

The Core Monitoring Plan: Current Status and Proposed Process for Completing a Final Core Monitoring Plan

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Where we have been?

- **First CMT meeting, April 9, 2004**
 - We decided on definition of core monitoring (same definition as in the AMP strategic plan)
 - We agreed the CMP needed to address basic information needs of stakeholders (but no extra “ornaments”)
 - We discussed the resources that needed to be covered in the core monitoring plan, but did not fully resolve what constituted “key resources”
 - Stakeholders identified a list of resources that included most of the same ones addressed in EIS and AMP Strategic Plan: Sediment , Wildlife/Vegetation, Fish, Food base, Cultural Resources (both Register eligible historic properties and other traditionally valued resources), Hydrology, Water Quality, Recreation, Threatened and Endangered Species, Power, Economics, Non-native species.

Where have we been? continued

- At 2nd CMT meeting (May, 2004), GCMRC tried unsuccessfully to get stakeholders to pare down the list of monitored resources.
- GCMRC was instructed by CMT to start developing a core monitoring plan with information provided at previous meeting.
- First draft plan finished June 9, 2004 and sent to SAB for review.
- Among other things, SAB criticized the plan for lacking an ecosystem perspective and lacking clearly defined monitoring objectives.

Where we have been? continued

- At third CMT meeting (September, 2004), some team members wanted to distinguish monitoring projects that were already fully implemented from those that were still undergoing research and development.
- Consequently, a decision was made to categorize monitoring programs in the plan as **green**, **yellow** or **red**, depending on their current status:
 - **Green projects:** PEP'd, piloted for 3-5 years, peer reviewed and already implemented.
 - **Yellow projects:** PEP'd, piloted, but not yet peer reviewed. Almost ready for “prime time”.
 - **Red projects:** PEP'd but not yet piloted or peer reviewed. Still undergoing some form of R&D.

Where we have been? continued

- Draft 3 of CMP (Green-Yellow-Red Plan) was presented to TWG September 27-28, 2004 as a work in progress.
- GCMRC requested feedback on the plan but received very little initially, except from a small handful of stakeholders.
- Some additional comments were received in January-February 2005, following TWG.

Where we have been? continued

- At 4th CMT meeting (March 9-10, 2005), stakeholders argued that “red” and “yellow” projects should not be included in the CMP because they were still R&D and therefore research, rather than core monitoring.
- One pivotal outcome of the March meeting was a decision by the CMT to limit the CMP to “green projects” only and to move red and yellow projects into a yet-to-be developed research plan.
- The CMT also decided that red and yellow projects would not be included in the CMP until they had been fully peer reviewed and vetted through an evaluation process.
 - The CMT then proposed and piloted a “proto-process” for “vetting” monitoring projects against a list of explicit criteria.

Where have we been? continued

- GCMRC revised the 3rd draft of the CMP based on recommendations from March 2005 CMT meeting
- Draft 4 was sent back to CMT for review and approval on April 3, 2005.
- At 5th CMT meeting (April 10-11, 2005), some stakeholders decided that even the green projects should not be included in the CMP until they had been vetted through an explicit evaluation process.
- CMT decided to call the draft CMP with green projects a “Provisional Core Monitoring Plan” for FY06, pending a thorough evaluation of each project.

Where have we been? continued

- Other decisions of April 2005 CMT meeting:
 - Final CMP should be structured around AMP goals, rather than resource categories
 - Not all CMINs in AMP strategic plan are “core”
 - The CMINs need to be separated into “core” and “non-core” MINs and prioritized
 - AMP goals need to be prioritized for budgetary purposes
 - NPS will take lead for establishing desired future resource conditions with targets
 - Final CMP will use a loose-leaf binder format, allowing projects to be added as they are finalized

Where are we now?

- 5th draft of CMP (current version) is now the Provisional Core Monitoring Plan for FY06
- PCMP includes only “green” projects:
 - Lake Powell hydrology and quality of water
 - Downstream surface water (stage/discharge)
 - Downstream quality of water
 - Lees Ferry Trout
 - HBC in the LCR

Where are we heading next?

- All “green” projects in PCMP will undergo rigorous evaluation process in FY05-06 before becoming part of the Final CMP
- If consistent with prioritized CMINs, yellow and red projects will be added to the CMP in FY06-08, as R&D and pilot phases are completed and they pass scientific review
- Final CMP will be reformatted and structured around AMP goals and prioritized CMINs

How will we get to a final CMP?

