



BDCP  
BAY DELTA CONSERVATION PLAN

# DELTA SCIENCE PROGRAM

## Second Panel Review of the Logic Chains

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and Kenny Rose

# The Charge to the Panel

- Evaluate internal logic, measurability, linkages between plan components and consistency in approach
- Recommend alternative ways of framing goals and objectives such that they are practicable
- Provide advice on constructing an integrated monitoring and evaluation program
- Discussion of metrics and monitoring

# Logic Chains Reviewed

- Longfin smelt
- Winter-run Chinook salmon

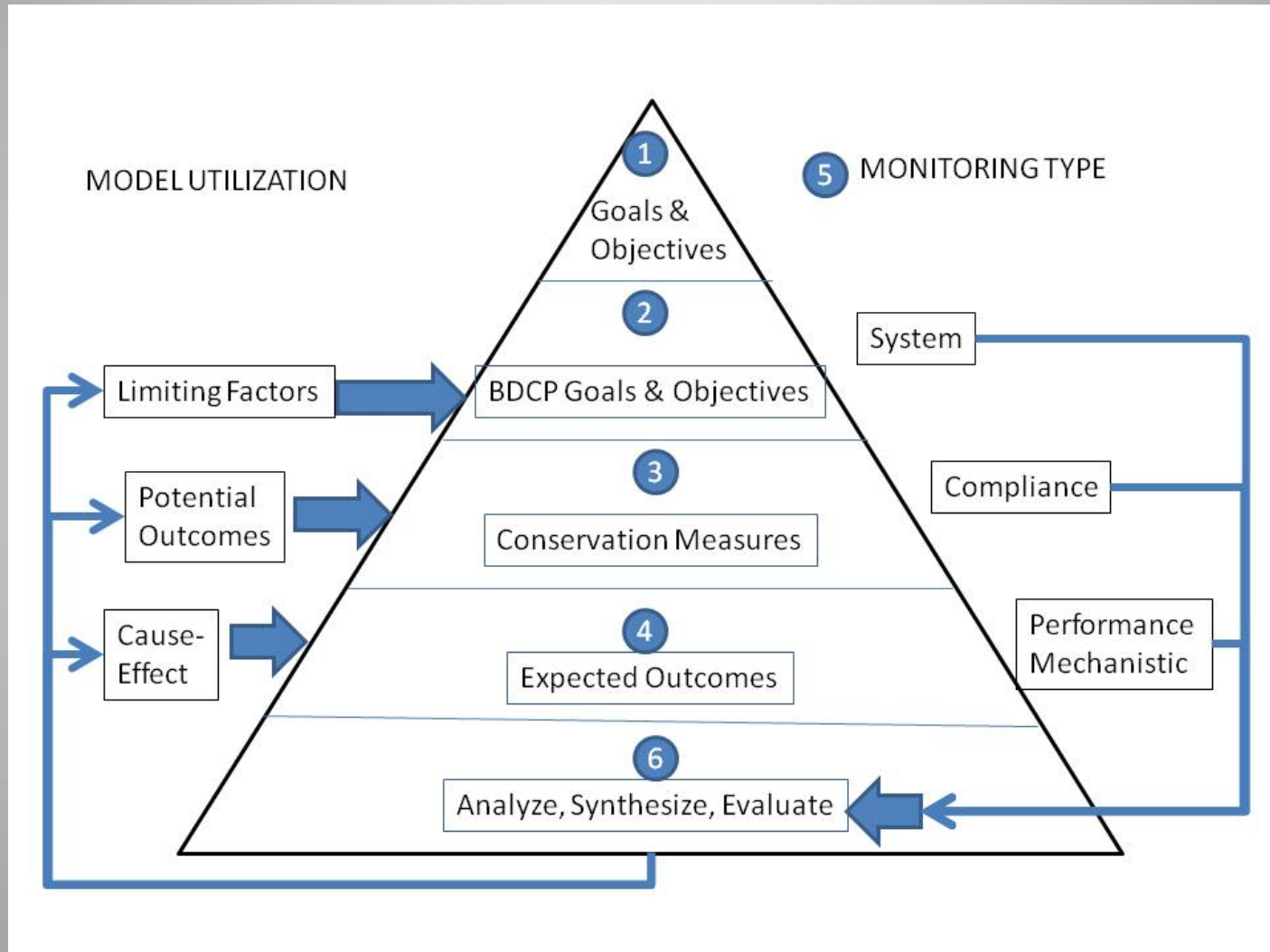
## Also provided

- White sturgeon
- Green sturgeon

# Progress to Date

- Two very detailed examples developed, capturing many of the potential factors affecting the species involved
- Responsive to previous review panel recommendations:
  - detailed preparation of logic chains for 2-3 species,
  - development of upper portion of the logic chain, and
  - collaborative development of the middle portion of the logic chain

