 1.9% increase over FY08</i>
110	GOAL 11 - CULTURAL						
111	CUL 11.R1.09	O	CRD	Research & Development of Arch. Site Core Monitoring (FY07 - FY11)	468,009	442,906	Funding for NPS involvement (70K) included. \$20K in logistics funding carried forward from FY08. Refer to Carry Forward Table Line 193.
112	CUL 11.R2.09	N	CRD	Implement Tribal Monitoring Projects	-	-	See funding in BOR section, Line 23.
113	SUB-TOTAL GOAL 11:				468,009	442,906	<i>FY09 Represents a 5.4% decrease over FY08</i>

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	GCMRC Project ID	Status	Funding Emphasis	Project Descriptions	Approved FY08 Budget (inc. CPI Increase)	Proposed FY09 Budget - Gross (inc. Burden)	Comments
50							
114	GOAL 12 - HIGH QUALITY MONITORING, RESEARCH & AEAM						
115	DASA 12.D1.09	O	CRD	Acquisition for Monitoring Data Acquisition - 4 Band Imagery (Remote Sensing; FY07--Ongoing)	260,000	200,000	Total cost equal \$609K, with carry forward from FY07 (\$148,400) and FY08 (\$260K), see Line 194. This will require 4-5 days of steady flows. 4 band imagery, field gps stations, & post processing. This represents 1 of the 4 longterm core monitoring protocols for sediment, refer to Lines 93 and 99.
116	DASA 12.D1.09	O	CRD	Acquisition for Monitoring Data Acquisition - LIDAR (Remote Sensing; FY07--Ongoing)	-	-	Deferred in FY09; Refer to Table of Deferred Projects, Line 186.
117	DASA 12.D2.09	O	APM	Grand Canyon Integrated Oracle Databse Management System (FY07--Ongoing)	178,607	182,351	
118	DASA 12.D3.09	O	APM	Library Operations (FY07--Ongoing)	42,635	55,633	
119	DASA 12.D4.09	O	APM	Legacy Analog Data Conversion (Analog to Digital - Reports & Imagery) (FY07--FY11)	78,736	129,227	Half-time vacancy will be filled in FY09; shared w/Library Ops, line 118.
120	DASA 12.D5.09	O	APM	GIS Support for Integrated Analyses and Projects, GIS Lead (FY07--Ongoing)	227,515	329,021	Fill GIS tech vacancy.
121	DASA 12.D6.09	O	CRD	Integrated Analysis and Modeling - Mapping Shoreline Habitat Changes (FY07--08)	115,888	-	
122	DASA 12.D7.09	N	CRD	Integrated Analysis and Modeling - FY09 Overflight (FY09--10) New Initiative	-	127,631	
123	<i>Sub-total Goal 12 DASA Portion:</i>				903,382	1,023,863	<i>FY09 Represents a 13.3% increase over FY08</i>
124	SUP 12.S1.09	O	APM	Logistics Base Costs (See BNELA for project related logistics costs; Ongoing)	126,691	178,444	Increased Personnel Costs
125	SUP 12.S2.09	O	APM	Survey Operations (Ongoing)	102,417	113,392	Additional Equipment needed for FY 09 overflight
126	SUP 12.S3.09	O	APM	Control Network (Ongoing)	134,823	172,196	
127	<i>Sub-total Goal 12 Support Portion:</i>				363,931	464,032	<i>FY09 Represents a 27.5% increase over FY08</i>
128	PLAN 12.P1.09	N	CRD	Enhancing the Conceptual Ecosystem Model to Identify Critical Ecosystem Interactions and Data Gap	100,000	50,000	Funded in FY08 w/Carryover - not included in FY08 Power Revenue Budget Total
129	PLAN 12.P2.09	O	APM	AMP Effectiveness Workshop will not be conducted in FY08 or FY09 .	-	-	Refer to Table of Deferred Projects, Line 187.
