General Core Monitoring Plan
TWG COMMENTS/GCMRC RESPONSE TABLE
September 21, 2010

DOCUMENT: General Core Monitoring Plan for the Glen Canyon Dam Adaptive Management Program (October 26, 2009)

Comment Number	Page	Line	Reviewer Name	Affiliation	Reviewer Comments (Be specific	Identify Action Requested	Response Requested	GCMRC Response/Action Taken
1		General	Capron	Western	Summary: components of the plan that I feel would make the plan more robust and useful to the AMP: 1. Discussion of other programs with long term monitoring needs (e.g., LTER program).			This plan is driven by the need to monitor effects of dam operations and management actions for the Glen Canyon Dam Adaptive Management, Other monitoring are driven by other needs and mandates. We discuss some of the other monitoring programs that overlap to some extend with the GCDAMP monitoring programs, such as those being carried out by NPS for GPRA or NHPA, S. 110 purposes, but do not think that reviewing the full suite of other monitoring programs occurring nationwide will add substantially to this plan,
2					2. Discussion of trade-offs between precision, increased monitoring, cost, and effectiveness and how the program should look at the scientific implications.			We have had a whole new chapter, now called Chapter 3, with added detailed about Step 4 of the 4-step planning process, to address this comment.
3					3. Description of current and projected funding elements not under CM so that we can better see what is in and what is out.			This request appears to be beyond the scope of this plan. In addition, there is no long term plan for the AMP that identifies the projected long term cost for all elements of the GCDAMP (i.e., monitoring , research, management and compliance)
4					4. Full integration of CMINs into the strategy for each goal.			For efficiency sake and to keep the CMP concise, we provided the list of all SPG revised/prioritized CMINS in the Appendix to the plan. Including them within the body of each program description seems unnecessarily redundant, particularly since they will be reviewed and potentially refined in Step 2, prior to being incorporated into the final plans for each goal.

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5					5. Key goals of our long term monitoring program.			We think this is adequately addressed in Chapter 1 – the goals are articulated in GCPA and the AMP Strategic Plan
6					6. Discussion of "core of the core" vs. other elements which might be good to have.			The AMWG, through the AMP strategic plan, provided a list of "core monitoring information needs." The list of CMINS, as, as revised and prioritized by SPG, defines the current core monitoring needs of this program. If there are different needs, or another list of higher priorities then AMWG needs to direct the TWG to revisit and revise the previous plan and redefine what they are. In Step 2, TWG has an opportunity to further review, refinement and prioritization of the existing CMINS
7		General	Capron	Western	Criteria and strategy for developing a CMP. One of the tools I was hoping to see in this document was a set of criteria or a strategy for determining what the core monitoring programs should be. For example, it might be important to sample resource X for core monitoring, but at what frequency (monthly, yearly, triennially) or extent?. Based on the choices we make it inherently involves risk in the sense that by sampling less your power to inform the program is likely reduced. Also, the CMINs are somewhat vague and are open to interpretation -- one person may have a broader (inclusive) interpretation while others may have a more minimalist viewpoint on the type of information they believe should be collected. Criteria and a strategy are needed to evaluate these tradeoffs and to involve managers in the decision making process. For example, some potential types of criteria: 1. CMIN: activity is essential to address the minimalist view point for the CMIN. 2. Frequency/extent: a series of options might be given which show how the power is reduced, or other scientific effect, by either reducing or increasing sampling rate or extent. 3. Priority: relates to a high priority item. 4. Confidence: include only those activities with high confidence of relating to the eventual DFCs. etc. Until DFCs are defined, we are developing monitoring approached that allow us to track status and trends in relative conditions			Prioritizing of CMINS was done by the SPG. The frequency/extent issue is addressed in core monitoring reports, based on PEP review and recommendations (e.g., FISH PEP). Also the TWG will have an opportunity to review, validate and prioitize the CMINs as part of the annual information needs workshops. Issues related to tradeoffs between precision, accuracy, and cost will be fully evaluated by TWG in the review of the individual core monitoring plans.
8		General	Capron	Western	What if we don't move forward right now with CM, are there LTEP (NEPA compliance) implications?			CM is a fundamental element of any adaptive management program. Robust, objective monitoring data is needed to support

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								experimental planning and any management actions that may be undertaken in an Adaptive Management context. Getting a plan in place to guide the GCDAMP should be one of the highest priorities of this program, if not the highest one. The CMP sets the stage and process for implementing steps 2-4 of the CMP process. Without an agreed upon CMP, it is unlikely that Steps 2-4 can or will be effectively carried out. The CMP, if agreed to and implemented, will allow the program to proceed in a structured logical manner.
9		General	Capron	Western	It would be informative if there was a section addressing other long term monitoring programs and provide some background, lessons learned, approaches for these. For example, the LTER sites: http://www.lternet.edu/sites/			Please provide more guidance on why you think it is necessary to include more discussion of other monitoring programs in this document. We relied on guidance in the DOI technical guide for adaptive management, AMP strategic plan, and other planning docs to frame the scope of this program. The monitoring program needs to be responsive to those needs, and this general plan describes how we propose to respond to those needs in general. Specific details will be described in the individual core monitoring reports at the conclusion of Step 4 of the core monitoring development process. We never intended the CMP to include a comprehensive review of monitoring principles, other monitoring programs or lessons learned. Perhaps the Science Advisors could be asked to address this issue.
10		General	Palmer	Western	Western suggests a core monitoring plan that describes the long-term monitoring: what data would be gathered regardless of the shorter term interests and current research. This suggestion is derived from the "Position Statement on Core Monitoring from the Core Monitoring Team" 9 April, 2004. In this document, the CMT suggests that the long term plan "adopt a minimalist framework (e.g., no ornaments on the Christmas tree)". When first considered, the budget for GCMRC was uncertain. The TWG suggested developing in a plan that would continue in the face of budget shortfalls. The cost of the core monitoring plan (as opposed to the monitoring plan) should insulate it from significant budget shortfalls. Further, a plan that would be supported by the TWG and AMWG so that it wouldn't need to be reviewed every year.	Rework the plan within a minimalist framework		This document responds to the information needs as defined by AMWG and as refined and prioritized through the SPG. It addresses all goals at some level, as agreed previously in the SSP and MRP. Allocation of funds among goals also reflects previously identified program priorities.. We believe the monitoring programs will be fundamental to evaluating the effects of new management or experimental actions such as the HFE protocol or nonnative fish management. The TWG and AMWG needs to determine if a minimalist approach will provide the information they need to make informed resource management decisions. Our view is that the current programs do approximate a "minimalist approach" based on our understanding of the

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								information needs and the risk tolerance of the AMWG and management agencies. We believe that this issue is best addressed in the context of Step 4 of the process
11		General	Capron	Western	The document does not include line numbers which are essential in providing detailed comments. Recommend SOP that line numbers be required for all documents undergoing TWG review.			This was an unfortunate technical glitch. Line numbers should have appeared throughout the document, not just on the title page and table of contents. They were added subsequently.
12		General	Capron	Western	Chapter 1: I really appreciated this section. I thought it was generally well written and informative.			Thank you! We appreciate receiving positive feedback as well as constructive criticism.
13		Docum ent wide	Kurt Dongoske	Pueblo of Zuni	Overall this document is deficient in the consideration and integration of the Native American perspective in the monitoring of these core resources. Over the years, each of the participating tribes have been developing their respective monitoring programs, but there has been little to no effort by GCMRC to initiate consultation with the tribes toward the development of a program or a system into which the tribal monitoring data and perspectives of key resources is integrated into the overall monitoring program that is detailed in this plan. The Pueblo of Zuni finds this unacceptable and suggests that GCMRC should begin to develop a program with the tribes that incorporates tribal monitoring data into this plan. This is necessary for GCMRC to meet some of the monitoring goals/targetss that are identified in this plan.	Initiate a dialogue with the tribes to design a progam to be detailed in this plan that delineates how tribal monitoring data and activities will be integrated into this monitoirng plan.		GCMRC has repeatedly expressed interest to the tribes in having a closer collaborative working relationship and better integrated monitoring programs. This comment makes it sound as though GCMRC has made no effort towards this end, which is untrue. GCMRC has initiated one workshop and several consultation meetings with the tribes in recent years to seek ways to improve the integration of Tribal monitoring programs. These meetings were opportunities for the tribes to express how and when they would like more collaboration and integration to occur. So far, the tribes have elected to design monitoring programs without input from GCMRC, without collaboration across tribal boundaries, and using approaches that fall outside the scope of western scientific practices. Thus, it is unclear how integration is supposed to occur. We welcome specific input from all the tribes on how they envision integration occurring.
14	General			Grand Canyon Wildlands Council, Inc.	In general, the plan is well written and referenced, and several elements are sufficiently well researched to merit moving them towards core monitoring status, including: Goals 2 (native fish), 4 (trout), 7 (flow and WQ), 8 (sediment), 11 (cultural), and perhaps 10 (economics). Basic understanding and suitable protocols for the other goals either have not had sufficient study and integrated analysis, or involve on-going projects that are essential for developing efficient, effective monitoring protocols; therefore, understanding of the other goals does not yet warrant transition into core monitoring. Overall, we recommend that the core monitoring plan be implemented gradually, with elements added when scientifically merited over the decade. Annual reporting on CMP implementation should be made to AMWG, including the status of elements			This is consistent with the intent of the plan.

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					not yet included, and revisions that arise to existing protocols. GCMRC has made a good effort to begin to codify a long-term core monitoring program for the Colorado River ecosystem (CRE) affected by Glen Canyon Dam. It is gratifying to see that the many historical reports and peer-reviewed literature are cited and help contribute to the foundation of the present effort. Those involved in previous phases of scientific understanding of CRE component and process interactions contributed much to the development of a coherent CMP. Recognizing the derivation of concerns, assumptions, and monitoring approaches is critical to meeting the scientific challenges of adaptive ecosystem management.			
15				GCWC	Consider a search and replace for "spring" (the season) with "springtime", and to pluralize "spring" as "springs" to eliminate confusion over these terms in the context of the CRE.			OK
16				GCWC	We didn't see any acknowledgements or even authorship in this document. Science in the real world requires accountability, so please place the authors' names on the document. Also, it would be polite to acknowledge those who contributed to the writing.			We will add names to the final document. Please note that we made a point of noting (in the footnote on p. 4) that L. Stevens' draft ms. provided the foundation for the following history section. We also intend to add an acknowledgment section to the final plan.
17				GCWC	Although not specifically necessary for this document, it is appropriate for the GCD-AMP to consider compiling an administrative history of its program – the why, who, when, did what, and where elements of program history, including documentation of existing precepts (and biases), the scientific literature generated by the program, and contemporary concepts and issues. Such a compilation will clarify conceptual advances, and prevent the program from repeating inquiries as time goes on. This is already a problem for the program, and enough of the historical figures are still with us to accomplish such an undertaking. Please consider contracting to an administrative historian outside of the federal government for such an undertaking.			This was also a recommendation of an earlier NRC panel. GCMRC will work on this, subject to AMWG approval and funding being provided
18				GCWG	Please clarify how changes in core monitoring protocols will be incorporated over time. We expect that improved protocols will arise through future PEP reviews, and expect that such shifts will include methods to calibrate past data with future data, to extend data interpretation. We did not see mention of this process in the CMP.			This topic is discussed on p. 28. Also, as described in the MRP and repeated in this document, there will be 5 year reviews of the program.
19				NPS	General Comment: if the format for commenting is to include line numbers, then the pages need to include line numbers.			See response to similar comment above. We apologize for the technical problem that resulted in the line numbers not carrying through the entire document.

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20				NPS	General Comment: 2 weeks for review of a guidance document for the next 5 years is inappropriate.			We sent out the document on Oct 26 and requested feedback by Nov 16, so actually the initial review period was 3 weeks.
21				NPS	General Comment: It's interesting that in numerous places in the document, AMWG "decisions" are mentioned. Given that the AMWG is an advisory committee, it seems inappropriate for the stakeholder group to make decisions in this context.			AMWG makes decisions that are forwarded as recommendations to the Secretary. We will review the text to make sure that AMWG's role is properly characterized throughout the document.
22				NPS	General Comment: Throughout the document, reference is made to the stakeholders needs, requests, decisions, etc… The program is the Secretary of the Interior's program and the work conducted is for the Secretary to be able to make informed decisions.			No disagreement, see above.
23				NPS	General Comment: As in other GCMRC proposals, there seems to be very little integration of monitoring with actual management activities that have been or may be implemented to achieve GCDAMP goals.			The relationship between core monitoring and management actions is illustrated in Figure 3 and Figure 4. Core monitoring looks at status and trends of resources. This information is necessary and important to both determining the need for management activities and their long term outcomes. For example, core monitoring for sediment is designed to evaluate the effects of MLFF and need for high flow experiments. HBC monitoring informs decisions about need for translocation, mechanical removal, etc.
24				NPS	General Comment: The plan should explain how the various relevant management agencies will be incorporated into the core monitoring programs. For example, there should be a strategic plan for how GCMRC and NPS will work together to get the data collected for Lake Powell.			We talk about the integration of management agencies in Chapter 5. Specific roles will be defined in the detailed core monitoring plans, once they are developed.
25				NPS	General Comment: There is no recognition of economic value core monitoring and R&D. The AMP is having a workshop in December to talk about priorities but not even a mention of the need is in this plan.			TWG is having a workshop to start a discussion on this topic in December 2009. We will include a statement to this effect in the next version of the plan.
26				NPS	General Comment: There has been an on-going issue related to the systematic delay in reporting from the GCMRC. Remedies to this problem should be addressed in this document.			Reporting is addressed in Chapter 5, We agree that timely reporting is a priority and have accounted for adequate staff and resource to provide timely reporting of monitoring results. We disagree that there has been "systematic delay" in reporting from GCMRC. We acknowledge that science reporting is often a time consuming process to do well, but we believe that GCMRC in most cases has managed to turn around large volumes of data and reports in a relatively timely fashion. We continue to seek ways to improve the

