Table 1. Socioeconomic Projects identified in the February 2010 Expert Panel Report

Proposed Study	Questions to be addressed	Proposed Use by AMP (Expert Panel Perspective)	TWG Comments
Socioeconomic research (in general)	See Table 3 attached	See below	
FY2010			
Define GCD operational base case and change cases.		This task addresses the fundamental need to define a base case (i.e., a "standard") against which proposed changes in dam ops can be evaluated in the future. The panel recommended that TWG select an operational scenario that reflects current (MLFF) operations. Base case needs to define monthly volumes, hourly (or even within hourly) outputs, amount of peak and off-peak power production, etc	
Power Modeling: Solicit firms for the WECC* analysis and conduct initial power modeling using currently available models. *WECC = western electrical grid.		It was the opinion of the expert panel that future economic analyses of hydro power replacement costs needed to consider & evaluate GCD power values, system capacity, and power replacement options in the context of the western electrical grid (WECC), rather than treating GCD and other CRSP facilities as an independent "closed" system. This is because GCD and the CRSP system are embedded in the western power grid, and the utilities to which WAPA sells CRSP power are also tied into the WECC. Therefore, it is the marginal price of electricity in the WECC that ultimately determines the value of power generated at GCD, and the WECC is the market by reference to which the economic value of GCD power should be determined. The expert panel recommended that GCMRC analyze how different types of CRSP operations may or may not "spill over" into the WECC. They viewed the analysis of potential "spill- over effects" between the CRSP and WECC, using an appropriate model, as a necessary first step to properly evaluate power value and potential replacement costs associated with future changes in GCD operations. The panel recommended that GCMRC solicit outside consultants to perform the WECC analyses using models that are most appropriate for this purpose. The panel also suggested that GCMRC enlist additional expertise to develop the RFQs for the power modeling work.	

Proposed Study	Questions	Proposed Use by AMP (Expert Panel Perspective)	TWG Comments
FY2011			
Non Use Values 101 Workshop Estimated cost=$15,000?	C, G (part), N, Q and T	The panel recommended that GCMRC host a Non Use Values 101 class to help TWG & AMWG understand the relevance and value of this type of study for informing future AMP decision making. This workshop would provide AMP stakeholders with a basic introduction to the concepts and rationales underlying non-use value studies, clarify terminology, and provide an overview of how this analysis is conducted and how the resulting data could be to interpreted and applied to inform AMP decisions.	
Initiate base case analysis; determine what "changes" to this base case will be analyzed. 1) Model WAPA's system with changes in GCD ops; 2)check flow gates between WAPA and rest of WECC under different operational scenarios; 3) establish framework for economic and financial analyses	I, W, S (in part)	This task would define the parameters of an MLFF base case scenario and then analyze its economic implications. The base case will provide the foundation against which economic projections of alternative dam ops would be compared in the future.	
Recreation: evaluate socioeconomic effects of resource use for Glen Canyon anglers and day-users in terms of values, preferences, and income generated by current use. Estimated cost =$50,000 - $100,000	B, W (part), A, O, L, G (part), C, & R	The panel proposed that GCMRC undertake socioeconomic studies focused on recreational values that include both market and non-market *use* values for specific river reaches. The panel maintained that it is the *benefits* to recreational value in a broad sense, rather than just regional income (as reflected in a typical market analysis) that are important for the AMP to measure. They proposed that the first study focus on angling and rafting use of the Glen Canyon reach.	

Proposed Study	Questions	Proposed Use by AMP (Expert Panel Perspective)	TWG Comments
Review 1994 Non Use Value Survey; update the questionnaire Estimated cost = $0	T, Q, G (part), C (part), N	The panel maintained that a new non-use value study is needed to properly assess resource values associated with Grand Canyon, and potential impacts to those values from dam ops. The focus would on values that are important to tribes and the American public that are not dependent on human use or consumption for their value. Preparing for this study will take considerable time; therefore the panel recommended that GCMRC and TWG start planning now for a future non-use value study, taking into account changes that have occurred in the canyon and to dam operations since 1995. Initiating Step #1 –discussion and review of old questionnaire – could be done at no additional cost to the AMP.	
Begin planning tribal surveys (identify scope of tribal participation; begin discussing with tribes what questions to ask, how to ask them to get at core values, etc.) Estimated cost = $5,000	O, L, R and B (part)	The expert panel heard from the Tribes that there is an unmet need to integrate tribal values in AMP decision making. Tribal surveys will start to address this need by more clearly defining what those values are and by determining how best to measure them and how changes in dam ops may effect tribal values. The panel recommended that GCMRC start to plan for future tribal surveys in Phase I and implement them in Phase II.	
FY2012			
Continue change case analyses. Conduct power flow studies that show the financial and economic consequences of GCD management alternatives on: WAPA, WAPA customers, and the Basin Fund	I, W, S (in part)	This task would evaluate economic outcomes from alternative dam ops in relation to the base case. TWG/AMWG/or DOI first need to define what “change cases” they want to analyze before this can be initiated.	