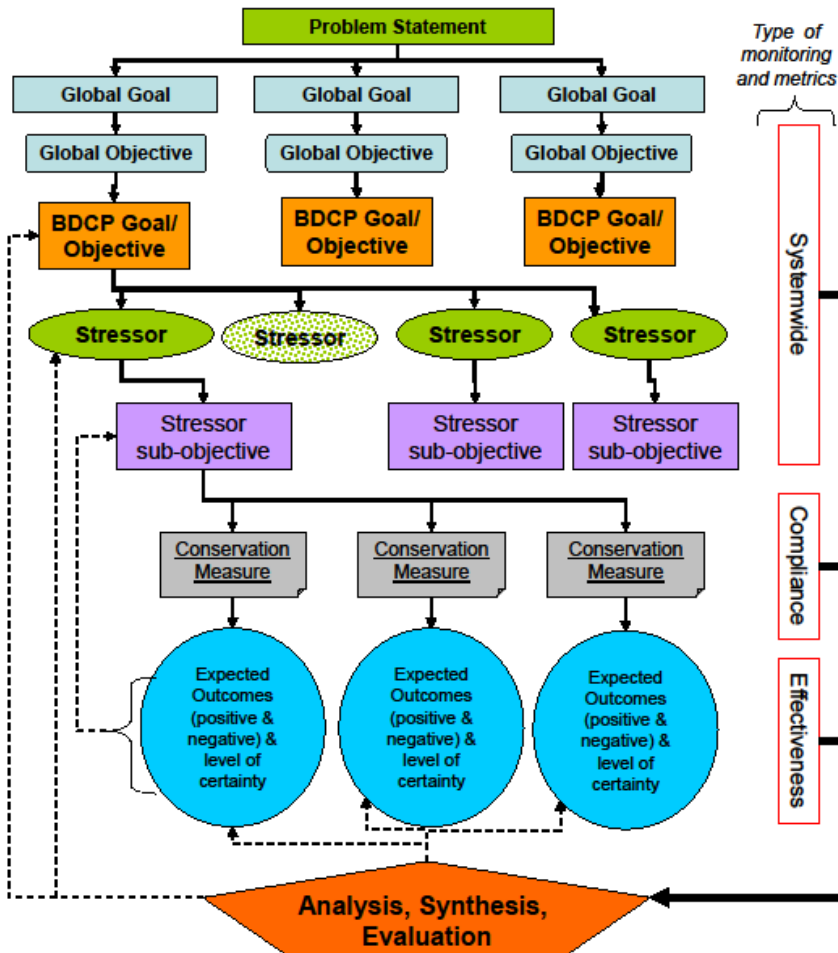
# Previous Panel Recommendations



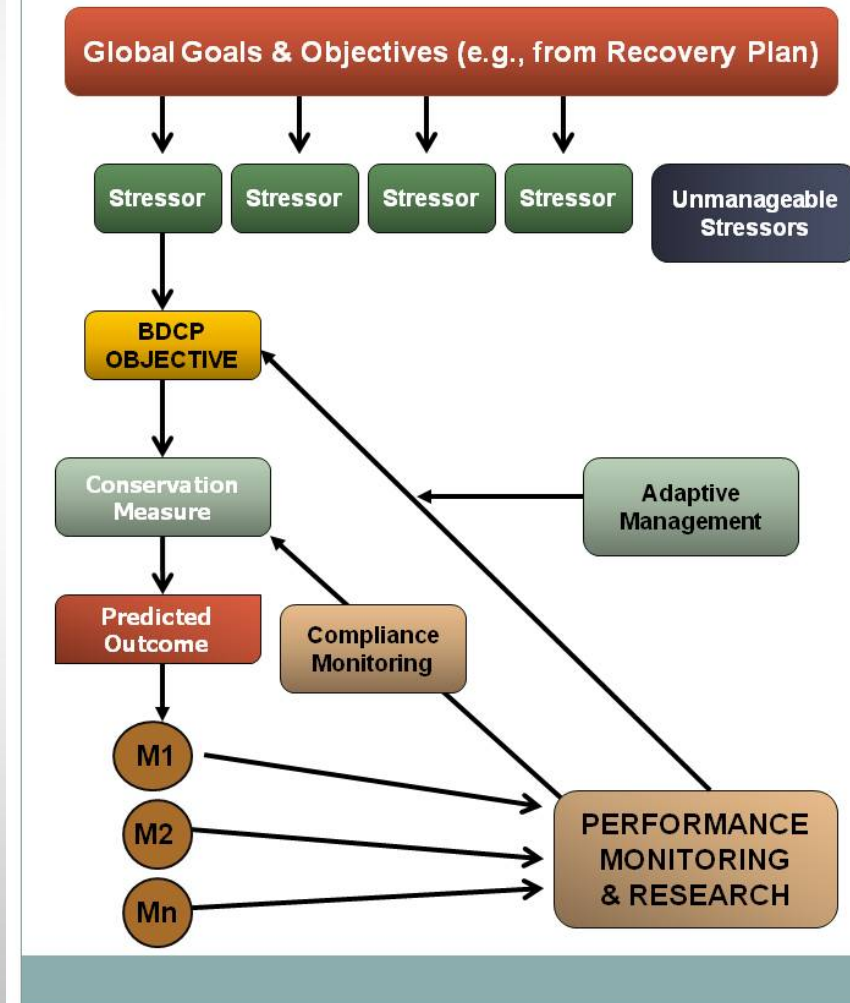
# Logic Chain Structure

## The Logic Chain Architecture

4-20-10



## LOGIC CHAIN

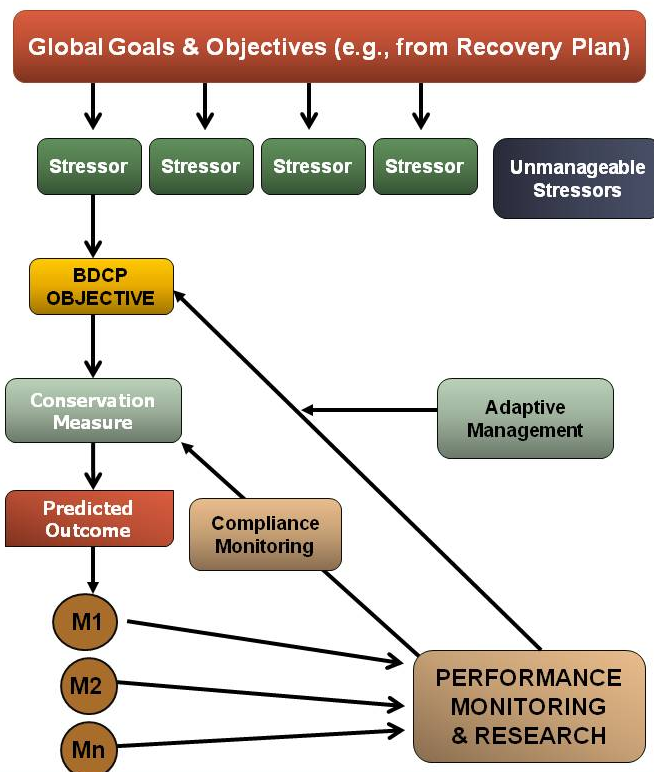


Schematic of the Logic Chain architecture for one species. One stressor (dapped green) is outside of the BDCP purview; thus it has no associated BDCP goal. In this example, stressors and steps below this level refer to one of the BDCP objectives; other BDCP objectives would be developed simultaneously. Similarly, for illustration purposes, only one stressor sub-objective is developed here. Dashed lines refer to different types of evaluations (based on monitoring data) that will be used to adaptively manage within the conservation strategy.