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								efficiency of reporting scientific results.
27				NPS	General Comment: Integration of NPS Inventory and Monitoring Network (more details in comment below) and on-going park I & M should be included in this document. In addition, a recognition and integration, where possible, of similar upper basin science should be included. GCMRC's work does not happen in a vacuum.			We added some additional text, but we think there needs to be additional TWG discussion to address how other monitoring programs fit into this plan. Again, we see the scope of this plan to be relatively narrowly focused on assessing effects of dam ops and related actions on downstream resources as required by GCPA. To the extent that there is relevant overlap with other science and monitoring programs, we agree that more integration with these programs would be beneficial. We are very familiar with other upper basin monitoring program and are applying knowledge gained from these programs in our current plan. For example, one of the leading upper basin scientists was included on the recent fish PEP and made recommendations based on his experience and knowledge of the upper basin science program.
28				NPS	General Comment: It is unclear how NPS priorities were considered when developing the CMP priorities.			NPS had extensive input into the development and refinement of CMINS and has been deeply involved in the development of previous versions of this plan.
					General Comment: The review period was extremely short and did not include an agency review before TWG review as GCMRC had agreed to previously.			We provided 3 weeks for review as agreed to with TWG. Procedures for DOI agency review in advance of TWG review have not been decided at this time.
29	Table of Contents	28-43		Grand Canyon Wildlands Council, Inc.	Goals 1 (food base) and 2 (native fish) are listed as being the same.			This error has been corrected.
30	Table of Contents	Goal 1 & 2		Ted Kowalski	Goal 1 and Goal 2 are identical, but in the document they are different. It is probably just a formatting issue, but if not, the document needs to better describe why Goal 1 and goal 2 are separately listed identically. (page 3, lines 28 and 36)			See response above.
31	SA 4		Capron	Western	DFCs, clarification. In a number of places the need for DFCs is discussed. GCMRC responses are varied and should be coordinated to one response. In some places it is viewed as a TWG, AMWG, AMP, and a GCDAMP responsibility. I think it is clear that DOI has taken on this responsibility and that the AMP has been told to stand-down on DFCs and MOs until further notice. But there seems to be a recognition among AMP members that DFCs are needed for this program to be successful. This could be clarified in the document and responses.			OK, we have revised to be consistent with ongoing activities related to DFC development

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32	SA 6		Capron	Western	Can or should the program move forward with CM without DFCs? Here, and in many other places, the need for DFCs is articulated. We all recognize the importance of DFCs to the program, but is it prudent to move forward now with a CMP without them? I would suspect that many activities would occur regardless of the DFC (e.g., LCR HBC monitoring, water temperature). I can also see activities that might not be implemented in the same way if we had DFCs (e.g., tributary fish monitoring, beaches throughout the canyon, perhaps sediment mass-balance). It occurs to me that the development of CM must be an iterative process: 1. CMINs are developed and prioritized. 2. The AMP provides draft guidance to GCMRC on the total budget which should be used for core monitoring needs. 3. GCMRC develops monitoring program based on the CMINs and draft budget. 4. The AMP reviews the proposal and considers risk of not doing activities on information needs and needs for funding in other areas. 5. The CMP is revised based on AMP feedback, some programs are scaled back/cut and others may be added. Steps 3-5 could be iterative over a number of years to reach consensus.			This CMP reflects the scope of the monitoring program that has been supported by AMWG and the SOI. It is consistent with the SSP and MRP, and it is based on the best available information at this time. We do not think it is wise or prudent to halt planning efforts until DFC are developed and finalized. DFCs and other guidance can be factored into the CMP when they are developed and adopted. We question the scientific basis for asking the AMWG to set an arbitrary limit on the funds available for monitoring. An alternative approach would be for the TWG and GCMRC to recommend the amount of funds necessary to meet the priority CMINs or to assess progress to meetings DFC. If TWG/AMWG/ DOI believe it is necessary to reduce the scope of the science program, it may also want to consider stopping work on several of the goals. (i.e., it may be best to do a good job on a few goals rather than a poor job on a large number of goals). These are management decisions beyond the scope of GMCRC to address in this plan.
33	SA 11		Capron	Western	Figure 4 is a good start to a conceptual model, but agree with the SA comment that it could include much more. It is a very complicated system, but I think one could create a very large one sheet representation of linkages, including CMINs and research – of course it wouldn't fit on a small sheet, poster size. I find these types of schematics to be helpful to illustrate the decision points (or results needed) and data necessary to support them. I don't feel like Figure 4 get's us there, but doing something more complicated would take substantial time.			We believe that Figure 4 is an appropriate conceptual model for this general core monitoring plan. More detailed conceptual models could be developed for each of the goals. We would like additional input from the TWG on this topic.
34	SA 13		Capron	Western	I agree that remote sensing is expensive and the utility is unclear to me across programs. Could we meet our needs with less expensive approaches in some areas? No doubt remote sensing is an amazing tool, and it may be important to include in the program on some levels, but maybe not to the extent that it is. It might be good to dedicate some discussion time to remote sensing at the workshop.			We are willing to have additional discussion about the utility and potential applications of remote sensing in the monitoring program.
35	SA 17		Capron	Western	I'm still not clear on the LCR reach sampling need and plan.			It is currently being revisited per FISH PEP recommendations. We suggest you discuss the details with Matt Andersen
36	SA 24		Capron	Western	I also agree that data could be served in graphical mode and that it could be beneficial to the program. NMFS also serves a			OK, noted.

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					lot of data in this way on fishing activity, sea lion counts, fish survey data, catch rates, etc. Most of it is automated now.			
37	Iii	36			Should be fish and not foodbase			This error has been corrected.
38			NPS	GRCA	*Chapter 1 Introduction and Background* This is an interesting history of the program. It seems that many of the same obstacles that prevented work in the early 1990s are still in place today. Perhaps the GCMRC should address the problems of the AMP rather than continue to push forward with programs that may never be implemented. A good example of this would be how the NPS continues to ask for specific information, have programs address NPS needs, and for reporting in a timely manner. In some cases the NPS has refused to issue permits and therefore implementation of GCMRC's desired programs has been delayed. Shouldn't the individual stakeholders information needs be included in a CMP? Multiple stakeholders have issues with work proposed, yet those issues are not addressed and it appears that GCMRC resolves the issue by elevating the concern to their regional director.			GCMRC attempts to work in good faith with all AMP stakeholders to develop a science program that meets multiple needs of the GCDAMP, which hopefully are compatible with agency needs although they may not be identical to individual agency program needs. GCMRC carries out that program once it has been approved by the Secretary of Interior.
39	1	Line numbers not provided; to do so would be beneficial in future reviews	Kubly	BOR	A wider look at the monitoring literature would improve the introduction to this document. The purposes of monitoring can go well beyond the four identified purposes in the draft CMP, particularly in an active adaptive management program where comparisons of resource state are made before and after major experiments. Some examples that you may already be familiar with are: MacDonald, L.H., A.W. Smart and R.C. Wissmer. 1991. Monitoring guidelines to evaluate effects sof forestry activities on streams in the Pacific Northwest and Alaska, an oft cited EPA document, identify 7 types of monitoring and the general characteristics of each (note MacDonald is identified on p. 6 of this document). Green, R. H. 1979. Sampling design and statistical methods for environmental biologists provides a description of BACI (before and after, control and impact) monitoring, which has relationships to GCDAMP monitoring needs. A third applicable reference, particularly to assessment of flows in Australian regulated rivers, is Chessman, B. and H. Jones. 2001. Integrated monitoring of environmental flows: design report. Department of Land and Water Conservation, New South Wales, Australia.	Provide broader perspective on monitoring	Yes, et seq.	We could provide a comprehensive literature review about monitoring but do not think that this is appropriate for this general core monitoring plan. The intent of this plan is not to review all past or possible monitoring approaches but to describe how we intend to address the monitoring needs of the AMP, as previously articulated in the AMP Strategic Plan, Strategic Science Plan and MRP
40	1		Kubly	BOR	It is not clear to me how a 4-step process that ends with "prepare final core monitoring program reports for each resource goal" produces project-level core monitoring protocols. Could you elucidate how the identified reports become proposals for monitoring? Or is this just a semantical difference?			The description of Step 4 of the process has been expanded considerably in the latest version of the CMP to address this comment and several similar ones.

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41	1	33	Barger	Wapa	Please clarify the purpose for the information needs workshop here.	Add language		The purpose of the PEPs is described in detail in Chapter 3.
42	1	34	Barger	Wapa	This discussion of PEPs is problematic since the PEPs are to review the monitoring aspects of each program. They are not for the core of the monitoring program. Somehow, there needs to be a way to get at the core of the monitoring. *This is also a general comment for this document.*	Add language		See previous responses to similar comments (e.g., comment #10) above.
43	1	41	Barger	Wapa	Please include the year that the AMWG priorities were set.	Change language		OK, text added in response to this comment
44	2		Kurt Dongoske	Pueblo of Zuni	Please change "Zuni" to "Pueblo of Zuni" or "the Zuni Tribe of the Zuni Indian Reservation"		yes	OK, change made.
45	2			Grand Canyon Wildlands Council, Inc.	It would seem relevant to cite Stevens and Gold (2002) here, as we presented the AMP strategy to the science and monitoring communities. Note that the year (2002) of that citation should be changed throughout the text, as 2003 was the date of a widely read review of that book, not the publication date. Also, it would be relevant to cite Lovich and Melis (2007), who tested the premises and preliminary results of the program.			The Stevens and Gold 2003 citation throughout this document refers to an article published in Monitoring Ecosystems, a 2003 publication. Please clarify which 2002 publication this comment refers to.
46	2		Kubly	BOR	I do not find the term "management action" in the GCPA language. There is reference to "activities that that will ensure that Glen Canyon Dam is operated in a manner consistent with that of section 1802" in addition to monitoring. Since the GCDAMP is still in the process of defining management actions, could you be more specific on where in the GCPA you find this reference, including which actions would apply.			Section 1802 references "other authorities under existing law" to achieve the intent of GCPA. We have revised text to be consistent with the language in GCPA.
47	2	29	Barger	Wapa	This state that the GCPA allows for management actions, but this language is not in the Act.	Please rewrite		See above (comment 46).
48	2	47	Barger	Wapa	The sentence, "In a broad sense…" overstates what is in the GCPA. These are the resources for long term monitoring for the effects of dam operations.	Please rewrite		We think our interpretation is appropriate in this instance.
49	3	P. 3, L.17; P.7, L. 30-39; P. 18, Fig. 3		Grand Canyon Wildlands Council, Inc.	We argue that the areal scope of the GCDAMP prevents or actually prohibits (rather than "effectively constrains") the program from achieving its scientific adaptive management goals. River ecosystem analysis requires several forms of scientific controls, including comparison of less affected reaches upstream from the dam with the impounded reach. Not being able to evaluate ecological conditions in Cataract Canyon, upstream from Lake Powell, has kept the GCD-AMP from testing many embedded biases and potentially incorrect assumptions about ecosystem stewardship options, the resolution of would greatly improved the efficiency and effectiveness of the program.			We believe our statement is accurate. Several PEP reviews have pointed out the limits associated with the geographic restrictions. The geographic boundaries are a construct agreed to by the stakeholders and it is the stakeholders that need to decide to revisit study boundary.
50	3		Kubly	BOR	The razorback sucker and southwestern willow flycatcher are included in conservation measures, but absent from your list of			We changed the text to make it clear that the list was intended to be examples, not a

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					federally listed species.			comprehensive list of all endangered species.
51	3		Kubly	BOR	GCMRC seems to constrain the scope of monitoring beyond the language that you cite. The word "primarily" suggests that there may be activities outside the geographic scope that you identify, as there are for the Little Colorado River fish investigations. If there are differences of opinion on the geographic scope, they can be made through an in-out process, rather than defined in the general core monitoring plan.			The word *primarily* is part of the quote from the AMP Strategic Plan language.
52	**3**	**1.3**	**NPS**		Please note that in discussing other compliance requirements that the CMP is trying to respond to, other agencies have the responsibilities and that needs to be reflected in the document. All the actions and responsibilities are not those of GCMRC alone.			OK—we will add clarification in the text
53	3	14	Werner	AZ	The geographic scope is defined in the Strategic Plan through the definition of Colorado River Ecosystem. That definition discusses tributary streams. Later in the CMP there is mention of tribs. The text on p 3 should be revised to reflect the definition in the glossary of the Strat Plan.	Revise text for clarity	Y	The definition we use is from the AMP strategic plan.
54	3	31	Barger	Wapa	This is not just for status and trends, but for how these relate to dam operations. The focus of long term monitoring is on dam operations effects.	Add language		In this plan, we use the definition of core monitoring that is provided in the AMP strategic plan, which is cited on page 2.
55	4	26-37		Grand Canyon Wildlands Council, Inc.	The earliest records of information from the CRE began with the photography and diaries by nineteenth century explorers (Powell, Stanton, etc.; as documented by Turner and Karpiscak 1980, Webb 1996, Stevens et al. 1997a, and others). Collections of insects (some of which are Grand Canyon endemic taxa) began prior to 1900 (e.g., Stevens and Huber 2004). The 1934 Rockefeller Expedition contributed much additional information on low-elevation insect life in Grand Canyon, and the 1938 Nevills expedition contributed substantially to knowledge of CRE flora (Clover and Jotter 1944). Efforts to compile species lists were undertaken, most notably by Bailey, McKee, MacDougall, and others. Other early sources of information are listed in Stevens et al. 1997a, sources which predate those listed on P. 4.			We did not attempt to provide a comprehensive history of monitoring in Grand Canyon in this document.
56	5	4-11, 43-48		Grand Canyon Wildlands Council, Inc.	The raison d'etre of the GCES and subsequent GCMRC programs came about because river recreationists and wilderness advocates responded strongly and negatively to Reclamation's 1980 FONSI. That FONSI claimed that no impacts on camping beaches would result from increasing the already extraordinary daily flow fluctuations downstream. It has always surprised me that river recreation has received so little attention in this program and that river recreationists have not exerted their influence more strongly, given the seminal influence they have over public opinion. As another aside, it might be useful to review the environmental compliance to			Noted.

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					evaluate which of the advocated changes contribute to our contemporary standards for ecosystem integrity.			
57	P.5, ; P.7	17-18; 1-6		Grand Canyon Wildlands Council, Inc.	Primary among our early concerns with establishment of a CMP for the CRE was that our ability to foresee changes in the system have been poor. Each year, some form of major change occurs (e.g., erratic high or low flows, the arrival of an endangered or non-native species, such as peregrine falcon or bald eagle, and Ravenna-grass or quagga mussel), potentially shifting the ecosystem's developmental trajectory. This indicates that we need to maintain a strong inventory program, a process that has largely been eliminated by GCMRC. We still do not know the identities of most of the zooplankton and macroinvertebrate taxa in the CRE, but efforts to document terrestrial invertebrate and vertebrate distributions have languished. Without recognizing the extent of our ignorance of these many life forms, efforts to manage ecosystem process will continue to founder because of unanticipated population changes of rare or ecologically important species.			Inventories for new species have never been identified as an AMP priority. However, several GCMRC monitoring programs could identify new species. Maintaining and updating a comprehensive inventory of Park resources would seem to be a primary responsibility of NPS, but you may want to bring your concern up to TWG/AMWG
58	5	44	Werner	AZ	"turbine" should be replaced with generator. The water moves the turbine. A shaft connects the turbine and the generator, which has coils of windings of a conductor on it.	Revise text for accuracy	Y	OK it now reads as: In 1980, a strong public outcry was provoked by the Bureau of Reclamation Finding of No Significant Impact for rewinding Glen Canyon Dam's hydroelectric **generators** and increasing diurnal flow fluctuations
59	6	26-30	Kurt Dongoske	Pueblo of Zuni	Noticeably lacking from this symposium was the Native American perspective. No Tribes that were currently participating in the GCES and/or the development of the GCDEIS were asked to participate.		N0	Noted.
60	6		Kubly	BOR	Suggest making "William Lewis" "Dr. William Lewis, University of Colorado, Boulder, the NAS Committee Chair."			This change was not made. We don't distinguish other Ph.D. scholars with this title. For consistency we've did not incorporate the suggested change.
61	7		Kubly	BOR	The statements "Some AMWG members have expressed the desire to mimic these characteristics in Grand Canyon. However, the native fish populations in that reach appear to be in poor condition, though there are logistical limits on sampling there" seem out of place here. The point about the desire for controls and limits from geographic scope is adequately made.			We will insert this change in the revised CMP: Some AMWG members have expressed the desire to use these sites for comparison with the Grand Canyon. An inclusion of upstream and unregulated site data could potentially enhance resource response interpretations in Grand Canyon. .
62	P.7 P.8	41-50 1-2		Grand Canyon Wildlands Council, Inc.	The early vegetation monitoring program clearly understood the need for on-going inventory. Although we are likely 95% of the way along in understanding which plant species occur in the CRE, more than 50% of the species in Grand Canyon occur within several hundred m of the river elevation, and new species are detected each year. Therefore, an on-going inventory and related protocols are needed in this plan to			See response about inventorying above.