Proposed Study	Questions	Proposed Use by AMP (Expert Panel Perspective)	TWG Comments
(FY12, continued)			
Recreation: evaluate socio-economic effects of resource use for Grand Canyon-Lake Mead white water and flat water rafters in terms of values at stake, user preferences, and income generated by current use. Estimated cost=$100K-150K	B, W (part), A, O, L, G (part), C, & R	Same rationale as for Glen Canyon recreational analysis, except that the focus of this study would be on the recreational uses downstream of Lees Ferry. Like the previous study, the proposed analyses would address both market and non-market values, so that the costs or benefits to recreation could be fully evaluated.	
Prepare survey, conduct focus groups for tribal surveys. Est cost=$40K	O, L, R and B (part)		
Non-Use Value Survey: Initiate OBM clearance to conduct non use survey; conduct focus groups, refine questions, and pilot survey Estimated cost=$200K	T, Q, G (part), C (part), N	The panel recommended that GCMRC start to plan for a future non-use value study during Phase I, to be ready for actual implementation in Phase II. These FY12 tasks would be part of the preparatory phase preceding implementation of the actual survey.	
FY2013			
Expand power flow studies to include financial and economic consequences of changing dam ops for the WECC	M, U, V, W	The panel felt there was a need to more fully analyze how proposed changes in dam ops may affect the larger western electrical grid, thus influencing power market values	
Conduct tribal surveys Estimated cost=$60K	O, L, R, and B (part)		

Proposed Study	Questions	Proposed Use by AMP (Expert Panel Perspective)	TWG Comments
(FY13, continued)			
Conduct Non Use Survey. Estimated cost = $500,000	T, Q, G (part), C (part), N		
Repeat recreation surveys	B, W (part), A, O, L, G (part), C, & R	The panel recommends that socioeconomic surveys be repeated every 2-3 years as a monitoring tool to assess how changes in dam ops affect recreational values	
FY2014			
Develop "real-time decision-making spreadsheet"			
Recreation surveys continue, repeating coverage of white water users ($150,000)	B, W (part), A, O, L, G (part), C, & R	The panel recommends that socioeconomic surveys be repeated every 2-3 years as a monitoring tool to assess how changes in dam ops affect recreational values	

Socioeconomic Questions

Workshop participants developed the following list of questions that they felt needed to be resolved in order to inform AMP decision making in the future. These questions were subsequently evaluated by the TWG members in terms of their perceived importance and the most appropriate time frame for addressing them (Phase 1 or Phase 2). As an outcome of this prioritization exercise, the questions that are highlighted below were identified by the TWG members as needing resolution in Phase 1, with B, D and H being ranked most important and most consistently prioritized for Phase 1 (see graphical representation of results in the scatter diagram below). Question W was also consistently ranked as important, but TWG members were split as to whether it should be addressed in Phase I or 2, with a slight majority (56%) favoring Phase 1 (see Table 3 below). The results of this exercise informed the expert panel's recommended list of socioeconomic activities to be pursued by the AMP over the next few years.

A. What are the attributes of the river that are important to recreational users?

B. How do high flow and other experiments affect recreation (river rafting fishing guides and other associated businesses, including tribes)?

C. Do we need to determine the value of "specialness" of resources, such as, hydroelectric power generation; visitor satisfaction; value of beaches to support rafting; values of high visibility wildlife e.g., peregrine falcon, big horn sheep; and value of a blue ribbon trout fishery?

D. What are the points of disagreement on methodologies and assumptions in regard to power analysis?

E. What would a consensus interagency methodology for modeling hydropower and recreation (e.g., fishing and rafting) economic outcomes look like?

F. Integrate all use and non-use socioeconomic data into a conceptual model.

G. What are the use and nonuse costs and benefits of HFE including the marginal costs and benefits of changes in HFE duration and size?

H. Having heard two distinct views, what is the value of hydropower capacity of GCD?

I. What is the base case on optimal power generation?

J. What are the requirements for economic information in GCPA, ESA, NHPA, NEPA, CRSPA, etc.?

K. What are the associated costs to hydropower of non-TCD warmer releases?

L. What is the sociocultural impact of recreational use in the Colorado River on Native American values associated with resources and places in the Grand Canyon?

