TWG 4-21-99
B. Gold
Attachment 5

PROPOSED PROGRAM ESTIMATES (4/19/99)
GRAND CANYON ADAPTIVE MANAGEMENT PROGRAM

PROGRAM AREA	FY2000	FY2001
I. Bureau Administration of AMWG	* 106,000	*110,000
II. Bureau Administration of TWG	80,000	83,000
-- TWG Chairman	20,000	20,000 → new item, money reduced from * @ $10k each
III. Bureau Administration of SAB	47,000	15,000
IV. Bureau Administration of AMP		
A. Program Management (Support Services)	*96,000	*120,000
B. Biological Opinion	71,000	95,000
C. Programmatic Agreements (Includes Logistics)	973,000	900,000
V. Bureau/Native American Support (Appropriations)	50,000	-0-
Sub-Total I. - V:	**1,443,000**	**1,343,000**
VI. GCMRC Program and Operating Cost		
A. Bureau Support Services	123,000	125,000
B. Operations, Personnel, Contract Services	2,023,000	2,070,000[1]
C. Physical Resources Science	700,000	950,000[2]
D. Biological Resources Science	1,500,000	1,800,000[3]
E. Socio-Cultural Resources Science	355,000	425,000[4]
F. Information Technologies Program	320,000	320,000
G. Remote Monitoring Technologies	400,000	400,000
H. Independent Review Panels	155,000	175,000[5]
I. Logistics	653,000	650,000
Sub-Total VI. A- J:	**6,229,000**	**6,915,000**
Total I. - VI:	**7,672,000**	**8,258,000**

[1]Proposed increase results from budgeting for a 3% cost of living increase for staff salaries.

[2]Proposed increase results from plan to initiate three new research projects dealing with sediment and flow and sediment related features and their linkages to ecological processes.

[3]Proposed increases results from new work related to TCD and SASF issues.

[4]Proposed increase results from additional work on cultural and recreational issues.

[5]Proposed increase results from funds needed to support a full years operation of the SAB.

FY 20001 PROGRAM AREA BUDGET PROJECTIONS

VI. C. PHYSICAL RESOURCES SCIENCE - basic monitoring program.

I. MONITORING OF SEDIMENT, FLOW AND SEDIMENT-RELATED FEATURES:

new A) ***Streamflow and Sediment Monitoring of Main Channel Colorado River and Gaged Tributaries*** – approximately $475,000,

new B) ***Monitoring of Terrestrial Shoreline Sandbars within Critical Reaches*** – approximately $150,000,

new C) ***Monitoring of Gaged Tributary Channel Characteristics for Flow and Sediment Modeling Verification*** - approximately $15,000,

D) ***Change Detection for Debris Fans, Cobble Bars and Rapids*** – approximately $30,000,

E) ***Selected Sediment and Flow Instrumentation of Key Ungaged Tributaries in Glen and Upper Marble Canyon*** – approximately $30,000.

MONITORING TOTAL = $700,000

II. NEW RESEARCH OF SEDIMENT, FLOW AND SEDIMENT-RELATED FEATURES – 2001

A) new ***Initiate Research and Development of 1-Dimensional Sediment and Flow Predictive Model for the Main Channel of the Colorado River between Glen Canyon Dam and Upper Lake Mead.*** This modeling effort will focus on tracking flow using the existing Unsteady Flow Model and multiple size-classes of sand, and silt/clay from inputs at the Paria and Little Colorado River past the Grand Canyon gage (export from "critical" reaches). This will be the first of likely a three-year effort, with an estimated first-year start-up cost of $150,000. If the additional funding is available, then this research would be competitively procured through an RFP, to be released in spring 2000.

B) new ***Initiate Integrated Research to Define and Model Relationships between the Coarse Sediment Budget of the Colorado River Ecosystem and its Aquatic Ecosystem.*** This modeling effort will investigate the linkages between tributary processes that structure the geomorphic framework of the Colorado River ecosystem, the relationships of those processes to the system's aquatic ecosystem, and long-term implications of ROD operations at Glen Canyon Dam. This will be the first of likely a two-year effort, with an estimated first-year start-up cost of $50,000. If the additional funding is available, then this research would be either competitively procured through an RFP, to be released in spring 2000, or conducted internally by GCMRC.

C) new ***Reach-Averaged Hydrodynamic Flow and Sediment Modeling of Sandbar Evolution within Critical Reaches of Glen and Marble Canyons.*** Unlike sandbar modeling that has previously occurred within the context of developing the Conceptual Model, this modeling research project will attempt to predict eddy-bar and channel-margin evolution under a variety of ROD scenarios, including BHBF and HMF implementation, thought to influence backwater habitats, campable areas, pre-dam river terraces and the terrestrial substrates where riparian vegetation exists. This will be the first of likely a two-year effort, with an estimated first-year start-up cost of $50,000. If the additional funding is available, then this research would be competitively procured through an RFP, to be released in spring 2000.

