Developing SMART Biological Objectives for the Stanislaus River

Injecting Science into our Discussions

Presented By
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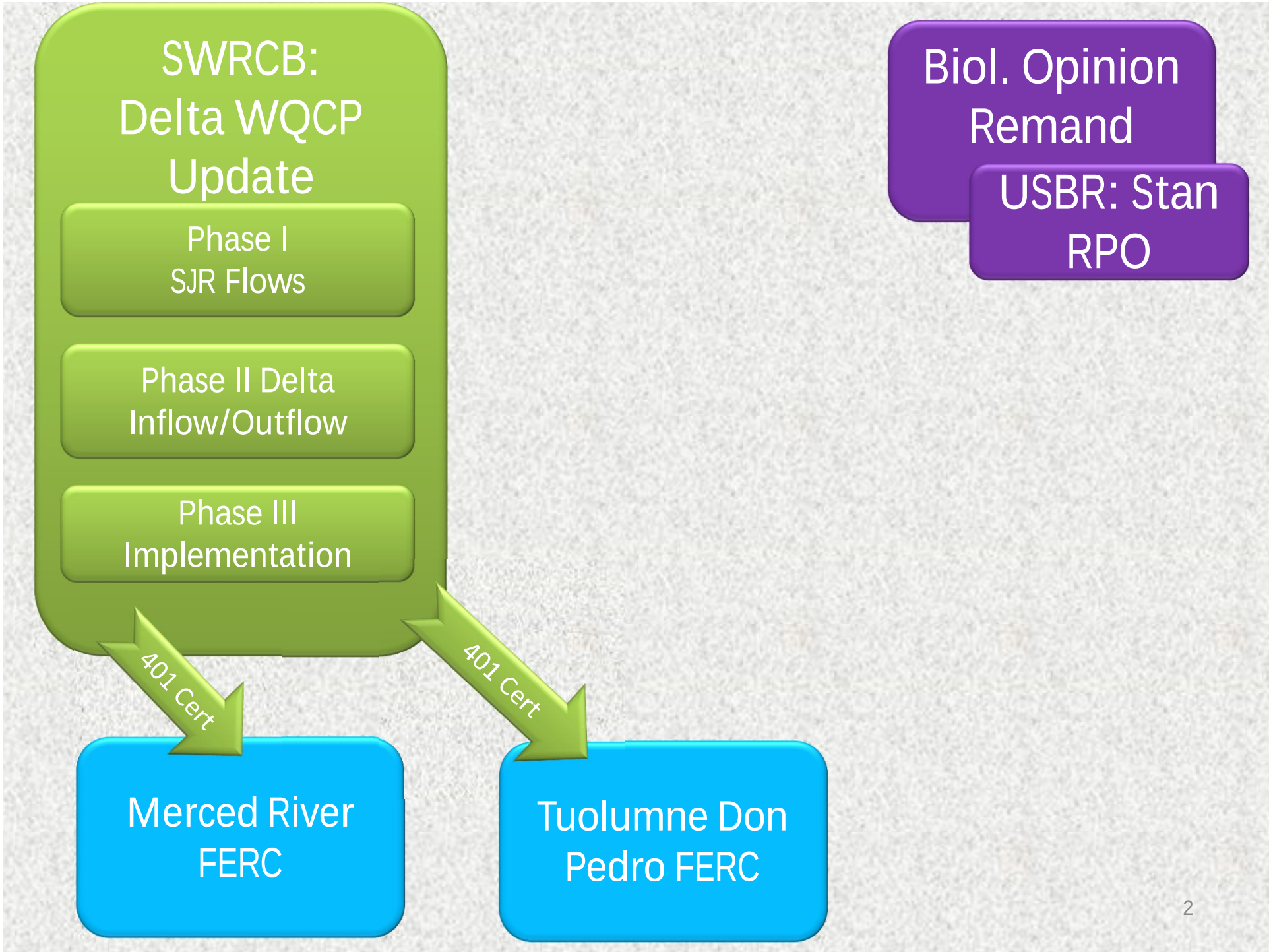
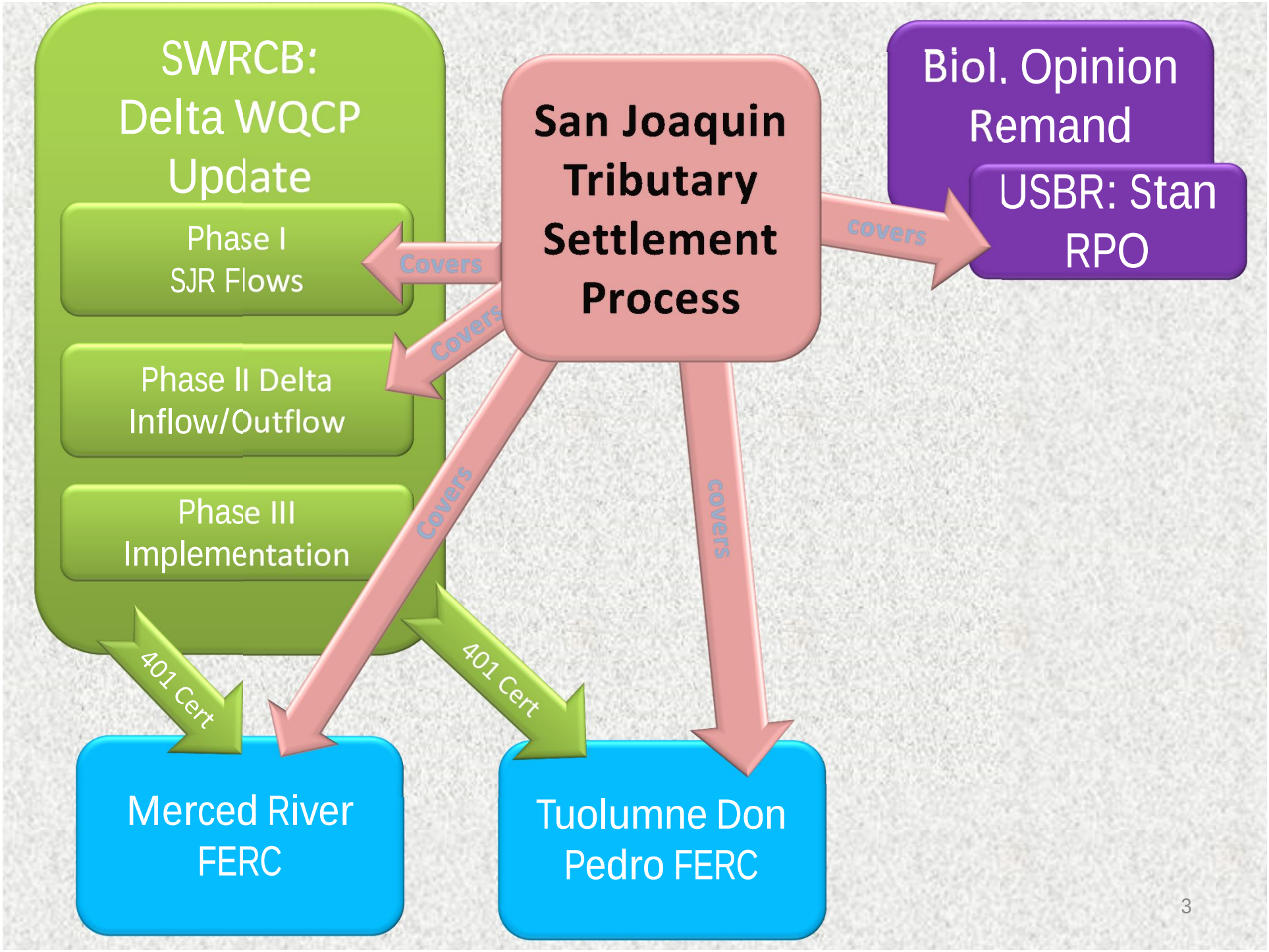

SWRCB:
Delta WQCP
Update
Phase I
SJR Flows
Phase II Delta
Inflow/Outflow
Phase III
Implementation
401 Cert
401 Cert
Merced River
FERC
Tuolumne Don
Pedro FERC
Biol. Opinion
Remand
USBR: Stan
RPO