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					continue documentation of plant species and their distribution, of both native and non-native taxa.			
63	8	38-39	Kurt Dongoske	Pueblo of Zuni	"National Historic Preservation Act Programmatic Agreement for Cultural Resources" is the title of the appendix in the Final EIS. The actual title of the agreement I believe is *Programmatic Agreement among the Bureau of Reclamation, the Advisory Council on Historic Preservation, the National Park Service, The Arizona State Historic Preservation Officer, Havasupai Tribe, Hopi Tribe, Hualapai Tribe, Kaibab Paiute Tribe, Navajo Nation, San Juan Southern Paiute Tribe, Shivwits Paiute Tribe and Zuni Pueblo Regarding Operations of Glen Canyon Dam*. The actual title may be a preferable use in this document.		**No**	Noted.
64	8		NPS		The NPS archaeological site monitoring program begun in the 1970's was not "informal"; specific sites were identified, photo replication points identified and assessments taken. The only thing informal was the schedule of monitoring episodes. Standardization of information came in the 1980's and 1990's, but the early work was not "informal".			We can find a different word to characterize it, but by comparison to any monitoring done today, the early approach to monitoring was more informal than what is occurring today.
65	8	5	Kowalski	Colorado	Add the following. "It is within the context of the Law of the River that the Glen Canyon Dam Adaptive Management Program operates." While this is implicit, Colorado would like it to explicitly state this.			This comment does not align with the page/line number cited. Please clarify where this additional sentence belongs.
66	9		Kubly	BOR	Do the references to "final" PEP reviews indicate there are no plans for further PEP reviews in these resource areas? Or should final be changed to most recent?			OK, will change to the " most recent PEP Review".
67	10		Kubly	BOR	How accurate does the conceptual model have to be in predicting the outcome of experiments before it has utility for managers to "serve as reliable tools to inform policy decisions"? Have the managers been queried to determine the accuracy and precision necessary for this use? What accuracy and precision are necessary from the monitoring to support the conceptual model development? What are the respective roles of GCMRC and managers in this determination?			All good questions. The primary purpose of the conceptual modeling project was to identify knowledge gaps and monitoring data needs, as well as experimental options to be considered in the future.
68	11		Kubly	BOR	You make the statement that "[t]he experimental designs proposed and implemented in the GCDAMP have been a direct and logical outcome of conceptual modeling activities." It could be argued that the proposed experimental designs have largely not been implemented, e.g. the GCMRC 16-year block design. Could you give examples to support your statement?			The 16 year block design was probably the best example of a direct outcome from the conceptual modeling work, but the current NSE research is another one.
69	11		Kubly	BOR	You end the history of monitoring without any analysis of PEP panel recommendations or the extent to which they have been incorporated. This includes recommendations on design and statistical analysis, including the use of power analysis to develop designs and set sampling levels to achieve desired precision. Suggest adding a section for this purpose.			Individual PEP panel recommendations are addressed, and as appropriate incorporated into the individual core monitoring reports. An analysis of all the recommendations and an analysis to which have been adopted is not within the scope of this general core monitoring plan. They are more appropriately

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								address in Step 3 and 4 of the process.
70	11		Kubly	BOR	I believe the Science Planning Group was a TWG ad hoc group.			No, our recollection is that it was established by direction of Michael Gabaldon in spring 2005 as an AMWG ad hoc committee.
71	11	26	Barger	Wapa	Another factor that has hindered development of the core monitoring plan is the lack of agreed-upon DFCs.	Please rewrite this section		OK. text modified
72	11	19-25		Grand Canyon Wildlands Council, Inc.	GCMRC has played a large role in maintaining a state of confusion with regard to monitoring in the GCD-AMP. GCMRC has had to be forced to synthesize important flow experiments that shape AMWG understanding of its stewardship options (e.g., the Year 2000 flow experiment - the most costly and least successful ecosystem experiment ever conducted), and has reported as fact preliminary results that have not necessarily been born out after final peer review. Will we ever know whether trout or warmer water was responsible for stabilization of LCR humpback chub population, or even whether the trout population reduction there was really due to GCMRC activities, or just to system-wide collapse of the trout population? Presentation of conflicting results, other communications issues, and continuing lack of advocacy for a whole-socioecosystem approach by GCMRC helps keep the AMP monitoring program in limbo. The AMP involves shared responsibility, but this paragraph inappropriately lays all the programmatic blame on the AMWG, which has been recipient of rather many of GCMRC's mixed messages. Let us work together rather than at odds to be better stewards of the CRE.			Paragraph of Plan referred to by this comment: "Other factors that have hindered rapid progress in the development of a core monitoring plan are (1) lack of agreement among AMP stakeholders about the purposes and objectives of monitoring in general, (2) lack of agreement among AMP stakeholders and scientists about what should be included within a core monitoring plan (that is, what defines *core* monitoring as opposed to other kinds of monitoring, such as monitoring effects of experimental actions or monitoring of specific management actions), and (3) lack of agreement about what levels of precision and accuracy in monitoring data are necessary to achieve program goals." GCMRC Response: While the GCMRC accepts responsibility for whatever role it has played in delaying the implementation of a core monitoring program, it is now trying to address these long-standing issues through a well-structured, thoughtfully planned core monitoring approach. The GCMRC believes that the three points made in the paragraph tied to this comment are factual and provide focus for moving ahead with a monitoring plan that more clearly defines these elements for monitoring the CRE. As the reviewer suggests, the staff of the GCMRC is ready and willing to work together with the GCMP ad hoc group to develop a useful monitoring plan and implement a core monitoring program.
73	11-12			Grand Canyon Wildlands Council, Inc.	The cause for confusion over the development of an efficient, effective CMP has been the failure of both the AMWG and GCMRC to adopt a whole-socioecosystem approach for the CRE, resulting in the still on-going Christmas tree (or "pin the tail on the donkey") approach to ecosystem management and, to some extent, monitoring. The 2005 knowledge assessment			While a broad socioeconomic approach may be most desirable, the lack of clear ecosystem goals for the program, combined with funding limitations and the desire of stakeholders to have a monitoring program that addresses specific resource concerns requires a more

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					workshop participants clearly recognized the large gulf between scientific understanding and management, yet GCMRC and AMWG consistently underestimate the depths of that uncertainty, particularly with regard to biological resources. More detail on that KAW report is needed on P. 14 to clarify the extent of that uncertainty and its implications for both science and management. Also, development of the CMP has been thwarted by increased emphasis from AMWG to move to a management approach before the scientific information has been sufficiently integrated to support such a shift.			constrained monitoring approach than may be desired by some stakeholders. (Note that some stakeholders advocate for a minimalistic monitoring program focused on only a few of the 12 resource goals identified by the AMP.)
74	12		Kubly	BOR	Surely GCMRC did not answer to the Core Monitoring team and would return to the TWG or AMWG before investing a significant amount of time and energy in the Christmas tree ornament approach. Missing from this portrayal are the strong concerns voiced by some team members that the core monitoring budget not exceed 40-60% of the science budget and that without some idea of the relationship among sampling frequency and precision and cost, coupled with the lack of desired future conditions, that it was difficult to identify the desired variables and the sampling regime.			We did not attempt, nor could we reasonably address in this document, all the historical discussions surrounding the development of the CMP. We have revised the text to focus more on where we are going, rather than where we have been in the past.
75	12		Kubly	BOR	The discussion of green, yellow and red should bring to bear the division of the science budget into core monitoring, research and development, and experimental components. Here again there was emphasis on ensuring the core monitoring budget would not grow to the point that it crowded out the other two important components of science endeavors.			See comment above.
76	12	25	Barger	Wapa	It is unclear why the outcome was to develop a plan with the Christmas Tree when in the position statement from the CMT, it sates "adopt a minimalist framework (e.g. no ornaments on the Christmas tree). I recall Jeff telling us that if we do all the ornaments, then the plan cannot work.	Add language		The Christmas Tree analogy is not appropriate to this plan. Not all desired/requested monitoring elements are being addressed in this plan. However, we have agreement through the approved MRP to address all AMP goals at some level and this is what we have done.
77	13		Kubly	BOR	It would be beneficial to summarize the findings of the Science Advisors on draft CMPs, in addition to those of CMT and TWG members.			We do not see the value of repeating comments provided on historical documents in this general core monitoring document. More important are the current SA views of the present document.
78	14	12-24	Kurt Dongoske	Pueblo of Zuni	My sense is that the tribes have a different perspective of this workshop than the one presented here in the text. Does this last sentence imply that GCMRC is washing their hands of tribal involvement in any of the science monitoring and/or research programs it is currently managing or will be developing? As pointed out above, there is a serious lack of integration of tribal monitoring activities and perspectives in this proposed monitoring plan that is to be administered and managed by GCMRC.		No	As stated previously and repeatedly, GCMRC is open to and interested in having a more collaborative relationship with the tribes in designing and implementing monitoring protocols and integrating protocols where appropriate into the final CMP. We have proposed hosting another workshop to address this concern in 2010.

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79	14		Kubly	BOR	The distinction between compliance activities and science activities reference tribal monitoring is misdirected. Tribes have delivered their protocols to TWG and to GCMRC. If the protocols are wanting in scientific rigor, suggestions for their improvement should be provided.			GCMRC provided an assessment of the protocols to Reclamation before they were funded. This sentence has been reworded to state that " tribes received additional funding from Reclamation to pursue their monitoring projects independent of GCMRC"
80	14	7	Barger	Wapa	There were discussions with the CMT that not all of a program would be core monitoring; maybe just a small part of it and how that could be shown for budget purposes/ and shown on the AWWP.	Change language		A lot of discussions have occurred over the past 15 years, but seldom resulted in recommendations that were adopted by the AMWG/SOI; this plan is specifically designed to address the process and direction contained in the AMWG approved MRP.
81	15		Kubly	BOR	Were KAW outputs explicitly incorporated into core monitoring development?			The KAW identified critical knowledge gaps that are (within funding constraints)being addressed through improved, well focused monitoring protocols .
82	15		Kubly	BOR	I assume that you will return to a fuller discussion of the prioritization process developed by the SPG. It deserves more attention. Also, there was an important kick-off meeting of the SPG with the Science Advisors that is not noted.			It was not our intention to get into more detail on this particular topic because what matters most is the results of the prioritization process (which are incorporated into this plan.) In addition these priorities will be revisited during the IN workshops in advance of the PEPs and development of the final core monitoring reports.
83	15	5-9		Grand Canyon Wildlands Council, Inc.	Desired future conditions have been established by the NPS, although other stakeholders with resource management responsibilities have not necessarily endorsed all parts of those DFC's and not all DFC's may be achievable. As recognized in the document, this programmatic deficiency greatly hinders all aspects of adaptive management, and we suggest that clearly-defined DFC's must be defined. The feasibility of achievement of those DFC's should be completed prior to finalization of a CMP and other program plans. Resolution of CRE DFC's is likely to require a major federal process.			See response to similar comments above.
84	15	17	Barger	Wapa	The SPG did put together a recommendation for DFCs for sediment and HBC.			OK, noted.
85	16 17	10 8		Grand Canyon Wildlands Council, Inc.	elsewhere, and in References Cited: Stevens and Gold 2002.			This reference is to the Stevens and gold article in the book, Monitoring Ecosystems, which was published in 2003. No change.
86	16	14	Barger	Wapa	Please clarify what the informed decisions are regarding.	Change title		The operation of the dam

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87	16	19-25		Grand Canyon Wildlands Council, Inc.	Self promotion by GCMRC, a federal office, is not warranted, here or anywhere. GCMRC could be replaced by a well-managed consortium of academics, coupled with USGS water flow and quality monitoring, and overseen by a senior scientist. GCMRC has expanded to a very large staff, far beyond the scope of that originally identified in the 1996 ROD, with most research and monitoring only indirectly under the control of the AMWG. Limited ecosystem-level expertise and failure to integrate historical data by GCMRC has contributed to the failure of the AMP to resolve numerous biological challenges to CRE stewardship.			Self-promotion is not the intent of this paragraph. We respectfully disagree with your characterization of GCMRC or the AMP as a failure. The addition of an integrated ecosystem element to the SSP and MRP, the funding of an ecosystem project within the annual work plan, the hiring of a senior ecologist, and the recent ecosystem workshops are all examples of GCMRC trying to take a more integrated ecosystem approach. Limited funding is a major limitation to implementing a broader ecosystem approach
88	17	Fig. 2	Kubly	BOR	I think Goal 12 is broader in context than successful monitoring and research. It entails the interactions among the scientific, political, and legal constructs of human interactions that determine whether the knowledge gained in adaptive management is successfully integrated into policies, including policy change where warranted. There is a rich and evolving literature on this subject that transcends adaptive management and enters into the realms of adaptive co-management and adaptive governance.			We agree. Figure 2 is a simple construct and not meant to imply that Goal 12 is only limited to successful monitoring and research.
89	17	Fig. 2		Grand Canyon Wildlands Council, Inc.	Good job with relating GCDAMP goals to ecosystem structure. An expanded version of this general model, in keeping with Walters et al. (2000) would show variation in trophic-goal relationships with distance downstream from the dam, and that not all biological resource impacts are affected by flow and sediment management.			OK.
90	18	figure	Barger	Wapa	This seems to be a monitoring figure, not a focused "core" monitoring figure.	Needs more language.		The point is that monitoring or core monitoring (however you define it) exists within the context of the elements reflected in Figure 3.
91	18	Fig. 3	Kubly	BOR	Effects monitoring is identified in this diagram. I think the different kinds of monitoring should be introduced early in the document (see my first comment) and distinguished from one another to set the stage for defining core monitoring. That could be done in an even broader sense by introducing this diagram early in the document.			OK, we will revisit the introduction section where core monitoring is first defined and clarify.
92	18	Fig. 3		Grand Canyon Wildlands Council, Inc.	is the caption offset? Also, the role of scientific controls should somehow be represented in this figure.			Yes caption is offset and will be fixed in final version. We would welcome your input on how to reflect the role of controls in this figure.
93	19	1	Barger	Wapa	This discussion is another example of the focus of this document on general monitoring, not core monitoring. Somehow there needs to be more discussion of how to find the core of monitoring.			This plan reflects GCMRC's understanding of what constitutes core monitoring as defined by the core monitoring information needs (CMINs) developed by the TWG/AMWG. It is unclear to us what WAPA considers to be

