

**GCMRC FY 2003 Work Plan
(Final Draft dated November 2, 2001)
Comments and Proposed Revisions from Technical Work Group for Final Work Plan**

General Comments and Recommendations		
Reference	TWG Comments/Proposed Revisions on Final Draft dated 11/2/01	GCMRC Recommendation (References are to changes that have been made in the 12/14/01 Draft of the FY 03 Work Plan)
GENERAL COMMENTS	In short: great job, drop the current work section.	Thanks.
GENERAL COMMENTS (cont'd)	It would be helpful to have a summary budget table that outlines the whole picture, including staff salaries and project funding. Perhaps I should take this up with the AMP budget committees.	Beginning in the FY 02 work plan GCMRC agreed to show the detail you request in the table that accompanies each project. The existing Table 2.3 is a summary budget that shows salary and other costs for each project. It provides a comprehensive presentation of the budget for GCMRC activities.
GENERAL COMMENTS (cont'd)	Some AMP stakeholders have raised concerns about the sufficiency of detail in the work plans in assessing the ability of the proposed work to accomplish the purposes of the project. It may be unwise to add additional detail such as monitoring methods, frequency and locations to an already large document, but we do see a need for that specific information in some forum. We suggest that the GCMRC and the TWG consider using the smaller ad hoc groups in such a detailed evaluation. Recent experience with the native fish work group was very positive in that regard when discussing the specifics of the current fish monitoring effort. Timely release of current results of monitoring and research contracts would also facilitate scientific interaction between managers and researchers and add to the trust level of both the AMP and the GCMRC work plans.	There is a continual struggle to find the right balance in the level of detail sought by different stakeholders. GCMRC continues to be asked for more detail by some and to be told by others that GCMRC has given them too much detail. The current process provides multiple opportunities to obtain detailed knowledge of GCMRC activities. These include the Project descriptions in the Annual Work Plan, the RFPs that are released, and the final contracts issued by GCMRC that include the reviewers'

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		<p>comments. GCMRC supports the experiment with small groups for those who want additional detail.</p> <p>Regarding the release of results, GCMRC's protocols call for releasing results after they have been peer-reviewed. However, GCMRC has continually tried to bring critical information to the AMWG and TWG in a timely fashion, sometimes before peer-review has been completed but at the point where GCMRC has confidence in the results. GCMRC will continue to do this.</p>
GENERAL COMMENTS (cont'd)	<p>We repeat that we are unable to fully digest the budget document in time to develop studied comments. We think the additional time provided from the TWG meeting until now has been helpful. Since this is a perennial problem we are encouraged by the idea to begin the development of a GCMRC budget earlier in the year. We would like to offer a suggestion. We suggest that the GCMRC consider a multi-year budget for its monitoring program. If monitoring contracts are let for 2-3 years, then we could review the monitoring program every three years and only discuss the remaining research or "new start" proposals every year. The contractors could still be obligated to report and provided deliverables to the GCMRC as often as needed. We would like to have the PI s report to the TWG every year on work in progress and we want to undertake a thorough review of the monitoring program every three years.</p>	<p>We would be interested in exploring a multi-year budget. In essence, we have done this by organizing the current work plan into ongoing and new projects.</p>

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GENERAL COMMENTS (cont'd)	<p>Recovery Goals for Humpback chub have been a continuing discussion item among AMP participants. The Goals finally derived by the U.S. Fish and Wildlife Service will have a direct impact on the objectives set by AMP. Therefore, we recommend the Workplan describe how Projects 2 and 4 (or others) will contribute to the knowledge needed to determine if we are achieving the Recovery Goals for Humpback chub in Grand Canyon.</p>	<p>Project 2: Status and Trends of Downstream Fish Community. The goals are to develop population estimates for HBC and FMS as well as other fish, including rainbow trout and brown trout. The Upper Basin recovery program should be able to use these abundance estimates for the Grand Canyon humpback chub population—one of the target populations for the recovery plans. One the recovery goals are adopted we will review the GCMRC monitoring program to ensure that the data being provided is useful to the AMP and the Upper Basin Recovery Program. Finally, the latest version of the AMP MO's is not specific to recovery, only maintenance of viable native fish populations and removal of jeopardy.</p> <p>Project 4: Native and Non-native interactions. The goals of this project include providing a better understanding of the competitory and predatory interactions of non-native fishes with native fishes. This type of information should be useful to the recovery program in evaluating the affect of non-native fish on native fish.</p>

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GENERAL COMMENTS (cont'd)	<p>We encourage the sharing of AMP goals and management objectives work among other agencies where such a sharing does not compromise the AMP mission (See example under Comment 8 <i>[copied below for reference]</i>). Responsibilities set forth under the EIS and ROD as well as the Grand Canyon Protection Act should not and cannot be delegated to others but work may be assigned to others through contracts or agreements so long as issues related to protocols, deadlines, goals and objectives are satisfactory to the AMP. We earlier recommended GCMRC actively coordinate with associated conservation programs to reduce overlap and look for cost sharing opportunities, etc. This function should be outlined in the Workplan.</p> <p><i>Comment 8: We question the proposed direction of Southwestern Willow Flycatcher survey efforts. Latest survey results showed one (1) pair above Diamond Creek yet supplemental surveys are proposed (pg. 50) to assess breeding success. This seems excessive. Meanwhile, surveys in the lower canyon, near the western boundary of Grand Canyon National Park, where many more SWWF have been seen in the past, GCMRC plans no surveys. Instead, this area will be surveyed by USBR, Lower Colorado River Region out of Boulder City, Nevada. The Workplan is quiet on this relationship, how or if data will be exchanged, what resources are committed, and whether an agreement to do the work has been developed. We are uncertain whether AMP's mission is compromised by this relationship and think the Workplan should describe how it would work to achieve AMP goals and objectives. (Note: this comment also appears in the Terrestrial section of this table.)</i></p>	<p>Coordination of the type you are calling for is occurring. GCMRC has peer-review and RFP guidelines that it follows regarding the delegation of work to others, including the work associated with monitoring and research. GCMRC currently has cooperative agreements with state, federal, and tribal agencies in both terrestrial and aquatic projects. See the revised project description for terrestrial resources that discusses collaboration on SWWF monitoring. Language added (pg. 40) re: SWWF effort in Lower Grand Canyon.</p> <p>Furthermore, we are meeting and working with Grand Canyon National Park to share data and to determine how our data collection efforts can help them in their inventory and monitoring program requirements.</p>
Chapter 1 The GCMRC FY 2003 Annual Work Plan		
GEOGRAPHIC, INSTITUTIONAL	<p>(Pgs. 1-2) I find this section to be rather torturous. I may be sorry that I open this can of worms, but I suggest the following rewrite:</p>	<p>Your comments, as well as recent TWG discussions over INs have been used to</p>

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SCOPE (Pg. 1)	<p>“The geographic scope of GCMRC’s activities is defined by the Colorado River Ecosystem (CRE) within Glen Canyon National Recreational Area and Grand Canyon National Park (figure 1.1). The CRE is defined as the Colorado River mainstem corridor and interacting resources in associated riparian and terrace zones, located primarily from the forebay of Glen Canyon Dam (GCD) to the western boundary of Grand Canyon National Park. The Programmatic Agreement defines the lateral extent of interacting resources for cultural resources as the 256,000 cfs stage elevation. For physical, biological, and recreational resources, the lateral extent of interacting resources is defined by the upper limit of the historic OHWZ. The scope of GCMRC activities also includes limited investigations into tributaries (e.g., Little Colorado River and the Paria River) and reservoirs (e.g., Lake Powell).</p> <p>All research and monitoring activities by GCMRC are intended to determine the effects of dam operations and other management actions on the natural, recreational, and cultural resources of the CRE. Scientific information from programs outside the GCDAMP may be needed as a means of strengthening the understanding of the entire CRE.</p>	revise this section for clarity.
MISSION (Pg. 2)	(Pg. 2) ...you should add “and other management actions” following “Glen Canyon Dam” to be consistent with the GCPA.	Done.
GCMRC SCIENTIFIC ACTIVITIES (Pg. 4)	(Pg. 4) Section A). Change “final” to “fixed.”	Done.

