



Memorandum

Date:	September 16, 2011
To:	Jerry Meral, Deputy Secretary, Natural Resources Agency, and members of the Adaptive Limits Working Group
From:	Chris Earle, Ph.D., and David Zippin, Ph.D.
Subject:	Adaptive Limits in the BDCP

Overview

One of the principal incentives for adoption of a Habitat Conservation Plan (HCP) is the "No Surprises" rule, which provides assurances that, as long as the plan is being implemented properly, permittees will not be subject to any later demands for additional commitments of land, water, money, or other resources, even if the needs of the species covered by the plan change over time. The assurances provided by the No Surprises rule, however, are tempered by the "Permit Revocation" rule, which provides that in instances where the continuation of the permitted activity would appreciably reduce the likelihood of the survival and recovery of the covered species, assurances may be nullified and the federal fish and wildlife agency may revoke the section 10 permit (50 C.F.R. § 17.22(b)(8)). The Natural Community Conservation Planning Act (NCCPA) provides similar assurances for NCCPs.

The conservation strategy for the Bay-Delta Conservation Plan (BDCP) is designed to attain the biological objectives, as demonstrated by monitoring. Due to uncertainty derived from numerous sources (e.g., data quality, effectiveness of the conservation measures, and future environmental change), adaptive management will be used to increase the likelihood that the biological objectives will be achieved.

Adaptive management is defined by the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) as a "method for examining alternative strategies for meeting measurable biological goals and objectives, and then if necessary, adjusting future conservation management actions according to what is learned."¹

¹ Five-Point Policy, 65 FR 35242, June 1, 2000.

As stated in the November 2010 draft of the BDCP, the plan's adaptive management program will: (1) identify key gaps in data and knowledge and steps to be taken to close such gaps; (2) gather new information through monitoring and targeted research programs; (3) identify ways to improve the effectiveness of conservation measures; and (4) establish a clear process to better inform decisions on how best to implement and adjust the conservation strategy. Outcomes of the adaptive management process could include changes in conservation measures, biological objectives and targets, monitoring actions and metrics, or analytical tools.

All changes within the adaptive management program will be made within bounds established by the BDCP. These limits define the extent of the obligations of the Authorized Entities under the Plan. The limits to the potential range of adaptive management responses are called "adaptive limits" in the BDCP.

This memorandum has been prepared to define, review, and propose an approach for use of adaptive limits in the BDCP. The subsequent sections of this memorandum:

- define the concept of adaptive limits;
- establish the purpose of adaptive limits and their place in the adaptive management process;
- establish principles to guide the development of adaptive limits for BDCP; and
- explain when changes to the BDCP Conservation Strategy within the adaptive limits would likely be invoked during plan implementation.

This memo focuses on the development of an approach to defining adaptive limits associated with Conservation Measure 1 (CM-1), *Water Facilities and Operations*. Limited application of adaptive limits may be needed for other conservation measures in the BDCP, but that is not the subject of this memo. The information in the memo is intended to provide background and a common set of definitions for the Adaptive Limit Working Group.

What are Adaptive Limits?

We propose that adaptive limits be defined as *the upper and lower boundaries of adjustments that can be made to a conservation measure within the context of permits and the regulatory assurances provided pursuant to State and Federal law*. Changes above or below the adaptive limits can be made, but such changes would be made on a voluntary basis and may require permit amendments. Changes made to conservation measures within the adaptive limits are made pursuant to the adaptive management program.

Adaptive limits are sometimes described using other terms, such as "adaptive range," "adaptive management limits," or "limits of allowable change."

Why Adaptive Limits are Important

Adaptive changes occur within the adaptive management program, and may apply to a number of the conservation measures. Adaptive management is an essential component of the BDCP because of the uncertainties that are inherent in the biological systems addressed by the plan. Uncertainties generally fall into two categories, uncertainties in our knowledge and uncertainties of the environment.

