



General Core Monitoring Plan Criteria Development

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Purpose:

Develop general criteria to use to evaluate individual core monitoring plans

1. Utilize decision support methods, SDM
2. Final revisions to TWG **Appendix B**, integrate SA comments.
3. Criteria will inform GCMRC as to how we will evaluate the individual plans and, therefore, what to include in them so we can evaluate the plans.
4. The criteria help to define the risk assessment.

Environmental decisions in the GCDAMP generally involve complex scientific and technical issues – in addition, a wide variety of program participants, value conflicts, scientific uncertainty, and social dynamics all combine to make environmental decisions difficult to make. The result of previous efforts to develop core monitoring and the CMINs themselves represent a “Christmas tree” approach (described below) which included all the “ornaments” or questions posed by the diverse group within the GCDAMP. The current CMP was not adequately formulated with the recognition that there are trade-offs among budget allocation, precision of determining change in resource conditions, and risks that managers take when decisions are made based on results from the monitoring.

The goal of this CMP process is to further refine those choices working in a collaborative relationship between TWG, GCMRC, and AMWG. To accomplish this, the development of individual core monitoring plans will adopt a collaborative adaptive management framework utilizing (a) program Goals and CMINs, (b) **criteria for element inclusion within plans**, (c) trade-off analyses in a risk assessment framework, and most of all (d) stakeholder involvement in the development of all of these elements.

What is the GOAL of Core Monitoring?

Develop a robust, long-term monitoring program that is core to the goals of the AMP.

Supports critical functions of the AMP and provides the foundation to answering critical questions or supporting critical management actions.

Projects will not be altered in periods of funding challenges.

The GCDAMP Strategic Plan defines core monitoring as follows:

Consistent, long-term, repeated measurements using scientifically accepted protocols to measure status and trends of key resources to answer specific questions. Core monitoring is implemented on a fixed schedule regardless of budget or other circumstances (for example, water year, experimental flows, temperature control, stocking strategy, nonnative control, etc.) affecting target resources.

After information needs are identified in adaptive management programs, development and implementation of monitoring programs typically proceed in three phases (Atkinson and others, 2004):

1. Resources are inventoried and key relationships between physical process, species, habitats, and other causes of variation such as dam operations are identified.

This was largely completed for most GCDAMP resource goals by the early 2000s

2. Long-term monitoring protocols and sample designs are pilot tested.

This step has been the focus for GCRMC during the past 8-10 years

3. Long-term monitoring and adaptive management activities are implemented.

This is where we are now, this is what we are trying to accomplish.

2009 WORKSHOP RESULTS

Dot-Ranking

1. Describe **criteria for evaluation**.
2. Need **DFCs**.
3. A **risk assessment** for critical choices, trade-off analysis
4. Should **avoid the “Christmas tree” approach**, in 40-60% range of the science budget.
5. The strategy discussion needs to be a greater focus of the document describing the **two strategies (science and management)**.
5. More integration of **tribal monitoring** in each CMP/goal.

Priority issues/concerns addressed in current draft plan

1. **Expanded description of Step 4:** describes criteria & analyses that will be done before TWG makes final Core Monitoring recommendation
2. Recognizes need to conduct **trade-off analyses & risk assessments** to understand implications of choosing monitoring approaches with more/less accuracy, statistical precision, sampling intensity etc. – also budget implications of these choices
3. Define **TWG process for evaluating/approving** long term core monitoring proposals (Appendix B)

TWG APPENDIX B

A Collaborative Approach



- (A) Decision making process using SDM
- (B) Trade-off analysis, risk assessment
- (C) Include a range of three alternatives which form the structure of the risk assessment
- (D) Evaluation criteria
- (E) Stakeholder involvement in the development of all of these elements.

TWG APPENDIX B: SDM

Step 1: Clarify the Decision Context (CMP: scope, roles)

Step 2: Define Objectives and Evaluation Criteria (Appendix B, the core of SDM is a set of well defined objectives and evaluation criteria)

Step 3: Develop Alternatives (App. B: High, Medium, Low)

>> Workshop to define specifics for each plan, refine criteria

Step 4: Estimate Consequences (individual plans, performance)

Step 5: Evaluate Trade-Offs and Select

>> Workshop to establish preference assessment (e.g. swing weighting)

Step 6: Implement and Monitor (CMP)

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TWGW APPENDIX B: Alternatives

Scope and Cost

Trade-off analysis framework

- “High” – would implement the CMINs for that goal to the extent practicable and represent as close to full implementation as can be obtained with current resources, and is based on current implementation strategy by GCMRC.
- “Medium” – would implement modest reductions in spending (about 10-30%) to implement the higher priority CMINs.
- “Low” – would implement substantial reductions in spending (about 40-50%) to implement only the highest priority CMINs.

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TWG APPENDIX B: The Objectives

Define a long-term management program which satisfies the needs identified in the CMINs. For each individual plan, the objectives are the CMINs themselves.

GOAL or CMIN	Revised CMIN Wording	SPG Prioritization
GOAL 2 Rank 1	Maintain or attain viable populations of existing native fish, remove jeopardy from humpback chub and razorback sucker, and prevent adverse modification to their critical habitat.	
CMIN 2.1.2	Determine and track recruitment (identify life stage), abundance and distribution of humpback chub in the mainstem.	Priority 1
CMIN 2.3.1	Determine and track the parasite loads on humpback chub and other native fish found in the LCR and in the Colorado River ecosystem.	Priority 2
CMIN 2.4.1	Determine and track the abundance and distribution of non-native predatory fish species in the Colorado River.	Priority 3
CMIN 2.6.1	Determine and track the abundance and distribution of flannelmouth sucker, bluehead sucker, and speckled dace populations in the Colorado River ecosystem.	Priority 4

Goal 2 Objectives

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TWG APPENDIX B: Evaluation criteria

The core of SDM is a set of well defined objectives and evaluation criteria. Together they define "what matters" about the decision, drive the search for creative alternatives, and become the framework for comparing alternatives.

TWG APPENDIX B: Evaluation criteria

In SDM, evaluation criteria are used to characterize the degree to which different alternatives are expected to meet objectives. They are used to:

- compare alternatives accurately and consistently;
- expose trade-offs including trade-offs among different degrees of uncertainty;
- generate productive discussion about better alternatives;
- prioritize information needs;
- communicate the rationale for and improve the transparency of decisions.

TWG APPENDIX B: Evaluation criteria

It isn't easy to define good evaluation criteria that are widely agreed upon by stakeholders, experts and decision makers. However, the up-front investment pays off in streamlined decision making, for two principal reasons:

- because data, modeling and expert judgment processes are focused on producing decision-relevant information;
- because large numbers of very complex options can be consistently and efficiently evaluated by multiple decision makers.

TWG APPENDIX B: Evaluation criteria

"What specific metric could we use to report the impact of these alternatives (High, Medium, Low) on this objective?(CMIN)"

Or

"What specific information would you like to see to be able to evaluate the impact of these alternatives on this objective?"

TWG APPENDIX B: Evaluation criteria

- AMWG Priority
- MOs and CMINs
- Compliance
- Legacy data
- Ecosystem importance
- Data quality/availability
- Cost/benefit and risk assessment
- Status of knowledge
- Methodology
- Trade-off Analysis

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Discussion