130	PLAN 12.P3.09	N	TBD	Low Steady Summer Flows - Data and Research Compilation, Synopsis and Synthesis	100,000	-	Funded in FY08 w/Carryover - not included in FY08 Power Revenue Budget Total
131	<i>Sub-total Goal 12 Planning Portion:</i>					50,000	

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	A	B	C	D	E	F	G
	GCMRC Project ID	Status	Funding Emphasis	Project Descriptions	Approved FY08 Budget (inc. CPI Increase)	Proposed FY09 Budget - Gross (inc. Burden)	Comments
50							
132	ADM 12.A1.09	O	APM	Administrative Operations (Ongoing)	228,363	248,769	
133	ADM 12.A2.09	O	APM	Program Planning & Management (Ongoing)	1,059,438	1,098,744	
134	ADM 12.A3.09	O	APM	AMWG/TWG Meeting Travel Funds (Ongoing)	18,077	18,933	
135	ADM 12.A4.09	O	APM	Independent Reviews	90,301	21,175	Fish PEP (w/river trip) to be conducted in FY09 using FY08 carry forward funds; Refer to Carry Forward Table, Line 195.
136	ADM 12.A4.09	O	APM	Executive Director of Science Advisors Review and Coordination; includes Science Advisors' Expenses (Ongoing)	214,200	211,750	
137	ADM 12.A6.09	NA	APM	2008 Science Symposium (Intermittent)	29,750	-	
138	ADM 12.A5.09	O	APM	GCMRC Component of SBSC Sys Admin Support (FY05-Ongoing)	202,300	211,871	
139	<i>Sub-total Goal 12 Administrative/Management Portion:</i>				<i>1,842,429</i>	<i>1,811,242</i>	<i>FY09 Represents a 1.7% decrease over FY08</i>
140	SUB-TOTAL GOAL 12:				3,109,742	3,349,137	<i>FY09 Represents an 7.7% increase over FY08</i>
141	GCMRC Power Revenues Under Cap Projects Sub-totals:				7,595,253	7,876,244	<i>FY09 Represents a 3.7% increase over FY08</i>
142							
143	GCMRC Power Revenue Funded Projects (NOT Capped) and Other Funded Projects						
144	BIO 7.R1.09	O	CRD	Water Quality Monitoring - Lake Powell & Tailwaters (FY07-09)	212,631	257,137	Refer to Line 92, Goal 7 Quality-of-Water
145	GCMRC Other Agreements Projects Subtotals:				212,631	257,137	<i>FY09 Represents a 20.9% increase over FY08</i>
146							
147	BOR and GCMRC Other Funded Projects						
148	BIO 2.R#.09	N	CRD	Near Shore Ecology / Fall Steady Flows - New Initiative	-	485,000	BOCM Total project is \$511,831 of which \$26,831 is funded by AMP power revenues under cap (see Line 73) and \$485,000 is funded by BOR appropriations.
149	BIO TBD	O	CRD	Environmental Research Agrmt (Temperature Control Device-TCD)	-	-	FY08 funding shown in HFE table; see Line 201.
