

# TESTIMONY OF FRASER SHILLING, Ph.D.

HEARING IN THE MATTER OF  
CALIFORNIA DEPARTMENT OF WATER RESOURCES AND  
UNITED STATES BUREAU OF RECLAMATION  
REQUEST FOR A CHANGE IN POINT OF DIVERSION FOR THE  
DELTA TUNNELS

# My research and education

- Ph.D. 1991.
- Research at UC Davis has focused on improving the use of environmental information in decision-making:
  - Water quality;
  - Water sustainability;
  - Mercury and fish; and
  - Transportation/infrastructure ecology.
- Have worked with many local, state and federal agencies, NGOs, and international organizations.
- Expertise in adaptive management primarily from the POV of informing and evaluating management

# My testimony, generally

Responds to the statements and positions set forth by Part 2 witnesses Christopher Earle (DWR-1014); Gwen Buchholz (DWR-1010); and Marin Greenwood (DWR-1012).

# What does the literature say about AM plans?

- Structured and comprehensive
- Allows modification of management
- Not subject to bias and political pressure
- Monitoring and research/experimentation is continuously funded, for the length of the project
- Firm triggers and guarantees
- Uncertainty not a shroud for indecision
- Include stakeholders in defining and evaluating management outcomes

# My testimony, specifically

## Identifying Critical Limitations and Flaws in the AM Plan That Will Affect Its Success

- Narrow scope of AM framework.
- Narrow range of management options.
- Committed water deliveries constrain adaptive management options.
- Lack of committed and adequate funding for monitoring and research.
- No meaningful triggers for abrupt, medium-term, or long-term changes in management.
- Operational rules insensitive to stress.
- Water agencies with vested interests in outcomes control process.
- No role for affected communities & water users.

# Narrow scope of AM framework

Not included: (Delta co-equal goals) ensuring water supply reliability, ecosystem health; 15-year construction phase; values and processes upstream of the intakes, upon which water diversion depends; part-time or full-time Delta aquatic organisms; communities outside of the water recipients

# Narrow range of management options

Consequences of operations for protected resources [listed fish] will be evaluated and operations changed within the boundaries of pre-conceived operational boundaries.

The standard of performance cited is the minimal threshold in the ITP. In other words, project operation need only maintain the species at their current endangered level to be considered successful.

# Committed water deliveries constrain adaptive management options

Pressures to increase deliveries will constrain the range of operation as the two primary operational flexibilities are timing and rate of diversion. This is in contrast to the literature evaluating AM success, which emphasizes the need to retain all practical management options.

No reason to expect water agencies and interests to constrain management to maximize deliveries.

# Lack of committed and adequate funding for monitoring and research

No committed funding... Research “should” be done... no hard-wired feedback loop between monitoring and research and management...  
sop to scientists?

# No meaningful triggers for abrupt, medium-term, or long-term changes in management

Triggers are equated with objectives.

But, AM plan does not describe link between these triggers/objectives and management actions.

This basically disconnects the AM loop.

# Operational rules insensitive to stress/change

Systems like the Delta are notoriously complex, seemingly chaotic, and replete with “wicked” problems.

Unpredictable changes are the most predictable aspect of the Delta.

However, the AM plan does not reflect this quality through operational rule sets that would be responsive.

# Water agencies with vested interests in outcomes control process

Although there is an inter-agency management group through which all decisions will filter, water delivery-oriented agencies dominate.

These agencies have a vested interest in the outcome and therefore have an inherent conflict of interest.

# No role for affected communities & water users

The most critical procedural issue is the exclusion of important stakeholders from the AM plan formulation.

Most large AM plans include stakeholders and this is a way to reduce conflict and litigation.

# Recommendations

Revisit scope to consider and cover the co-equal goals of the Delta Reform Act, including protections of the Delta as a place.

Include broader range of concerns to be addressed in adaptive management process.

Include stakeholders and unbiased agencies in decision-making process and open governance to extend beyond biased and vested interests.

Establish conditions to any permit for established triggers – for example, if negative impacts to human, wildlife, fish and other communities occur, start by turning off intakes.

Don't defer hard decisions about how to deal with uncertainty, firm triggers, triggered management action, and ranges of actions to include cessation of operations.