SWRCB:
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Tributary
Settlement
Process
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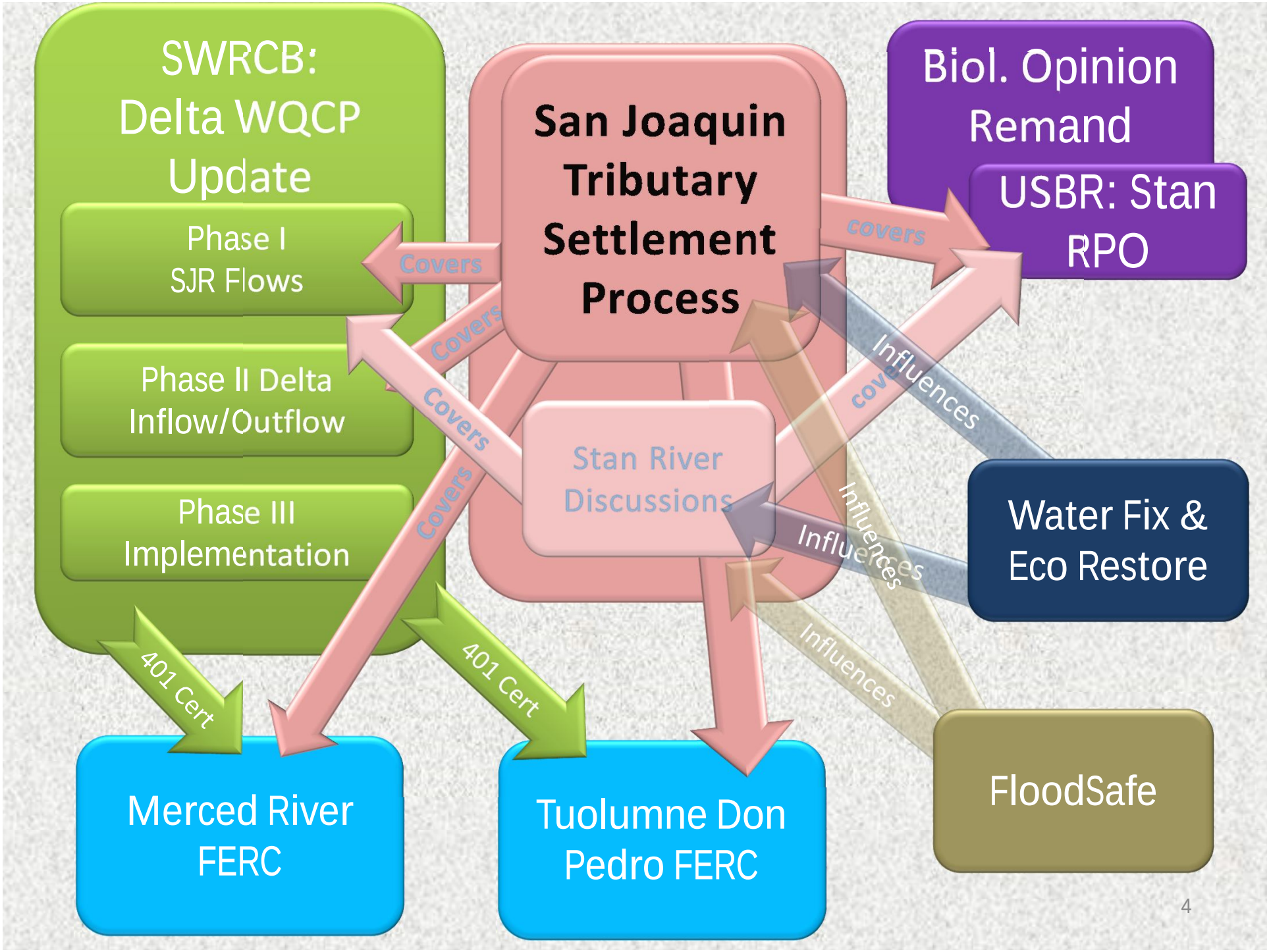
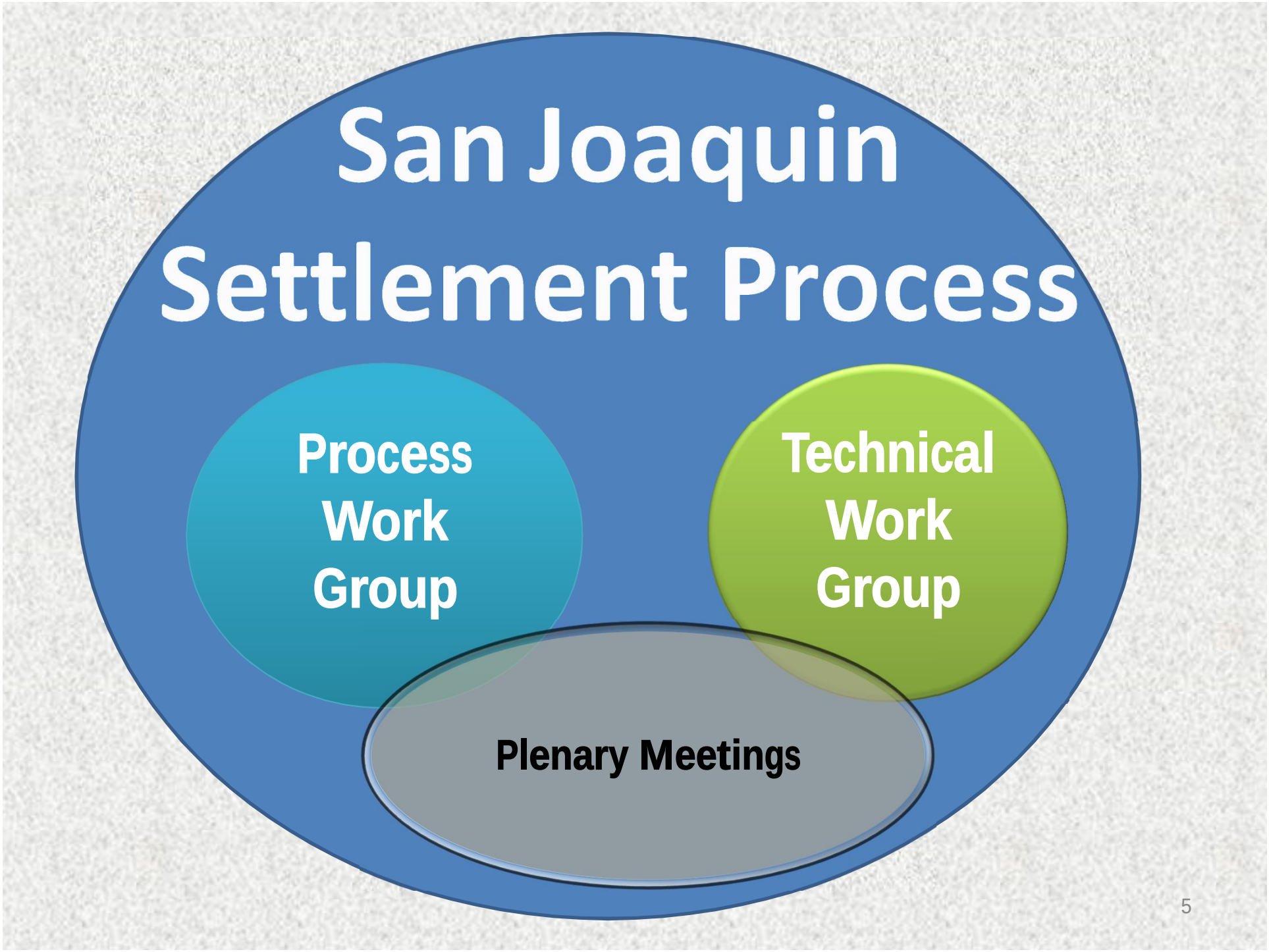
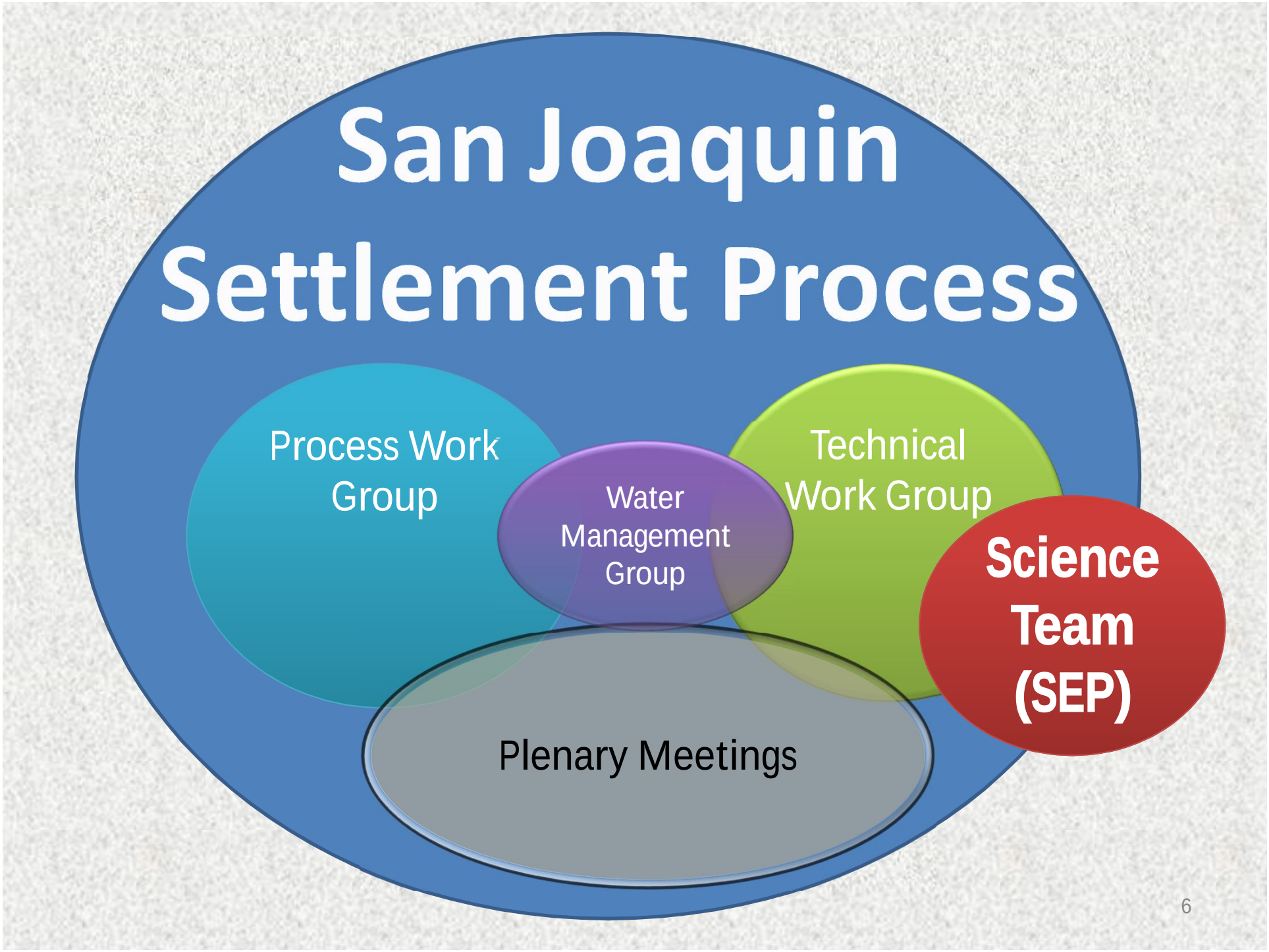
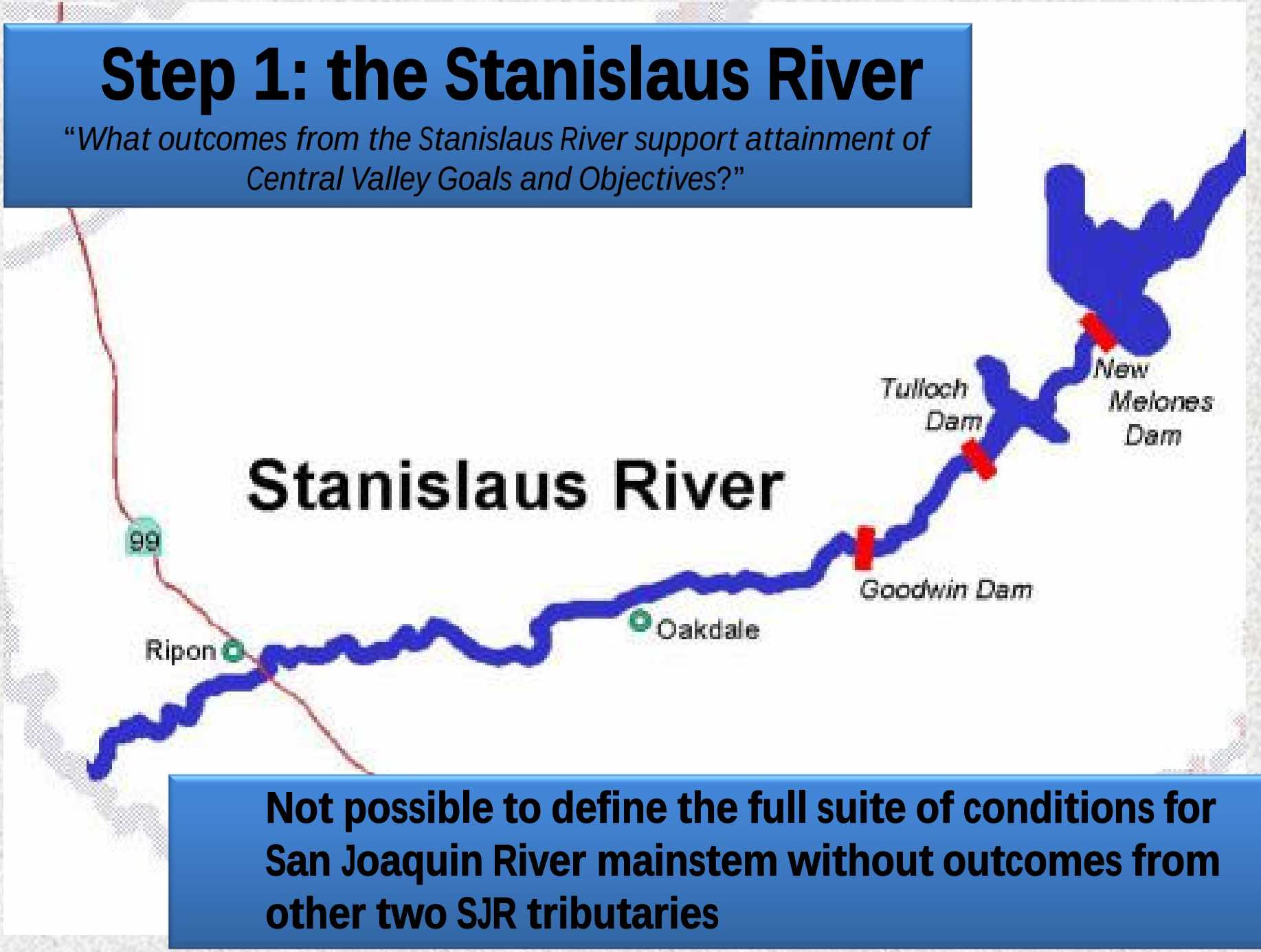

