

**INCLUDES TWG COMMENTS: 1/3/2011**

**Table 1.** Socioeconomic Projects identified in the February 26, 2010 “Final Report of the GCMRC Socioeconomic Research Review Panel.”

Proposed Study/Activity	Questions Addressed	Proposed Use by AMP (Expert Panel Perspective)	TWG Comments
<p>Socioeconomic research overall and its application to GCDAMP decision-making.</p> <p>Cost: TBD</p>	<p>J, F</p>	<p>How will the market, non-market use and nonuse values be integrated into policy analysis? The Panel recommended that the DOI Office of Policy Analysis and/or DOE and/or WAPA develop a policy position paper on how the dollar values of market, non-market and non-use values will be used in the different decision making processes such as NEPA analysis, adaptive management and in any benefit-cost analysis.</p> <p>Resolving these questions of how market, non-market use and nonuse values should be integrated into Grand Canyon policy formulation would address questions J and F raised at the December Socioeconomics workshop.</p>	<p>CREDA: At the end of the report the question is raised – how will the results of all this economic work be used in the GCDAMP decision making process? CREDA suggests that this should be one of the very first questions to be answered. DOI must not wait until it sees the answers before it decides how or if economic impacts will affect its decisions.</p>
<b>FY2010</b>			
<p>Staffing.</p> <p>Cost: TBD</p>		<p>As GCMRC shifts to greater emphasis on socioeconomic studies, GCMRC staff with resource economics expertise will be required to conceptualize the required studies, to initiate RFPs and help secure study funding, and to provide study oversight. Resource economics staff will also be needed to help interpret study results and to outline the implications of these results for agency policy. Additional resource economics staff will be required to do this effectively. This assumes that most of the socioeconomic research will be conducted by outside consultants. If some of the studies were to be conducted in-house, the requirement for additional staff would be much greater.</p>	<p>Norm: include staffing proposal by expert panel (done).</p>

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<p>Define GCD operational base case and change cases.</p> <p>Cost: TBD</p>		<p>This task addresses the fundamental need to define a base case (i.e., a “standard”) against which proposed changes in GCD operations 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. The panel also recommended studies related to the financial effects of changes to GCD operation and distributive effects.</p>	<p>CREDA: The panel may have recommended MLFF as the base, but they acknowledged controversy. CREDA recommends pre-ROD conditions be the base; the Argonne post-ROD work could “fill in” this gap, with the new work as additive.</p> <p>Jerry: Selecting the operational scenario will be crucial-there are great variations in dam operations within the MLFF . Current 8.23 maf seems to be the current scenario compared to late 1990 averages of 11 maf.</p>
<p>Solicit firms for WECC analysis and conduct initial power modeling using currently available models.</p> <p>Cost: TBD</p> <p>WECC = Western Electrical Coordinating Council (i.e., western grid).</p>		<p>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.</p> <p>The Panel recommend that WAPA’s existing power flow models be used to analyze the expected effects of changes in generation at Glen Canyon Dam, including effects on (a) generation (federal or non-federal) within the WAPA system, (b) loadings on transmission lines, (c) ability to meet reliability criteria, and (d) spot market prices at the Palo Verde Hub. These effects should be estimated for a near-term year (e.g., 2012) and a long-term year (e.g., 2020), because in the long-run more changes can typically be made via investments that could mitigate any short-term effects.</p> <p>If WAPA’s power flow models demonstrate changes in flows at the border of WAPA’s system, or at interconnection points with other systems, then a more extensive modeling effort will be required, to check for changes in the above four indicators (generation, transmission,</p>	<p>CREDA: Should clarify that the capacity impacts are Glen Canyon generating capacity. This is the relevant metric – not sure what “system” means.</p> <p>The marginal price of electricity in the WECC is not an appropriate measure to develop trade-off analysis for operational decisions. Basically, there is no “marginal price” WECC-wide. Generation and markets are regional, constrained by physical transmission constraints. The WECC as a whole is not a “market”. Capacity can’t be purchased at the PV hub, and is not necessarily “always available”. PV prices do not reflect the cost of capacity. It is inappropriate to state that the “value” of GCD power should be compared to the WECC as a “market”, because</p>