150	BOR and GCMRC Other Funded Projects Projects Subtotals:				-	485,000	
151							
152	GCMRC TOTAL AMP FY2009 PLANNED PROGRAM COSTS:				7,807,884	8,618,381	<i>FY09 Represents an 10.4% increase over FY08</i>
153							

**DRAFT ESTIMATED BUDGET
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	A	B	C	D	E	F	G
	GCMRC Project ID	Status	Funding Emphasis	Project Descriptions	Approved FY08 Budget (inc. CPI Increase)	Proposed FY09 Budget - Gross (inc. Burden)	Comments
50							
154	PROGRAM COSTS:			BOR Power Revenues Under Cap Estimated Program Costs:	FISCAL YEAR 2008	FISCAL YEAR 2009	
155				BOR Power Revenues Under Cap Program Costs (gross)	1,824,747	1,826,356	
156				GCMRC Power Revenues Under Cap Program Costs (gross)	7,595,253	7,876,244	
157				Subtotal BOR & GCMRC Power Revenue Under Cap Estimated Program Costs	9,420,000	9,702,600	
158							
159	PROGRAM INCOME:			BOR Power Revenues Under Cap Program Estimated Income:	FISCAL YEAR 2008	FISCAL YEAR 2009	
160				BOR Power Revenues Under Cap Program Costs (gross)	1,824,747	1,879,489	
161				GCMRC Power Revenues Under Cap Program Costs (gross)	7,595,253	7,823,111	
162				Subtotal BOR & GCMRC Power Revenue Under Cap Program Costs	9,420,000	9,702,600	Income projected at 3% CPI increase from previous fiscal year (9,420,000 X 1.03 = 9,702,600)
163							
164				DIFFERENCE BETWEEN ESTIMATED COSTS AND ESTIMATED INCOME FOR POWER REVENUES UNDER CAP:	0	0	
165							
166	PROGRAM COSTS:			BOR Appropriated and Other Program Estimated Costs :	FISCAL YEAR 2008	FISCAL YEAR 2009	
167				BOR Appropriated and Other Program Costs (gross)	475,000	475,000	
168				GCMRC Appropriated and Other Program Costs (gross)	212,631	742,137	
169				Subtotal BOR & GCMRC Power Revenue (Non-Capped) and	687,631	1,217,137	
170							
171	PROGRAM INCOME:			BOR Appropriated and Other Program Estimated Income:	FISCAL YEAR 2008	FISCAL YEAR 2009	
172				BOR Appropriated and Other Program Costs (gross)	475,000	475,000	
173				GCMRC Appropriated and Other Program Costs (gross)	212,631	742,137	
174				Subtotal BOR & GCMRC Power Revenue (Non-Capped) and	687,631	1,217,137	
175							
176				DIFFERENCE BETWEEN ESTIMATED COSTS AND ESTIMATED	0	0	
177							

**DRAFT ESTIMATED BUDGET
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	A	B	C	D	E	F	G
	GCMRC Project ID	Status	Funding Emphasis	Project Descriptions	Approved FY08 Budget (inc. CPI Increase)	Proposed FY09 Budget - Gross (inc. Burden)	Comments
50							
178	The following funding estimates are NOT included in the funding tables, above.						
179	GCMRC DEFERRED PROJECTS - DEFERRED TO BALANCE FY2009 DRAFT BUDGET						
180	BIO 2.R14.09	O	CRD	Test Sonic Tags (FY07--FY09)	76,365	61,816	
181	BIO 2.R#.09	N	ORD	Backwater Seining (FY09 - FY10)	-	37,123	Anticipate incorp. into NSE
182	<i>Sub-total Biology Portion of Unfunded FY09 Projects:</i>				76,365	98,939	
183	REC 9.R5.09	D	CRD	Evaluate Relation between Flows and Recreation Experience (FY08 - FY09)	-	145,200	
184	REC 9.R3.09	O	CRD	Compile Campsite Inventory and GIS Atlas (FY07--FY09)	86,179	42,436	
185	<i>Sub-total recreation Portion of Unfunded FY09 Projects:</i>				86,179	187,636	
186	DASA 12.D1.09	O	CRD	Acquisition for Monitoring Data Acquisition - LIDAR (Remote Sensing; FY09--Ongoing)	-	401,370	LIDAR aquisition and post-processing
187	PLAN 12.P2.09	O	APM	AMP Effectiveness Workshop will not be conducted in FY08 or FY09 .	-	-	Will not be conducted in FY08 or FY09 .
