San Joaquin River Restoration Program

Fisheries Management Work Group
Technical Feedback Meeting

CSU-Stanislaus
October 7, 2008

Agenda

- Introductions
- Fish Management Plan Progress
  - Purpose and Scope
  - Limiting Factors Definitions
  - Restoration Strategy and Routing Examples
- Next Steps and Future Meetings

Introductions

- Name
- Agency or Affiliation
- Why the San Joaquin River is important to you and/or your agency.

Purpose

- Fisheries Management Plan
  - Revisit the purpose, scope, and progress to date
- Revised Limiting Factors Approach
  - Review the approach to defining
  - Get your feedback on whether or not the approach follows a logical process
- Updated Restoration Strategy and Decision Tree
  - Get your input on:
    - Transparency of the strategy
    - Do the updates address the feedback provided at the September meeting

FMP is a Programmatic Roadmap for Fisheries Restoration & Management

- Roadmap to adaptively manage restoration and maintenance of naturally reproducing and self-sustaining populations
- Addresses salmon and other fish (including steelhead)
- Geographic scope emphasis is the San Joaquin River to the confluence of the Merced River
- Programmatic strategy for implementation of the Settlement from a fisheries perspective
  - Outlines how a fisheries implementation plan would be developed

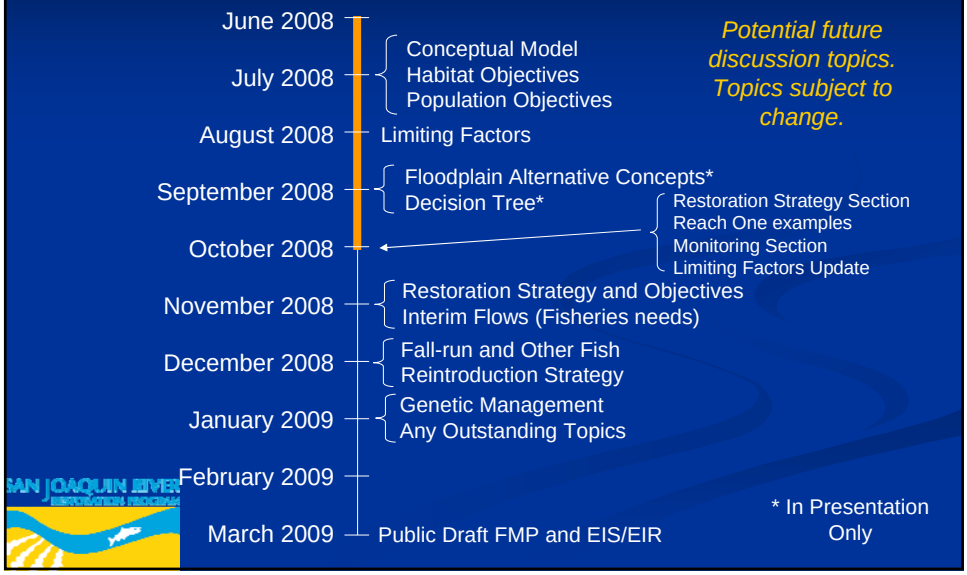
Sections of the FMP

- Chapter 1: Introduction
  - Purpose
  - Planning criteria, planning process, and plan assumptions
  - External review
- Chapter 2: Restoration Goals
  - Definition of fish in good condition
  - Spring-run goals
  - Fall-run goals
  - Other fish goals
- Chapter 3: Reintroduction Strategy
  - Genetics management
  - Stock selection
- Chapter 4: Restoration Strategy and Objectives
  - Restoration strategy
  - Objectives
  - Reach-by-reach evaluation and action routing
- References
- Restoration Flows Appendix
  - Interim Flows
  - Restoration Flows