SWRCB: Delta WQCP Update
Phase I SJR Flows
Phase II Delta Inflow/Outflow
Phase III Implementation
San Joaquin Tributary Settlement Process
Stan River Discussions
Biol. Opinion Remand
USBR: Stan RPO
Water Fix & Eco Restore
FloodSafe
Merced River FERC
Tuolumne Don Pedro FERC
Covers
covers
Influences
401 Cert


San Joaquin Settlement Process
Process Work Group
Technical Work Group
Plenary Meetings


San Joaquin Settlement Process
Process Work Group
Water Management Group
Technical Work Group
Science Team (SEP)
Plenary Meetings

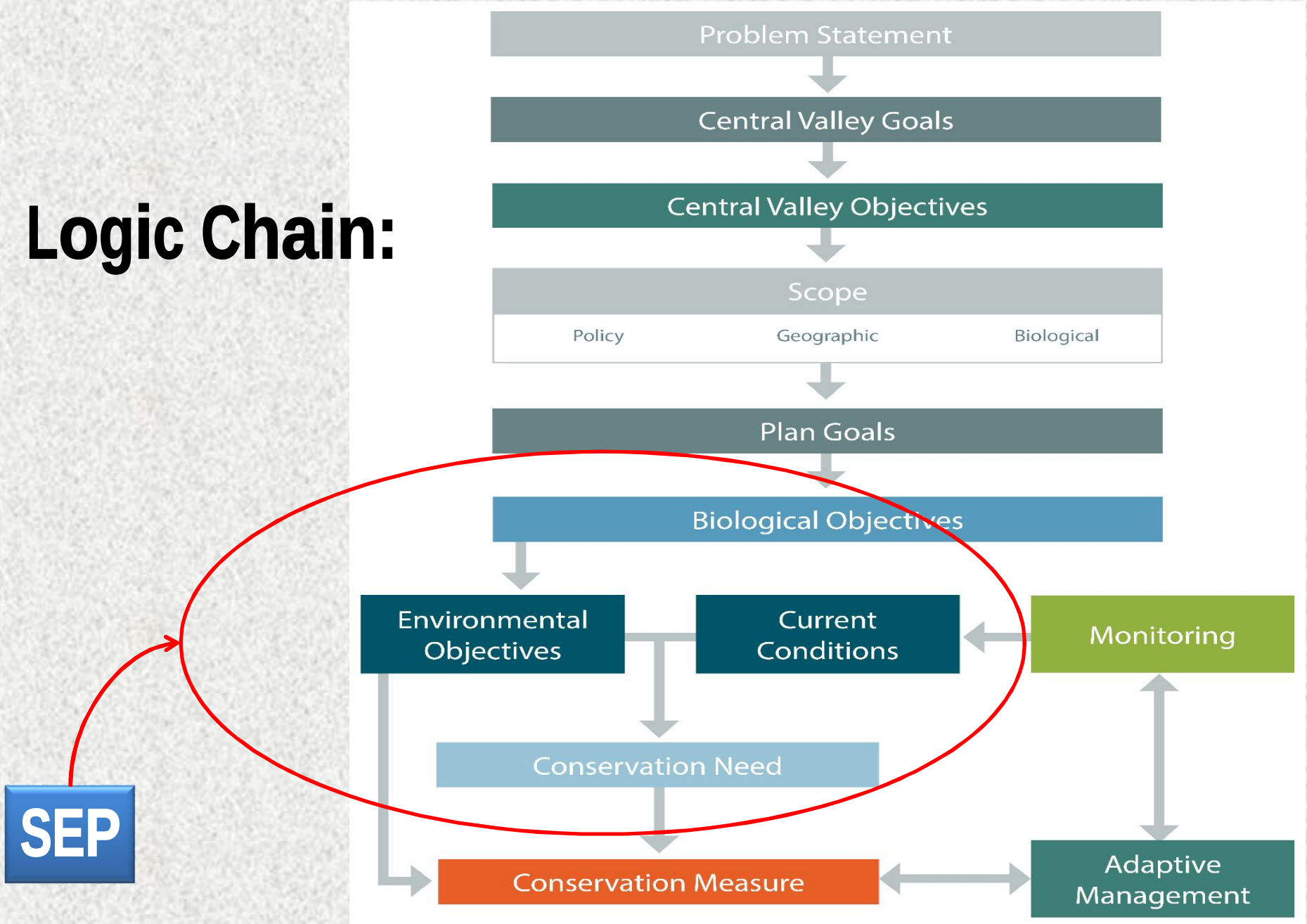
Step 1: the Stanislaus River

"What outcomes from the Stanislaus River support attainment of Central Valley Goals and Objectives?"



Not possible to define the full suite of conditions for San Joaquin River mainstem without outcomes from other two SJR tributaries

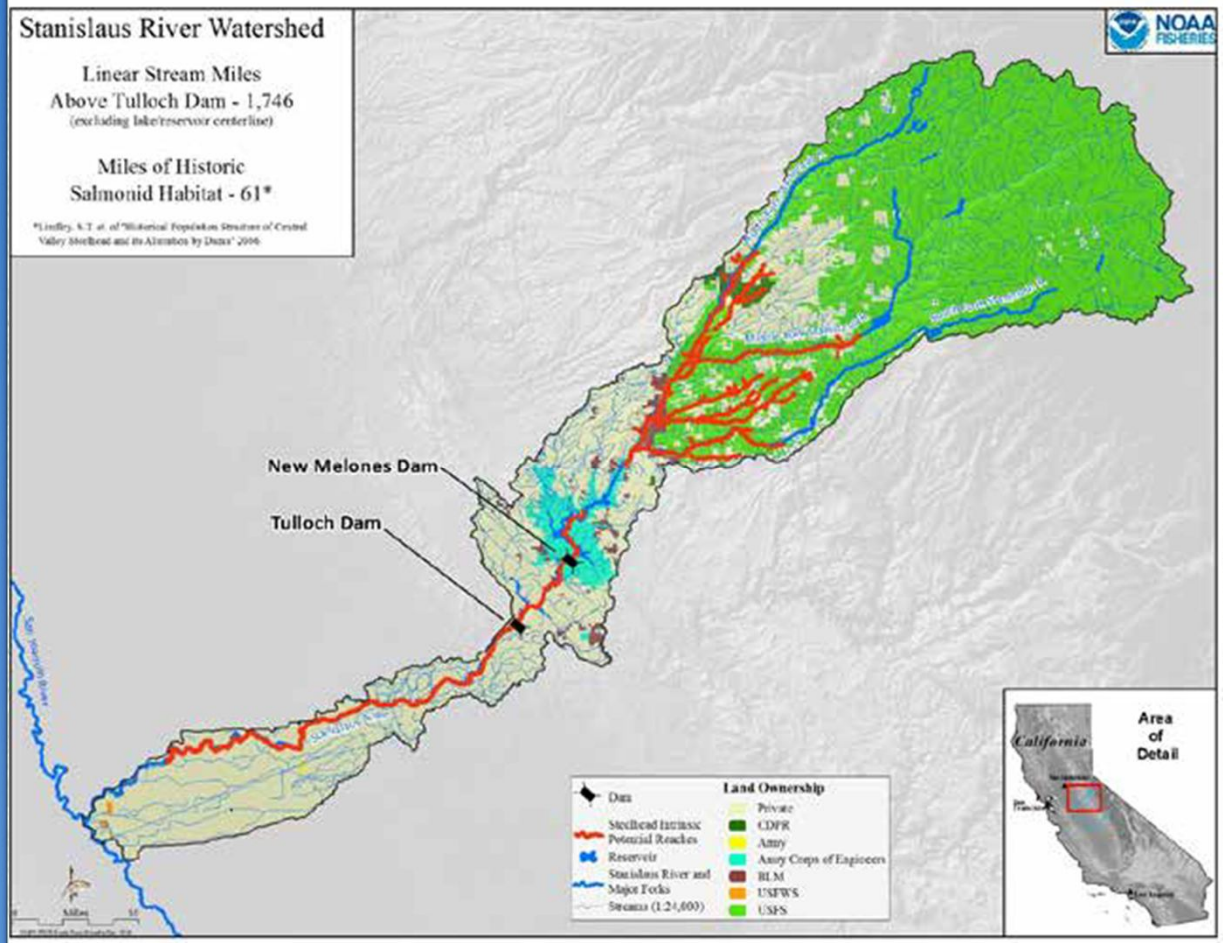
Logic Chain:


Problem Statement
Central Valley Goals
Central Valley Objectives
Scope
Policy
Geographic
Biological
Plan Goals
Biological Objectives
Environmental Objectives
Current Conditions
Monitoring
Conservation Need
Conservation Measure
Adaptive Management
SEP

Geographic Scope

Set objectives for the Stanislaus that:

- Can be attained by actions in watershed
- Independent of non-watershed outcomes
- Serve Central Valley Goals and High Level Objectives
- Does not explicitly address southern Delta nor larger estuary