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	(Pg. 4, para. 2) The final version of the work plan should include the latest version of these definitions.	Definitions made consistent with those in the Final Draft INs forwarded to AMWG for recommended adoption.
	(Pg. 4) Definitions: the wording of definitions is at variance with the same definitions in the Information Needs document. We have made comments on the language in the INs document and ask that they also be applied to the definitions in this document.	See comment above.
CURRENT KNOWLEDGE (Pg. 5)	<p>General Comments</p> <p>This section represents a significant lost opportunity to educate and make the case for priority needs. Although I don't know exactly how the text should be structured, it seems that this section should include: 1) a unified, clear, and concise synthesis of the current understanding of how the CRE works; 2) an overall description of the changes that are occurring in the CRE, why they are occurring, and how they relate to management objectives; 3) a synthesis of how the Center's approach to research and technology comes together to aid in our understanding of the CRE; and 4) an argument for what monitoring, research and management actions should occur next.</p>	This section has been substantially revised to address this comment and many of those that follow.
CURRENT KNOWLEDGE (cont'd)	The exhaustive section "Current Knowledge" should be dropped entirely from the work plan. It is not necessary in reviewing the out year projects, unless this section is intended to replace the annual "state of the resources" report? Obviously, a lot of work by your program managers went in to preparing this section. However, because of its multi-authorship, it lacks. The scope of the	We have revised this section to be a more concise description of current knowledge as compared to a description of the current status of each project. We believe that this section belongs in the

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	section varies from program to program and it lacks a consistent style, theme, and format. This section makes the workplan too long – you have to get to page 39 before actually getting into the FY2003 activities, which is the main focus of this document.	Annual Work Plan and provides a foundation for understanding the proposed projects.
CURRENT KNOWLEDGE (cont'd)	The recommendations in the Current Knowledge section do not match with the funding categories. There should be continuity or clarification somewhere in the document. Having the beginning section divided by disciplines, but the budget section divided by integrated disciplines makes the document difficult to track. I recommend the Current Knowledge section should reference the appropriate section in the budget discussion. References to past work plans rather than providing the information here is inappropriate. This should be a stand-alone document.	Current knowledge section has been revised.
CURRENT KNOWLEDGE (cont'd)	<p>Current Knowledge: Sediment And Stream Flow Resources (Pgs. 5-15)</p> <p>(Pg. 5) Each of the subheadings in this “chapter” repeat a lot of the same information synthesized in the Rubin et al. (2000) memo. As a whole it’s a thorough review of the program, but perhaps too detailed and much longer than the other programs.</p>	See revision.
CURRENT KNOWLEDGE (cont'd)	(Pgs. 12, 14) We remain skeptical of the importance assigned to sediment work. With dam construction, sediment input to the Colorado River below the dam has been reduced by such vast amounts that all efforts to attempt salvage of pre-dam sediment relic conditions by flow controls may be a waste of time and money. Such items as annual monitoring of 735 lesser tributaries for periodic debris flows (pg. 12) and documenting at hundreds of sites how	Conservation of sediment is a basic objective in Goal 8 and its MO’s, and fine sediment is referred to specifically. Because the program is driven by goals and objectives set by the stakeholders, it is included as one of the 12 elements of

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	coarse-sediment inputs alter the geomorphic framework of the river are costly efforts. We have seen little justification for such exhaustive efforts in answering the question of whether ROD flows are permitting "recovery and long-term sustainability of downstream resources while limiting hydropower capability and flexibility only to the extent necessary to achieve recovery and long-term sustainability." In addition, suggesting that minimizing dam releases during the highest electricity demanding months of July through September in order to optimize fine sediment conservation (pg. 14) is not an acceptable management solution for achieving long-term sustainability.	the program. It is not GCMRC's decision as a science center to define what is important or trivial to the stakeholders.
CURRENT KNOWLEDGE (cont'd)	(13, 2, last two sentences) This is not an ongoing project. It's a good idea, but listed as a funded, ongoing deal and that is simply not true.	Phase I synthesis for sediment hydrology and geomorphology ends Dec. 31, 2001. Referenced text deleted from 03 annual plan.
CURRENT KNOWLEDGE (cont'd)	(Pg. 14) Findings of the TWG Sediment Ad-hoc Group should be referenced here.	See revision.
CURRENT KNOWLEDGE (cont'd)	<p>Current Knowledge: Aquatic Resources (Pgs. 18-19)</p> <p>(Pg. 18, para. 1) It is unclear under which program the aquatic food base in the Lees Ferry reach is covered; this also is true of native fish in the Lees Ferry reach. Some clarification would be beneficial.</p> <p>(Pg. 18, para. 2) Suggest changing "1990's" to "1990s."</p>	See revision.

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CURRENT KNOWLEDGE (cont'd)	(Pg. 19, para. 2) In Native Fish Work Group discussions it was indicated that no suitable gear for collecting carp (and channel catfish) has been implemented in the Little Colorado River. This seems to be a necessary prerequisite to establishing population estimates for this species.	See revision.
CURRENT KNOWLEDGE (cont'd)	(Pg. 19) The workplan is silent on how the GCMRC will implement the Integrated Water Quality Program PEP recommendations for downstream areas. We see no redesign of the downstream program as a result of the PEP suggestions but see five (5) changes to the Lake Powell program stemming from PEP ideas. At a minimum, the workplan should provide a roadmap and schedule to achieve PEP recommendations for downstream areas and describe the status of initiating downstream water quality work other than temperature.	The IWQP long-term plan is being revised in response to the PEP recommendations and will be presented to the TWG and AMWG consistent with AMP protocols for revising a program in response to PEP recommendations. This is in process.
CURRENT KNOWLEDGE (cont'd)	<p>Current Knowledge: IWQP</p> <p>(Pg. 20, para. 1) The meaning of the phrase “[d]ilute and mixed conditions in Lake Powell” is not clear. Does this mean that the reservoir was not stratified during this period of time?</p>	The lake was still stratified, but not as strongly as it typically is. Temperature and salinity were more homogeneous in the lake, weakening the stratification and allowing greater mixing.
CURRENT KNOWLEDGE (cont'd)	<p>Current Knowledge: Socio-cultural Resources (Pgs. 21-24) Cultural Resources (Pgs. 21-23)</p> <p>(pg. 21) Under Previous Investigation, the finding that the 45,000 cfs BHBF had either no effect, no adverse effect, or a beneficial effect needs to be considered based on the findings of the sediment studies. New sediment information should have changed these findings as well.</p>	New sediment information suggests that the timing of BHBFs, when sediment load is high, can be the most beneficial to cultural resources. In addition, preliminary results (Wiele, draft report 2000) of modeled data indicate that high flows with heavy sediment loads may tempor-

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		arily stem erosion at some archaeological sites. Please see page 14.
CURRENT KNOWLEDGE (cont'd)	(Pg. 21 para. 2) The second sentence of this paragraph seems to say that erosion of alluvial terraces has only occurred since completion of Glen Canyon Dam. Is that the intended meaning? The concluding sentence of this paragraph would benefit from references or personal communications.	Please see clarifications and references on page 14.
CURRENT KNOWLEDGE (cont'd)	(Pgs. 21-22) We question the justification for beach habitat-building flows offered as a mitigation method for cultural resources. It is an exaggeration to suggest that because BHBF had "no effect, no adverse effect or a beneficial effect" that this "strongly" supports the conclusion that BHBF can be used for "system-wide mitigation." The workplan should not use such conclusions as a basis for future work.	Please see the above response and clarifications on page 14.
CURRENT KNOWLEDGE (cont'd)	(Page 22, carryover paragraph) The conclusion that "beach habitat-building flows can offer a system-wide mitigation for cultural resources" seems to be at odds with conclusions drawn in the Physical Resources section on potential for sediment conservation, see e.g. pages 10 and 14. Can you clarify?	Please see above response and clarifications on page 14.
CURRENT KNOWLEDGE (cont'd)	(Page 22, para. 1) Can the draft report in review be cited? The close of this paragraph identifies work activities that reflect the PEP recommendations. Can this coupling be made more explicit with examples?	Although the report is under review, the draft report is Wiele and Franseen, 2000. Please see page 14 and the list of references.

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CURRENT KNOWLEDGE (cont'd)	(Page 22, Ongoing Investigations) It is not clear how many sites were held to be impacted by mainstem water levels and head cutting arroyos. Or were all 91 sites with physical impacts in these categories?	Approximately 83% or 75 sites were impacted. Please see page 14.
CURRENT KNOWLEDGE (cont'd)	(Page 23, para. 1) There appears to be a conflict in findings between the Southern Paiute Consortium and Hopi findings. For the former, "sites seemed to be flourishing and...there was no evidence of disturbance or impacts," whereas for the latter there was "concern for water releases and sediment availability to sustain important riparian resources for plants important for ceremonies..." Are these results comparable?	The tribes may monitor different locations and resources of importance to them. Therefore, their concerns and assessments may differ and may not be directly comparable.
CURRENT KNOWLEDGE (cont'd)	Current Knowledge: Socio-cultural Resources (Pgs. 21-24) Recreational Resources (pgs. 23-24) (Pg. 23, Previous Investigations) The closing sentence of this paragraph contains an attribution of a relationship between lowered mainstem base levels and beach gulying during monsoon rainstorm runoff. It would be strengthened through provision of a literature citation or personal communication.	The reference has been added. Please see page 14.
CURRENT KNOWLEDGE (cont'd)	Pg. 24, Recent and Ongoing Investigations, last paragraph) The penultimate sentence should probably read "was compiled and synthesized in FY 2001."	Editorial comment made.
CURRENT KNOWLEDGE	(Pg. 24) A previous recreational study concluded recreationists prefer "camping beaches and activities such as white water rafting, day-use rafting in	Comment noted.