Uncertainties in knowledge are those that arise from an incomplete or inaccurate understanding of the ecological systems in the plan area. Because biological systems are complex, there will always be some degree of uncertainty in knowledge. However, the purpose of targeted research, monitoring and adaptive management is to improve our understanding of the species and natural communities covered by the BDCP. Adaptive management provides the mechanism that will turn that improved understanding into action to improve the effectiveness of the BDCP.

Uncertainties of the environment are those that arise from environmental change, and may be either inherent in the system (e.g., annual variation in rainfall) or related to future, more unpredictable environmental changes (e.g., sea level rise due to climate change). Adaptive management provides a basis for operational flexibility and adjustments to management strategies in response to these changes in the environment (or our improved understanding of those changes). This flexibility and additional capability improve confidence that the BDCP will be able to attain its biological objectives in the context of environmental changes.

Adaptive Limits in the Current BDCP (November 2010 Draft)

The November 2010 draft BDCP (page 3-311) discusses the concept of adaptive limits (using the term “adaptive range”), but does not contain quantitative statements about adaptive limits. Instead, it discusses two example scenarios of "analytical ranges" (Table 3-13, November 2010 draft BDCP) for long-term water operational criteria, noting that the example ranges are presented only for analytical purposes, pending later development of adaptive range proposals. The two example analytical ranges include initial operational criteria, as well as lower and upper range limits for each criterion.

It is our understanding that these examples did not reflect a consensus position by the Steering Committee. Therefore, we do not recommend using these examples as starting points for determining the adaptive limits in the Working Group. They are mentioned here only for context.

Principles for Establishing Adaptive Limits

The following principles should be used to help guide the development of adaptive limits for water operations in the BDCP.

- Adaptive changes should be used to address uncertainties regarding the effectiveness of the conservation measure (relative to other BDCP conservation measures);
- Adaptive changes to CM-1 may be necessary because of the high degree of reliance on this conservation measure to benefit one or more key covered species as compared to other BDCP conservation measures;
- Adaptive changes within the adaptive limits should be consistent with the co-equal goals of BDCP to restore the delta and restore water supplies;
- Adaptive changes must be practicable, including financially feasible;
- Adaptive changes must be proportional to the impacts of the covered activities; and
- Adaptive changes should be designed to avoid adverse effects on non-target covered species that prevent permit issuance for those species.

Adaptive limits will be defined for the components of CM-1 (i.e., parameters) that are most uncertain and important to the covered species. Thus adaptive limits will be framed and limits set in the context of relevant biological objectives for covered species. It is likely that not all components of CM-1 will need adaptive limits.

Applying Adaptive Limits in Plan Implementation

Adaptive changes should be proposed and implemented through a process that ensures that actions that may adversely affect water supply are warranted. The November, 2010 draft BDCP, section 3.7.3 (beginning page 3-584), discusses how adaptive limits would be implemented, and presents a decision process, here summarized, showing how adaptive limits could be used in practice:

1. Proposal to change operating criteria within the adaptive range provided to Program Manager
2. Review of proposed change - The Program Manager, through the Science Manager, will solicit independent science input on the proposed change.
3. Submittal of proposal for change by Program Manager to the "Decision Body" ("Decision Body" not defined in the November, 2010 draft BDCP).
4. Review of proposal for change by "Decision Body."
5. (Unspecified) provision for dispute resolution if "Decision Body" cannot reach a decision.
6. Establish the changed criteria as new operational criteria for the conservation measure.

This approach is largely appropriate, but further refinement will be required to incorporate adaptive limits and achieve an implementable structure. The necessary changes include:

- Decision-making process needs to be clarified and linked to BDCP governance structure
- Decision rules and criteria need to be established to define the circumstances in which adaptive limit actions would be implemented. Criteria may include:
 - Expected progress towards biological goals and objectives not being made. Define how this is determined (e.g., reasonable time period with downward trend or lack of progress; not meeting multiple metrics)
 - A changed circumstance occurs that requires changes to conservation measures.