# Goals, Objectives and Stressors (upper section)

- Distinguish between Global goals and objectives set by agencies and “BDCP” goals and objectives.
- Stressors linked to the global goals and objectives should be considered prior to the identification of BDCP objectives.
- Stressors not potentially influenced by BDCP should be explicitly listed in the logic chains.

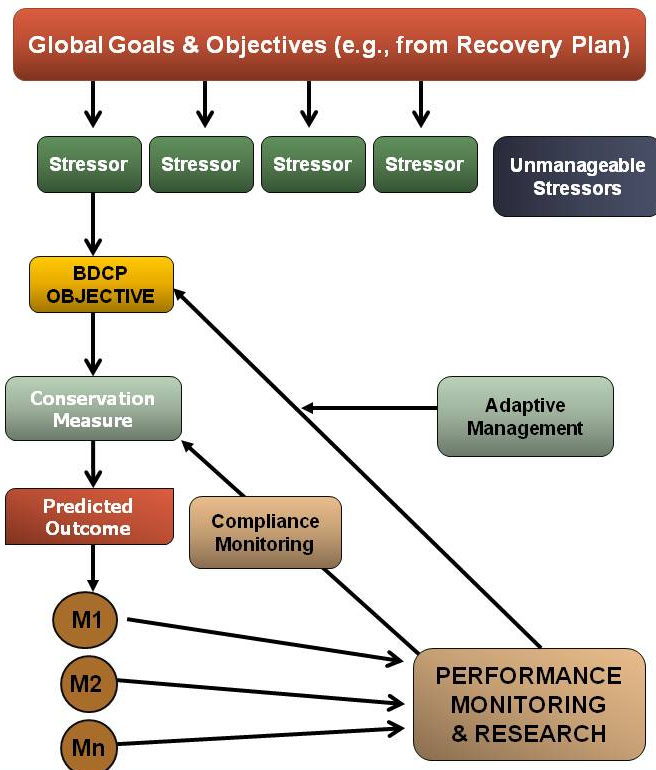
## LOGIC CHAIN



# Monitoring Metrics

- Whenever possible, objectives should focus on measures of individual and population-level performance, e.g.,
  - habitat-specific estimates of growth and survivorship,
  - quantitative estimates of abundance, and
  - quantitative measures of movement and/or distribution.
- The BDCP performance metrics must relate to fish vital demographic rates