- CMT is proposing to use several interrelated processes to prioritize AMP goals and CMINs and to evaluate monitoring data relative to AMP goals and highest priority CMINs.
- CMT proposes to undertake the prioritization of AMP goals for budgetary purposes and to prioritize CMINs to refine focus of the final core monitoring plan during summer FY05.
- CMT will evaluate each monitoring program according to explicit evaluation criteria in FY05-06, starting with the green projects.

PROPOSED CRITERIA FOR RANKING AMP GOALS

- **Critical to ecosystem function**
 - Does the Goal address a critical ecosystem function?
- **AMWG priority**
 - Is the goal an identified AMP priority (within the top 10 from the 2004 AMWG prioritization exercise), and if so, what is its level of priority? (Priority 1 will receive 5 points, priority 2 will get 4 points, etc. but priorities 5-7 each get 1 point, and Priorities 8 or less receive no points)
- **CMINS**
 - How many “Core” MINS fall under the goal? (This will require completion of the CMIN prioritization process first). List the total number of core MINs identified during the CMIN prioritization exercise.

PROPOSED CRITERIA FOR RANKING AMP GOALS (continued)

■ Compliance

- Does the goal address a resource category that is specifically mentioned in the NPS Organic Act and/or GCPA?
- Does the goal address a resource that was specifically analyzed in the EIS for Operations of Glen Canyon Dam or specifically discussed in the ROD?
- Does the goal fulfill the needs of a specific legal compliance requirement outside of GCPA, EIS/ROD, and the NPS Organic Act (e.g., ESA, LOR, NHPA)?

■ Cost/benefit and risk assessment

- How critical is the goal for maintaining a healthy and functional Colorado River ecosystem?

■ Status of knowledge



- How well do we understand the status and trends of the resource related to this goal?

CRITERIA FOR PRIORITIZING CMINS

- **Definition of “core”**
 - Does the CMIN meet the definition of “core” as defined in the revised plan?
- **AMWG priority**
 - Does the CMIN directly or indirectly address an AMP priority?
- **MO's**
 - How well does the CMIN address the MO relative to other CMIN's?
 - Does it address multiple MO's or additional CMIN's?
- **Compliance**
 - Does the CMIN address a resource category specifically mentioned in the NPS Organic Act and/or GCPA?
 - Does the CMIN address a resource specifically analyzed in the EIS or specifically discussed in the ROD?
 - Does the CMIN fulfill the needs of a specific legal compliance requirement outside of GCPA, EIS/ROD, and the NPS Organic Act (e.g., ESA, LOR, NHPA)?

CRITERIA FOR PRIORITIZING CMINS

(continued)

- Representation of the resource and ecosystem
 - How well does the CMIN represent the resource and ecosystem?
 - Can it represent multiple resources at equivalent or lower trophic levels?
 - Can it be used as an indicator of overall ecosystem health?
- Critical to ecosystem function
 - Does the CMIN address a critical ecosystem function?

EVALUATION OF MONITORING DATA

- Information needed to evaluate the monitoring data will be presented in a step-down fashion, as follows:
 - Ecosystem> resource>management objective>(CMINs)> indicator(s)>geographic extent>change over time (determined by accuracy, precision, and frequency)
- The data evaluation process will also serve as the outline for organizing and presenting the detailed information identified by stakeholders as necessary for inclusion in the final core monitoring plan.

CRITERIA FOR EVALUATING THE MONITORING DATA

- **AMWG priority**
 - Does the data directly or indirectly address an AMWG priority?
 - Describe the applicable AMWG priority and how the data address it.
 - Discuss whether or not an AMWG priority is being addressed directly or indirectly.
 - If the priority is not being addressed completely, describe the scope of what is and is not being addressed by current data.

DATA EVALUATION CRITERIA, cont.

■ MOs and CMINs

- Does the data directly or indirectly address an existing MO and specific CMIN?
- List applicable MOs and CMINs and how the data address them; note whether or not they are being addressed directly or indirectly.
- If the MO's and IN's are not being addressed completely, the scope of what is and is not being addressed.
- Specify the information needed to answer the management objective and associated CMINs completely.
- Describe what would need to be done to overcome current limitations in answering the question completely.

DATA EVALUATION CRITERIA, cont.

■ Compliance

- Does the data satisfy a specific legal compliance requirement outside of GCPA and the NPS Organic Act (e.g., EIS/ROD, ESA, LOR, NHPA)?
- List applicable compliance requirement and how/why the data address them.
- If the compliance requirement is not being addressed completely, discuss the scope of what is and is not being addressed.

DATA EVALUATION CRITERIA, cont.