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(cont'd)	Glen Canyon, and fishing and recreation experiences.” We trust future studies will be able to avoid repeating this line of investigation and provide more meaningful study purposes. We recommend avoiding further studies of this type.	
CURRENT KNOWLEDGE (cont'd)	(Pg. 24) Floods are as the only “feasible” means to deposit sediment above normal fluctuations. The list of feasible alternatives was limited by the National Park Service in the FEIS. On-site suction dredging of river sediment and deposition to desirable shore locations is feasible but was summarily dropped as being unacceptable by the NPS. The many advantages such a method offer in terms of preserving sediment, enhancing camping beaches at specific sites, and minimizing collateral damage to other resources by flood releases are offset by this NPS policy.	Comment noted.
CURRENT KNOWLEDGE (cont'd)	Current Knowledge: Information Technology Program (pgs. 25-30) This section is not really a “current knowledge”, but a progress report on ITP project accomplishments. This section includes several formats for the different projects that bust up the “flow” of the document. “Flow” is probably something you were not necessarily trying to achieve, but it would help to at least be consistent. Need better section subheadings under surveying and remote sensing. As it is all subheadings are lumped. For example, terrestrial base maps, hydrographic base maps and canyon control are clearly subheadings under surveying, but not listed that way. This section is also inconsistent in referencing projects it supports.	Subheadings were re-formatted using appropriate sub-heading order.

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CURRENT KNOWLEDGE (cont'd)	<p>Current Knowledge: Information Technology Program Data Base Management System (Pg. 25)</p> <p>A lot said here about what the DBMS will potentially provide, but not much on the current state of the project. Perhaps a simple % complete line or two would help.</p>	The development and implementation of the DBMS has been delayed and is just getting started in FY 02. Part of that effort is to have a timeline for completions of the development of the database architecture and a schedule for populating the database. Once that is completed it will be provided to the TWG.
CURRENT KNOWLEDGE (cont'd)	<p>(Pg. 25) Under the ITP Data Base Management System, I would like clarification on the pilot project which will result in a functional Oracle/GIS database and web based query application. It also states that remaining data collection efforts will be prioritized. I would like to see that priority list. TWG should have input based on future research and active monitoring.</p>	The ORACLE Database is being developed by looking at a pilot effort to populate the database with historic and existing fisheries data and to link that data to other data collected by GCMRC and its predecessors. The priority list refers to which data will be moved into the database first. This has not yet been developed and does not in any way influence future research and monitoring.
CURRENT KNOWLEDGE (cont'd)	<p>Current Knowledge: Information Technology Program Geographic Information Systems (Pgs. 25-26)</p> <p>What exactly is the "database development initiative"?</p>	It should read "DBMS development project." This has been corrected in the text.

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CURRENT KNOWLEDGE (cont'd)	<p>Current Knowledge: Information Technology Program Library (Pg. 26)</p> <p>(Page 26, third bullet) More information on how to access and use the FTP site would be useful.</p>	The FTP site is now referenced in the text.
CURRENT KNOWLEDGE (cont'd)	<p>Current Knowledge: Information Technology Program Surveying – Terrestrial Base Maps (Pg. 27)</p> <p>Several statements in this section are not true. 27, 2, 4 - One meter contour interval and a four meter DTM are <u>not</u> the resolution and accuracy required for change detection used for sediment monitoring. Technically, the center does have surveys of NAU study sites since 1990. However, these should be considered legacy data because control issues and are not necessarily available for use by other investigators.</p>	The relevant sentence has been modified to specify "landscape level" sediment monitoring. This data set is intended to complement the NAU sandbar project.
CURRENT KNOWLEDGE (cont'd)	<p>(Pg. 27) ITP Terrestrial base maps, the last paragraph recommends sub-meter accuracy topographic coverage, but it is not clear in Chapter 2 budget section, if this is funded. Also, under Mapping Warm-water fish habitats and cultural features, page 32, it appears that high resolution photograph is not recommended.</p>	Sub-meter accuracy topographic coverage is scheduled for FY2002 as part of the Multi-spectral digital imagery and LIDAR data collection project and has been budgeted for. An RFP is being prepared and will be issued shortly. The high resolution photography referenced in Mapping Warm-water fish habitats and cultural features refers to thermal infrared (TIR) imagery, not color infrared.

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CURRENT KNOWLEDGE (cont'd)	<p>Current Knowledge: Information Technology Program <u>Surveying – Hydrographic Base Maps (Pgs. 27-28)</u></p> <p>The hydrographic mapping program was established to support monitoring <u>and</u> to produce a base map of the channel. There is no mention of the FY2000 LSSF work still in progress.</p>	<p>The GCMRC IT program has completed its portion of the LSSF hydrography work. Although the sediment group is still working on LSSF projects and it is anticipated they will complete this work in 2002, the GCMRC survey department has completed the 1-3rm and the 42-45rm sections of the LSSF multibeam data. The GCMRC survey department will continue to coordinate the integration of these data sets into GIS and DBMS. However, the editing and processing of these data sets are no longer in the 2002 work plan.</p>
CURRENT KNOWLEDGE (cont'd)	<p>Current Knowledge: Information Technology Program <u>Surveying – Canyon Control (Pgs. 28-30)</u></p> <p>Perhaps a blurb explaining what "control" is would be appropriate here. Control coordinates are still in the process of being verified by additional GPS observations. How then can the program claim to have all these gaps "tied in" or "linked"? In addition to the base control network, local control points, used for years by several long-term monitoring projects that are within areas claimed to be "tied in" or "linked", have yet to be included in the network. The ongoing GPS observations for control verification should be first in this section as this is one of the most important functions of the survey department at the moment. As is, this section makes many claims that are not really true and needs a complete rewrite.</p>	<p>The existing control network whose origins are with the original GCES GIS sites have been linked together by GPS and conventional traverse. The original intent of the existing control network was to provide adequate ground control for photogrammetric stereo-rectified orthophotography as well as topography. This ground-derived panel control yielded very accurate local control. However this was not a concentric solution. Even though these GIS site networks were tied together by means of conventional</p>

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		<p>traverse, they could not yield overall geodetic accuracy.</p> <p>The control work currently being developed by GCMRC is not "verification," but an upgrade to the "NGS rim control standard." This control adjustment process will allow accurate coordinate closure to the network from outside geodetic sources such as remote sensing applications. Also, these adjusted coordinates should allow for accurate analysis between legacy data sets and GPS-derived remote sensing data sets.</p>
CURRENT KNOWLEDGE (cont'd)	(28, 1, 2) I am skeptical that there are approximately 20 "first order" control points on the rim. Are these the NGS control points referenced on page 29, paragraph 5?	<p>There are well over 20 first order points control points on the rim. For a list of these points and their accuracies, visit the NGS website at www.noaa.ngs.gov, or contact the GCMRC survey office. The seven NGS points that are listed exceed the first order classification and are the minimum required for use as base stations for GPS control missions and remote sensing operations.</p>

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CURRENT KNOWLEDGE (cont'd)	<p>Current Knowledge: Information Technology Program Remote Sensing - Mapping Riparian Vegetation (Pgs. 31-32)</p> <p>(Pg. 31) What community classification system is being used for the riparian vegetation communities and how many categories can be delimited at the described levels of accuracy? Have errors of commission and omission been segregated?</p>	<p>The classification system used is Spence, et al. (1994). Approximately 8-10 categories can be delimited at the described level of accuracy. However, the five study areas from which this classification is based do not cover all possible associations in the canyon. Errors of commission and omission have been segregated but not reported.</p>
CURRENT KNOWLEDGE (cont'd)	<p>Current Knowledge: Information Technology Program Remote Sensing – Monitoring Sand-bar Deposits (Pgs. 33-34)</p> <p>No claims should be made regarding LIDAR accuracy and precision until control point verification is completed and LIDAR can be properly assessed.</p>	<p>LIDAR has been properly assessed and found to substantiate the claims. Reports documenting this will be available shortly.</p>
PROTOCOL EVALUATION PROGRAM	<p>(Pg. 35, para. 2) Have either the Integrated Water Quality Program PEP report or the Aquatic Food Base and Native Fish Monitoring Program PEP report been reviewed and commented on by the TWG?</p>	<p>TWG has commented on the IWQP PEP recommendations and GCMRC is revising the IWQP Long-term plan. This will be reviewed with the TWG.</p> <p>TWG has created a small group to work with GCMRC in responding to the Aquatic Foodbase and Native Fish PEP recommendations. That effort is in progress.</p>

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CONTINGENCY PLANNING	(Pg. 36) Are the referenced contingency plans a part of this work plan?	The referenced contingency plans are those that have been in place from subsequent years. Once contracts are awarded, these are reviewed for their adequacy relative to the FY in which the work will be conducted. The effects impact matrix exercise is done annually.
FUTURE CHALLENGES	(Pg. 37) The term "seasonally adjusted steady flows" should be replaced by "experimental native fish flows to satisfy the biological opinion on operation of Glen Canyon Dam."	Done.
SCHEDULE & BUDGET	(Page 37) The last "and" in the first sentence should be removed.	Done.
SCHEDULE & BUDGET (cont'd)	(Page 37) The GCMRC Workplan Schedule and Budget (pg. 37) would be more valuable if it described the entire budget of \$10,009,720 and its component Science Activities budget of \$7,842,000 (pg. 37-38) and the \$2,167,720 for Administration and Technical Support Services (pg. 155-178). Only by displaying all costs for this program and revenue sources will the AMP membership be able to make informed recommendations.	The Bureau of Reclamation prepares the work plan for AMP activities not covered in the GCMRC work plan. These two plans need to be viewed together to address this comment.
SCHEDULE & BUDGET (cont'd)	(Pg. 38, carryover paragraph) The total FY 2003 budget amount identified in Table 2.3 is \$7,842,000.	The correct amount is \$7,877,000. The text has been corrected.