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								"general" vs. "core" monitoring. The plan addresses the core monitoring information needs as defined by the TWG and AMWG.
94	19	2.2	NPS		It is difficult to understand how the CMP can meet the outlined objectives of unambiguous and measurable while also stating that the plan is currently designed to report "relative measures". Defining resource condition and targets is critical to the success of the program. Without those unambiguous and measurable measures, it seems that the plan will repeat the very pitfalls it warns against.			The plan recognizes the importance of DFCs to this program. We disagree that they are a prerequisite to development of this core monitoring program. Relative measures of change can provide important information to the program, even in the absence of precise DFCs. We can monitor whether resources have changed in relation to a baseline condition, and there is nothing ambiguous about determining whether resource conditions have changed relative to an earlier baseline measurement. We do agree that the monitoring program could be enhanced with the definition of measurable, attainable DFCs.
95	19	6-12		Grand Canyon Wildlands Council, Inc.	Include bullets related to continuing basic inventories (as indicated in Fig. 3) and a bullet on learning from restoration actions. Although GCMRC has undertaken a few such activities (trout eradication at the LCR, archeological site stabilization), other restoration efforts have been undertaken by other GCDAMP partners and outside agencies. CRE restoration experiments include: LCR and Shinumo HBC translocation; tamarisk stand-replacement at Lees Ferry, Hidden Sloughs, and in GC tributaries; removal of Ravenna-grass; and other activities; California condor reintroduction; and other activities.			OK, we will consider some additional bullets in the revision.
96	19	38	Kubly	BOR	None of your targets use ecosystem functions. With a large emphasis on ecosystem-level measurements, are there no targets that revolve around functions or larger community standards?			None that the AMP has agreed to at this point.
97	19	22	Kubly	BOR	Point well taken on performance measures.			Noted.
98	19	39-45		Grand Canyon Wildlands Council, Inc.	Please do not place the "easy to understand" bullet as the leading target for the plan, as it appears to "dumb down" management. This is a complex ecosystem and difficult-to-understand elements of management are what the program needs to understand and resolve.			OK, this has been changed.
99	20	1	Barger	Wapa	This discussion of CMINs may be getting at the problem with core monitoring vs monitoring. There are no MINs, only Ins and CMINs. The core monitoring should not be all monitoring, only the minimalist part of monitoring.			The focus of this plan is on CMINS (Core Monitoring Information Needs) which were defined by the AMWG and TWG in the AMP strategic plan and further refined by the SPG. To us, it seems quite logical to focus the CMP on the CMIN's
100	20	2.3	Capron	Western	Section 2.3 introduces the CMINS that are found in Appendix A, but unfortunately stops there. I was expecting the integration of the CMINs with the strategy for developing the			We agree that these are appropriate considerations. However, as defined in the MRP, the CMP is meant to be a programmatic

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					core monitoring. Only a couple of the individual goal sections later in the document reference any of the CMINs. I think it would have been helpful if under each goal there was a process similar to these steps: a) describe the CMINs, discuss priorities b) walk through all the monitoring that has occurred or is proposed for that goal c) relate CMINs to needed research for core monitoring and describe monitoring/activities that will not be proposed as CM for that goal. Table 4 (p. 34) is probably the most helpful section of the document because it lays out the intended focus of each program (along with Table 6). But it needs support. Certain questions arise that I don't know how to resolve: 1. Which CMINs have been implemented with this proposed plan and which haven't? 2. Was the CMP consistent with the prioritization of the CMINs?			document. We expect these types of detailed considerations will be addressed in steps 2, 3 and 4 of the process.
101			??	??	3. Management decisions: AMP managers must go through a process to determine eventually what gets funded and what may need to be forgone. This isn't a science-only process, it is a compromise between what we want to do and what we choose to do based on our risk level. For example, it might be good to measure 10 aspects of a goal, but managers may only choose to fund 7/10 – it may limit the questions we can answer, but it may provide funding for other priorities. My sense is that this program being proposed here is responsive to the myriad CMINS and other issues that have been provided to GMCRC but that we haven't had the opportunity to decide if we want to have all of this be core monitoring. Some aspects we may only want to include as monitoring for a few years. I don't see how we even begin to untangle this when the plan doesn't incorporate the CMINs as integral components of each goal CMP.			This is a general (programmatic) plan that's designed to lay out the overall goals, objectives, scope, and estimated staff and budget requirements of the core monitoring program for the AMP. It is designed to be responsive to the CMINS (Core Monitoring Information Needs) which were defined by the AMWG and TWG in the AMP strategic plan and further refined by the SPG. Detailed discussions of each of the CMINS, priorities, levels of precision and accuracy are intended to be addressed in other steps of the core monitoring process. We do not oppose setting funding priorities. Our hope is that priorities will be established based on sound principles of science and adaptive management using appropriate decision support tools. Unfortunately these tools are currently not available to the AMWG or TWG. We support the development of such an objective process as part of Steps 2-4 of the CMP process
102	20	End of page	Kubly	BOR	Missing text; prior to this you state that "[i] In this case, past monitoring data and models cannot offer much insight into optimum policy choices" but do not clarify why this statement applies to the GCDAMP case.			We have clarified the language.

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103	21	5-7	Kurt Dongoske	Pueblo of Zuni	Does this include tribal values as they relate to ecosystem resources?	Please answer question	yes	We may not fully understand this question. To the extent that the Tribes have identified an interest in monitoring changes in the condition of native flora and fauna, the answer is yes, but if this question is asking whether this monitoring plan attempts to address the more esoteric values that tribes may place on these resources, the answer is no
104	21	Fig. 4		Grand Canyon Wildlands Council, Inc.	Include climate in the model, in one of the lower boxes. Also, add nutrients and zooplankton to the list of basal resources influenced by dam operations.			We will add a "climate" box to the figure, but believe that the nutrients and zooplankton are generally conveyed in the aquatic food base box. The intent was to keep this portrayal as simple as possible, but admit that climate should have been listed.
105	22	6-15	Kurt Dongoske	Pueblo of Zuni	Why are tribal monitoring programs conspicuously absent from any mention in this paragraph?	Please answer question	yes	We do not know how the current tribal monitoring programs fit in at this point. They are being conducted independently and without direct oversight of the AMP at this point in time. And as yet we have not seen how the information being collected is being used to monitor dam effects
106	22	Fig. 5		Grand Canyon Wildlands Council, Inc.	Add terrestrial vegetation (habitat) and invertebrates (fish food) as inputs from other submodels from the lower right-hand box.			We included figure 5 specifically to solicit input on the value of using these "outward looking" matrices for all of the AMP resources.
107	22	1-10	Andy Makinster	AZGFD	Perhaps mention cooperation/interaction with the Upper Basin in this section. For example, how they have handled non-native fish invasions (i.e. knowing what they know now, what would they have done differently in terms of non-native species detection)	Clarify actions taken, if any, in cooperation with the Upper Basin	Text summarizing interaction with the Upper Basin to describe integration with other programs	We provide several examples of collaboration/cooperation but we can expand the text to include an example of the upper basin interactions. Text will be revised in subsequent CMP version.
108	22+	2.6	NPS		The NPS monitoring program of archaeological sites affected by Glen Canyon Dam should be included in the list. Although the program is not currently funded, it was developed, in collaboration with all the entities, to provide information on site condition and threats to integrity of those sites along the river corridor. The program was the subject of a PEP review, changes to monitoring protocols were implemented and the resultant information was the basis for the BOR sponsored treatment plan. The implementation of monitoring for NHPA compliance is no different than work done for ESA compliance, yet those projects are listed. AZGFD and USFWS are the only programs mentioned. Perhaps a detailed discussion about why the GCMRC hasn't			Not all monitoring being done by NPS is relevant to the AMP. The 2000 Cultural Program PEP noted that the NPS arch site monitoring program did not adequately or meaningfully address the needs of the AMP for information about effects of dam operations or the efficacy of treatments being implemented and recommended redesigning the program, which is why a new approach has been initiated To the extent that existing monitoring programs are providing information on status and trends of resources relative to effects of dam operations or to treatments undertaken within an adaptive

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					collaborated with more programs? There is an entire NPS Inventory and Monitoring Network, focused on regions such as the Colorado Plateau. It would seem likely that the NPS I&M program would be an appropriate collaborator and a way for the GCMRC to move beyond the confines of the CRE geographic scope? The NPS has discussed this with GCMRC in the past yet and it was our understanding that the NPS I & M program would be integrated into this document, however, it appears to still be missing.			management framework, we agree that they should be noted in this document.
109	22-23			Grand Canyon Wildlands Council, Inc.	If other agencies (e.g., NPS) are conducting monitoring relevant to the AMP, are those data and reports being provided to the GCMRC database, and if not, why not? The NPS is conducting recreation analyses, avian censuses, vegetation manipulation, and other functions that should be integrated into the overall CRE model; however, there appears to be little communication or data sharing among the two agencies. Also, what about Glen Canyon NRA – have its information needs and management been fully met by Grand Canyon NP?			There has been data sharing in areas of archeological, recreation, vegetation, etc. The sharing of information has not been consistent. GCMRC is committed to working with NPS to improve data sharing as core monitoring proceeds. The GCMRC is fully committed to share its data, consistent with Fundamental Science Practices, with all stakeholders through it web site. We are working on a data sharing agreement with NPS.
110	P. 24 bottom, P.5, top			Grand Canyon Wildlands Council, Inc.	Indicate the time frame for PEP reviews. On p. 28 you claim it should be every 5 years, but a more relaxed (7-10 yr) schedule likely will become appropriate once a more complete socioecosystem approach is adopted.			Point well taken. We may need to re- evaluate the appropriate schedule for PEP reviews of core monitoring projects.
111	24	20-32	Kurt Dongoske	Pueblo of Zuni	How does the commitment to meet with the Tribes delineated in the Tribal Consultation Plan fit into this annual workshop? Additionally, how is the development of this monitoring plan going to comply with the Tribal Consultation Plan?	Please answer questions	yes	Tribes can express their individual preferences at any time, either at the annual meeting with all tribes and agencies, or through separate consultation meetings as requested.
112	24	2.7	NPS		This section contains only three phases but Table 2 is a very detailed explanation of how the programs are developed and implemented. One concern for the NPS is that we are viewed as a reviewer for research permitting only, not for appropriateness or subject matter experts in the various disciplines.			In some cases NPS works as a cooperator on specific projects (e.g. Lake Powell, recreation, Bright Angel Creek flow monitoring). NPS subject experts have contributed to past PEP reviews and are welcome to do so in the future. We are always available to work with the NPS and discuss methods for field data collection, processing, analyses and reporting.
113	??		??	??	The process outlined in the table is inconsistent for each of the goals that follow. It is important to clearly outline the status of each of the goals, including both the positive components and the obstacles of actual implementation. Somewhere there should also be a place to integrate new information and use it to assess the goals and information needs. The feedback loop is not complete and appears as a never ending set of information needs with no place where information collected feeds back into the process.			The steps in Table 2 (now Table 3 in the new draft) have not been completed for all of the goals, and individual monitoring projects are at different stages of evolution. Our goal is to align each of the monitoring projects with the activities in this table. Feedback is an important element of the monitoring process. The CMP includes a number of steps to provide feedback, including periodic PEP reviews, reporting to the TWG, Fact Sheets, periodic symposia and frequent meetings with management agencies.

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114	24	2.7.1	NPS		It seems that there needs to be someplace to identify that information needs should come from the management agencies, not just the TWG. There is a basic flaw in the program if management needs, clearly identified as core to the program, are not incorporated with the expectation that TWG will serve as the management review.			This is a policy issue for NPS to discuss and resolve with AMWG and DOI leadership.
115	25	2.7.3	Capron	Western	I'm not sure that "reports" is the best title for these, I was confused the first time I read this. Perhaps these could be called "plans" because this is in fact the individual core monitoring plans that we are going to review right?			We are following the language used in the MRP here, but will defer to the TWG about what they want to call these reports/plans.
116	25	bottom		Grand Canyon Wildlands Council, Inc.	An overall synthesis of core monitoring results is needed to integrate and update core monitoring efforts, likely at least at 5-10 year intervals.			Noted.
117	26	1	Barger	Wapa	This discussion does not address what part of monitoring should be core, where is the precision, accuracy, and periodicity.			See previous responses to this comment.
118	27	figure	Barger	Wapa	See comment above			See response above.
119	27	Table 2		Grand Canyon Wildlands Council, Inc.	Integrated biological inventory should be a component of the planning process, and further inventory efforts should be recognized in the implementation process.			We think that the monitoring described by GCMRC is sufficient, within the existing fiscal constraints, to address dam impacts on all organisms because habitat impacts on the currently described organisms will be similar for less well known organisms, such as terrestrial invertebrates. A relatively complete inventory of biological resources in Grand Canyon along the Colorado River is available from existing documents, particularly, but not limited to, GCES and GCMRC publications. It is likely that there are some organisms, such as terrestrial invertebrates, that are not well described in existing literature, though some of these are available from Grand Canyon National Park. While additional inventories could be of some value, we recommend that they are more properly included in NPS inventories and documentation of Park resources. It is not clear what the reviewer expects an integrated inventory to include because an inventory, by definition, would be of individual organisms.
120	28	2.9	Capron	Western	A 5-year interval is being proposed for review, which is often an easy choice. But my experience is that this often seems too quick, but 5 is an easy round number to use. It might be better to say 5-10 years or 8 years or something a bit more realistic. My experience is that 8-10 years seems to be a good time for major reviews. That gives 5 years of work with 3 years of			We feel that five year increments is an appropriate interval and is consistent with the 5 year review cycle proposed in the MRP. However we understand the point and are willing to consider a longer time period if desired.