RESEARCH AND MONITORING TOTAL = $950,000

Some proposed funding Before TCD moves forward.

VI. D. BIOLOGICAL RESOURCES SCIENCE

Aquatic food base Extend contract 230,000

Analysis of existing protocols and implementation of other suggested protocols; synthesis of previously ollected data, and continued monitoring to provide indicators of aquatic food base status. Will include coordination with protocol evaluation and synthesis of previous data collection efforts to establish long term monitoring protocol program.

Native Fish Extend Contract 470,000

Status and condition of fish downstream of Lees Ferry with emphasis on HBC and other native fish. Will include coordination with protocol evaluation and synthesis of previous data collection efforts to establish long term monitoring protocol program.

Lees Ferry Trout 130,000

This program is scheduled to be put out for long-term monitoring for 5+ year contract, based on protocal evaluation done during FY 2000.

Water Quality 50,000

Downstream mainstem and tributary monitoring. May be completed in-house or externally with USGS gauging station work. To be determined following external peer-review.

Aquatic Monitoring Total 880,000

Terrestrial Monitoring(Vegetation & bird monitoring) 200,000

Terrestrial vegetation will need to be evaluated since it was not done the previous year. This will likely be the first of several years for long-term monitoring for vegetation. The results of bird work funded in FY 000 may determine that these programs may alternate in funded years. It is likely to be more effective and informative to combine efforts for terrestrial vegetation and avifauna monitoring.

Research (fish) 50,000

This is the 2nd year of funding for genetics work associated with humpback chub and 2nd population requirements.

In-house Biology Research 50,000

Protocol evaluation (fish & food base) 40,000

Vegetation, avifauna, trout and KAS will have PEP done in FY 2000. Furthering the likelihood of contract extensions for Aquatic food base and Native fish monitoring through 2001.

Total $1,220,000

new **Temperature Control Device**

Funding beyond monitoring to address TCD issues. These are research Questions that may be addressed either in a lab or field environment. These are preliminary estimates of work and may require increase after a research lan to be developed by GCMRC is provided to the Bureau of Reclamation.

Water Quality

Effects of warm and cold water releases on nutrient in the forebay and in downstream releases.

$50,000

Aquatic food base
Productivity, compositional shifts of benthos, algae and drift under temporary warming conditions (lab experiments, modeling and literature review). $50,000

Fish
Effects of warm or cold water releases on timing of trout and other non-native fish life histories and recruitment in Lees Ferry and downstream (includes data analysis, literature review, modeling lab experiments). $90,000

Spawning or recruitment success in mainstem native fish populations (trials to determine the best method to measure these parameters in the mainstem when a TCD flow occurs).
$70,000

Shoreline Vegetation
Effects of warming on marsh community constituents-- with emphasis on traditional cultural properties and plant species found to support insect faunal that are utilized by bird populations (literature review, data analysis, methodology to determine effects). $50,000

Total proposed TCD costs for FY 2001 **$310,000**

new **Seasonally Adjusted Steady Flows**

There is currently a contract underway to develop flow experiments associated with SASF. SASF may be implemented as early as FY2000 or 2001, depending on hydrology. As with the TCD, data collection efforts would be directed toward answering specific questions associated with an action, and additional funds would be needed for these research questions.

Native fish (3 trips @40,000/trip including data entry time) $120,000
Collecting relative abundance in the mainstem around the experimental variables (before, during and after steady flows, for example).

Aquatic food base (2 trips plus sorting and data entry) $ 60,000
Collecting data regarding community composition and productivity around the experiment as above.

Additional logistic costs
Fish trips ($25k/trip) $70,000
Aquatic food base (10k/trip) $20,000

Total proposed SASF budget **$270,000**

Total proposed FY 2001 Budget **$1,800,000**

VI. E. SOCIOCULTURAL RESOURCES SCIENCE

Based on the comments made at the February TWG meeting, a budget increase of $70,000 has been proposed for this program. The details of the increase are as follows:

A) Cultural resources: A $ 50,000 increase is proposed. The increased funds would be applied to two areas. First, the funds would supplement previously approved monies allocated for additional work related to

geomorphology in FY2000. It is anticipated that there may be questions resulting from the current study that may require more work. Second, some of the additional funds would be programmed for protocol evaluations within the cultural area. These funds would be in addition to previously programmed monies that would be used for protocol evaluations that would begin in FY2000.

B) Recreational resources: A $ 20,000 increase is proposed. These funds would be programmed for additional work relative to campsite synthesis, recreational fishing protocol assessments, unanticipated information requests, and information synthesis. These additional funds are necessary in anticipation that current studies are expected to suggest additional areas for inclusion with the campsite synthesis, recreational fishing information may require synthesis and a data protocol review, and to support unanticipated information requests.