General Comments and Recommendations		
Reference	TWG Comments/Proposed Revisions on Final Draft dated 11/2/01	GCMRC Recommendation (References are to changes that have been made in the 12/14/01 Draft of the FY 03 Work Plan)
BUDGET REVIEW	(Pg. 38) Should the potential for reallocation of dollars that would become carry forward also be identified?	A process for reviewing and agreeing to carry-over requests exists between GCMRC and the Bureau of Reclamation. In FY 01 and in all subsequent years, information sharing with the TWG Budget Ad hoc occurs.
Chapter 2 Scientific Activities (pages 39-154)		
TABLE 2.1	<p>Master Project Schedule (Pgs. 40-41)</p> <p>Item A.1.1 is apparently a component of A.1. If A.1 is to be contracted out through a new RFP in FY2003, is A.1.1 not going to be a part of that RFP?</p> <p>Isn't Item B.1 ongoing in FY2001?</p> <p>What is the anticipated duration of E.1.1 before it is reviewed for continuation?</p>	<p>A.1.1: Pending project component review, we anticipate the present agreement structure with the Tribal groups.</p> <p>B.1 is ongoing, change made to table.</p> <p>E.1.1: The project is reviewed annually prior to renewal. Discussions are on going to integrate this project with sediment/campsite monitoring efforts.</p>
TABLE 2.2	<p>FY2003 Funding Sources (Pg. 42)</p> <p>In which project under part B is the monitoring of native fish in the Lees Ferry reach included?</p>	Downstream Fish Project—see recommended approaches and methods.

General Comments and Recommendations		
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TABLE 2.3	<p>Summary Table of Projected FY 2003 Budget (Pg. 43)</p> <p>There are no IT Program Costs included in this table. Is that correct? Are Science Advisors costs included in Independent Reviews? If so, what portion of the cost is for this purpose?</p>	<p>IT program costs are listed by functional areas under the Common Services- Technical support Services category and include:</p> <p>G-1 Geographic Information Systems G-2 Data Base Management Systems G-3 Library G-4 Survey Services G-5 Decision Support System G-6 Systems Administration G-7 Aerial Photography</p> <p>Yes- Science Advisor costs are included in Independent Reviews (refer to table F-4). Science Advisor costs for FY03 are \$84,000 and represent 46% of non-salary costs.</p>
Chapter 2 - A. Terrestrial Ecosystem Activities		
<p>PROJECT DESCRIPTIONS</p> <p>GENERAL COMMENTS (PGS. 45-178)</p>	<p>The text needs serious editing to be clear and concise, and to describe the projects with a consistent format.</p>	<p>Comment noted and the text has been edited. We have sought consistency through the consistent use of sub-heads in the project descriptions. The actual descriptions may vary in detail to meet the complexity of a specific project.</p>

General Comments and Recommendations		
Reference	TWG Comments/Proposed Revisions on Final Draft dated 11/2/01	GCMRC Recommendation (References are to changes that have been made in the 12/14/01 Draft of the FY 03 Work Plan)
PROJ DESC GENERAL COMMENTS (cont'd)	Although the INs are not yet approved, they are far enough along that it would make sense to identify the specific INs that the project is intended to address.	The plan will be amended and the INs inserted into the plan with review by the TWG when they have been approved by the AMWG. The project descriptions have been prepared with the latest version of the Draft INs as a guide.
PROJ DESC GENERAL COMMENTS (cont'd)	There should be a direct correspondence between the type of information gathered and the metric(s) used in the MOs.	The MOs and the INs guide the work to be done. The RFPs and the data requested will be consistent with the metric specified in the MO.
PROJECT DESCRIPTION GENERAL COMMENTS (cont'd)	Each project description should be explicit about how it will assist in helping to set targets for the management objectives.	The individual projects are designed to provide information that may be useful in setting targets for Management Objectives. Please see clarification on page 31. We are also proposing to use the funds allocated for AMWG/TWG requests to initiate an activity explicitly intended to develop the information that the AMWG and TWG will need, in conjunction with GCMRC, to recommend targets. See revised AMWG/TWG request section in the FY 03 annual plan.

General Comments and Recommendations		
Reference	TWG Comments/Proposed Revisions on Final Draft dated 11/2/01	GCMRC Recommendation (References are to changes that have been made in the 12/14/01 Draft of the FY 03 Work Plan)
PROJECT A.1. TERRESTRIAL ECOSYSTEM ACTIVITIES	<p>TERRESTRIAL ECOSYSTEM ACTIVITIES (pgs. 45-52)</p> <p>The way I read this description, the project appears to be misdirected. For terrestrial communities, the MOs call for knowing changes in: 1) the number of patches; 2) the size of patches; 3) the distribution of patches; 4) the total area of the community; and 5) and the composition (e.g., dominance, density, presence/absence of native species) of the community. I assume that the first four attributes can be obtained with the proposed remote sensing (if an ecological community classification is part of the project) described on pages 69-72. And some aspects of composition may also be obtainable via remote sensing. If this is true, then this project should be focused on detecting changes in community composition for each community type. Instead, it appears to be focused on the response of animal species to vegetation structure.</p> <p>In addition to providing information on changes to composition at the community level, this project probably should address INs specific to southwest willow flycatcher nesting habitat. As far as I could tell, the project description only mentions supplemental surveys to assess reproductive success.</p>	<p>We agree with this comment, the language in the project description has been changed to clarify.</p> <p>Agree-language changes made to clarify and add emphasis.</p>
A.1. (cont'd)	<p>The way I read this description, it does not appear that this project will answer any of the INs under MO 11.2. It needs a major rewrite that focuses activities on the INs.</p>	<p>The project description was guided by the existing INs. We recommend reviewing this project once the IN's are adopted to ensure it provides the required information.</p>

General Comments and Recommendations		
Reference	TWG Comments/Proposed Revisions on Final Draft dated 11/2/01	GCMRC Recommendation (References are to changes that have been made in the 12/14/01 Draft of the FY 03 Work Plan)
A.1. (cont'd)	(Pg. 48, General Project Description) It is difficult with the information provided here and in subsequent methods to determine to what extent the effects of dam operations can be delimited from other environmental factors in these studies. It also is not clear what amount of change in resource conditions can be detected with the proposed frequency and intensity of sampling and what analyses are contemplated to make these determinations.	Please see 5 th bullet under project goals and objectives.
A.1. (cont'd)	(Pg. 50) We question the proposed direction of Southwestern Willow Flycatcher survey efforts. Latest survey results showed one (1) pair above Diamond Creek yet supplemental surveys are proposed (pg. 50) to assess breeding success. This seems excessive. Meanwhile, surveys in the lower canyon, near the western boundary of Grand Canyon National Park, where many more SWWF have been seen in the past, GCMRC plans no surveys. Instead, this area will be surveyed by USBR, Lower Colorado River Region out of Boulder City, Nevada. The Workplan is quiet on this relationship, how or if data will be exchanged, what resources are committed, and whether an agreement to do the work has been developed. We are uncertain whether AMP's mission is compromised by this relationship and think the Workplan should describe how it will work to achieve AMP goals and objectives.	Language added re: effort in Lower Grand Canyon.
A.1. (cont'd)	(Pg. 51, 4th bullet) Will small mammals and invertebrates be sampled in the same locations as bird, lizard, and vegetation patch sampling, or only at camping sites?	Only at camping sites.

General Comments and Recommendations		
Reference	TWG Comments/Proposed Revisions on Final Draft dated 11/2/01	GCMRC Recommendation (References are to changes that have been made in the 12/14/01 Draft of the FY 03 Work Plan)
A.1. (cont'd)	<p>TERRESTRIAL ECOSYSTEM MONITORING – Cultural Component – Tribal Participation</p> <p>(Pgs. 53-55) Several references are made to “western and tribal perspectives” on resource conditions and a likelihood that these two perspectives may differ. The purpose of having two components to this project seems to be to ensure that both perspectives can be provided, however the project goals and objectives also include “to integrate western and tribal perspectives on the monitoring and assessment of terrestrial resources in the CRE.” It is not clear to what extent the methods for data gathering are the same as or differ from those being used by researchers in the non-cultural (western scientist) component of this project. Thus, it is not clear whether the data from these components will be comparable and on what basis the integration will occur.</p> <p>In the section on <u>Integration</u> the word “significant” is used. Without a defined level of statistical significance being assigned to the term, the level of change that will be considered significant may vary considerably among readers. It should either be replaced with another word or the level of significance considered statistically significant should be provided.</p>	Please see clarification on page 47.
PROJECT A.2. KAS & HABITAT	<p>MONITORING KAS AND HABITAT (pages 55-59)</p> <p>Following the presentation by Jeff Sorenson at the last TWG meeting, it appears that the monitoring protocol needs a major revision to deal with sampling bias and population estimates for habitat above 100K cfs.</p>	Agree-language inserted and we have proposed a budget increase to provide increased attention to survey in area above 100,000cfs. Language inserted to specify attention to seasonal biases in population estimates.