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		<p>reliability, and hub prices) throughout the WECC.</p> <p>If needed in a second step, the panel recommended that GCMRC solicit outside consultants to perform the broader 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.</p>	<p>operationally the WECC is NOT the market.</p> <p>Jerry: workshop and evaluation of the GT Max model included in HYD 10.R2.11-12 to determine the suitability of this model for this purpose</p>
<b>FY2011</b>			
<p>Non Use Values 101 educational workshop.</p> <p>Cost: \$15,000</p>	<p>C, G, N, Q, T</p>	<p>The panel recommended that GCMRC host a Non Use Values 101 class to help TWG &amp; 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.</p>	<p>CREDA strongly supports the recommendations of the socio econ ad hoc group regarding the econ training. ( see paper by Shane Capron)</p> <p>Jerry: A more basic course which outlines differences b/w market ,non market ,and non use studies is needed. Additional more in depth webinars /conference calls could be added as needed.</p>
<p>Power Modeling: initiate base case analysis.</p> <p>Cost: TBD</p>	<p>I, W, S</p>	<p>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 GCD operations would be compared in the future.</p> <p>Determine what “changes” to this base case will be analyzed.</p> <ol style="list-style-type: none"> <li>1) Model WAPA’s system with changes in GCD ops,</li> <li>2) Check flow gates between WAPA and rest of WECC under different operational scenarios,</li> <li>3) Establish framework for economic and financial analyses.</li> </ol>	<p>CREDA: See above comments re selection of pre ROD conditions as the base case.</p>

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<p>Recreation: initiate recreation surveys of Glen Canyon anglers and day-use rafters.</p> <p>Cost: ≈\$50,000 - \$100,000</p>	<p>B, W, A, O, L, G, C,R</p>	<p>The panel proposed that GCMRC undertake socioeconomic studies focused on recreational values that include both market and non-market <i>use</i> values for specific river reaches. The panel maintained that it is the <i>benefits</i> 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.</p>	<p>WAPA: The panel proposed studying recreation expenditures (market) as well as the non-market aspect of recreation. This recommendation included several suggestions on how to avoid an incorrect recreation market analysis.</p> <p>While the panel suggested that economics of scale could be had by gathering recreational data on both market and non market aspects at the same time, this is really a program decision. We imagine it's the case that market data are easier to gather and can be analyzed easily. Dave Garrett calls recreation expenditure analysis the "low hanging fruit". On the other hand, data on recreational consumer surplus (preferences) will require a proper survey design and additional input from stakeholder groups. We suggest that the expenditure data be gathered and analyzed while the nonmarket survey instrument is being developed</p> <p>Jerry:  -- reviews by the NRC, recreation PEP, and the expert panel review have been critical on the lack of understanding by the program related to user values  --previous studies are dated Richards(1985) Bishop(1987)</p>

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<p>Review 1994 Non Use Value Survey and update the questionnaire.</p> <p>Cost: \$0</p>	<p>T, Q, G, C, N</p>	<p>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.</p>	<p>CREDA: Regarding recreation surveys, how are the views of people who are not interested in fishing/rafting accounted for? Regarding non-use surveys, as asked by the Hualapai representative at the workshop, how can any willingness-to-pay survey be designed so as to eliminate all of the biases of the respondent (economic, cultural, spiritual, etc.)? Should a non-use value for non carbon emitting hydro electric generation be identified?</p>
<p>Identify tribes for specific surveys of preferences and attitudes.</p> <p>Cost: \$5,000</p>	<p>O, L, R, B</p>	<p>The expert panel heard from the Tribes that there is a need to integrate tribal values in AMP decision making. Tribal surveys should 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 GCD operations may affect tribal values. The panel recommended that GCMRC start to plan for future tribal surveys in Phase I and implement them in Phase II.</p>	<p>WAPA: While the panel recommended the gathering of information regarding Native American attitudes, it's unclear to us how this fits into the gathering and analyzing of economic information and how it might inform decision makers regarding changing the operation of GCD. We'd like to separate the sociological analysis from the economic analysis and consider the panelists recommendations as they relate to gathering data on Native American attitudes and the GCD AMP program.</p>
<p><b>FY2012</b></p>			