FMP = Fisheries Management Plan

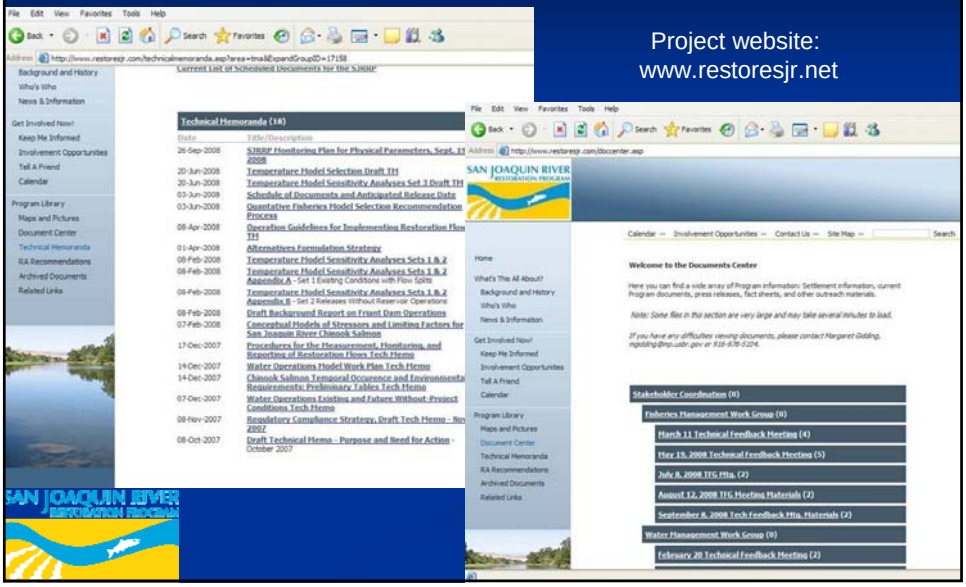
Program Documents Related to or Driving the FMP

Input from the Feedback Group is an Important Aspect of the FMP



Prior Documents and Meeting Materials Available on the Website

Project website:
www.restoresjr.net



Approach to Defining the Limiting Factors for Adult Migration

Forcing Function	Limiting Factor	Physical Impact(s)	Biological Response(s)
Hydrology	Insufficient streamflow	unsuitable water temperature	disease, increased mortality, increased egg mortality *in vivo*
		degraded water quality	increased straying, reduced survival and fecundity disrupted migratory cues
		insufficient depth	increased straying, reduced survival and fecundity disrupted migratory cues
		altered flow (quantity)	increased straying, reduced survival and fecundity disrupted migratory cues
	Altered water signature	altered water chemistry	increased straying, reduced survival and fecundity disrupted migratory cues
Diversion/Barrier	Degraded water quality	degraded water quality	increased straying, reduced survival and fecundity disrupted migratory cues, disease
	Physical barrier	excessive vertical barrier; wall	physical injury, migration barrier
		insufficient depth	increased straying, reduced survival and fecundity disrupted migratory cues
		unsuitable velocity	increased straying, reduced survival and fecundity disrupted migratory cues
Harvest	Excessive harvest	removal and harrassment of fish	increased stress, reduced abundance, mortality
Contaminant Input	Degraded water quality	poor water quality	increased straying, reduced survival and fecundity disrupted migratory cues, disease
		unsuitable water temperature	disease, increased mortality, increased egg mortality *in vivo*

Approach to Defining the Limiting Factors

- Forcing Function
  - The driving force impacting the ecosystem.
- Limiting Factor
  - Stressors resulting from forcing functions that significantly influence the abundance and productivity of the Chinook salmon population.
- Physical Impact(s)
  - The physical impact of the limiting factor.
- Biological Response(s)
  - The biological response of the physical impact.
- Significant:
  - Affect ability to meet Restoration Goal

Limiting Factors Definitions Adult Migration Example

Forcing Function	Limiting Factor	Physical Impact(s)	Biological Response(s)
Hydrology	Insufficient streamflow	unsuitable water temperature	disease, increased mortality, increased egg mortality *in vivo*
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		insufficient depth	increased straying, reduced survival and fecundity disrupted migratory cues
		altered flow (quantity)	increased straying, reduced survival and fecundity disrupted migratory cues
	Altered water signature	altered water chemistry	increased straying, reduced survival and fecundity disrupted migratory cues

- Forcing Function: Hydrology
  - The driving force impacting the ecosystem.
- Limiting Factor: Insufficient streamflow and altered water signature
  - Stressors resulting from forcing functions that significantly influence the abundance and productivity of the Chinook salmon population.
- Physical Impacts: Various
  - The physical impact of the limiting factor.
- Biological Responses: Various
  - The biological response of the physical impact.