- **Legacy Data: Does the data contribute to an historical record that is important to continue?**
Provide a complete description of the legacy data
 - kinds of data collected
 - where the data were collected (provide location map)
 - the accuracy, precision, and frequency of the legacy data
 - original purpose for which the legacy data was collected
 - Was the data was validated by an acceptable QC/QA plan?
 - Does GCMRC compliant metadata exist for this legacy data?
 - Do the legacy data meet GCMRC data standards?
- Describe the applicable historical record, how many years of existing data, how proposed new data will enhance the record.
- Discuss how historical data address AMWG priorities, MOs, CMINs.
- If the AMWG priority or MO or IN is not being addressed completely, describe scope of what was/was not addressed by legacy data.
- Describe whether or not legacy data collection protocols underwent a PEP, when PEP occurred, whether or not PEP concurred with methods of data collection, and how they were changed if PEP did not concur.

DATA EVALUATION CRITERIA, cont.

- **Data quality/availability:** Is the accuracy and precision of the data known for proposed data collection, and if so, is the level of accuracy/precision adequate, inadequate, or more than adequate to meet the needs of the program?
 - What data is being proposed for collection?
 - How will the data be collected?
 - Where will the data be collected (need location map)?
 - Describe the accuracy, precision, and frequency of the data and explain why this level of accuracy/precision/frequency is necessary
 - What is the statistical power?
 - Describe the data QC and QA plan.
 - Specify whether or not GCMRC compliant metadata has been developed and whether or not data meet GCMRC data standards.
 - How and where will the data be stored?
 - How will someone be able to obtain the data?

DATA EVALUATION CRITERIA, cont.

- **Cost/benefit and risk assessment:** What are the relative merits of collecting this data relative to other data collection?
 - How well do the data represent the resource and the ecosystem?
 - Do the data relate specifically to a critical ecosystem function?
 - What changes to the resource will the accuracy, precision, and frequency of data collection pick up (climatic, natural variability, natural or man-made events, etc. – over what minimum time interval)?
 - Describe the consequences of collecting data with higher and lower accuracy, precision, and frequency in terms of cost, ability to detect change over time, knowledge, and risk to the resource.
 - Describe how the data are being or will be analyzed.
 - Describe products that will be developed from this data.
 - Identify the metrics of success.

DATA EVALUATION CRITERIA, cont.

- **Methodology:** Does methodology exist that provides acceptable accuracy, precision, and frequency of data?
- **Describe proposed methodology.**
 - Is similar work being done elsewhere? If yes, provide a synopsis of similar work being done elsewhere and methodology being used.
 - Describe possible alternative methodologies, and discuss the pros and cons of these alternative methods in terms of cost, accuracy, precision, and frequency of data

DATA EVALUATION CRITERIA, cont.

- **Status of knowledge:** What is the current status of our knowledge about the resource that the data is intended to monitor?
 - Discuss whether or not existing data has been analyzed.
 - Discuss whether or not targets and/or metrics have been established.
 - Describe what the data shows relative to AMWG priorities, MOs, and CMINs.
 - Discuss whether or not the data are measuring the right things/variables.
 - Discuss the current status and trend of the resource based upon this data.
 - Describe what is known about cause and effect relationships, and relevance of data to evaluating such relationships.
- Discuss whether or not the data is meeting the AMP's need relative to detecting decline or improvement of a resource over a useful period of time.

Key issues still needing resolution:

- Need explicit rationale for defining a monitoring activity as “core” vs. “non-core”
 - Is core monitoring about tracking trends in resource condition regardless of possible causes of condition change, or is core monitoring specifically about tracking & documenting effects of dam operations?
 - Is “compliance monitoring” always core monitoring?
- What criteria define a “key” resource for core monitoring purposes? (see proposed definition)
- Should we monitor resource condition generally or focus on specific indicators of ecosystem “health”?
- Are controls essential for successful core monitoring?

Proposed definition of core monitoring (provisional, subject to TWG/AMWG acceptance):

“Long-term repeated measurements using scientifically accepted protocols to measure status and trends of key resources to answer high priority management questions (CMINS) contained within each of the goals (and respective MOs) set forth in the AMP Strategic Plan. Monitoring is considered core when it is essential to assess the long-term health and well-being of a high priority CRE resource (either directly or by using a relevant surrogate). Core monitoring is implemented on a fixed schedule with scientifically valid methodologies that provide robust data using defined metrics with appropriate accuracy and precision to describe an appropriate level of change over time frames specified by AMP stakeholders.”