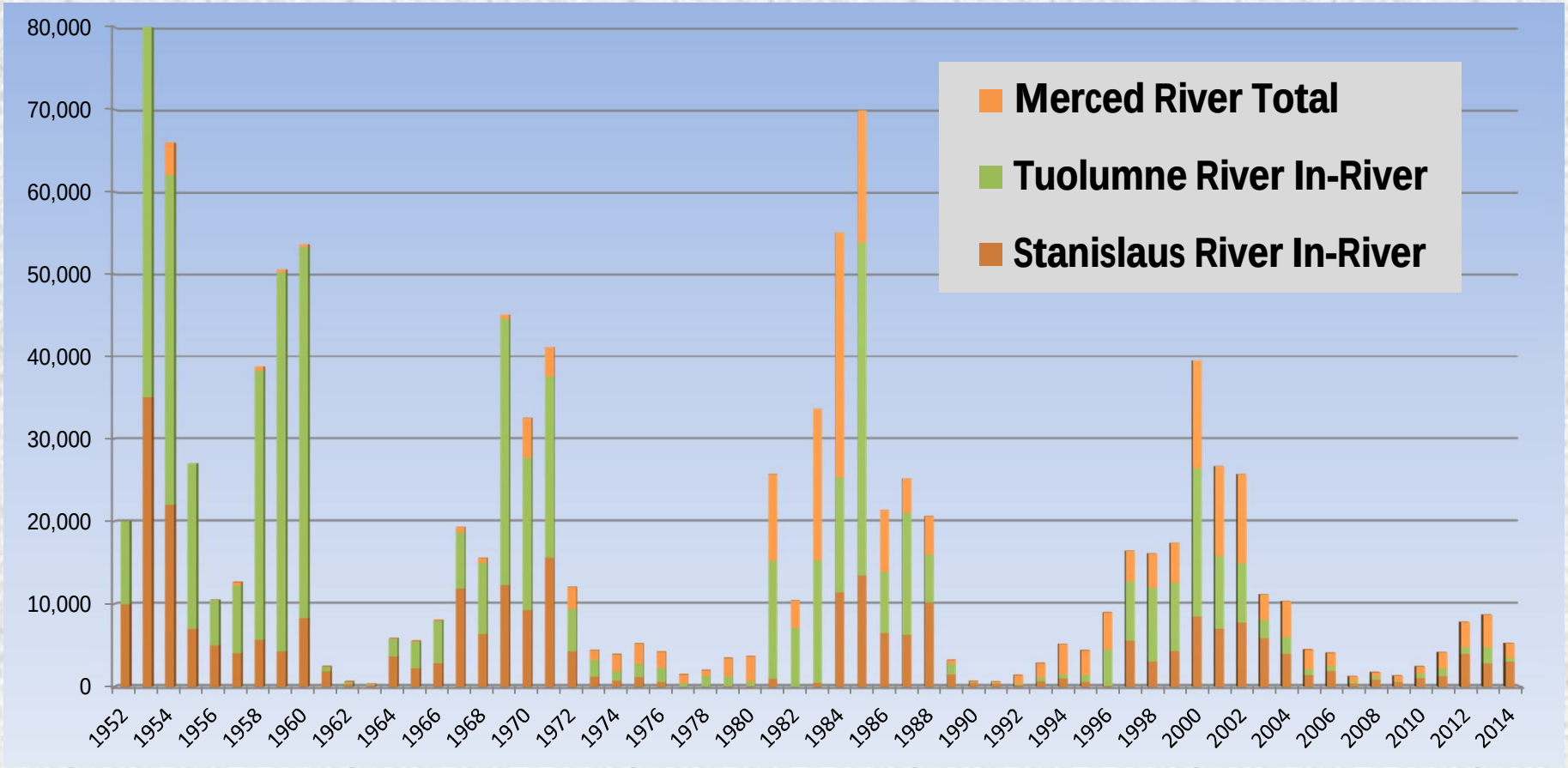
Stanislaus River Watershed

Biological Scope

Three salmonid populations

- Fall run Chinook salmon
- Spring run Chinook salmon
- *Oncorhynchus mykiss*

San Joaquin River Fall Run Chinook Salmon Escapement (from GrandTab)