Approach to Defining the Limiting Factors for Adult Migration

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The Restoration Strategy is the Adaptive Management Strategy

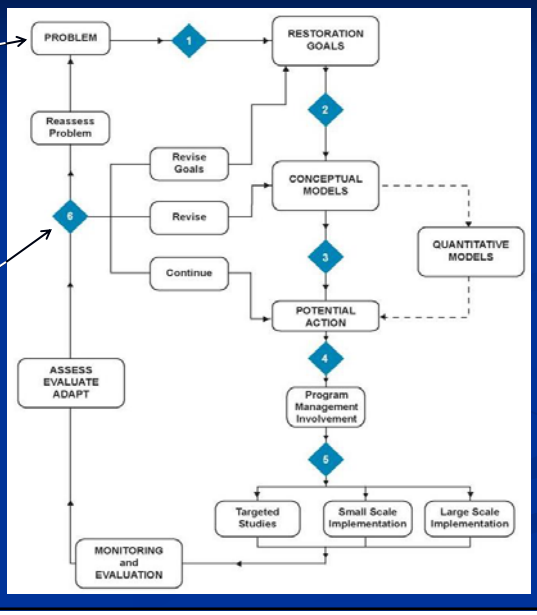
- Fisheries Restoration Strategy = Fisheries Adaptive Management Program
- Guide for future fisheries management actions
- Allows flexibility and adjustment for:
  - Increased knowledge and understanding
  - Changing conditions
- Building on other strategies

Adaptive Management Process

Start by defining the problem

Decision Node = Key or critical decision points

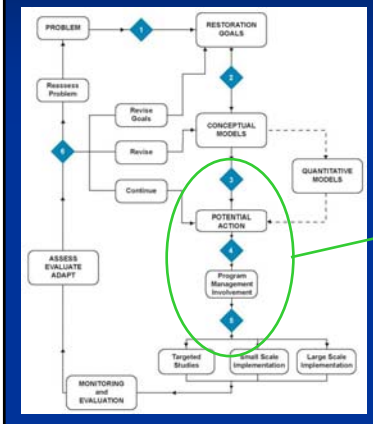
The Adaptive Management Process is the foundation of the FMP.

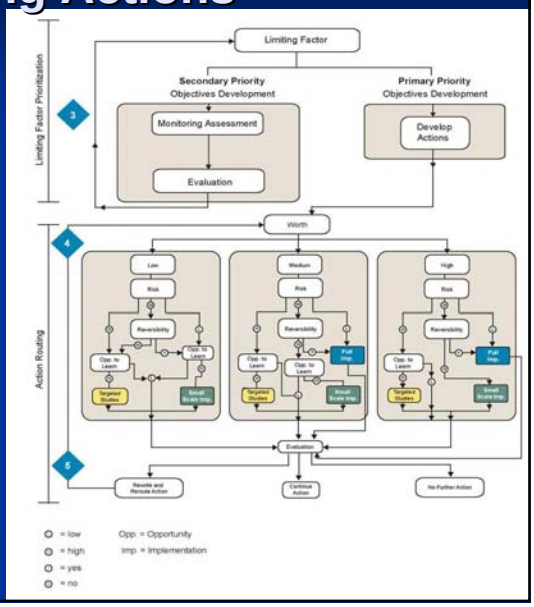


Decision Nodes:

1. Identify problem
2. Develop restoration goal
3. Limiting factors prioritization
4. Action routing
5. Program management input (cost, feasibility, partnering, political considerations, etc.)
6. Assess and adjust

Limiting Factor Prioritization and Routing Actions





Action Routing Definitions

- Worth
  - Measure of a positive outcome.
  - Combines the magnitude and certainty of positive outcomes to convey a “value” of an action.
- Risk
  - Measure of the risk of a negative outcome.
  - Combines the magnitude and certainty of negative outcomes to convey the cumulative “potential” for a Restoration Action to result in an adverse, or negative outcome.
- Reversibility
  - The ease and predictability with which the outcomes can be undone and/or reversed.