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<p>Conduct power flow studies that show the financial and economic consequences of GCD management alternatives on WAPA, WAPA customers and the Upper Basin Fund.</p> <p>Cost: TBD</p>	<p>I, W, S</p>	<p>This task would evaluate economic outcomes from alternative GCD operations 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.</p>	
<p>Recreation surveys continue, now covering white water users including Diamond Creek to Mead rafters.</p> <p>Cost: \$100-150,000</p>	<p>B, W, A, O, L, G, C, R</p>	<p>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.</p>	<p>CREDA: How are the specific reaches determined? Through the DFC process?</p> <p>Jerry:  --reviews by the NRC, recreation PEP, and the expert panel have been critical of the lack of understanding by the program related to recreation values  --there is a need to understand the effects of different flow regimes on trip attributes and resource conditions that effect the quality of river experiences  --non river recreation use in the CRE is not understood</p>
<p>Prepare surveys of tribal preferences and attitudes.</p> <p>Cost: \$40,000</p>	<p>O, L, R, B</p>	<p>A socioeconomic research program for GCMRC needs to recognize not only the economic impacts but also the social impacts on the Tribes that result from changes in dam operations. The Tribal social impacts may suggest both opportunities and constraints that should be considered as changes in river operations are contemplated. Information to be covered in this survey should include attitudinal questions and impacts of flow regimes. Tribal representatives should be invited to participate in the development and testing of the survey.</p>	

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Conduct focus groups and piloting of Non-Use Value survey, and initiate OMB clearance. Cost: \$200,000	T, Q, G, C, 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.	
<b>FY2013</b>			
If needed: expand power flow studies to include the financial and economic consequences of Glen Canyon management alternatives for the entire WECC.  Cost: TBD	M, U, V, W	The panel believed there was a need to more fully analyze how proposed changes in GCD operations may affect the larger western electrical grid, thus influencing power market values. The need to evaluate the impacts on the WECC would be assessed in step 1 under power modeling in FY 2011 and 2012. During FY2011, information generated by the WAPA modeling effort would be used to develop budgets for FY2012 and beyond, once a determination is made about the potential geographical scope of economic effects and whether the expanded WECC-level analysis is deemed necessary to influence GCDAMP decision-making.	CREDA: See comments above re “the market”. Trade-off analysis most likely would not extend to the WECC.
Conduct tribal surveys. Cost: \$60,000	O, L, R, B	A socioeconomic research program for GCMRC needs to recognize not only the economic impacts but also the social impacts on the Tribes that result from changes in dam operations.	
Conduct full non-use value survey.  Cost: \$500,000	T, Q, G, C, N	It is now almost 15 years since the Welsh et al. (1995) study was conducted. Much has changed including the management scenarios in the Grand Canyon and the demographics of the U.S. population, especially in the Four Corners Region. As recommended by the National Research Council in its report “Downstream”, these nonuse values are quite important to understanding the public benefits of alternative management strategies in the Grand Canyon. By tying flow-related changes to the environment to the non-use value survey, the incremental or marginal nonuse values can be estimated that are most useful for evaluating potential management actions in the Grand Canyon.	
Recreation surveys continue, repeating the coverage of Glen Canyon and day-use. Cost: \$150,000	B, W, A, O, L, G, C, R	The panel recommends that socioeconomic surveys be repeated every 2-3 years as a monitoring tool to assess how changes in GCD operations affect recreational values.	CREDA: How long does it take to synthesize data from the surveys, and will results from each survey be available prior to the next one being started?
<b>FY2014</b>			

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Develop "real-time decision-making spreadsheet."  Cost: \$50,000 - \$100,000		To the extent that repeated analyses of power market impacts are required as part of the future decision-making it may well be possible to ease the calculations by developing a simplified response-surface model, embodied in a spreadsheet, linking changes within the CRSP service area to impacts on prices and capacity requirements within WECC.	
Recreation surveys continue, repeating coverage of white water users.  Cost: \$150,000	B, W, A, O, L, G, C, R	The panel recommends that socioeconomic surveys be repeated every 2-3 years as a monitoring tool to assess how changes in GCD operations affect recreational values.	

**Table 2.** Polling results from a TWG December 2009 Socioeconomics workshop. 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). 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.

<b>Importance and Timing of Socioeconomic Questions to Inform Decisionmaking for the AMP</b>						
<b>All Workshop Participants and Official TWG Members</b>						
<b>Socioeconomic Questions</b>	<b>All Participants</b>			<b>Official TWG Members</b>		
	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**