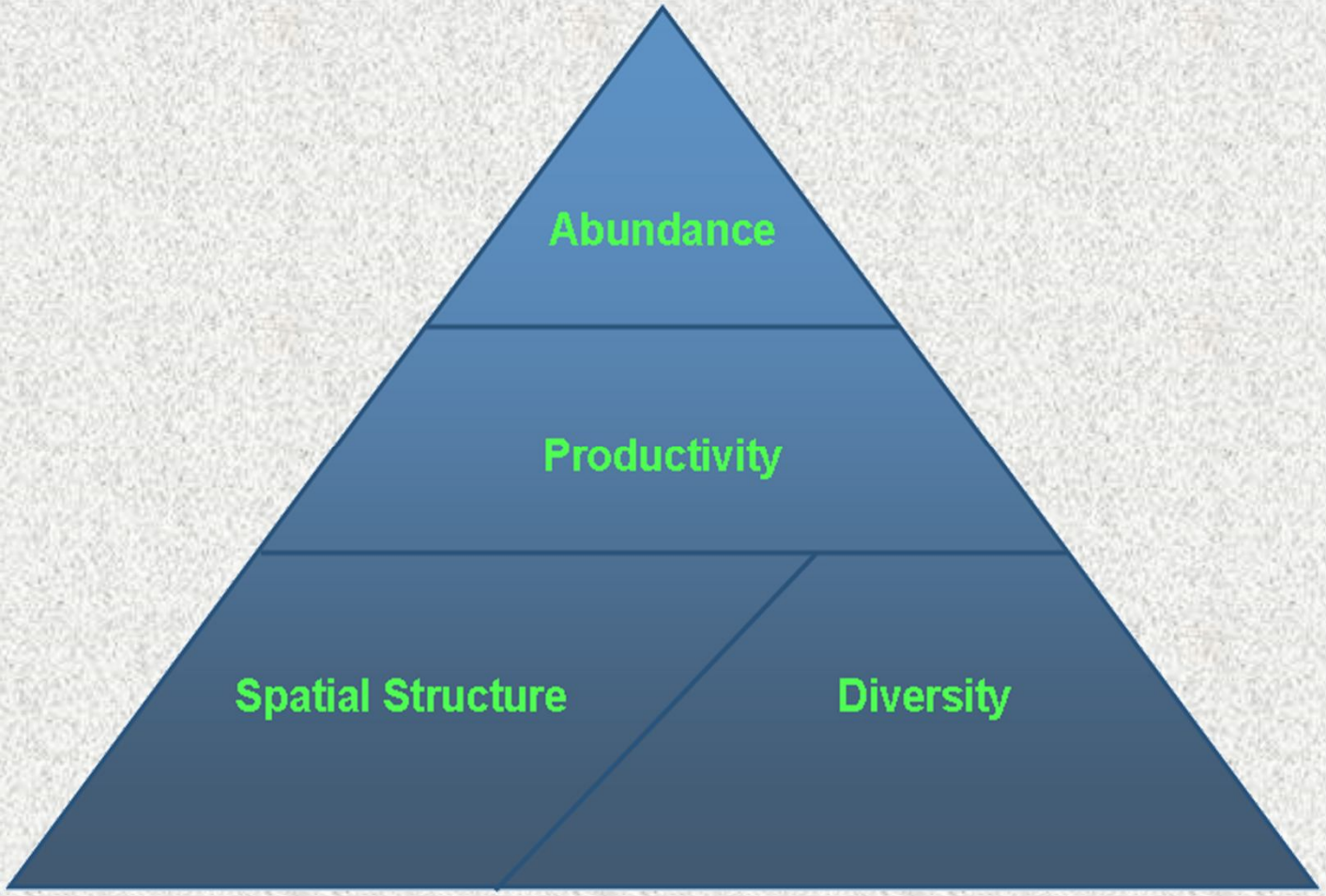
SEP Process

Public Process

Development of S.M.A.R.T. Objectives

- Specific
- Measurable
- Achievable
- Relevant
- Time-bound

Biological Objectives
Salmonid Population Viability Attributes



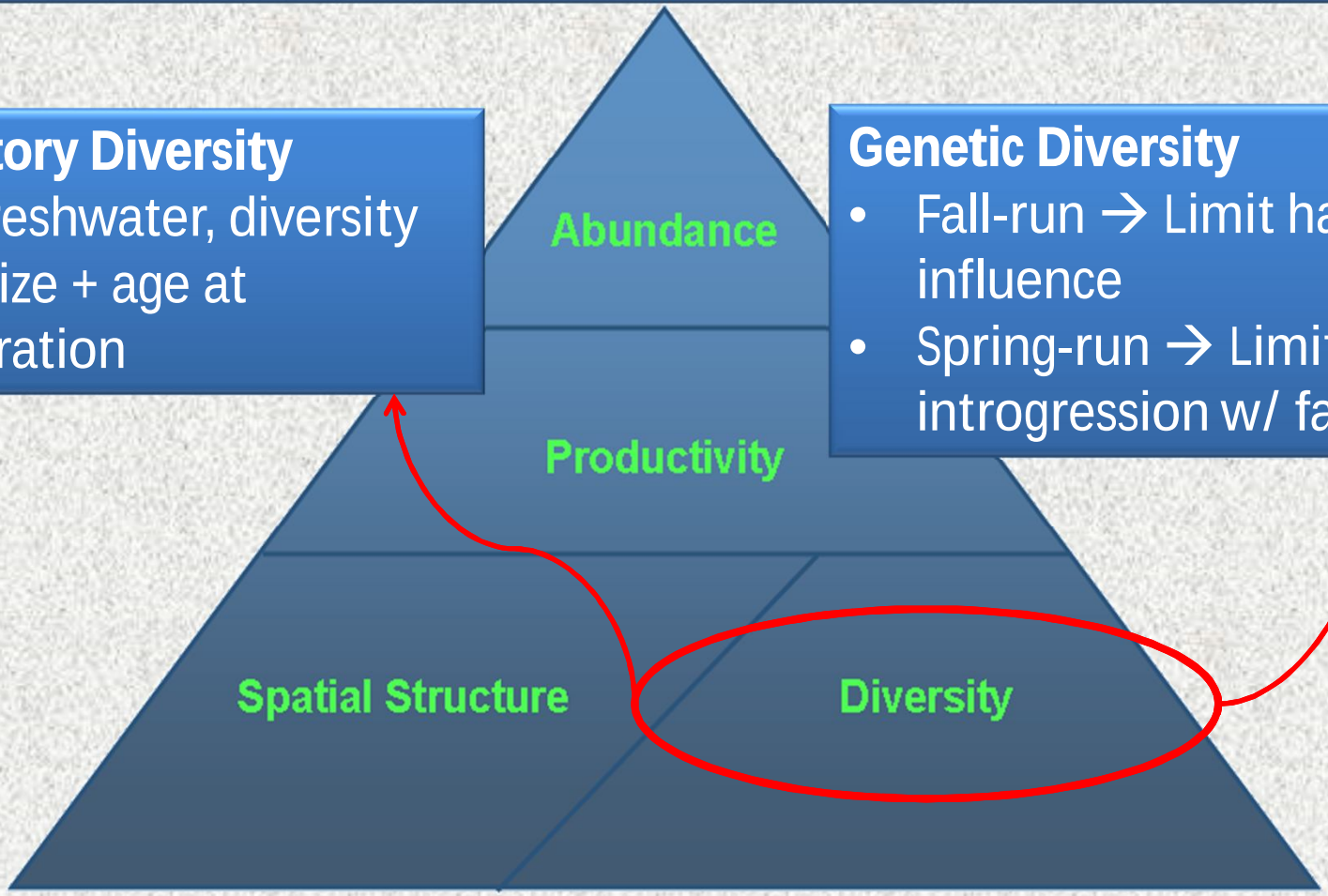
Biological Objectives
Salmonid Population Viability Attributes

Life History Diversity

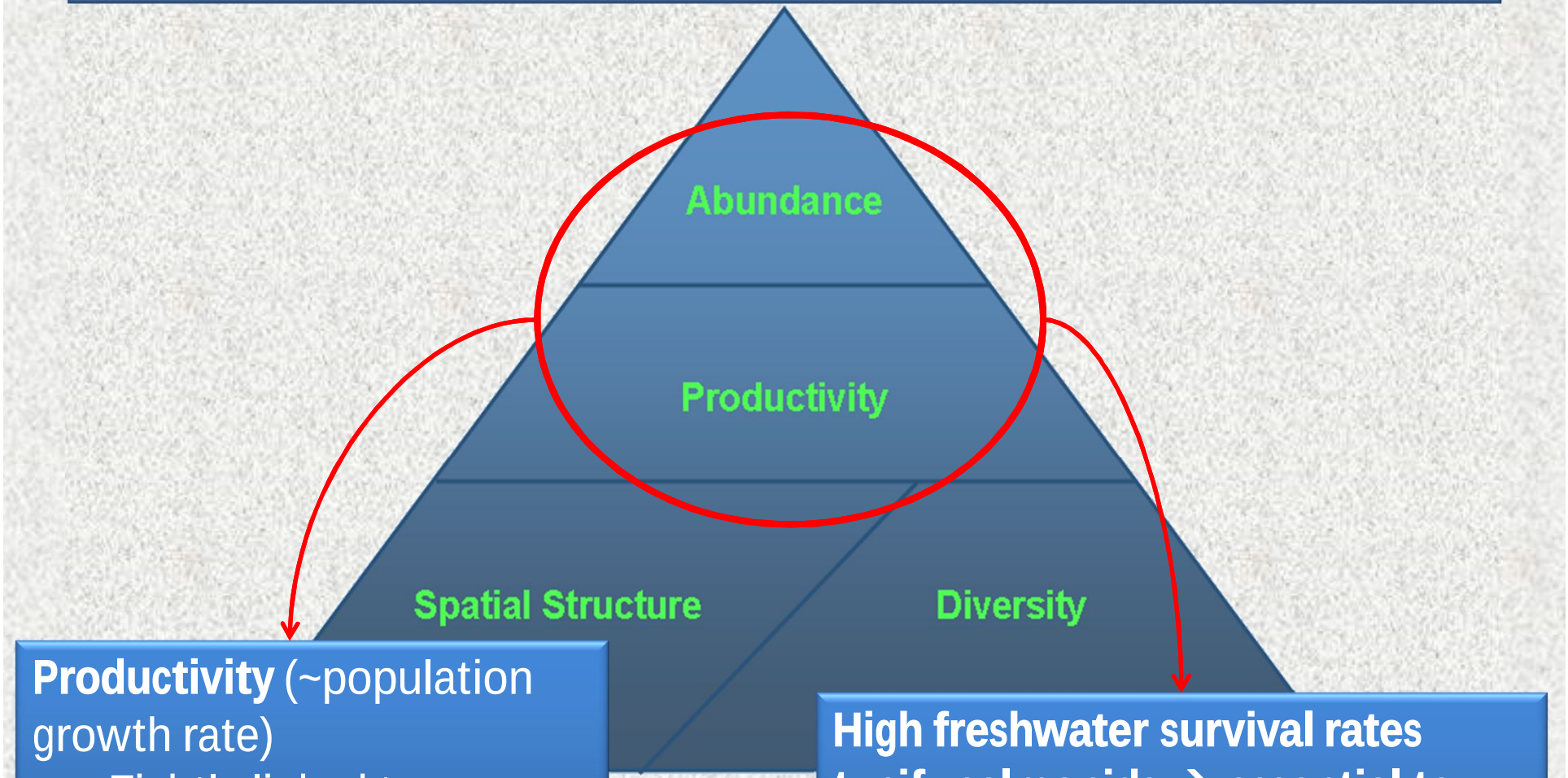
- In freshwater, diversity → size + age at migration

Genetic Diversity

- Fall-run → Limit hatchery influence
- Spring-run → Limit introgression w/ fall-run