Example Adult Migration Objective and Decision Tree Action Routing

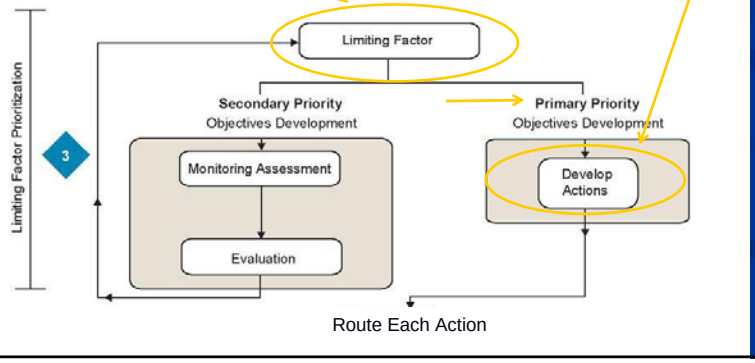
- Limiting Factor: Inadequate Streamflow
- Objective: Provide flows sufficient to ensure habitat connectivity and allow for unimpeded upstream passage

Location	Priority
Reach 1	**Low** – Has flow year-round
Reach 2	**High** – No flows under existing conditions
Reach 3	**Low** – Has flow most of the year
Reach 4	**High** – Limited or no flows under existing conditions
Reach 5	**High** – Multiple sources of flow that could influence straying

Limiting Factor Prioritization

Limiting Factor: Inadequate Streamflow

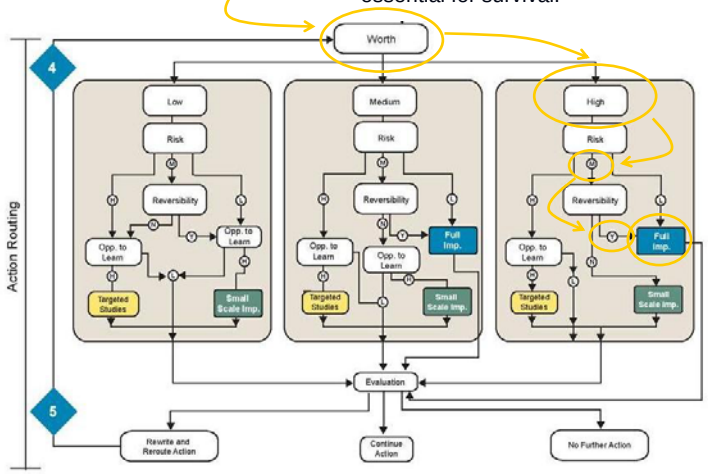
Potential Actions:
- Low flow channel construction
- Channel modifications in Reaches 2 and 4
- Verify adult temperature objectives



Action Routing: Low Flow Channel Construction

Action: Design low flow channels to maintain adequate depth and connectivity for adult passage in all years (including dry years).

Worth: High because successful migration is essential for survival.



Risk: Moderate. Failure to appropriately implement could have a negative impact.

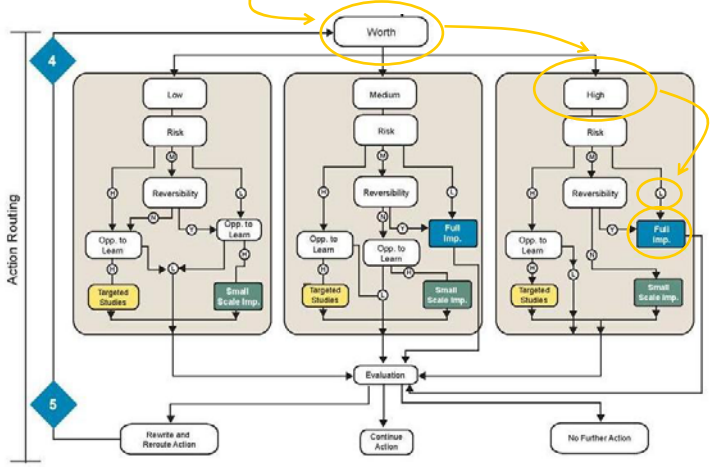
Reversibility: Reversible as additional construction could correct or modify.

Outcome: Recommend Full Implementation

Action Routing: Channel Modifications in Reaches 2 and 4 (or Eastside Bypass)

Action: Design channels to convey Restoration Flows and provide for passage, with an assumed level of floodplain development.

Worth: High because successful migration is essential for survival.