188	TOTAL OF UNFUNDED CONTINUING OR DEFERRED PROJECTS / NEW INITIATIVES FOR FY 09:				162,544	687,945	
189							
190	GCMRC CARRY FORWARD FUNDS FROM PREVIOUS YEARS'						
191	BIO 6.R2.09	O	COR	Vegetation Transects (FY07--FY10)	-	59,300	Utilize carry forward from 08 in 09 for cooperater
192	PHY 7.R2.09	N	CRD	Integrated Flow, Sediment Transport and Temperature Modeling of the CRE (FY09 - 10)	-	194,323	\$194,323 will be funded w/carryover funds from FY08; \$130,929 from FY08 and \$63,394 from FY07 (refer to Goal 7, Line 94.)
193	CUL 11.R1.09	O	CRD	Research & Development of Arch. Site Core Monitoring (FY07 - FY11)	-	20,000	\$20K in logistics funding carried forward from FY08.
194	DASA 12.D1.09	O	CRD	Acquisition for Monitoring Data Acquisition (Remote Sensing; FY07--Ongoing)	-	408,400	Total cost equal \$609K, with carry forward from FY07 (\$148,400) and FY08 (\$260K). This will require 4-5 days of steady flows. 4 band imagery, field gps stations, & post processing. This represents 1 of the 4 longterm core monitoring protocols for sediment, refer to Lines and .
195	ADM 12.A4.09	O	APM	Independent Reviews	-	37,500	Fish PEP (w/river trip) to be conducted in FY09 using FY08 carry forward funds; Refer to Independent Reviews, Line
196	GCMRC Carryover Funds Subtotal:				-	719,523	

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	GCMRC Project ID	Status	Funding Emphasis	Project Descriptions	Approved FY08 Budget (inc. CPI Increase)	Proposed FY09 Budget - Gross (inc. Burden)	Comments	
50								
197								
198	BOR and NPS High Flow Experiment Funding				FY 2008	FY 2009		
199	NA	NA	EXP	BOR-GCMRC Reimbursable Agreement 06-AA-40-2439	744,043	500,000	\$500K for FY09 is from the Experimental Fund - See BOR Line Item #22.	
200	NA	NA	EXP	BOR-GCMRC Reimbursable Agreement 06-AA-40-2439	-	682,457		
201	NA	NA	EXP	BOR-GCMRC Reimbursable Agreement 06-AA-40-2575	1,403,500	-	Refer to Line 149	
202	NA	NA	EXP	NPS-GCMRC Reimbursable Agreement F8210080003	400,000	-		
203	BOR and NPS High Flow Experiment Funding Projects Subtotals:				2,547,543	1,182,457		
204								
205	Explanation of information found in columns A and F of the Draft Estimated Budget for the GCMRC GCDAMP FY2009, Revised April 3, 2009							
206	Column	A	1-3	BIO: Biology PHY: Physical Science REC: Recreation HYD: Hydropower				
207	GCMRC Project ID Program Areas			CUL: Cultural DASA: Data Acquisition, Storage and Analysis SUP: Support				
208				PLA: Planning ADM: Administration				
209				4-5				GCDAMP Goal Number
210				6-7				Project Number within GCMRC Annual Work Plan
211		7-8	Fiscal Year of Proposed Budget / Annual Work Plan					
212	Column	B	O: Ongoing N: New C: Complete					
213	Status							
214	Column	C	APM: Admin & Program Mgmt COR: Core Monitoring CRD: Core Monitoring Research & Development ORD: Ongoing Research & Development LTE: Longterm Experiment NA: Not Applicable					
215	Category							
216	Column							
217	Project Description	D	Project Title (Start Date -- End Date)					
218	Column	E	FY 2008 GCDAMP Approved Budget Numbers					
219	FY 2008 Approved Budget							
220	Column	F	FY 2009 GCDAMP Estimated Draft Budget Proposal					
221	FY 2009 Estimated Draft Budget							
222	Column	G	Comments; BOCM represents Biological Opinion Core Monitoring items.					
223	Comments							
224								
225								