

## Draft Outline of Presentation

February 16, 2000

Just throwing out ideas here. Needs much polish before meeting.

[Goal: Focus on implications of gaming for policymakers. Do not get into the details of the games.]

### Games Run

- Game 1. B(2) is primary means for fish protection beyond standards. B(2) interpreted in manner generally favorable to Projects.
- Game 2. Integration of b(2) with EWA. Designed to shed light on scenario in which b(1) type reoperations are maximized and export cuts using b(2) are minimized.
- Game 3. Approximation of the biological bar. Selectively apply USWS/ NMFS prescriptive standards + additional actions to produce a level of protection consistent with regulatory assurances.

Each game was run for the period 1981 –1994 for two target periods: Beginning of Stage 1 (1a, 2a, 3a) and End of Stage 1 (1b, 2b, 3b).

### Results

- Export patterns. See Figures ---- and -----.
- Operational patterns
- Fish protection
- Water quality impacts

### Insights

- Goal of water management strategy is to create flexibility, relative to current deliveries, current protections.
- Then consume that flexibility through a combination of greater protection, greater deliveries.
- This process forces new operational patterns. Significant reductions in winter, spring exports. Major increases in summer and fall exports.
- Operational shifts may have water quality implications.
- Water development and increased deliveries erode environmental protection. Feedbacks must be designed into the solution.
- EWA is primarily a mechanism to shift the risk of fish friendly operations off the Projects. This reduces opposition to fish actions. However, assumes that EWA has sufficient assets to shoulder this risk.
- EWA is able to leverage several acre-feet of reoperation for every acre-foot of water it actually delivers to the Projects.
- B(2) is brittle without an EWA backup. Difficult to make numbers come out right. Difficult to deal with surprises
- The definition of b(2) matters a great deal. Primary issue is the use of b(1) water. Essential that we not lose ability to use Project flexibility as a result of b(2) decision.
- Delta storage more effective in wetter years. Good for the EWA or for CVP
- Groundwater effective for dry years, but slow to fill.
- Banks and JPOD are more effective measures for increasing flexibility. But that flexibility is eroded if coupled to increased deliveries.
- Water purchases very valuable. Note that export purchases/ reduced demand are analytically indistinguishable. CALFED must decide how much water can be purchased/ conserved at an acceptable price. The rest is shortages or reduced protection
- Yuba water remains significant underutilized. A long-term purchase of Yuba water could substitute for some amount of water development with little local impact.

### Game 1.

Limited ability to reoperate the system limited amount of environmental protection available. Any definition of b(2) that forecloses possibility of reoperation (whether called b(1) or "debt") is clearly suboptimal. Flexibility that the Projects cannot use, but which could be used for greater protection would simply need to be abandoned.

### Game 2.

Major increases in reoperation of system. Significant improvements in environmental protection while maintaining level of deliveries. Requires creation of an EWA able to take on debt of several hundred thousand acre-feet in some years.

### Game 3.

Full protection scenario. Major increases in environmental protection. However, some loss of supply compared to Games 1 and 2 and virtual elimination of remaining flexibility as evidenced by inability to fill storage south of Delta. Since supply losses occur in nearly every year, would require permanent acquisition of several hundred thousand acre-feet of water in the export area.

### Priorities

JPOD/ expanded Banks are the foundation of any effort to increase flexibility. However, requires feedbacks to assure that fish share in the benefits.

Delta storage is highly productive, generating about 1 acre-foot per year of supply for every acre-foot of storage. However, production is weighted toward wetter years. Implies that control is more appropriate for EWA or for CVP.

Groundwater storage best used as "strategic reserve". Fill during wet years. Empty during extended drought. Yield/capacity is in the standard range of 20%.

Etc.