General Comments and Recommendations		
Reference	TWG Comments/Proposed Revisions on Final Draft dated 11/2/01	GCMRC Recommendation (References are to changes that have been made in the 12/14/01 Draft of the FY 03 Work Plan)
A.2. (cont'd)	<p>(Pgs. 57-58) General Project Description and Recommended Approach/Methods</p> <p>In a recent presentation to the Technical Work Group by Jeff Sorensen of AGFD, reference was made to a recommendation to survey periodically the entire habitat of the ambersnail at Vaseys Paradise. Jeff also identified results from his thesis that show strong seasonal biases in population estimates using existing methods and suggested those methods should be reviewed. We find no acknowledgment that either recommendation has been considered in the FY2003 work plan.</p>	<p>Agree-language inserted and budget increased to provide increased attention to survey in area above 100,000cfs.</p> <p>Language inserted to specify attention to seasonal biases in population estimates.</p>
PROJECT A.3. CULTURAL RESOURCE MONITORING, MITIGATION	<p>CULTURAL RESOURCE MONITORING & MITIGATION (PGS. 59-60)</p> <p>(Pg. 59) More information should be provided on what parts of this project were not completed. Inclusion of logistics dollars in the budget suggests that field work remains to be completed in FY 2003, yet in Table 2.1, page 40, the project is listed as concluding in FY 2002.</p>	<p>All contract funds for this project were obligated in FY 02. However, due to the research needs, the final field trip will occur in FY 03. The cost for the field logistics is shown in the FY 03 monies. Please see clarifications on page 52.</p>
PROJECT A.4. TERRESTRIAL ECOSYSTEMS	<p>NEW RESEARCH IN TERRESTRIAL ECOSYSTEMS (PGS. 60-61)</p> <p>Additional priority research projects include 1) terrestrial community changes since 1963, 84, 91, and 96 (INs 6.1.1, 6.2.1, 6.3.1, 6.4.1, 6.5.3, 6.6.3 and 6.7.4); 2) dynamics of communities in the OHWZ to learn how to manage it (IN 6.3.2); and 3) community classification (IN 6.2), if it is not covered under the terrestrial habitat map and inventory project.</p>	<p>These areas are covered under the terrestrial ecosystem monitoring project.</p>

General Comments and Recommendations		
Reference	TWG Comments/Proposed Revisions on Final Draft dated 11/2/01	GCMRC Recommendation (References are to changes that have been made in the 12/14/01 Draft of the FY 03 Work Plan)
A.4. (cont'd)	(Pgs. 60-61) We understand from discussions at the November TWG meeting that GCMRC will bring a defined work plan to the TWG before this project, which is presently undefined, is funded.	This is correct.
A.4. (cont'd)	We think some time should be allocated for the Biology Program Manager for Project A.4. New Research and for Project A.9. Kanab Ambersnail Taxonomy. We assume the PM will be involved in these two projects.	Time has been allocated.
PROJECT A.5. CULTURAL DATABASE	CULTURAL DATABASE IMPLEMENTATION (PGS. 61-64) (Pgs. 61-64) Completion of the database plan (FY 2002) and implementation of the database plan (FY 2003) are both scheduled to be done through an outside contract. The sensitivity of some cultural resource data and restrictions on its distribution may make it very difficult for an outside contractor to successfully complete this work. We suspect that a high level of involvement by GCMRC and coordination through the Programmatic Agreement group will be necessary. Also, we did not see any mention of a metadata document as an integral part of the database plan. This component will be very important given the diverse nature of the data and the methods under which they were collected.	Comment noted. We anticipate close levels of cooperation between all parties to formulate a data base plan and to implement the plan. <i>[Note: in the current revision to this plan, this is no longer Project A.5. – see pg. 62 for details]</i>
PROJECT A.6. CULTURAL MONITORING PLAN	CULTURAL MONITORING PLAN IMPLEMENTATION (PGS. 64-66) (Pgs. 64-66) As was the case for the database plan and implementation, the monitoring plan and its implementation are interdependent and successional. Existing cultural monitoring and mitigation, which was scheduled to end in FY 2002, was funded at approximately \$150,000 per year. The new monitoring	Due to a delay in the development of the cultural monitoring plan, the proposed project to implement the plan will be delayed until FY 2004. Funds from this

General Comments and Recommendations		
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	plan is funded for only \$25,000. Is that much reduction in cultural monitoring expected to occur? It appears this work may still be done, but that it is now distributed across the terrestrial and integrated resources parts of the work plan. It is not clear in the work plan, however, whether the cultural portions of the terrestrial and integrated parts of the work plan will fall under the monitoring plan identified in this section. It would help if these relationships were made more clear.	project have been reprogrammed into proposed projects: C.8; E.3; E.4; E.5; and E.6 in this plan.
PROJECT A.7. MAPPING HOLOCENE TERRACES	MAPPING HOLOCENE TERRACES (PGS. 66-69) The principle comment of the Hopi Tribe on the FY03 Work Plan is the same one that we made at the November TWG meeting. Specifically, we requested that there be a better distinction made between the tasks of A7: Mapping Holocene Terraces and A8: Terrestrial Habitat Map and Inventory . As the projects are described in the November 2 draft work plan, there is considerable overlap in what is being conducted. <i>(Note: the same comment is made on Projects A.7 and A.8, so it appears in both places in this table)</i>	Please see the clarifications made on page 55. <i>[Note: The project number for Mapping Holocene Terraces has been changed to Project A.5 – see pg. 54.]</i>
A.7. (cont'd)	(Pgs. 66-69) It appears that this project may be contingent upon the findings of the geomorphic mapping workshop and that its budget may be less than identified. Has GCMRC identified any contingencies or alternate projects for these funds should they not be used in this project?	We anticipate conducting the mapping project as approved in FY 2002 and have not identified alternate projects to expend these funds at this time.
PROJECT A.8. TERRESTRIAL HABITAT MAP, INVENTORY	TERRESTRIAL HABITAT MAP AND INVENTORY (Pgs. 69-72) The principle comment of the Hopi Tribe on the FY03 Work Plan is the same one that we made at the November TWG meeting. Specifically, we requested	Please see the clarifications made on page 58.

General Comments and Recommendations		
Reference	TWG Comments/Proposed Revisions on Final Draft dated 11/2/01	GCMRC Recommendation (References are to changes that have been made in the 12/14/01 Draft of the FY 03 Work Plan)
	that there be a better distinction made between the tasks of A7: Mapping Holocene Terraces and A8: Terrestrial Habitat Map and Inventory. As the projects are described in the November 2 draft work plan, there is considerable overlap in what is being conducted. <i>(Note: the same comment is made on Projects A.7 and A.8, so it appears in both places in this table)</i>	<i>[Note: The project number for Terrestrial Habitat Map and Inventory has been changed to Project A.6 – see pg. 57.]</i>
A.8. (cont'd)	<p>I understand that the intent of this project is to produce an ecological community classification. If so, I would like that clarified, and have the suggested classification methodology presented. You may want to connect with Estevan Muldavin with the New Mexico Natural Heritage Program. He is an expert on community classification in southwestern riparian ecosystems.</p> <p>The project should use the benchmark years identified by the AMWG/TWG (i.e., 1963, 1984, 1991, and 1996). Clearly, there will be difficulties in obtaining community-level resolution from the imagery available in some of those years, and some comparisons may need to be done at a coarser level of resolution (e.g., OHWZ, tamarisk, sand beach, marsh).</p>	<p>This will occur in combination with the terrestrial ecosystem mapping project-see expanded project description.</p> <p>Early year comparisons have been added as feasible.</p>
A.8. (cont'd)	(Pg. 70) It is stated that “[t]he primary goal for this project is to document geomorphology, including Holocene deposits, and compositional changes in the vegetated terrestrial habitat at an 80 mile coverage...” Would the Holocene deposits coverage be part of that identified in project A.7 above?	The proposed project is a terrestrial vegetation map. There is no overlap with the project mapping Holocene deposits. The clarifications have been made in the project descriptions.

General Comments and Recommendations		
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PROJECT A.9. KAS TAXONOMY	KAS TAXONOMY (PGS. 72-74) There was some discussion at the past TWG meeting about whether to accomplish this project with a PhD student or a contract. I'd like to see an analysis of the expected cost, time to complete, and quality of product from the different approaches.	This project has been changed in budget and scope to issue an expanded RFP in late FY02 or early FY03.
A.9. (cont'd)	(Pg. 72) This project needs to be elevated beyond a 4-year doctoral project. The KAWG determined this was a high priority. TWG and AMWG need this issue resolved more quickly in order to evaluate the biological opinion and higher flows. This project should be scoped and issued as an RFP to see if there is interest and ability. Regarding monies needed for field work. We repeat that we think it is appropriate in some cases to go outside the CRE to do analysis. Given the possible magnitude of the expense, we suggest the pursuit of a cost-share agreement with an interested university of federal agency. In any case, funds need to be made available, even if from the AMP.	This project has been changed in budget and scope to issue an expanded RFP in late FY02 or early FY03.
A.9. (cont'd)	(Pgs. 72-74) We advocate that the morphologic/anatomic analysis be morphometric and multivariate, rather than using the more classical typological approach used previously.	We will consider these concerns as the above mentioned RFP is developed and an award issued.
A.9. (cont'd)	We think some time should be allocated for the Biology Program Manager for Project A.4. New Research and for Project A.9. Kanab Ambersnail Taxonomy . We assume the PM will be involved in these two projects.	Time has been allocated.