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					write-up and publication to review.			
121	28	2.9	NPS		There is certainly value to parallel monitoring protocols when new technologies are employed, but redundant systems should come to an end. It would be appropriate to recognize the feasibility of running dual systems and the need to evaluate and move forward with single systems (for both logistical and financial reasons).			We agree. We did not mean to imply that parallel methods would continue indefinitely. We have changed the sentence to clarify this point.
122	28	13	Kubly	BOR	"Project budgets should ideally be increased annually by 5 percent to enable the projects to continue evaluating new methods and monitoring instruments and to cover periodic independent reviews." If CPI increases an average of 3% each year, how does GCMRC propose to maintain balance of funding among different parts of the program? There has been almost no attention to budget limitations thus far in the GCMP, but there have been considerable discussions previously in the CMT and SPG about whether the CMP budget should drive the level of sampling or vice versa. Also, we lack information on tradeoffs between statistical precision and sampling intensity that will drive costs.			We are recommending what we think makes sense from a scientific standpoint. How to address the increasing competition for funding for monitoring, research, management and compliance is a huge issue the AMWG and the DOI need to wrestle with
123	29	10	Kurt Dongoske	Pueblo of Zuni	Are tribal resource concerns and tribal monitoring programs contained within the broad category of "cultural resources" in this bulleted item?	Please specify what is covered by the term "cultural resources"	yes	Yes.
124	29	2.10	NPS		Key to the success of any core monitoring element is whether or not it is answering the questions it needs to address. It is important to include realization that even if a program was deemed core, if it is not producing desired results, it shouldn't continue.			Not sure we understand this comment adequately to respond. Please clarify what is meant by "not producing desired results"? But generally if a monitoring program is not responsive to a CMIN or other information need, the program should be redesigned or discontinued.
125	29	2.10	Capron	Western	I assume by the first bullet in the list that food base is included under the "food web" item? Perhaps you could include the goal numbers here, just to be clear.			OK.
126	29	22	Kubly	BOR	It may well be advisable to develop priorities within each CMP that will allow selection of monitoring variables and/or sampling intensity within the limits of budgets, i.e. tradeoffs above. This need should be acknowledged and addressed in the general plan.			We think that the new chapter 3 addresses this concern in concept now.
127	29	Last par.	Capron	Western	This is the first place I found where cost is considered. I think the biggest issue for the program is balancing our wish to monitor everything (Christmas tree approach) vs. the necessity to have a balanced budget that allows for adequate short-term monitoring and hypothesis testing (research). As a reader, it would have been helpful if there was further discussion of this			We agree that this is an important issue. One goal of this general plan to lay out the full program in a general sense so that TWG and AMWG can understand and respond to the budget ramifications of the choices that are made.

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					trade-off between precision, assessing all the CMINs (or not), and cost. When I got to this point of the document and read this I was left with the impression that we have somehow locked ourselves into a CM program that will consume much of our budget. I agree that the CM programs should be protected from annual-budget manipulations, but this only works if the CM programs are the "core of the core" as a former program participant used to say.			
128	30	Table 3; goal 11	Kurt Dongoske	Pueblo of Zuni	The FY2000 PEP for cultural resources reviewed a program that was substantially different from the monitoring program being designed by GCMRC now.		no	Agreed.
129	30	Table 3	Capron	Western	Goal 8 should be listed as provisional only.			OK.
130	30	Table 3	Kubly	BOR	I am not aware that any core monitoring has been recommended by TWG and accepted by AMWG or the DOI management agencies. Thus, I do not see how GCMRC can argue that there has been some core monitoring in place since 2008.			The sediment core monitoring proposal has been adopted provisionally and implemented as core monitoring since 2008. Once we have agreement on the general core monitoring plan, and the basic approach needed to move projects from pilot phase to long-term core monitoring, TWG can apply its new criteria and processes to determine whether to adopt the plan on a more permanent basis.
131	31	Figure 6	Kurt Dongoske	Pueblo of Zuni	This is the first time this document uses the acronym "TCP." Prior to this the document references archaeological sites and cultural resources. Why the change in this figure? Up to this point the document has not even recognized that the Tribes may have special places and resources of importance in the CRE that can be categorized by the term TCP. The treatment of tribal concerns and resources in this document up to this point has been exceedingly insufficient and somewhat insulting.	Please answer question	yes	TCPs are a specific type of historic property andhistoric properties are included within cultural resources. We clearly do not intend that that the treatment of tribal cultural concerns in the draft plan to be insulting. We welcome specific suggestions for improving on the sufficiency aspect of this comment.
132	31		NPS		It's interesting that the AMP goals for cultural resources were relabeled Archaeological Sites and TCP's in the figure. The point of using the term "cultural resources" was to acknowledge that many resources thought of as "natural resources" such as fish, birds and plants are considered "cultural" resources by the Tribes. We'd suggest using the original label.			Point well taken. We will change the figure in the final version of the plan.
133	31	Fig. 6	Kubly	BOR	Figure 6 does not acknowledge the important monitoring (and management) of nonnative fish that is being undertaken by the program, outside of that accomplished in the Lees Ferry trout fishery. Also, regarding the trout fishery, existing monitoring, which GCMRC sees as being core in FY 2010, does not adequately address recent questions concerning emigration from the reach and the natal source of trout in Grand Canyon.			Figure 6 (now Figure 7 in the new draft) relates to the AMP goals as defined in the AMP strategic plan and there is no specific goal for non-natives other than in relation to natives or in relation to the Lees Ferry Trout fishery.

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134	32	5-7	Kubly	BOR	How do "metrics" fit into the hierarch of core monitoring measurements in relation to parameters?			Need clarification of this comment in order to respond.
135	34	Table 4	Capron	Western	See comment above.			OK
136	34	Tbl 4@4	Werner	AZ	Frequency of seasonally isn't clear. Does this mean 4x/yr? Or something else?	Revise text for clarity	Y	Yes, it refers to each season. An adjustment to the table has been made.
137	34-37	Table 4:1		Grand Canyon Wildlands Council, Inc.	While emphasis on the aquatic food base has occupied much AMP attention over the past 25 yr, there has yet to be any indication that food is limiting to fish in the CRE. The results of the on-going effort may dramatically shift emphasis of these efforts. 2) There has been not been, to our knowledge, any contribution to the program from springs monitoring. While such findings may be important, the topic has remained loosely described and has not been justified here. Please clarify the rationale, methods, and planned analyses and reports. 3) Recreational impacts on CRE biological resources remain an important, but largely unexplored topic, one the NPS has not addressed, and one that is appropriate to at least mention in this plan.			**No change to document.** Modeling work by Kennedy and others and presented to AMWG and TWG members by C. Walters indicate overharvest potential by consumers which would suggest food limitations, particularly at the LCR. The upcoming PEP in 2011 will be an opportunity to discuss the results and focus of the food base program. The 2007 terrestrial PEP suggested that springs are little affected by river operations and their inclusion in a monitoring program associate with the effects of dam operations on resources should be reconsidered by stakeholders.
138	36	Table 4; 11b	Kurt Dongoske	Pueblo of Zuni	Interesting that TCPs are identified here when the program has no idea what the range, types, and numbers of TCPs are within the scope of this program. Isn't this a bit disingenuous? The document presents no narrative explaining the integration of tribal monitoring programs or even an acknowledgement that a program will have to be cooperatively developed to deal with and manage the information generated by these tribal programs.		Yes	See previous responses to similar comments above. We look forward to working with the Tribes to rectify these concerns.
139	37	Table 4; goal 12	Kurt Dongoske	Pueblo of Zuni	Aspects of goal 12 also seek to integrate the tribes into the Quality Adaptive Management Program in a meaningful and productive manner. Seems to be missing from this whole discussion of Goal 12.	Please include a discussion on how tribes will be meaningfully integrated into this plan	Yes	Yes, Goal 12 portion of the CMP focuses on data management primarily. We are willing to work with the Tribes to determine how to integrate their monitoring interests into the CMP, and we have proposed that this be a desired outcome of the Tribal workshop planned for the fall of 2010.
140	39		NPS		Goal 1: Exploring the feasibility of reintroduction of NATIVE invertebrate assemblages should be a focus of CMP.			We believe this is outside the scope of core monitoring as currently defined by the TWG. This is better dealt with as a research project although some of the core monitoring data could inform the feasibility study.

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141	40	11-27		Grand Canyon Wildlands Council, Inc.	CRE aquatic food base monitoring was initiated in earnest in 1990, and was initially built upon by GCMRC but then abandoned. Nonetheless, our most basic understanding of flow-benthic ecology was derived from those studies and serves as a foundation for the present effort. Appropriate referencing of that early work may help dispel the notion that GCMRC is simply reinventing this particular wheel.			This section will be revised to include a more comprehensive review of previous work to include for example Stevens et al 1994; Shannon and others, 1997 and identify the key elements of those findings. We note that the April 2010 version was not revised as intended.
142	41			Grand Canyon Wildlands Council, Inc.	Methods: All of these approaches have been tried in the past, although they did not receive the support or staff appropriate to accomplish the objectives. The present effort promises to integrate past and present findings to clarify and hopefully develop predictive models for some long-recognized patterns. In addition, the contemporary food base work promises to provide clearcut, long-term monitoring recommendations. We remain concerned that large ecosystem changes occur with individual flow events, and thus the monitoring sites and schedules should remain flexible at least until the results of the present effort have been fully integrated into the overall socioecosystem model.			No changes to the document. There will be a thorough review of the research findings prior to development of a core monitoring proposal. We anticipate that the protocols will incorporate PEP recommendations and consider new information that comes from the ecosystem model, DFC, and other sources.
143	42-48		NPS		Goal 2 I was please to see the inclusion of HBC aggregation monitoring in the plan. The incorporation of humpback chub aggregation monitoring into a long-term monitoring program will be helpful to determine the success of HBC translocation projects that have been implemented (e.g., Shinumo Creek).			Thank you
144	42-48		NPS		There is no mention of ongoing management activities that are being implemented to meet Goal 2. GRCA translocated 300 HBC into Shinumo Creek in 2009, and additional translocations are in planning stages. While the success of these projects remains to be seen, they may contribute directly towards Goal 2. It seems appropriate to at least mention these conservation activities, and how GCMRC's proposed monitoring efforts may provide information to support these efforts.			Agreed. We will mention these management actions and how core monitoring will help evaluate their success
145	42	10-14	Andy Makinster	AZGFD	Clarify whether the 2008 Bio. Opinion states annual assessment of HBC population in the LCR, mainstem CO river, or both	Text reflecting actual literature in 2008 Bio. Opinion	Further clarification of Bio Opinion	This clarification will be provided
146	42	25-26	Andy Makinster	AZGFD	Change 'an estimate of rainbow trout abundance' to 'significant changes in RBT catch rates and distribution'. Researchers have a limited ability to conduct pop. estimate during routine monitoring; instead use long term trends to determine significant changes	Change text	Change text	The change will be incorporated in the revised CMP plan.
147	42	2nd Paragra	NPS		The report mentions that adult humpback chub monitoring data provide information for investigating what factor or			The paragraph should identify that the HBC data in conjunction with other monitoring data

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		ph			factors influence population fluctuations, which is certainly true. However, there is no specific mention of how the data will actually be used to assess factors that influence HBC trends. In fact, the latest HBC status update using the data described in this monitoring proposal (cf. Coggins and Walters 2009) warns the reader that "*…this recruitment time-series must be used with caution in any attempts to develop post-hoc hypotheses concerning management actions or environmental factors that may or may not have influenced recruitment and subsequent adult abundance.*" The environmental or management-related factors that may influence HBC population fluctuations may arguably be the most important assessment that can be completed to achieve Goal 2. The question is, when and how are the data collected, through monitoring proposed here, going to be used to actually answer this question?			(e.g., water temperature data, nonnative catch rates, food base status) can inform stakeholders about factors that contribute to populations fluxes in HBC. This is explained further on p. 52 (April 2010 version) in links to other program elements. Reference will be made to how these data is used in the ecosystem model to identify the factors that may influence HBC population fluctuations.
148	43			Grand Canyon Wildlands Council, Inc.	Background analysis of handling impacts on HBC remain uncompleted. Whatever the cause of this delay, potential conflicts of interest may be too great for GCMRC to conduct such an analysis. Therefore we urge the AMP to have the SA engage qualified, unbiased fisheries biometricians to investigate potential handling impacts on HBC from the Center's fisheries database.			This is a topic that should be brought up during annual work plan discussions among stakeholders and GCMRC.
149	44	32-33	Andy Makinster	AZGFD	Primary species captured in the LCR reach are native FMS, HBC, SPD, and BHS. Primary non-native is still RBT. Catfish species are captured occasionally in this reach	Change text	Change text	Changes will be made to account for the nonnative fish distribution pattern
150	44	39	Andy Makinster	AZGFD	Stone et al. (2007; The Southwestern Naturalist 52(1): 130-137) is a good citation regarding potential sources, impacts, and management concerns of Asian tapeworm	Include citation	Review literature	Additional citations will be made to the CMP where appropriate
151	45-48			Grand Canyon Wildlands Council, Inc.	Insufficient attention has been paid to other native fish population dynamics in the CRE. HBC are not necessarily a good "umbrella" for all native fish species in the system, and certainly are not appropriate as umbrellas for the terrestrial taxa. More attention to other fish species is warranted, as is restoration of HBC range to the full river, and the reintroduction of extirpated fish and other species, as indicated on P. 49.			Mainstem monitoring provides an index of the abundance of other natives fishes besides HBC. Funding is currently insufficient to add additional monitoring of other native and nonnative fish populations
152	46	15-20	Kurt Dongoske	Pueblo of Zuni	GCMRC has been alerted to the importance of the confluence of the LCR/Colorado River to the Pueblo of Zuni. At what point is GCMRC going to "consult" with the Pueblo of Zuni concerning these activities? The need to consult should be recognized in this plan because the out come of that consultation may impact future activities in this location.	Please respond to the question	Yes	DOI agencies have being consulting with the Pueblo of Zuni since September 2009 and we will continue to work with Zuni leadership and other tribal governments that share these concerns to try to find a suitable solution to these concerns.
153	46	5th paragra	NPS		It seems that the GCMRC is considering the PEP recommendations to scale back the number of sampling trips			Any change to the LCR sampling protocol will only be made after a thorough analysis of

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		ph			on the LCR. Specifically, the fall trips may be dropped. Fall sampling may be necessary to determine the status of YOY HBC in the LCR, and possibly assess YOY survival. These data may be important to support efforts to create an off-site refuge population or translocation projects. For example, YOY survival rates and/or abundance may be needed to determine how many YOY HBC can be safely removed from the LCR for management activities.			the data (per the PEP recommendation) and discussion with the TWG
154	47	15-16	Kurt Dongoske	Pueblo of Zuni	The need to continue mechanical removal of non-native fish at this reach is being contested by the Pueblo of Zuni. The Pueblo of Zuni believes that the future that the mechanical removal will continue is uncertain at this time. Does this imply that GCMRC does not seriously consider Zuni's position and that you will continue with this program irrespective of what is decided during consultation with the DOI?	Please respond to the question	Yes	Of course not! GCMRC will abide by whatever direction is endorsed by the Secretary of the Interior
155	47		Capron	Western	Hunt, 2008 not in References.			Reference needs to be added to latest version. Comment inserted in reference section of April 2010 version.
156	47	3	Andy Makinster	AZGFD	Change 'The 2009 PEP for Grand Canyon fish recommended that some of the methods and locations of this sampling be incorporated…' to 'Dependent upon review of the 2009 PEP recommendations, methods and locations of this sampling may be incorporated…'. At this time, review of 2009 PEP recommendations for the lower 1200 meter project and FWS hoop netting is incomplete.	Text reflecting analysis of PEP recommendations is yet to be complete	Change text	Relevant to the PEP recommendations, GCMRC and cooperators will analyze the different data sets as recommended to determine if and how to make the appropriate transitions in sampling methodology.
157	47	middle pars	Capron	Western	The annual spring/summer LCR inflow assessment. The last time this was done was for the concurrent estimate in 200?. I wasn't aware this was an integral monitoring component of the program. Also, is this the work that is slated to include trammel nets? I have serious concerns with adding trammel netting to our monitoring program without understanding why it is critical to do so and what the effects on HBC may be. I hope this will be a consideration in the CMP for goal 2, and that we will discuss these techniques with the upper basin recovery program.			The revision will incorporate outcome of PEP review and recommendations and identify how transitions in sampling methodologies will occur.
158	47	26	Andy Makinster	AZGFD	Change '….in some years' to '…during the latter of two spring mainstem electrofishing trips'. AZGFD has conducted this monitoring regime below Diamond Creek since 2004 during its downstream monitoring program.	Adjust text	Change text	Trammel nets have been deployed for mainstem fish sampling since the 1980s. It is not a new component of monitoring in the mainstem. The approach is under review and includes a multi-gear evaluation effort being conducted in 2010.
159	47	28-30	Andy Makinster	AZGFD	Change to 'A stratified random approach is used to sample individual sites throughout the river between Lees Ferry (RM 0) to Lake Mead. Delete the text stating the project samples aggregations of humpback chub and the data collected by the project supports the ASMR model for humpback chub abundance and trends. Electrofishing conducted during this project is ineffective at capturing humpback chub. While the	Change and delete text	Change and delete text	Text will be revised in subsequent CMP version.