## LOGIC CHAIN

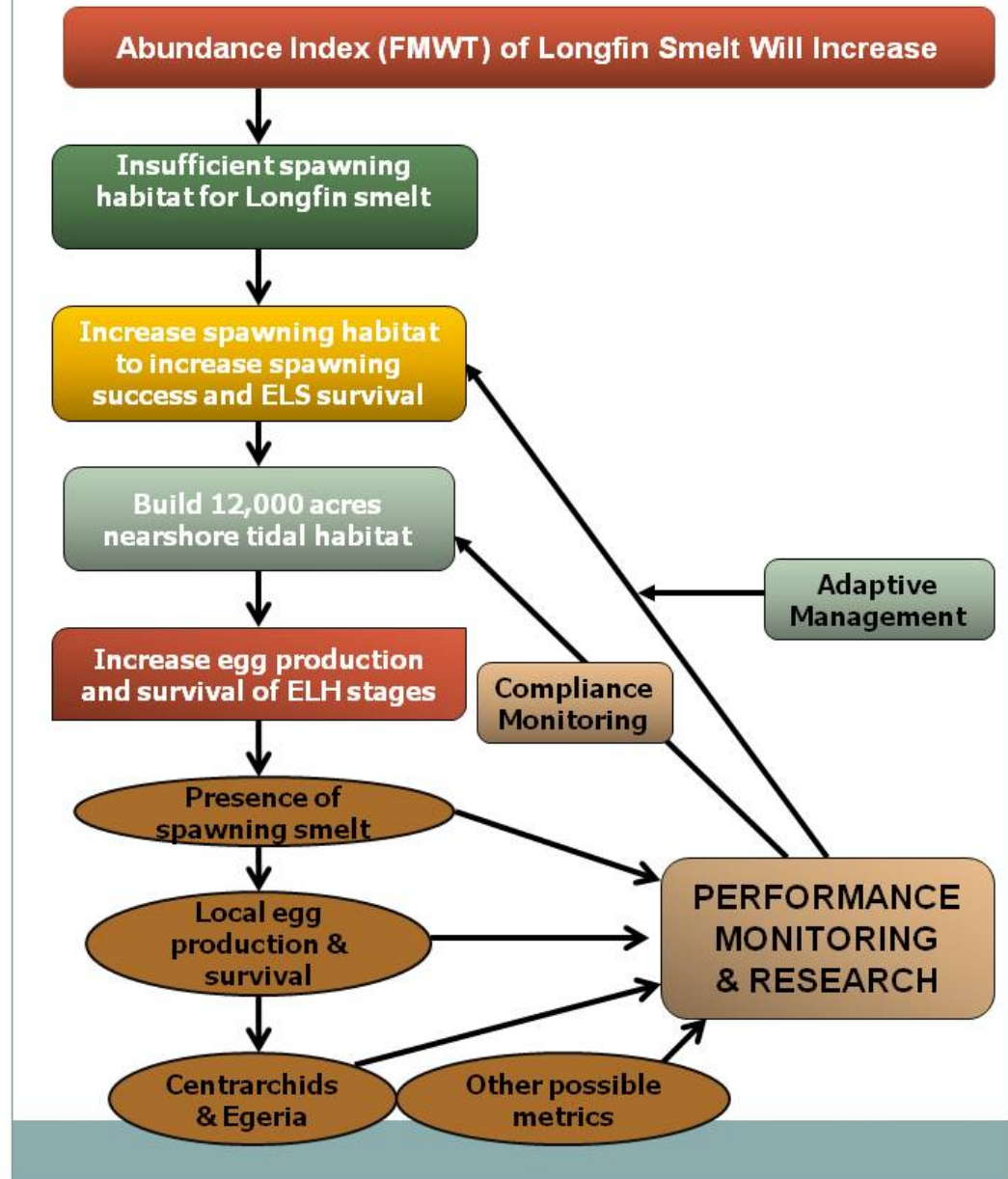


# Logic Chain Structure

- Explicit Treatment of Uncertainty
  - Given the 50-year projected life of the BDCP, issues like climate change and continued invasion by non-native species need to be considered
  - Magnitude and uncertainty estimates should be included to facilitate prioritization of conservation measures and aid in future adaptive management
    - Important to include supporting documentation
- Focus of Logic Chains
  - In addition to covered species, consider developing logic chains that focus on key community or ecosystem properties

# Example of Revised Structure

## LOGIC CHAIN



# Logic Chain Content

- VSP criteria need not be universally applied. Greater flexibility will allow the logic chains to be tailored to each species
- Successful management requires clear terminology
  - define all terms, e.g., productivity

# Logic Chain Content - Monitoring

- Need to distinguish:
  - 1) level that addresses the Global Goal
  - 2) assessing how a specific conservation measure affects appropriate abiotic and biotic variables, and vice-versa
  - 3) compliance monitoring
- Measuring vital demographic rates for performance monitoring is possible

# Knowledge Base

- Create and maintain a repository of data, e.g., NSF's Long-Term Ecological Research site network
- Identify the key unknown biological attributes of covered species e.g. spawning habitat, movements, diet, and make a concerted effort to provide *stable* funding to address these knowledge gaps

# Applying the Logic Chains


- Articulate linkages among logic chains, effects analysis, implementation plan, monitoring and research components, and adaptive management
- Identify issues to be addressed:
  - in the draft Plan (i.e., by November),
  - during the subsequent refinement phase (e.g., the following ~ year, pre-permit), and
  - during implementation

# Applying the Logic Chains

- Consider using a formal decision support system to identify high priority measures and those for early implementation
- Adaptive management plan should be developed in sufficient detail for the November Draft Plan to clarify:
  - procedures will be used to revise BDCP objectives
  - how additional information, especially reduced uncertainty, will be incorporated during implementation

## Applying the Logic Chains

- Recommend a comprehensive articulation of BDCP conservation outcomes based on the logic chains, including their spatial distribution, at decadal intervals to identify targeted outcomes and provide flexibility for changing environmental conditions



Thanks,  
and  
Questions?