General Comments and Recommendations		
Reference	TWG Comments/Proposed Revisions on Final Draft dated 11/2/01	GCMRC Recommendation (References are to changes that have been made in the 12/14/01 Draft of the FY 03 Work Plan)
Chapter 2 - B. Aquatic Ecosystem Activities		
PROJECT B.1. AQUATIC FOODBASE	MONITORING AQUATIC FOODBASE (PGS. 75-79) There is insufficient information to evaluate this project. Will protocols be revised in FY 2003 based on PEP recommendations, or in later years?	Changes underway, we intend to complete protocol revision in FY03.
B.1. (cont'd)	(Pg. 77) We trust the proposed quarterly and annual reports on aquatic food base productivity and benthic composition will also provide some assessment of confidence in the data sets (pg. 77). These data sets are very likely to have extreme variability; therefore, any linkage to water quality data collected must be put in a proper context.	Project is undergoing PEP recommended changes. Part of the problem is this very high variability.
PROJECT B.2. DOWNSTREAM FISH	MONITORING STATUS AND TRENDS OF DOWNSTREAM FISH COMMUNITY (PGS. 79-84) (Pg. 79) This project should also be addressing Goal 4. (Pg. 83) The schedule information is confusing. Its not clear what is ending and when.	Goal 4 added. Clarifying language added.
B.2. (cont'd)	(Pgs. 79-84) The Rationale/Problem Statement section of this project identifies relationships between habitat features, food resources and the status of the fish being investigated as they are affected by dam operations. It is not clear, however, whether habitat features and dam releases will be measured in	This project is intended to determine status and trends in resources. It is not intended to establish causal relationships.

General Comments and Recommendations		
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	<p>conjunction with fish measurements so that relationships can be sought in data analysis. Is this covered later in the integration section? Under Status on page 82, it is indicated that this project was implemented in FY 2002 and that it will be revised based on PEP recommendations. Table 2.1 on page 40 indicates this project was undergoing monitoring review and development in FY 2001 and that it was ongoing in FY 2002. This is in agreement with the Schedule section on page 83 in which it states this (FY 2003) will be the third of a three year effort. Here it also is stated that FY 2003 will be the first full year of a revised long term monitoring effort. It is not clear when PEP recommendations will be implemented. Will this be in FY 2003? The budget table on page 84 identifies that \$200,000 for this project will be solicited from appropriations. It is not clear what part of the project will not be accomplished if the appropriations are not received.</p>	<p>PEP recommendations are being implemented in FY02 and FY03.</p> <p>These funds will support approximately 2-3 sampling trips on the mainstem or LCR. GCMRC has not prioritized their utilization pending FY02 findings.</p>
B.2. (cont'd)	<p>Project B.2 is nearly one million dollars in size yet the PM is allocating only five (5) percent of his time on the project. This seems too low for this size project. Lastly, the Fisheries Biologist time is mostly allocated to Project B.2 but none is shown for Project B.4 and very little for B.5. Some time for these latter projects should be gleaned from B.2 owing to their important fisheries issues.</p>	<p>PM time has been increased. Fishery Biologist time remains the same. The downstream fish long term monitoring is a high priority for the Fishery Biologist position.</p>
B.2. (cont'd)	<p>At a recent Native Fish Work Group meeting, there was some discussion regarding the extent of fish monitoring in the Colorado River Ecosystem. Presently, monitoring terminates at Diamond Creek, leaving no continuing monitoring over the remaining 50 miles of the CRE to Grand Wash Cliffs. This is a transition area between river and reservoir and one in which the fish community is strongly influenced by non-native species. Non-native fish are a continuing concern to efforts to enhance humpback chub and other native fish</p>	<p>GCMRC has resource limitations, which preclude planning to monitor this part of the river in FY03. We will reassess in FY04 after long term monitoring in mainstem (which partially addresses these concerns by looking at species distribution) is in place.</p>

General Comments and Recommendations		
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	<p>numbers. Also, USBR is considering a temperature control device for Glen Canyon Dam and this device will produce warmest temperatures in this reach, thereby further confounding our understanding of the fish community and possibly adding to the non-native fish problems. Establishment of some baseline description of the fish community in this area would seem to be an important task to help to understand ramifications of future management actions. We suggest a serious look at this area as part of the downstream fish monitoring program, both now and in FY 2003.</p>	
<p>PROJECT B.3. LEES FERRY TROUT</p>	<p>MONITORING OF THE STATUS AND TRENDS OF THE LEES FERRY TROUT FISHERY (Pgs. 84-87)</p> <p>With native fish, and particularly humpback chub, there is an effort to tag and recapture fish from the earliest possible size and age for stock assessment and population estimates. In the case of rainbow trout, it appears this interest is confined to fish of age II+. If this is not the case, perhaps the language could be modified to make it clearer that earlier life stages are also considered.</p>	<p>Only age 2+ fish are PIT tagged and only a portion of those ~2500/yr. Handling and tagging smaller fish would be prohibitive without substantially increasing cost-their numbers are simply too high. Tag data is used mostly to document movement. CPUE provides good estimate of relative abundance.</p>
<p>B.3. (cont'd)</p>	<p>We have some question about time allocations for the Biology Program Manager and Fisheries Biologist. We think some time should be allocated for the Biology PM for Project B.3. Lees Ferry Trout and Project B.7. Lake Powell. We assume the PM will be involved in these two projects. Also, no time is shown for the Fisheries Biologist to interface with the Aquatic Food Base work even though there is a strong connection. <i>(Note: the same comment is made on Projects B.3 and B.7, so it appears in both places in this table.)</i></p>	<p>There will be modest time allocations in these areas but not sufficient to warrant a budget change.</p>

General Comments and Recommendations		
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PROJECT B.4. HBC	<p>POPULATION GENETICS OF HUMPBAC CHUB (PGS. 87-90)</p> <p>Mike Douglas made a presentation to the TWG where he stated the N_e/N_g ratio for humpback chub in Grand Canyon is 0.0575. This ratio is required for calculating the minimum viable population size. If additional information is needed for a robust estimate of this ratio, can the work be accomplished through this project?</p>	This will be discussed with the project PI. Requires no change in FY03 plan.
B.5. NON-NATIVE FISH	<p>NEW RESEARCH ON NATIVE AND NON-NATIVE FISH (PGS. 90-92)</p> <p>There was considerable discussion at the past TWG and the native fish work group following the TWG meeting about the need to move quickly on controlling non-native fish in the LCR. This project should include research needs for the LCR as well as Bright Angel.</p>	Language to indicate feasibility analysis of control in LCR has been added.
B.5. (cont'd)	<p>This project seems to deviate from its General Project Description, which emphasizes determining predation rates of non-native fish on native fish, to determining if non-native predator suppression in Grand Canyon is feasible in the Project Goals and Objectives. A management action to evaluate the feasibility of suppressing brown trout in Bright Angel Creek is being planned for autumn 2002 by Grand Canyon National Park, Arizona Game and Fish Department, Bureau of Reclamation and GCMRC. The project proposed here, but with continued emphasis on monitoring of brown trout in conjunction with diet studies, could serve to help assess the efficacy of brown trout suppression and responses of native fish that are known prey of brown trout.</p>	We agree and this is our intent.

General Comments and Recommendations		
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PROJECT B.6. IWQP - DOWNSTREAM	<p>INTEGRATED WATER QUALITY MONITORING: DOWNSTREAM ACTIVITIES (PGS. 93-94)</p> <p>Project text speaks to integration with sediment, food base, and fisheries studies, but no means for attaining this integration are identified. Will samples be taken concurrently by individuals in the three project area? The budget for this work is more than doubled in 2002 from that in 2001, but Recommended Approaches/Methods "are currently being developed as part of the IWQP five year plan." It is not clear whether the additional dollars are going for additional sampling of variables previously sampled or addition of new variables to the previous set. It also is not clear what work is being done by contract as opposed to by GCMRC staff.</p>	<p>Clarifying language added to project description.</p>
B.6. (cont'd)	<p>(Pg. 93) The Integrated Water Quality Program schedule is not clear. It states that sampling regimes are being developed as part of a five-year plan then shows a budget for year 2 of a 3-year project. The budget shown is apparently for year 3 of the project (FY 2001, 02 and 03). The Status says the project was initiated in FY 2002 and earlier describes LSSF work in FY 2001 as pre-empting work slated for that year. We assumed the project initiated in FY 2002 was the PEP and development of the 5-year plan. Why is the FY 2003 Workplan failing to anticipate implementation of the 5-year plan being developed (and hopefully completed) now? The FY 2003 Workplan should anticipate something for sampling costs and manpower since the plan should be done soon.</p>	<p>Clarifying language added. Language added indicating long term cost reduction anticipated.</p>