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					project does conduct random sampling in humpback chub aggregations, this species is rarely encountered. The only support for the ASMR model is that the humpback chub that are rarely captured are scanned for the presence of PIT tags and given a PIT tag if absent. Other native species (FMS, BHS) are frequently captured with electrofishing.			
160	47	46	Werner	AZ	Why is it important to survey when the water temp is the highest? Aren't the fish there through the year?	Revise text for clarity	Y	Text will be revised in subsequent CMP version.
161	49	28	Werner	AZ	There is active recruitment in Lake Mead. The latest report is in the lit cited. This sentence should be revised to clarify the scope of the work from the Shortage BiOp. The "potential" question fits the river in the GC but not Lake Mead.	Revise text for clarity	Y	Text will be revised to address this comment.
162	49-50		NPS		Goal 3 – This goal has been ignored for too long by the AMP and GCMRC as reflected in the minimal attention it is given in the CMP. All extirpated species should be listed with CMP needs not just the razorback. In addition, the razorback sucker information is out of date. The NPS, BOR and others working collaboratively have made some progress toward meeting the parts of the shortage BO tasks. That progress should be reflected in the report and at a minimum a plan to outline GCMRC role in future razorback work should be included in CMP.			Currently there are no approved CMINs approved for extirpated species. Once CMINs are agreed to and funding to address the CMINs is identified they will be added to the program.
163	52				Goal 4 Why is there no research goal to determine population estimate of trout and just relative abundance?			The much more expensive population estimate of rainbow trout was considered by the 2009 Protocol Evaluation Panel for Grand Canyon Fishes. The PEP reviewed existing data, including population estimates and relative abundance estimates, and concluded that repeated conduct of a population estimate was an unnecessary expense because the relative abundance estimate (catch per unit effort) tracks so closely with the historic population estimates. The PEP recommended that limited resources of time and money would be much more effectively spent on other aquatic monitoring questions. GCMRC concurs with this conclusion and so does not recommend collecting the large amount of data needed for a rainbow trout population estimate.
164	52	5-7	Andy Makinster	AZGFD	Add 'The GCDAMP desires to maintain a viable, self-sustaining sport fishery for rainbow trout….'	Add text	Add text	Noted Text will be revised in subsequent CMP version.
165	52	7	Andy Makinster	AZGFD	Add '…this fishery is a popular recreational activity for local and visiting anglers that provides a substantial economic benefit for the Marble Canyon business community'.	Add text	Add text	Noted Text will be revised in subsequent CMP version.
166	52	7	Andy Makinster	AZGFD	Add 'Rainbow trout were stocked into the Lees Ferry reach soon after the closing of Glen Canyon Dam. The stocking regime continued until 1998 when it was determined the	Add text	Add text	Noted Text will be revised in subsequent CMP version.

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					majority of recruitment into the adult population was from natural production'.			
167	52	18	Andy Makinster	AZGFD	Add 'Monitoring of the Lees Ferry and downstream COR RBT population…..'.	Add text	Add text	Noted Text will be revised in subsequent CMP version.
168	52	30	Andy Makinster	AZGFD	Add '….include monitoring of nonnatives and that the management goals of the fishery shift away from maintaining a target number of adult fish to managing instead for high angler satisfaction'.	Add text	Add text	Noted Text will be revised in subsequent CMP version.
169	52	30	Andy Makinster	AZGFD	Change 'This recommendation' to 'The first recommendation'	Change text	Change text	Noted Text will be revised in subsequent CMP version.
170	52	31	Andy Makinster	AZGFD	Delete 'due to' and change to 'or through'	Delete and change text	Delete and change text	Noted Text will be revised in subsequent CMP version.
171	52	33	Andy Makinster	AZGFD	Add 'The second recommendation focuses on adjusting creel (angler) interview questions which have been ongoing since the establishment of the fishery. The questions will be designed to elicit responses from the Lees Ferry angling community about the satisfaction of their angling experience.	Add text	Add text	Noted Text will be revised in subsequent CMP version.
172	53	16-18	Kurt Dongoske	Pueblo of Zuni	If the 2009 PEP did not recommend continuation of the young life stage studies, why is GCMRC continuing to fund this work?	Please respond to the question	Yes	PEP recommendations are suggestions for consideration. In order to understand relationships between dam operations HFEs and trout population dynamics GCMRC considered it important to continue this study. This information is important to assessing the effects of the HFE on trout and decisions related to native fish management and control.
173	53	7-9	Andy Makinster	AZGFD	'…call for assessment of the population, including population estimate, growth rate…'. Annual population estimates for the Lees Ferry reach, I believe, was deemed unnecessary due to the cost associated with such an undertaking. Past population estimates correlate very well with monitoring the catch per unit effort index. Thus, the index likely serves as a sound surrogate for the population estimate.	Change text	Change text	Noted
174	54	27-33	Kurt Dongoske	Pueblo of Zuni	How is this monitoring going to help us understand if Lees Ferry RBT are moving downstream to the confluence with the LCR necessitating mechanical removal? Why isn't this discussed under this goal?	Please respond to the questions	Yes	This question is best address through a research study as opposed to core monitoring. Please not that several lines of evidence all suggest that the majority of RBT in the LCR reach originate in Lee Ferry
175	54	bullets	Capron	Western	This section seems to simplify the PEP recommendations to a point that I think misses some important issues. My interpretation of the PEP recommendations is that too much effort has been expended in trout monitoring and that we should reduce that effort and focus primarily on adult numbers and condition. I think this section should be expanded and that the PEP recommendations should be described in more detail and be complete. That type of summary is likely to be completed during the PEP review this winter for Goal 2, but a			Noted Text will be revised in subsequent CMP version.

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					good start could be made here.			
176	54	23	Andy Makinster	AZGFD	Change to 'For future years, the sampling of the Lees Ferry reach should continue to monitor all species present…'. Current monitoring attempts successfully to monitor all species present in the reach (FMS, rare occasions of nonnatives such as SMB, WAL). Its not like we've been selectively sampling for RBT only; that species is just the most dominant one in the reach.	Clarify text	Clarify text	Noted Text will be revised in subsequent CMP version.
177	54	25-29	Andy Makinster	AZGFD	Monitoring of the Lees Ferry reach will not continue downstream of the mouth of the Paria River. First, conductivity issues associated with the mouth of the Paria River will prohibit effectively sampling with electrofishing. Second, the area surrounding the mouth of the Paria River is logistically unfeasible; it's a shallow area in the middle of a mild rapid. Third, areas where it is feasible to sample with electrofishing are included in the random sampling design of the downstream electrofishing monitoring program.	Delete text	Delete text	Noted Text will be revised in subsequent CMP version.
178	55	32-34	Kurt Dongoske	Pueblo of Zuni	Thanks for recognizing the Tribal values associated with this place, but will it be a consideration in the development of a monitoring protocol?	Please respond to the question	Yes	Yes.
179	55			Grand Canyon Wildlands Council, Inc.	The AMP has pursued detailed studies of Kanab ambersnail genetics and mortality, which the AMP has been informed will result in synonym of KAS with Niobrara ambersnail. However, no recent progress has been reported on publication of those results, and further policy attention to KAS has stalled. The emphasis on KAS in this program is likely to dissipate after publication of those findings. In keeping with AMP Goal 12, we urge GCMRC to move forward swiftly with peer-reviewed publication of study results to prevent even more backlogs of unpublished information from slowing program progress.			We will determine the status of the publication and report to the TWG.
180	57	11-13	Kurt Dongoske	Pueblo of Zuni	Perhaps the GCDAMP should leave the monitoring of the ambersnail to the NPS.		No	Currently it is done by AGFD with logistic assistance provided by NPS. Complete—transfer of this to NPS is an option that could be considered.
181	57	last par.	Capron	Western	I thought this was an excellent section with good questions about how to integrate KAS into our program considering the potential change in listing status.			Acknowledged
182	58	22-24	Kurt Dongoske	Pueblo of Zuni	Where is the intention of integrating Traditional Ecological Knowledge (TEK) from the tribes that can inform on these plant communities? Is GCMRC acknowledging that TEK is important information (i.e., data), but choosing to ignore its importance to this plan?	Please respond to the question	yes	Incorporating TEK into monitoring requires assistance from the tribes and may be best facilitated through the planned tribal monitoring workshop

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183	58	24-27	Kurt Dongoske	Pueblo of Zuni	How does campable area fit into this goal?	Please respond to the question	Yes	Vegetation growth/expansion has a direct influence on amount of campable area. This is covered under Goal 9 rather than Gaol 6.
184	58				Plan should include some monitoring strategy (working with the NPS) for tamarick beetle (*diorhabda elongate)* which could have profound impact upon the riparian vegetation community			GCMRC and NPS are working on coordination regarding the beetle. The impact will potentially affect birds as well as vegetation.
185	59	17-18	Kurt Dongoske	Pueblo of Zuni	GCMRC is acknowledging the importance of the native terrestrial environment to Native Americans, but that importance and concerns are not directly addressed in this monitoring proposal. Does GCMRC really know what the tribe(s) want monitored or what their resource concerns are?	Please respond to the question	Yes	Probably not in as much detail as tribes may wish we did, but this is not for lack of asking. We hope the tribes will be willing to share this information with us in the future so we can be more responsive to their concerns.
186	59	bottom		Grand Canyon Wildlands Council, Inc.	P. 59: bottom: The TEM program involves an enormously complex study design that may, over the next century, provide something worthy of management concern, but is neither real-time nor habitat-related. Virtually no peer-reviewed studies of dam influences on riparian vegetation have emerged from this program. We feel that a realistic examination of the terrestrial vegetation field program should be conducted, taking into consideration the recommendations of the vegetation monitoring program PEP review panel, and focusing on development of a predictive model relating vegetation responses to flow.			Agreed. A response to the PEP recommendations is in progress and the CMP reflects a revision of TEM approach.
187	59-60	12-22		Grand Canyon Wildlands Council, Inc.	Because of study design issues and poor data collection, previous terrestrial invertebrate and avian monitoring and research has generally failed to demonstrate any real difference between lower and upper riparian zones. Also, previous invertebrate studies have largely failed to meet NPS database management requirements, and specimens from that program appear to have disappeared without databasing into a host of collections around the U.S. The results of those studies have not been published in the peer-reviewed literature, a shortcoming that limits the credibility of the studies. The text on P. 60 is essentially wrong, vastly oversimplifying variability among invertebrate life histories and habitat requirements, and it fails to even mention rare or endemic river corridor invertebrate taxa that may eventually play a much larger role in river management. The topic of invertebrate monitoring requires rethinking before it is posed here as a long-term monitoring topic.			The results of a arthropod monitoring feasibility pilot study conducted in Glen Canyon will be presented to the TWG in 2010 and incorporated into CM plans.
188	60-61			Grand Canyon Wildlands Council, Inc.	Stage-vegetation relationships are, after 12 yr, still preliminary and do not yet appear to be useful for riparian succession modeling. Data collection around such a model should be the focus of the terrestrial vegetation monitoring program; however, the model must be developed prior to establishing			The approach described is to change and include a stratified sample that incorporates geomorphic features as well as stage elevation. These data in association with landscape change data can be used in predictive

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					vegetation monitoring criteria. The agglomerative methods on p. 61 are only useful for description, not for predictive modeling and at this point we are left with anecdotal rather than predictive capability for this important component of the program. We consider the riparian vegetation monitoring protocols to be premature, and the first focus should be on modeling needs.			modeling. The monitoring information would feed into predictive modeling for calibration and validation.
189	61	39-43	Kurt Dongoske	Pueblo of Zuni	Where is the integration of tribal monitoring into this new program of terrestrial monitoring?	Please respond	Yes	We need assistance from the tribes (perhaps through the tribal liason) to help us figure out how integration can occur and identifying those data that GCMRC collects can be used by the tribes for their interpretations and presentation to the AMP stakeholders.
190	64 71	24 4-10		Grand Canyon Wildlands Council, Inc.	P. 64, L 24: Misplaced indent. The Goal 7 flow and WQ section looks good. P. 71, L. 4-10: Monitoring sandbars every 4 yr does not seem sufficiently frequent. A 1-3 yr schedule would be more appropriate, with a subset of bars surveyed each year.			We're attempting to balance the need to maintain the time series with cost and needed precision. The sandbar monitoring data show gradual declines in the absence of HFE's. The trend is not affected by a change from annual to biennial (every 2 yr) surveys. So, the current plan is to monitor sandbar study sites (NAU sites) every 2 years. Supplemental monitoring may occur around HFE's or other events. Every 4 years is the systemwide monitoring from air photo overflights. More frequent overflights is not feasible (logistically or financially). Continuous monitoring of 20 to 35 sites will be done by remote camera (this was not in draft CMP and has been added).
191	68	26; protecti on of archaeo logical site	Kurt Dongoske	Pueblo of Zuni	Don't believe that this has been conclusively scientifically confirmed. I thought GCMRC in conjunction with the USGS was still researching whether this was in fact a by-product of sandbars. If it is a by-product of sandbars it will only help a very few number of archaeological sites and to broad brush its preservation capabilities is a bit of hyperbole.		No	Opinion noted.
192	70		NPS		NPS support the addition of system-wide sediment inventory using orthophotos to suite of excellent legacy sediment monitoring protocols. Continued integration of the various elements of the sediment monitoring and analysis of sometimes conflicting information from the various sediment monitoring tools still needs to be addressed by GCMRC and should be mentioned in the CMP as a goal for the next few years to complete.			Good comment and we agree that better integration and synthesis between the monitoring tools is essential. Rather than change the draft CMP, I would rather attempt to address this by highlighting these efforts in annual work plans
193	71	16	Werner	AZ	Should the word be aggradation rather than aggregation?	Check context/word usage	Y	Revised