Biological Objectives
Salmonid Population Viability Attributes



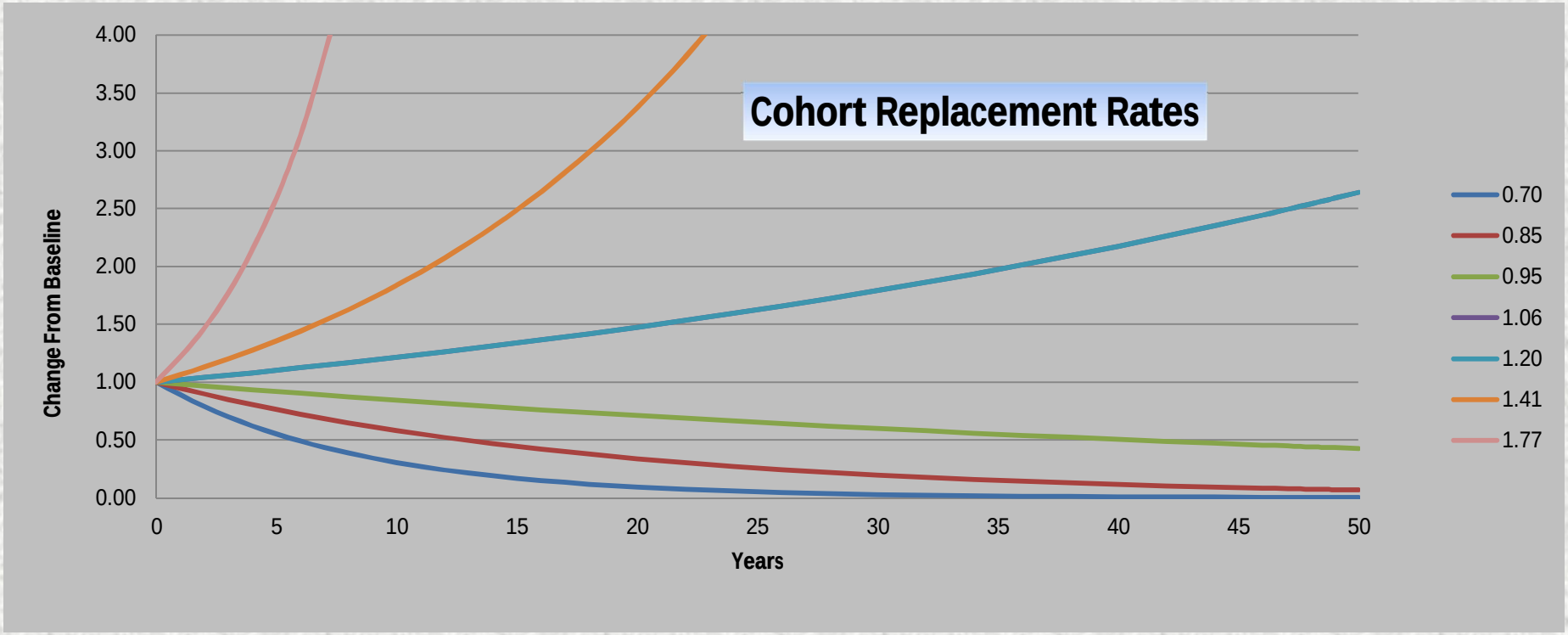
Productivity (~population growth rate)

- Tightly linked to abundance, but **not** identical

High freshwater survival rates typify salmonids → essential to their high intrinsic population growth rate

Productivity
(Population Growth)

Often determined as a function of abundance target and time window to attain abundance target:



Productivity (Population Growth)

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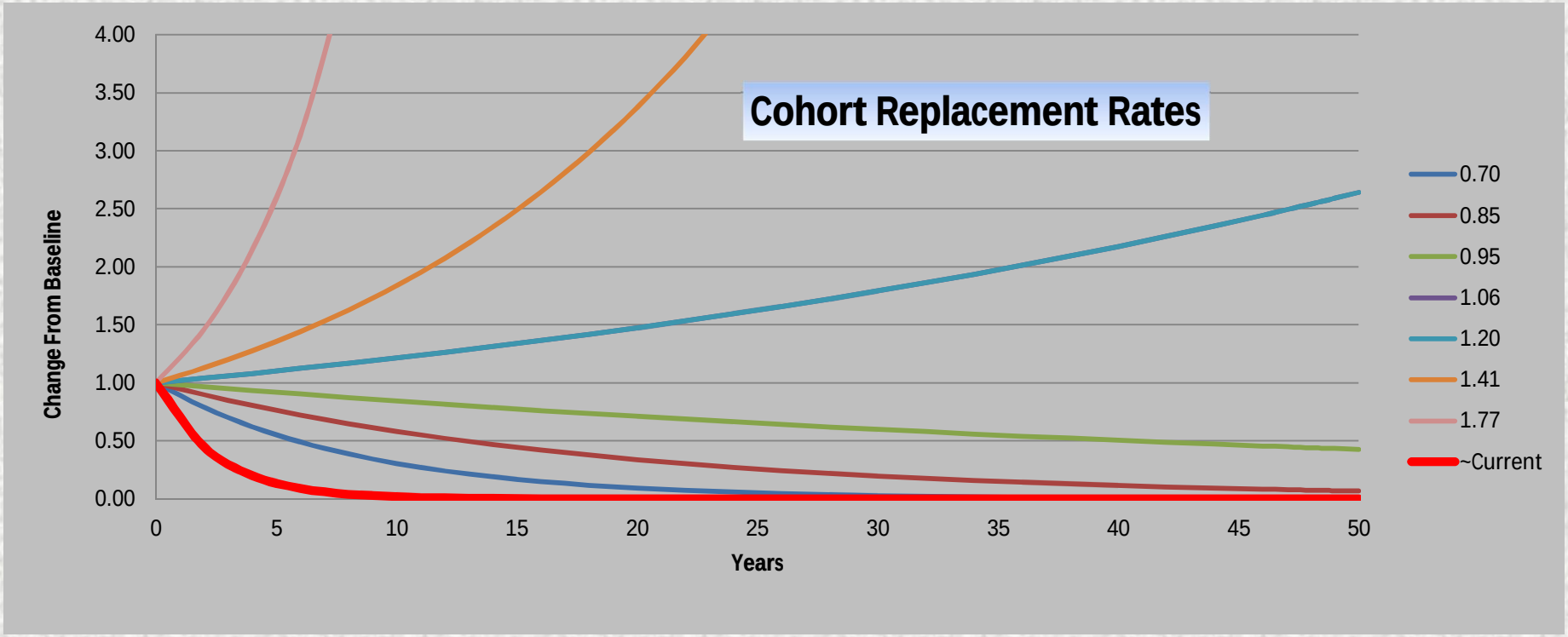

- Current CRR's are **much** lower than 1 (= replacement, or stable) and suggest short time to extirpation

Productivity (Population Growth)

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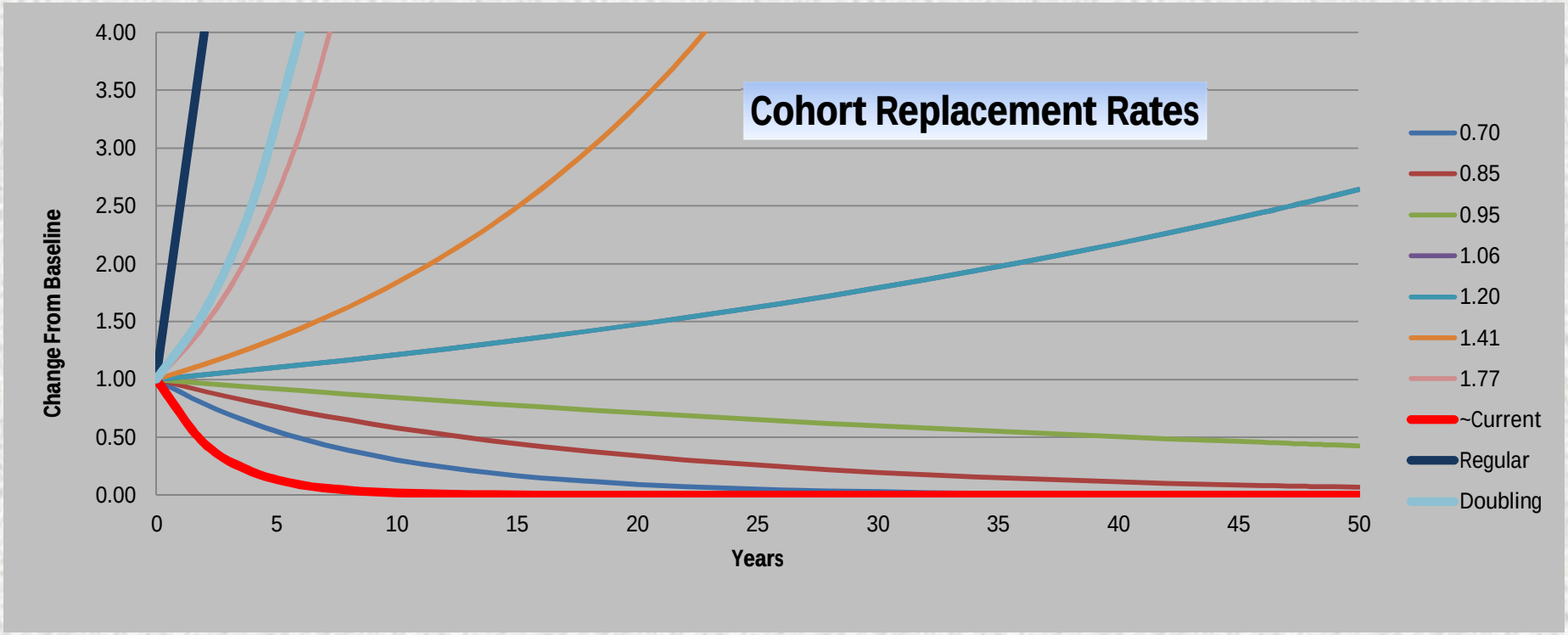