General Comments and Recommendations		
Reference	TWG Comments/Proposed Revisions on Final Draft dated 11/2/01	GCMRC Recommendation (References are to changes that have been made in the 12/14/01 Draft of the FY 03 Work Plan)
B.7. IWQP – LAKE POWELL	<p>INTEGRATED WATER QUALITY MONITORING LAKE POWELL (PGS. 95-97)</p> <p>The previous section mentioned that the IWQP PEP recommended increasing the water quality emphasis downstream of Glen Canyon Dam. It is clear that added emphasis is being placed on downstream sampling, but it is not apparent whether there is any prospect for reduced sampling costs for the reservoir, particularly with the development and implementation of the CE-QUAL-W2 model. It does appear that operating expenses are declining as staff costs increase with a fixed budget. Some further explanation of future field versus modeling needs would help us to better understand how the objectives of this project will be accomplished.</p>	Language added indicating long term cost reduction anticipated.
B.7. (cont'd)	<p>We have some question about time allocations for the Biology Program Manager and Fisheries Biologist. We think some time should be allocated for the Biology PM for Project B.3. Less Ferry Trout and Project B.7. Lake Powell. We assume the PM will be involved in these two projects. Also, no time is shown for the Fisheries Biologist to interface with the Aquatic Food Base work even though there is a strong connection. <i>(Note: the same comment is made on Projects A.7 and A.8, so it appears in both places in this table.)</i></p>	There will be modest time allocations in these areas but not sufficient to warrant a budget change.
Chapter 2 - C. Integrated Terrestrial And Aquatic Ecosystem Activities		
PROJECT C.1. FINE SEDIMENT STORAGE	<p>INTEGRATED LONG-TERM MONITORING OF FINE-GRAINED SEDIMENT STORAGE THROUGHOUT THE MAIN CHANNEL (PGS. 98-105)</p> <p>A contract for \$75,000 to monitor camping beaches is proposed under Project C.1 yet no GCMRC Program Manager time is shown. Who will oversee the</p>	This project component is a portion of the larger project monitoring fine-grained sediment storage. Administration of the project is included within the sediment component budget on page 95.

General Comments and Recommendations		
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	contractor for GCMRC and what amount of time is needed?	
C.1. (cont'd)	<p>We appreciate this attention to integration of monitoring across programs. It is a significant step forward for GCMRC and the AMP. The specific monitoring objectives on page 100 are addressed by sampling that is either annual or biennial in frequency. Is there any accompanying analysis that has been conducted to identify whether this sampling frequency is sufficient to capture the rate of resource responses to changes in dam operations? Our impression is that fine sediment geomorphology can change rapidly in response to hydrologic events, which may be highly variable in number during any given year or two-year period and arise from either natural runoff events or dam operations. Also, to what extent are the measurements identified here commensurate with those being taken in studies conducted within the program areas? We think these considerations are important because some inference from "weighted evidence" gathered during long-term, core monitoring will have to be applied to the analysis of status and trends as a means of discerning effects of dam operations from other causative factors. With respect to the "35 previously monitored sand bars" mentioned under Project Goals and Objectives on page 99, has it been decided that these sand bars constitute a subset that allows extrapolation to the CRE, or are they being maintained largely to allow continuity of comparisons with the existing data set?</p>	Text revised with project description in response to this comment.
C.1. (cont'd)	<p>(Pg. 99) Fine-grained sediment monitoring is described as occurring in phases We can find no description of the ultimate monitoring phases or what signals an end of Phase 1. What are the phases and end points of each phase?</p>	Text revised with project description in response to this comment.

General Comments and Recommendations		
Reference	TWG Comments/Proposed Revisions on Final Draft dated 11/2/01	GCMRC Recommendation (References are to changes that have been made in the 12/14/01 Draft of the FY 03 Work Plan)
PROJECT C.2. STREAM FLOW, FINE SEDIMENT TRANSPORT	<p>INTEGRATED LONG-TERM MONITORING OF STREAM FLOW AND FINE-SEDIMENT TRANSPORT IN THE MAIN CHANNEL COLORADO, PARIA AND LITTLE COLORADO RIVERS (PGS. 108-115)</p> <p>We felt this project description came closest to any yet of providing the desired level of detail. Our only question is whether the pulsed tributary events that produce the majority of sediment and particulate organic matter, particularly the large, woody fraction, will be adequately captured by the sampling regime. We know that some attention has been given to putting in place upstream sensors in the Paria River to give advanced warning of hydrologic events originating higher in the watershed. Are there any plans to incorporate this system into the sampling regimen for the tributaries?</p>	<p>See revision of the section "Rationale/ Problem Statement"</p> <p>Text has been added to address the question posed by the reviewer (<i>last sentence of comment</i>).</p>
PROJECT C.3. COARSE SEDIMENT	<p>INTEGRATED LONG-TERM MONITORING OF COARSE-GRAINED SEDIMENT INPUTS, STORAGE AND IMPACTS TO PHYSICAL HABITATS (PGS. 116-121)</p> <p>It appears that our question on remote sensing of tributary inputs is addressed, at least in part, in this project. One aspect of this project that we did not see addressed is the question of sources and sinks for particulate organic matter. We appreciate the recognition that coarse-grained sediments are the source of much organic matter in the system. Little attention has been paid, however, to the transition of that organic matter to smaller size classes, its entry into the dissolved pool, and its reconstitution as autochthonously produced organic matter. Has any thought been given to tracking the pathways for organic matter that enters the system as part of the debris flows? Is it possible that even as the coarse substrates are the site for much autotrophic production, the fine substrates, particularly in deep pools, backwaters, and embayments, are the sites for much entrapment and subsequent decomposition of allochthonous organic matter?</p>	<p>See section on "Integration."</p> <p>Text has been added to address the questions raised here by the reviewer (<i>last two sentences of comment</i>). The role of organic matter in the overall dynamics of the ecosystem is still being evaluated by the aquatic biologists of the science program.</p>

General Comments and Recommendations		
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PROJECT C.4. STREAM FLOW, SUSPENDED- SEDIMENT	INTEGRATED STREAM FLOW AND SUSPENDED-SEDIMENT TRANSPORT MODELING WITHIN THE COLORADO RIVER ECOSYSTEM (PGS. 121-129) C.4.A. and C.4.B. : Our only comment on this project is that it is good to see attention paid to transport of the silt and clay fractions. One aspect of clay mineralogy that has not been addressed, to our knowledge, is the varying affinities of different clay minerals for phosphorus (adsorption-desorption) and the role that clays retained in the system may have in supplying phosphorus for both autotrophic and heterotrophic production. This would be a good subject for integration across water quality, biology, hydrology and sediment projects.	Re: Roles of fines in nutrient budgets and sediment modeling research. Comment noted.
PROJECT C.5. CONCEPTUAL MODELING, COARSE SEDIMENT INPUTS	ADVANCED CONCEPTUAL MODELING OF COARSE-GRAINED SEDIMENT INPUTS RELATED TO EVOLVING PHYSICAL HABITATS AND AQUATIC PROCESSES (PGS. 129-132) We strongly support continued development of the conceptual model as a tool for integration and better understanding of the structure and function of the CRE.	Comment noted.
PROJECT C.6. CRE CONTROL NETWORK	DEVELOPMENT OF A COLORADO RIVER ECOSYSTEM CONTROL NETWORK (Pgs. 132-135) The schedule for this project looks overly ambitious given the level of support for the surveyors involved. My suggestion is to get a more realistic evaluation of where the network is at this point, then devise a scheme to get it done as soon as possible. The FY2002 schedule looks impossible to do in two river trips. I think more effort is needed to complete the control network by 2004.	We maintain that this schedule is appropriate.

General Comments and Recommendations		
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	Either more time needs to be allocated for the survey technician, or a more realistic schedule should be given for the project, given the resources.	
C.6. (cont'd)	(Pgs. 134-135) Do the areas of survey work under <u>Status</u> on page 134 correspond with those in the table on page 135 titled Project Timeline 2000-2004 for FY 2003?	These have been updated to be consistent.
PROJECT C.7. CRE HYDRO MAPPING	<p>DEVELOPMENT OF A COLORADO RIVER ECOSYSTEM HYDROGRAPHIC MAPPING PROGRAM (PGS. 136-138)</p> <p>See comments above for project C.6 [<i>copied below for reference</i>]. This is also an overly ambitious schedule for completing the mapping.</p> <p><i>The schedule for this project looks overly ambitious given the level of support for the surveyors involved. My suggestion is to get a more realistic evaluation of where the network is at this point, then devise a scheme to get it done as soon as possible. The FY2002 schedule looks impossible to do in two river trips. I think more effort is needed to complete the control network by 2004. Either more time needs to be allocated for the survey technician, or a more realistic schedule should be given for the project, given the resources.</i></p>	Now that the problems associated with the LSSF multibeam data sets are solved, the multibeam data collection and processing scheduling should be appropriate. The schedule is based upon data sets collected and processed in 2001.
C.7. (cont'd)	This project seems to have great potential for change detection with an expected contour interval of a quarter-meter without interpolation.	Agreed!