M. Can the values of dependable power and water supplies be reflected in future economic analysis?

N. How much weight should non-use values be given compared to market and non-market use values?

O. What is the economic benefit of river recreation to tribes?

P. What is the socioeconomic impact of mechanical removal of non-native fish and other actions?

Q. What is the total non-use value for natural cultural, and recreational resources along the river?

R. What are the socioeconomic benefits and costs of hydropower generation from HFE to tribal communities?

S. What is the total economic impact to upper basin water users from changes to power generation from base case?

T. What are the non-use values for different resources (including the tribal perspective) so we can include these values in trade-off analysis?

U. What is the value of clean power generation at GCD nationally?

V. Can we obtain an assessment of alternative economic consequences associated with different flow regimes at GCD from one or more CRSP customers, including indirect impacts?

W. Determine impacts on marketed hydropower and recreation values of alternative flow scenarios in real time to support decision making.

X. Can contracting for firm power WAPA be adjusted to be more flexible for current hydrology and operations without affecting the Basin Fund?

Table 3. TWG prioritization of questions in terms of importance and preference to address in Phase I or II

Importance and Timing of Socioeconomic Questions to Inform Decisionmaking for the AMP

All Workshop Participants and Official TWG Members

Socioeconomic Questions	All Participants			Official TWG Members		
	Average Importance Rating	Phase 1	Phase 2	Average Importance Rating	Phase 1	Phase 2
	28 participants			16 participants		
B-How do high flow and other experiments affect recreation (river rafting fishing guides and other associated businesses, including tribes)?	4.0	79%	21%	3.9	75%	25%
H-Having heard two distinct views, what is the value of hydropower capacity of GCD?	4.0	79%	21%	3.8	75%	25%
W-Determine impacts on marketed hydropower and recreation values of alternative flow scenarios in real time to support decision making.	4.0	64%	36%	4.0	56%	44%
Q-What is the total non-use value for natural cultural, and recreational resources along the river?	3.8	50%	50%	3.8	44%	56%
D-What are the points of disagreement on methodologies and assumptions in regard to power analysis?	3.6	75%	25%	3.7	75%	25%
E-What would a consensus interagency methodology for modeling hydropower and recreation (e.g., fishing and rafting) economic outcomes look like?	3.6	46%	54%	3.6	38%	63%
A-What are the attributes of the river that are important to recreational users	3.5	71%	29%	3.3	69%	31%
G-What are the use and nonuse costs and benefits of HFE including the marginal costs and benefits of changes in HFE duration and size?	3.5	61%	39%	3.4	63%	38%
O-What is the economic benefit of river recreation to tribes?	3.5	54%	46%	3.4	50%	50%
U-What is the value of clean power generation at GCD nationally?	3.5	46%	54%	3.6	50%	50%
C-Do we need to determine the value of specialness" of resources such as hydroelectric power generation; visitor satisfaction; value of beaches to support rafting; values of high visibility wildlife e.g. peregrine falcon, big horn sheep; and value of a blue ribbon trout fishery?"	3.4	39%	61%	3.1	31%	69%
L-What is the sociocultural impact of recreational use in the Colorado River on Native American values associated with resources and places in the Grand Canyon?	3.4	43%	57%	3.4	50%	50%
M-Can the values of dependable power and water supplies be reflected in future economic analysis?	3.4	39%	61%	3.5	50%	50%
T-What are the non-use values for different resources (including the tribal perspective) so we can include these values in trade-off analysis?	3.4	57%	43%	3.2	56%	44%
I-What is the base case on optimal power generation?	3.2	50%	50%	3.3	38%	63%
N-How much weight should non-use values be given compared to market and non-market use values?	3.2	46%	54%	2.9	44%	56%
R-What are the socioeconomic benefits and costs of hydropower generation from HFE to tribal communities?	3.2	36%	64%	3.3	31%	69%
V-Can we obtain an assessment of alternative economic consequences associated with different flow regimes at GCD from one or more CRSP customers, including indirect impacts?	3.2	54%	46%	3.4	44%	56%
F-Integrate all use and non-use socioeconomic data into a conceptual model.	3.1	29%	71%	2.9	31%	69%
J-What are the requirements for economic information in GCPA, ESA, NHPA, NEPA, CRSPA, etc.?	3.1	57%	43%	3.1	63%	38%
P-What is the socioeconomic impact of mechanical removal of non-native fish and other actions?	3.1	61%	39%	3.4	81%	19%
S-What is the total economic impact to upper basin water users from changes to power generation from base case?	3.1	39%	61%	3.4	44%	56%
X-Can contracting for firm power WAPA be adjusted to be more flexible for current hydrology and operations without affecting the Basin Fund?	3.1	32%	68%	3.2	38%	63%
K-What are the associated costs to hydropower of non-TCD warmer releases?	2.8	21%	79%	2.6	31%	69%

Scatter Diagram
Importance and Timing of Socioeconomic Questions
Official TWG Members – December 2, 2009