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194	72		NPS		Goal 9 – the text recognizes the NPS role to some degree but fails to recognize the integrated nature of the recreational work proposed. The NPS, as land manager, is intimately involved in assessing affects to recreational experience. The campsite atlas, for example, is a cooperative venture between NPS and GCMRC yet the text downplays NPS integration (while highlighting AZGFD involvement in the trout work). Other than the text stating that the program will compliment the NPS/CRMP program, there is nothing specific to detail how these programs will be coordinated. It would be useful to work with NPS recreation specialists on a more robust discussion on how these programs will work together. GCMRC should be relying on NPS to provide data on the downstream recreational values given that these are tied to NPS mission goals.			GCMRC has repeatedly reached out to the NPS to coordinate and integrate our respective monitoring programs. GCMRC welcomes additional opportunities in the future to work collaboratively with NPS subject experts in developing and implementing mutually useful monitoring programs.
195	73	3-7	Kurt Dongoske	Pueblo of Zuni	How is being out of sight and sound of other parties a function of dam operations?		No	Dam ops affect size, numbers and distribution of sand bars used for camping, which in turn affects distribution of people and perceptions of crowding.
196	73	middle	Capron	Western	First place a CMIN was incorporated into the CMP for a goal, Goal 9.			Yes.
197	73	14-16	Kurt Dongoske	Pueblo of Zuni	Camp crowding, safety, and types and intensity of human impacts seem to be marginally related to dam operations and more directly affected by the NPS permitting process and the resultant over-crowding in a "wilderness" setting.		No	We disagree (in part). We agree that NPS permitting process is definitely an important part of the equation though.
198	75	31-34	Kurt Dongoske	Pueblo of Zuni	Monitoring of the recreational experience should be left largely to the NPS and the monitoring program of GCMRC should be a reflection of a program that allows the NPS to do the majority of the monitoring and evaluation.		no	Opinion noted. We have no objection to working cooperatively with NPS on this project.
199	76	9-10	Kurt Dongoske	Pueblo of Zuni	Shouldn't this be the primary responsibility of the NPS, not the GCDAMP? I find it curious that so much energy is being put into recreationists' enjoyment satisfaction and the Native American communities are ostensibly absent from this plan and are by and large disenfranchised from GCMRC's proposed core monitoring plan.	Please respond	yes	We hear the opinion but disagree with the assessment that Native American communities are disenfranchised in any way.
200	76		NPS		In the methods section, it would be useful to discuss how the vegetation evaluation will be linked to the vegetation mapping and monitoring described in goal 6 and how this information will be integrated into NPS work.			OK, we have revised text to be more clear about this.
201	76-77			Grand Canyon Wildlands Council, Inc.	How were the elements recommended by the PEP selected. Such decisions should be based on conceptual or empirical models, which should then drive monitoring data compilation. For example, we need a simple sandbar recreational use model, but that does not appear to have been attempted thus far. Also, it seems to us that monitoring river running safety is			The PEP panel prepared the conceptual model that is illustrated on p. 74. It ties back to the CMINS for Goal 9, which included the elements described.

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					an obviously important task, one that should be undertaken by the NPS; however, being familiar with past information on the topic, we have yet to see a report on this topic the updates the findings of Myers et al. (1999). In this arena, GCMRC should work more closely with the NPS.			
202		Goal 10	Palmer	Wapa	This section will likely need to be rewritten following the Economic Workshop in December, 2009			We will update based on the Socio economic panel report as appropriate
203	78-80			Grand Canyon Wildlands Council, Inc.	Please proceed with developing a power marketing core project – it is an important resource for the AMP to keep track of and report upon. However, it is premature to include monitoring methods and plans in the CMP.			Noted.
204	General	Goal 11	Palmer	Wapa	This section needs to be rewritten to distinguish goal 11 from the efforts to complete NHPA Section 106 compliance on the federal action of GCD dam operations from the longer-term monitoring of cultural sites authorized under the GCPA.	Add clarifying information to this section		Purpose of Goal 11 monitoring is to evaluate effects of dam ops on cultural sites; we believe this information is directly relevant to NHPA and will help inform NHPA compliance requirements for assessing dam effects on historic properties.
205	81	12-13	Kurt Dongoske	Pueblo of Zuni	Not to mention information and data on past human behavior and lifeways.		no	
206	81+		NPS	GRCA	Goal 11: This goal refers to cultural resources in the broadest terminology, yet the monitoring program is focused on archaeological properties and physical changes, ignoring the greater purpose articulated in the goal. The issue of erosion is significant and both BOR and NPS are implementing a treatment plan specifically related to this issue. Erosion as a result of Glen Canyon Dam is a generally accepted principal. The 2000 PEP "panel concluded that distinguishing natural erosion from dam caused erosion is a task that is probably "not cost effective." The PEP continued by noting, "Glen Canyon Dam has made it (the sedimentary system of the Canyon) increasingly sediment-starved, and thus erosion rates must be increasing at some scale and dam operations must contribute to the spatial and temporal variability in rates of erosion of deposits along the river corridor (Doelle 2000, pg. 39). It seems that trying to develop core monitoring relative to this topic is not cost effective and offers little useful information for active management of the resources. Information on rates of erosion is interesting and are less critical for the land managers given the limited resources available to implement the approved treatment plan. We believe the core program could focus on elements not addressed in other programs such as monitoring protocols for non-archaeological properties.			We disagree that the larger goal of cultural resources is being ignored, but the focus first and foremost is on the specific types of resources that all federal agencies have a legal mandate to consider. The PEP made many recommendations about various ways to improve the cultural program. PEP recommendations concerning the PA monitoring program, and the need to revise the previous monitoring approach, were scattered throughout the report. Recommendations were reported under several different sub-topics in the PEP report, and there is not total consistency between all of them. However, the primary recommendations regarding monitoring were as follows: "Recommendation #8: Redefine the Cultural Resource Monitoring Programs" "The PEP recommends that the monitoring program be reoriented to contribute information to: 1) prioritize historic properties for treatment decisions and 2) evaluate the effectiveness of treatment options such as check dams or restriction of access to sites. In the future, monitoring should be used in a

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					The 2000 PEP offered 3 primary recommendations supported by a number of sub-elements. The CMP does not fully relay the recommendations of the PEP relative to the existing NPS monitoring program. The 4 parts were: 1. prioritize properties for treatment; 2. evaluate effectiveness of treatments; 3. document progressive erosion where treatment has not yet been implemented but is planned; 4. ensure visitor effects remain below a threshold that causes long-term damage or loss of integrity. The first and second recommendation have been implemented (it would be appropriate to state that this has been completed) and on-going monitoring efforts are the mechanism for documenting progressive erosion where treatment has yet to be implement. The proposed core program does not practically address the recommendations even though the text suggests that GCMRC is simply following through on the recommendations made in 2000. The reviewed plan currently identifies different variables to collect than has been detailed in proposal requests. This suggests that the monitoring of archeological sites continues to be an experimental process where equipment is being tested and new variables get collected. This also suggests that the Chapter 2 table 2 programmatic approach is not being followed for this resource. This is also evident in the methods section where the first sentence of the paragraph is "Potential monitoring protocols include". It would seem that the core monitoring should be refocused to address true needs, not ones that have been addressed or are parts of other on-going programs.			much more focused and quantitative manner to document progressive erosion at sites where preservation measures have not yet been implemented, to assess the effectiveness of particular protection measures, and to ensure that the effects of visitor activities remain below a threshold that causes long-term damage. " In another section of the PEP report, reviewers had this to say about the previous and future monitoring program: "A great deal of monitoring seems to be taking place, but it is not part of a unified plan. Neither is the monitoring leading logically to the development of the HPP or to incorporation into Adaptive Management decisions. Monitoring (a tactic) has been substituted for management (a strategy). This has turned the process on its head and is counterproductive. "Recommendations: □ NPS, BOR, and GCMRC, in consultation with Tribes, should develop a unified long-term monitoring plan (tactics) for archaeological sites and TCP elements. This plan should be a supporting element of the HPP (a series of interlinked strategies) and reflect the responsibilities and authorities of the parties under the PA, the ROD, and the GCPA. □ Monitoring should have two purposes: 1) Once the HPP is in place, monitoring should be designed to permit NPS to assess the effectiveness of long-term management strategies established in the HPP. 2) Monitoring should be used by BOR to evaluate the effects of different flow regimes on archaeological sites, native plants, and other resources directly affected by changing water levels and gain and loss of sediment. In other words, monitoring should be designed and organized to serve as the basis for periodic quantitative evaluations of effect of dam operations, effectiveness of erosion

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								control methods, and development of treatment plans. Frequency of monitoring should be based on a geomorphological predictive model, specific tribal concerns, degree and type of previous impacts, likelihood of visitation, location relative to high- flow events, etc. Previously collected monitoring data should be evaluated to determine its usefulness as baseline information for the monitoring plan in the HPP. The data base of eligible archaeological sites and place-specific elements of the traditional cultural landscape should include quantifiable information on all types of effects identified through monitoring by NPS, Tribes, and others." In another part of the report, the following recommendations were also provided: "Archaeological Sites Monitoring: The ongoing monitoring of archaeological sites is providing longitudinal information on the condition of the sites, however, the interaction between site condition and the impacting agents is not being fully recorded or evaluated. In other words, it is also necessary to quantitatively monitor the impacts themselves, as well as the cultural context. Field reviews of a few sites currently being monitored under this strategy revealed that little information is being collected on physical processes occurring within the site boundaries. For example, rates of erosion on individual gullies/arroyos and other forms of erosion are not being quantified. In order to evaluate the actual loss of archaeological data over a span of time, this information is critical. In turn, once the rate of impacts and associated pending loss of archaeological data are known, it is possible to prioritize endangered resources and to program necessary mitigative activities." "Given the responsibility of the GCMRC for long-term monitoring and for ecosystem

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								modeling, it seems essential and highly appropriate that the GCMRC take on the role as the centralized data repository for cultural resource information. Clearly NPS needs access to these data as well." (All of the above text is quoted verbatim from the PEP report. There were several additional recommendations concerning how to redesign monitoring besides these.)
207	82	1-6	Kurt Dongoske	Pueblo of Zuni	How does GCMRC propose to incorporate this information, if shared by the Tribes, into their overall evaluation of the health of the CRE? Additionally, what steps have been taken by GCMRC to work with tribes to develop an information management system that appropriately deals with tribal information that is considered sensitive?	Please respond	yes	It would be helpful if Tribes would define DFCs that reflect their perceptions of what constitutes "ecosystem health" GCMRC treats all information provided by the Tribes as sensitive and we do not distribute it unless the Tribes make it clear that it is OK to do so. We suggest that this also be a desired outcome of the 2010 tribal monitoring workshop
208	82	19-22	Kurt Dongoske	Pueblo of Zuni	Still a hypothesis that GCMRC is testing; stop incorporating the presentation of hypotheses as proven scientific fact.		no	
209	82	3rd paragr	Barger	Wapa	I disagree there is a strong linkage, especially since the sites tend to be above 80,000cfs. Rather, there may be a linkage, but since most sites are actually above 95k, it is unlikely there is an effect. Also, in the last sentence, we really need sediments up to the sites, again, at least above 80k.			Opinion noted. (Current information suggests otherwise.)
210	82-83	Goals 9 & 10		Ted Kowalski	Goals 9 and 10 do not seem to be well flushed out in my opinion. Additional description of the survey work that would be conducted for goal 9 could be helpful. Rather than photos of 45 popular campsite sonly, (page 82, line 12) perhaps the annual documentations should be more thorough (focusing on the top 90 campsites perhaps). Page 83, line 9, the camping atlas makes a lot of sense.			Taking photos of 45 sites is just one element of the program. We also conduct repeat surveys of campable area (now proposed to be done every other year) and are exploring use of remote sensing to detect change on a system wide basis in the future. We have modified this section to make sure that the full scope is clear.
211	83	13-20	Kurt Dongoske	Pueblo of Zuni	This is one interpretation of these past events. Another interpretation would be that the Terrestrial Ecosystem Monitoring program was established without tribal input and then the tribes were asked to fit their monitoring needs within a pre-designed western science paradigm setting the tribal participation up for failure. Tribes went to the BOR for funding their monitoring programs because it became very apparent that GCMRC was not interested in collaborating with tribes as this current document demonstrates.		no	We respectfully disagree with this version of the program's history.
212	83	34-38	Kurt Dongoske	Pueblo of Zuni	Please include the citation for this review panels report.		Yes	OK, done.

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213	84	9-12	Kurt Dongoske	Pueblo of Zuni	I didn't think LiDAR could detect artifact movement! In fact, the biggest criticism of LiDAR is that it cannot detect or evaluate changes to archaeological surface features. This program continues to be narrowly focused on what is currently happening to the surface of archaeological sites when we should be more interested in understanding the past hydrologic behavior of the river that has preserved some sites and presumably scoured others out of existence. We need a more holistic view of how and why some archaeological sites continue to remain rather than focusing solely on current natural processes. Wind and sand are not directly tied to dam operations.		No	This comment seems to reflect a lack of understanding about the technology and how it can be used to inform the AMP about changes occurring at cultural sites. Lidar with photo-draping capability allows us to link a visual image of the site surface (along with its various features and artifacts) to direct measurements of those points and features. We respectfully disagree with the notion that sand is not tied to dam operations, or that wind working in conjunction with the available sand supply is not an important process to understand in order to get at that "more holistic" view we are seeking to understand.
214	84	18-21	Kurt Dongoske	Pueblo of Zuni	This monitoring program or the R&D program for monitoring does not address TCPs. In fact, one seriously doubts whether GCMRC even knows where or what the TCPs are that the tribes consider important. Had GCMRC known about and was sensitive to tribal issues, then the recent letter from the Zuni Governor about the mechanical removal of trout at the confluence would not have needed to have been written or sent.		No	So far, Zuni has not shared this information with GCMRC, except at a very generic level. Are the Tribes willing to share information about their TCPs with the program? With regard to the last comment,we disagree that GCMRC was not sensitive to Zuni concerns. GCMRC solicited input from all the tribes about their concerns with mechanical removal as we were in the process of preparing the FY09 work plan. Initially, prior to Mr. Dongoske's employment by Zuni, we were told that if we continued to mitigate the effects of mechanical removal through putting trout remains to beneficial use, as had been done in the past, we were being responsive to tribal concerns. Since then, we have learned otherwise and we have being working with Zuni and the other tribes in a good faith effort to address their concerns with regards to this and all other issues of tribal concern. This negative characterization of GCMRC in unwarranted, untrue and unhelpful.
215	84	27-29	Kurt Dongoske	Pueblo of Zuni	This appears to be merely lip service to the tribes by GCMRC. I don't see any effort by GCMRC to pro-actively work with the tribes to develop a monitoring and assessment program that incorporates the results of tribal monitoring into the GCMRC system of resource condition assessment and health of the ecosystem.		No	We disagree with this statement. GCMRC has repeatedly invited the tribes to meet and discuss their issues and concerns.
216	84			Grand Canyon Wildlands Council, Inc.	Please proceed with developing the cultural resource monitoring program – these are critical resources for many AMP stakeholders and need to be monitored in a scientifically credible fashion. However, it is premature to include			OK.