General Comments and Recommendations		
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PROJECT C.8. RECREATION-AL EFFECTS	RECREATIONAL EFFECTS TO CULTURAL AND BIOLOGICAL RESOURCES (PGS. 138-140) This project is pretty hazy in terms of how it is actually going to accomplish what it proposes. Perhaps it would be worthwhile if its scope were expanded to include the effects of both recreation and scientific activities on the resources. This project also addresses MO's 9.4 and 9.5.	Comment noted and the changes have been made.
C.8. (cont'd)	(pg. 138) Despite its title, there is nothing in the project description regarding biological resources. We suggest changing the title and not the description of the project. Visitor use probably affects cultural resources. This should be a study. Research and visitors may also affect biological resources, but we think this is different enough that it should be a separate study. Visitor use may affect cultural resources. This should be the focus of the study. We can think of no useful reason to study the effect of visitor impacts as they relate to dam operations. Not only does this seem undoable, it would ignore the impact of visitors per se. We cannot support the aspect of this proposed study which ties it to dam operations.	Comment noted and references to biological impacts have been deleted. Clarifications have been made on pages 129 and 130. One objective of this study is to identify visitor impacts that are related to dam operations from general visitor impacts. Without special authority, GCMRC is restricted to studies related to dam operations.
C.8. (cont'd)	The proposed project covers recreational effects that may be related to dam operations and that may be due to research activities. Is there any integration of this information with data collected by the National Park Service or Arizona Game and Fish Department on other recreational effects?	Comment noted. These aspects will be incorporated into the SOW for the project.

General Comments and Recommendations		
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Chapter 2 - D. Remote Sensing Activities		
PROJECT D.1. DIGITAL IMAGERY, LIDAR	<p>MULTISPECTRAL DIGITAL IMAGERY AND LIDAR DATA COLLECTION (Pgs. 140-144)</p> <p>Table 2.1, page 41 indicates this project will end in FY 2002, but the table on page 143 indicates continuance through 2007. The text indicates that the remote sensing initiative will be completed in FY 2003. Some text should be provided to identify the review that will occur following completion of the initiative and how it will affect the decision on future remote sensing.</p>	The Remote Sensing Initiative ends in 2002. Multispectral Digital Imagery and LIDAR is ongoing for as long as this data is useful for monitoring. This project reflects anticipated outcomes of the Remote Sensing Initiative based on preliminary results. The formal reporting of these results will take place in FY2002.
Chapter 2 - E. Unsolicited Proposals (pgs. 144-146)		
UNSOLICITED PROPOSALS – General Comments	(pg. 144) By 2001 (if memory serves) the tribal representatives indicated that the tribes would be on the same budget schedule as the AMP. Proposals to monitor resources from a tribal perspective should be proposed at the time of budget formulation. Money set aside should be for those projects describe on this page "truly outstanding proposals that address a key concern which may be overlooked in the research planning process."	Agreed and comment noted.
General Comments (cont'd)	We have some disagreement with an unsolicited proposal occurring every year. GCMRC could solicit this work as part of an ongoing monitoring program.	By its nature an unsolicited proposal cannot be solicited. The intent of this activity is to maintain a modest amount of funding that will encourage scientists from outside the process to suggest activities that might contribute to the

General Comments and Recommendations		
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		goals of the program that we did not consider two years out in our planning process.
PROJECT E.1. ADOPT-A- BEACH	Adopt-A-Beach (Pages 144-146) This project has been ongoing since 1996, and it is indicated under Schedule on page 146 that it will continue to be funded "subject to receipt and acceptance of an unsolicited proposal." No indication is given whether a review has been completed to identify the utility of the data and the analysis provided from this project. It seems that 5 years of funding and data gathering would be sufficient to conduct such a review and we encourage GCMRC to do so rather than providing <i>de facto</i> funding based on continued receipt of an unsolicited proposal.	Comment noted and clarifications made on page 138.
E.1. (cont'd)	(Pg. 145) This [<i>Adopt-A-Beach</i>] project should be placed under the sediment program, not recreation. This is a sediment-based project, from which recreation benefits.	Comment noted. This project incorporates qualitative aspects of the recreation components of sediment sand bars. We anticipate more integration between this project and ongoing sediment studies.
E.1. (cont'd)	(Pgs. 145-146) Is it time to also fund a synthesis project, or is that what an "integrative data report" will contain?	Agreed. We anticipate more integration between this project and other sediment/camping beach studies.

General Comments and Recommendations		
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PROJECT E.4. TRIBAL OUTREACH	TRIBAL OUTREACH (PGS. 148-150) (Pg. 148) This project does not appear to be integrated with the tribal participation in biological monitoring (page 51). Integration is appropriate and necessary to improve tribal participation.	The proposed project includes several possible mechanisms for tribal outreach to the AMP, tribal groups, and the general public. The biological monitoring project with the tribal component is a specific project that integrates different data and perspectives for the purposes of terrestrial monitoring. The objectives of that project are not public outreach <i>per se</i> .
E.4. (cont'd)	Although the title of this project refers only to tribal outreach, the Rationale/Problem Statement suggests a wider audience. There appears to be an overlap of this project with the Tribal Participation component of the Terrestrial Ecosystem Monitoring (Project A.1). It would be beneficial to include text that explains how they are different.	The goal of this project is tribal outreach within and external to the AMP program. A number of possible mechanisms are suggested. Please see the clarifications on page 140.
PROJECT E.5. PUBLIC OUTREACH	PUBLIC OUTREACH (PGS. 150-152) (Pg. 150) This project should be directed at dissemination of information collected within all of the AMP programs, not just the GCMRC cultural program.	Agreed and comment noted. Please see clarifications on page 142.
E.5. (cont'd)	This project seems to be restricted to dissemination of information collected within the cultural resource program. Particularly with the integration of programs, it seems that this outreach effort should go beyond the cultural program. This extended coverage is mentioned under Recommended	Please see clarifications on page 143.

General Comments and Recommendations		
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	<u>Approach/ Methods</u> on page 151 by reference to "other AMP information" but there is little detail to indicate the intended breadth of coverage.	
Chapter 3 Administration and Technical Support Services (pages 155-179)		
F.1. ADMIN. OPERATIONS	ADMINISTRATIVE OPERATIONS (Pg. 157) What are budget line items for "awards" \$25,000 and administrative and network support \$65,000 for? Perhaps a blurb explaining these items?	Awards are monetary performance-based awards for GCMRC employees and other USGS support staff who provide services to GCMRC. BOR guidelines suggest budgeting an average of \$750 per employee. Administrative & Network Support – USGS FSC are funds paid by GCMRC for its share of administrative and telecommunication services at the Flagstaff Science Center (FSC). The administrative portion includes overall management of the FSC, small purchasing services, facilities and space management, vehicle maintenance, mail delivery, safety program, and security. Sharable telecommunications includes support for the local area network (LAN) maintained by USGS staff at the FSC. Note: GCMRC does not pay any overhead costs to USGS; therefore, GCMRC pays directly for the services received.

General Comments and Recommendations		
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G.5. DSS	<p>DECISION SUPPORT SYSTEM (PGS. 174-175)</p> <p>More details are needed about this project. Also claims of GCMRC having developed "an integrated Oracle database of research on the CRE" are stretching the truth quite a bit.</p>	<p>Details of the DSS will be forthcoming. The sentence referencing the oracle database activities has been modified to reflect that this work is being accomplished in FY2002.</p>
G.5. (cont'd)	<p>It is our understanding that GCMRC has committed to presenting the proposal for a decision support system to the TWG before commencing this project.</p>	<p>See above.</p>
PROGRAM SCHEDULE	<p>Program Schedule (Pg. 179)</p> <p>In March of 2002, do you intend to just review the SCORE report, or do you plan to update the report? I would prefer a review of information presented in the SCORE report and an update.</p> <p>Should the update for Congress be in this schedule? The Charter calls for the report to include the status of resources.</p> <p>It would be useful to develop the different reporting formats that we have discussed. On the river trip, we discussed three different levels of reporting for different audiences. There was, I think, reporting of status and trends for each MO, and status and trends for "synthetic indicators." The synthetic indicators would be reported using actual data in the SCORE report, and something real simple to digest such as a green light (everything is cool), yellow light (there is some concern), red light (everything is ugly) analogy. Randy Peterson took notes and might be able to scrounge up what we talked about—it seemed brilliant at the time.</p>	<p>The text is intended to indicate that the updated SCORE report will be reviewed with the TWG. The text has been changed to reflect this.</p> <p>The "Report to Congress" effort is led by BOR and not shown in GCMRC's plan (which reports on science activities led by the Center).</p> <p>The SCORE report is being revised to provide information on the status and trends of resources through graphs, fact sheets, Pls project reports, and publications in peer-reviewed journals.</p>

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APPENDICES		
Appendix One (Pgs. 184-190)	The paraphrased MOs do not correspond to the paraphrased MOs in the IN document. Rather than risk keeping edits up to date, I recommend that you simply point people to the original source in the strategic plan.	The MOs have been paraphrased to facilitate a reading of the proposed projects. For the specific language of the MOs, please see the AMP Strategic Plan.
Appendix Two (Pgs. 191-202)	Same comment as above. However, a cross tab of INs by projects would be informative.	The revised INs will be inserted into and referenced in this annual plan when they have been finalized.