L = low
H = high
Y = yes
N = no

Opp. = Opportunity
Imp. = Implementa

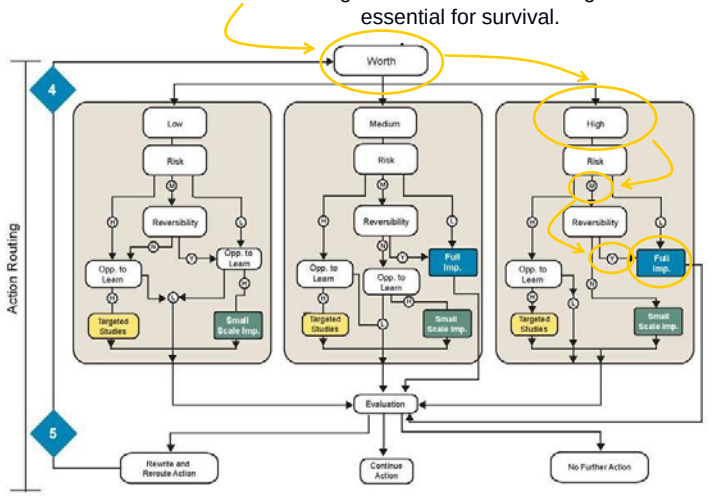
Risk: Low. Increasing flows for purposes of channel connectivity and temperature augmentation considered single greatest effect on successful migration within the project area.

Outcome: Recommend Full Implementation

REVISED Action Routing: Channel Modifications in Reaches 2 and 4 (or Eastside Bypass)

Action: Design channels to convey Restoration Flows and provide for passage, with an assumed level of floodplain development.

Worth: High because successful migration is essential for survival.



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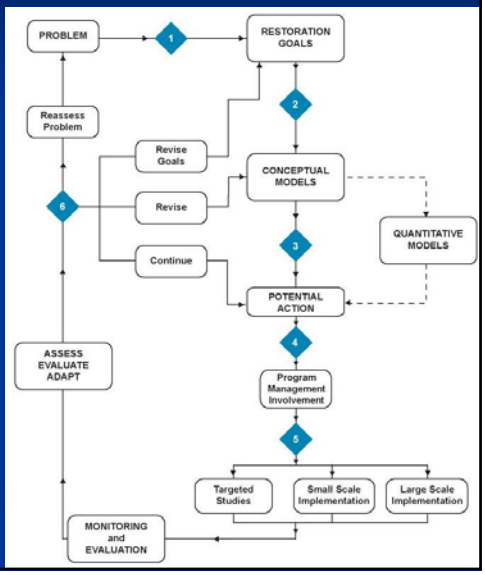
Outcome: Recommend Full Implementation

Adaptive Management Process: Questions

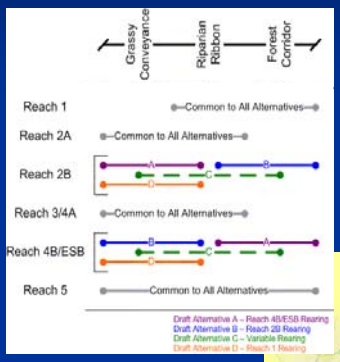
- Does the Restoration Strategy Section appear concise and transparent?
- Does it follow a logical process?
- Do the examples work?
- Do you have recommendations for a different process or improvements to the process?

Decision Node 5 – Address Questions and Input?

- Decision Node 5 includes non-biological considerations such as cost, feasibility, partnering and cost sharing, and political considerations
- What additional items should be considered in this node?
- Does this node address the input received at the September meeting?



Future Meeting: Reach-by-Reach Actions Common to all Concepts



- Discussed at September meeting
- Continuing to work on this and anticipate more information at November meeting

Future Meeting: Reintroduction Section

- Information on the section was requested at the September meeting
- Related to Genetics Management and will be addressed at the December meeting

Next Meetings

- November 4
  - Topics:
    - Restoration Strategy and Objectives
    - Interim Flows (Fisheries needs)
- December 10
  - Topics:
    - Genetic Management
    - Any Outstanding Topics
- Meetings at CSU Stanislaus
- 1:00 p.m. to 3:00 p.m.

SAN JOAQUIN RIVER
RESTORATION PROGRAM