- Current CRR's are **much** lower than 1 (= replacement, or stable) and suggest short time to extirpation
- Typical population growth rates for Chinook salmon are **much** higher than those suggested by the "time-to-attain-doubling" approach

Stanislaus Fall-run Salmon
Draft Objectives Summary

Type	Part	What?	How Much?	When?
Life History	a	Fry Timing	Maintain current range	12 years
	b	Parr Timing	Begins ~10d earlier	12 years
	c	Smolt Timing	Begins ~14d earlier	12 years
Life History	a	Fry Proportion (Min)	20% Wet yrs 20% Drier yrs	12 years
	b	Parr Proportion (Min)	20% Wet yrs 30% Drier yrs	12 years
	c	Smolt Proportion (Min)	10% Wet yrs 20% Drier yrs	12 years
Productivity	a	Freshwater survival = 2.24% **	10.2% Median Egg-Caswell	9 years
	b	Freshwater survival = 4.46% **	13.4% Median Egg-Caswell Survival	15 years
	c	Freshwater survival = 10% **	25.1% Median Egg-Caswell Survival	24 years
Genetic	a	Hatchery Origin Spawners	<20%	TBD

** = Major caveats to which you should pay attention

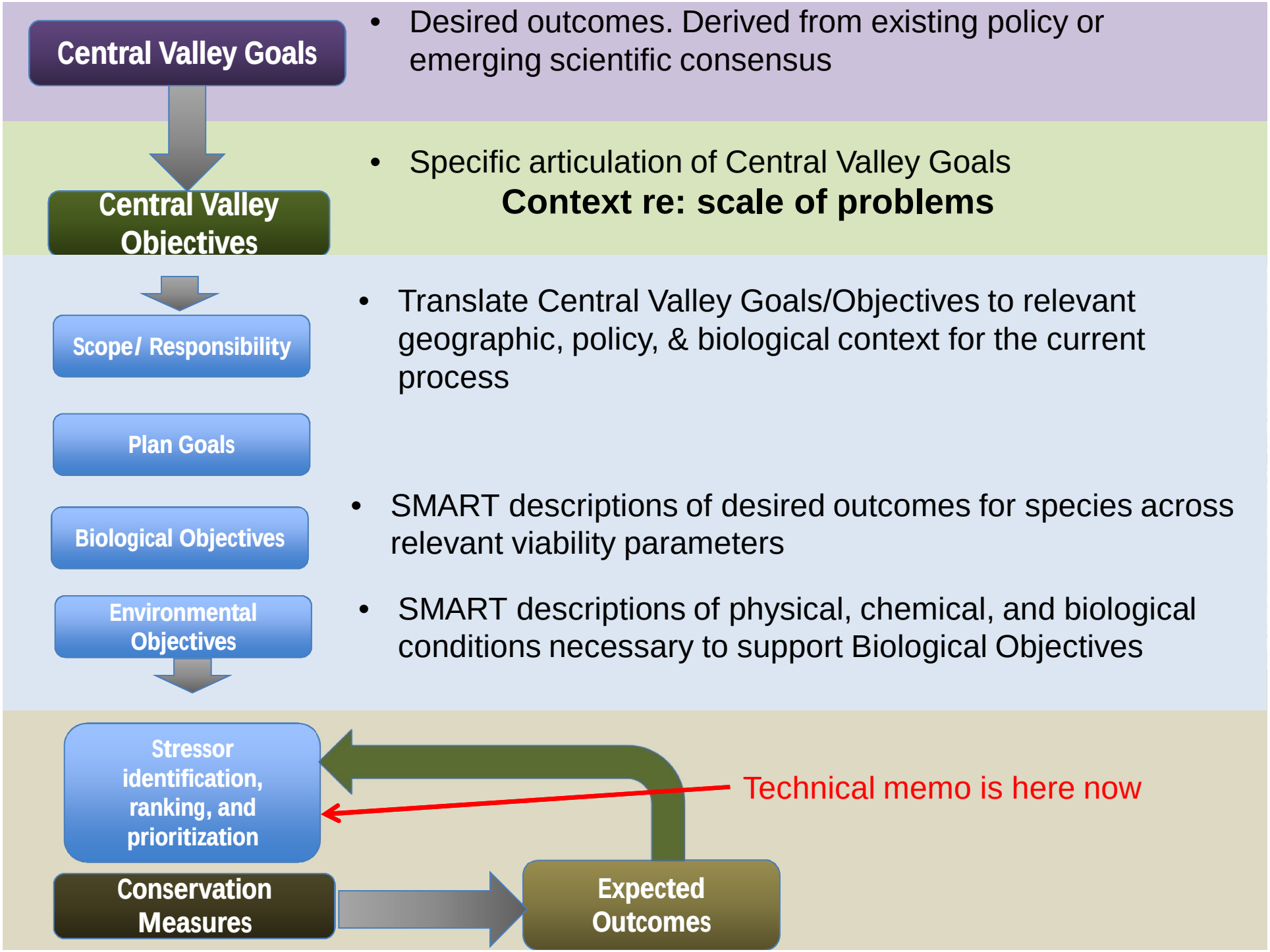
Environmental Objectives

example

Table 11

Temperature Objectives for Chinook Salmon and Steelhead Adult Upstream Migration

Spatial Extent (Habitat Type)	Temporal Extent	Condition	Range (Metric)
Delta to Holding/ Spawning Grounds	**Fall-run:** Late September to December **Spring-run:** March to June **Steelhead:** September to April	Optimal	8°C to 14°C (46.4°F to 57.2°F) (Daily Average)
			9.5°C to 15.5°C (49.1°F to 59.9°F) (7DADM)
		Sub-optimal	14°C to 19°C (57.2°F to 66.2°F) (Daily Average)
			15.5°C to 20.5°C (59.9°F to 68.9°F) (7DADM)
		Detrimental	> 18°C (64.4°F) (Weekly Average)
			> 19°C (66.2°F) (Daily Average)
			> 20.5°C (68.9°F) (7DADM)
			> 22°C (71.6°F) (Instantaneous)


Central Valley Goals
• Desired outcomes. Derived from existing policy or emerging scientific consensus
Central Valley Objectives
• Specific articulation of Central Valley Goals
Context re: scale of problems
Scope/ Responsibility
• Translate Central Valley Goals/Objectives to relevant geographic, policy, & biological context for the current process
Plan Goals
Biological Objectives
• SMART descriptions of desired outcomes for species across relevant viability parameters
Environmental Objectives
• SMART descriptions of physical, chemical, and biological conditions necessary to support Biological Objectives
Stressor identification, ranking, and prioritization
Technical memo is here now
Conservation Measures
Expected Outcomes

SEP Team:

American Rivers – John Cain, Sara Larsen

The Bay Institute – Jon Rosenfeld, Alison Weber-Stover

Cal Dept. of Fish and Wildlife – John Shelton, Stephen Louie, Tim Heyne

National Marine Fisheries Service – David Swank, Rachel Johnson, John Wooster, Brian Ellrott, Monica Gutierrez, Rhonda Reed, Stephen Edmondson, Sierra Franks

The Nature Conservancy – Jeanette Howard

Trout Unlimited – Rene Henry

US Fish and Wildlife Service – Julie Zimmerman, JD Wilkert, Paul Cadrett, Ramon Martin

Anchor QEA – John Ferguson, Elizabeth Appy

And others….