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					monitoring methods and plans in the CMP.			
217	84	5	Werner	AZ	Why stop at Diamond Cr?	Clarify rationale	Y	Noted.
218	84-89			Grand Canyon Wildlands Council, Inc.	Pp. 84-89: This section should be about how to maintain the long-term scientific integrity of the monitoring program, and how to keep it functioning effectively. As it is written, it is a make-work wish list for more sophistical and costly remote sensing technology, not about maintaining and improving scientific integrity. The following section on the structure of GCMRC should be merged with this section, rather than oddly subdividing it up. This technology wish list presented here should be reduced to one paragraph and presented in the context of advocating for good science by improving technology. In the rewrite, provide a description of all of the original ROD language describing GCMRC and its role. That should be followed by a section on how science and scientific review is conducted for the AMP, and what the challenges and successes have been. Include information on how results on each major undertaking are used to inform the program and the scientific community and the public. Reference to the peer-reviewed and gray literature produced by the program for each AMP Goal should be developed, to better evaluate scientific progress and efficiency in each. The theme of planned flooding can potentially be used as a theme, but please include an explanation of the timing and consequences of GCMRC's delay in evaluation of the Year 2000 flow experiment, and how that delay has affected program assumptions and directions. The description of the present staffing plan should include how many individuals are employed in what capacity, why some positions are or are not filled, and more detail on how well the program involves outside collaborators, and how many students are supported by the program. A justification should be provided about how the present staffing varies from the original concept for GCMRC in the ROD. The recent recommendation by AMWG to provide qualified stakeholders with first option on surplused equipment also should be mentioned as a benefit to the program.			Remote sensing data is currently being used by several research and monitoring projects. A few research examples of include: selection of net locations in the LCR, site selection for NSE, river maps that provide accurate documentation of study site locations; monitoring examples are: community and gross change in vegetated area, sandbar abundance and geomorphology, campsites, and archaeological sites. From an archival perspective, periodic corridor-wide remotely sensed data provide irreplaceable, historical records of the system, which allow historical analyses for unforeseen research and monitoring issues. Remote sensing is applicable to goals 6, 8, 9, 11, and 12. The additional discussion of ROD, peer-reviewed and gray literature, science and scientific review, planned floods, staffing, outside collaboration, and surplus may best be addressed in this goal or elsewhere throughout the document – GCMP ADHOC may be able to help here.
219	86	10	Kurt Dongoske	Pueblo of Zuni	Nice to see the use of the word "may" in relationship to windblown sand protecting archaeological sites. The rest of the document seems to imply the term "will" protect archaeological sites.		No	
220	86	29-31	Kurt Dongoske	Pueblo of Zuni	Cultural resources are a broader category than archaeological sites, but this document by and large focuses only on		No	

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					archaeological sites and merely gives lip service to the other places and resources that comprise the category of cultural resources; especially Native American resources and places of concern.			
221	89	4-13	Kurt Dongoske	Pueblo of Zuni	Problem I see with LiDar is that it cannot interpret or evaluate surface archaeological features. therefore, the utility in detecting impacts to archaeological sites and their information content is minimal. Based on the high cost of doing LiDAR, I don't believe that the limited information gained is worth the cost.		No	
222	90		??	??	This is an area that GCMRC has seemed to let slip over the last few years. In fact, the lack of access to data and the lack of website updates indicate that DASA is a very low priority of the GCMRC. Given the current state of its DASA program and its outreach efforts, there are many changes needed for this section including: 1. Concrete analysis and plan to update website 2. Concrete plan to get better access to all GCMRC datasets 3. Plan to integrate legacy reports with current reports in accessible on line search and downloadable format 4. Plan to make GIS data available for public download. 5. What happened to the legacy data scanning project (photos, old reports, etc.)? What is the plan to get that back on track? 6. Plan to make datasets of general interest including hydrology, water chemistries, sediment, fish, etc. more easily available for download. Even summary statistics from some of these areas would be better than what stakeholders have access to now. 7. Reporting of findings from GCMRC staff and its cooperators has been unacceptably slow. Plan to remedy this situation should be outlined in this section. Assume overhaul of peer review process is needed to speed review and reporting process.			This response reflects the status on September 15, 2010 of the website: http://www.gcmrc.gov. A searchable document database, developed by SBSC IT, is currently available on the new website. http://www.gcmrc.gov/publications/publications_default.aspx Due to copyright issues and reduced funding not all legacy reports are available. DASA maintains a section of the GCMRC website where published tabular and spatial datasets, reports, and metadata can be downloaded. http://www.gcmrc.gov/dasa Fundamental Science Practice approved tabular datasets are available and are managed by the Data Acquisition and Management System (DAMS), presented during the January 2010 TWG meeting. Current datasets served include Water discharge, temperature, and specific conductance; Acoustic Sediment, Lake Powell chemical data, major ions, nutrients, and profiles. Spatial datasets are served with ARC GIS Server. Spatial data is currently unavailable for download through the new GCMRC website. The IT staff of SBSC is working on providing internet connectivity for ARC GIS Server. GIS staff are designing new methods for public data availability. Reduced DASA funding has resulted in a reduced effort for aerial photo scanning

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								DASA and GCMRC are currently finalizing a data sharing MOU that will help facilitate sharing of provisional datasets between GCDAMP agencies. Additional datasets are being prepared for online availability through DASA's DAMS software. Improving our performance on reporting is a high priority for GCMRC. We would be glad to discuss this issue and potential solutions in more detail with the GCMP ADHOC.
223	90-99			Grand Canyon Wildlands Council, Inc.	The information management plan is outstanding and is needed before a long-term information management program or a core monitoring program can be implemented. When will that plan be completed? GCMRC has been collecting data for more than a decade and sits on the previous decade of largely uncompiled information. Each day the task of integrating those data grows more difficult. Please expedite the development and completion of this plan.			We are aware of the growing amount of un-integrated legacy monitoring data, and are implementing several solutions to help deal with this issue: DASA has implemented a metadata development plan and is currently working to describe and archive legacy datasets using FGDC metadata. The purpose of DASA's recently developed Data Acquisition and Management System (DAMS) is to archive, compile, and integrate current, legacy, and future monitoring data, and make that data available on the GCMRC website. For example, legacy Kanab Ambersnail data has been imported into DAMS and described with FGDC metadata.
224	100		Capron	Western	Chapter 5: I think this chapter would have worked better earlier in the document. I'm preparing a revised outline that illustrates a different approach to the topic.			This section has been moved forward in latest version of the document and is now incorporated within the new Chapter 3.
225	100		Capron	Western	Ch 5: This chapter is lacking a discussion of other programs like the LTER sites.			A good point. The GCMRC will work with the GCMP ad hoc to identify how the additional information related to LTER sites might be incorporated into chapter 5 in future revisions
226	100			Grand Canyon Wildlands Council, Inc.	How much of the USGS's Southwestern Research Center and staff is supported by the AMP. Are long-absent USGS staff being supported by the AMP? On lines 7-10 a quote is given about the quality of information; however, the EIS and ROD also indicate that GCMRC is to be a small, efficient body, which does not appear to be the present condition of that office. See comments for Pp. 84-89 (above).			The GCMRC's AMP derived budget partially contributes to supporting IT and some of the administrative SBSC positions that provide travel, computer and budget assistance to the GCMRC Chief and staff needed to implement the annual work plan and provide science support to the GCDAMP. These costs are clearly defined in the biennial work plan that

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								is reviewed by the TWG and AMWG. Not certain what is meant by "long absent USGS staff" being supported by the AMP? We acknowledge that GCMRC has evolved into a larger operation than may have been originally envisioned in the EIS. However, at the time, the EIS did not specify that USGS would lead the science effort—this was a decision of the Secretary in 2000. Today, much of the science work under the AMP is carried out by cooperating agencies/universities and contractors with collaborative involvement and oversight by GCMRC. We believe that GCMRC is appropriately sized based on the its science mission and program management responsibilities, our involvement in overseeing and conducting and publishing results of research and monitoring activities, and the data management, analysis and logistical support needs of the program. In general, we believe that the quality of science support currently provided to the AMP would diminish if GCMRC consisted of a small core staff of administrators with little direct involvement in the research and monitoring work.
227	101	4-6	Kurt Dongoske	Pueblo of Zuni	Please define the process for outside monitoring data being integrated into this core monitoring plan. No mention of that effort until here.		Yes	Outside monitoring data has and will continue to be utilized by GCMRC to the extent those data are relevant to the information needs of the program and are scientifically defensible. For example stream gaging data at Lees Ferry, Paria River and Grand Canyon near Phantom Ranch were historically collected prior to the GCMRC and are continued now to support the GCDAMP, as well as discharge from GCD. In addition, water temperature data from the dam, water quality data for Lake Powell, climate data are other examples of outside monitoring data that are utilized by GCMRC and the program
228	101	34-36	Kurt Dongoske	Pueblo of Zuni	Are these positions in addition to your program managers?	Please respond	Yes	Section Comment is Related to: "**Core Monitoring Program Management** – 4.0 Full-Time Equivalent (FTE) permanent positions at the (Government Service) GS-11 to 15 range (senior ecologist, science chief, biology, physical and modeling, sociocultural, data management, logistics program manager)"

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								GCMRC Response: These are all administrative (Chief) and program management positions that currently exist in the GCMRC.
229	101	43-44	Kurt Dongoske	Pueblo of Zuni	Interesting that there are no archaeologists identified as science specific specialists for the monitoring of sociocultural science; especially after the majority of the program is devoted to providing information on the status of archaeological sites. Seems incongruent.		No	GCMRC's sociocultural program manager is a fully qualified archaeologist and her time is accounted for in the monitoring budget.
230	101		Capron	Western	Staffing: I can't follow the staffing requirements which are on this page and follows to the next section with a conclusion of 26 FTEs needed in 2015. This certainly seems like a lot of FTEs especially given our recognition of recent funding limitations. It is hard to tell how much time these FTEs will give to CM vs. other operations. I'm concerned that a growing number of FTEs will lead to less available funding for science/research, and it is difficult to evaluate these tradeoffs with this limited information. It would be helpful if the staffing requests were related to the GCMRC org. chart.			The GCMRC admits that this information is somewhat confusing, but only intended that the 26 FTE total was a first-cut attempt to identify the total cumulative staff requirements needed to maintain core monitoring capabilities based on the size and scope of the current or anticipated monitoring projects. We expect thesse estimates to be refined based on TWG and AMWG review of indivial core monitoring projects (step 4 of the procress) The GCMRC will work with the TWG and/or the GCMP ad hoc group to develop a new organizational chart for staff supporting core monitoring – one that will identify positions that are either totally or partially devoted to core monitoring activities annually.
231	101	16		Grand Canyon Wildlands Council, Inc.	Periodic reviews of GCMRC's productivity and competence also should be conducted, either by the SA or by external reviewers or auditors.			We would support a constructive review of our program. We also think other elements of the AMP should be subjected to a similar review
232	102	10	Werner	AZ	This paragraph doesn't fit well under the Information Outreach heading. Check paragraph structure, flow from previous page.	Check	Y	Agreed. This paragraph should have been placed under the heading above "GCMRC Staffing Requirements"
233	102	16	Werner	AZ	If the specifics are not known for several resource areas can the FTEs/budget be predicted now?	Explain	Y	Generally, these estimates based on the staff, cooperators, and budgets that have been conduct monitoring under approved workplans – including the FY 2010 plan implemented by the GCMRC. As included in Chapter 5, these are only intended to be general estimates to support long term staff and budget planning. They are subject to revision in proposed and agreed to "Step 4" process of developing the GCMP.

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234	102-103		Capron	Western	CMP costs: The first paragraph ends with a total cost of about $6 million ($6.4 million on page 104) for the CMP and GCMRC estimates this as 60% of the total AMP budget. However, I think a better representation of this is the percentage of the budget allocated to GCMRC, which works out to about 75%. It is not likely that the portion of the budget allocated to BOR administration of the program will be used to fund CMP activities, so I think 75% is a more accurate description of the relative cost. This leaves about $2.3 million for other monitoring programs and research related activities. Table 6 is very helpful in figuring out costs related to programs and funding. It would be really helpful to see this combined with the full program for each goal, in order to see what is not proposed as CM. Plus, I don't think these numbers are included with the discussion of each goal, at a minimum a reference should be included under each goal to this table. At this point in time, I think the AMP needs to decide if this is the right mix of CM and other science. From this CMP I don't think we have a lot of tools to do that, other than a gut feeling that this may be more than we want to spend on long term monitoring (given current funding constraints). This brings up the following questions: 1. What is our long term need for funding for experimental programs and short-term monitoring? 2. What are the DFCs and MOs such that we can accurately determine which of the core monitoring proposals meet our needs, or perhaps is beyond our needs? 3. What are the tradeoffs between cost and loss of precision in our data collection (i.e., could we sample on a biennial schedule instead of annual and still reach the same conclusions and have roughly the same power in the data?). 4. There is a trade-off between core monitoring to support nearly all of the CMINs and cost – my sense is that GCMRC is preparing a CMP that covers many of our needs to respond to the vast majority of the CMINs (although I can't follow that here, this is just my assumption), how do we move from this point to either accept that strategy or refine our CM needs in order to reduce the budget to something less than proposed (e.g., something on the order of 40-50% of the GCMRC budget)?			One of the purposes to the CMP is to facilitate long term budget planning for monitoring, research, experimentation, compliance and management actions and program management. GCMRC does not believe tthat all of the needs can not be met within the capped AMP power revenues unless there are major reductions in the science program. We believe that major reduction in core monitoring will significantly impact the adaptive management process by effecting the ability of the program to assess resources status and trend, measure progress toward achieving AMP goals/DFCs and evaluating the effectiveness of management actions. As such we believe that seeking alternative revenues sources fro management and compliance needs should also be part of the strategy considered by TWG/AMWG. We do not believe it is prudent to hold up finalization of the CMP until all of these issues get resolved.
235	104	Table 6; line 11	Kurt Dongoske	Pueblo of Zuni	Does this mean that more than 90% of the cost of cultural monitoring will be spent internally by GCMRC?	Please respond	yes	No, it does not mean that.

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236	104	Table 5		Grand Canyon Wildlands Council, Inc.	The costs presented do not appear to be competitive with what could be achieved though other routes (e.g., academic institutions or NGO's). The number of GCMRC staff supported for many of the goals appears to be excessive.			Opinion noted.
237	112			Grand Canyon Wildlands Council, Inc.	The last reference: Stevens and Gold was published in 2002 (an ESA review on that book appeared in 2003, and likely is the source of confusion to the authors of this report).			OK, fixed.
238	132	QA/QC	Werner	AZ	The font is different from the rest	Note the irony		Irony noted.
239				Grand Canyon Wildlands Council, Inc.	LITERATURE CITED Myers, T.M., C.C. Becker, and L.E, Stevens. 1999. Fateful journey: injury risk and death on Colorado River trips in Grand Canyon. Red Lake Books, Flagstaff.			OK, it has been added.