Key Points

1. **Adequate flows are essential** *to the health of the Delta and anadromous fish populations*
2. **Multiple benefits** *of inflows for anadromous fish include:*
   - *Increased survival*
     - *Improved passage*
     - *Decreased predation (temp and exposure)*
   - *Floodplain inundation*
   - *Life history strategy diversification*
3. **Salmon population targets are key** *for achieving success.*
   - *Narrative objective should reference CVPIA/AFRP targets*
4. **Physical and biological indicators can help** *guide management actions and track progress.*
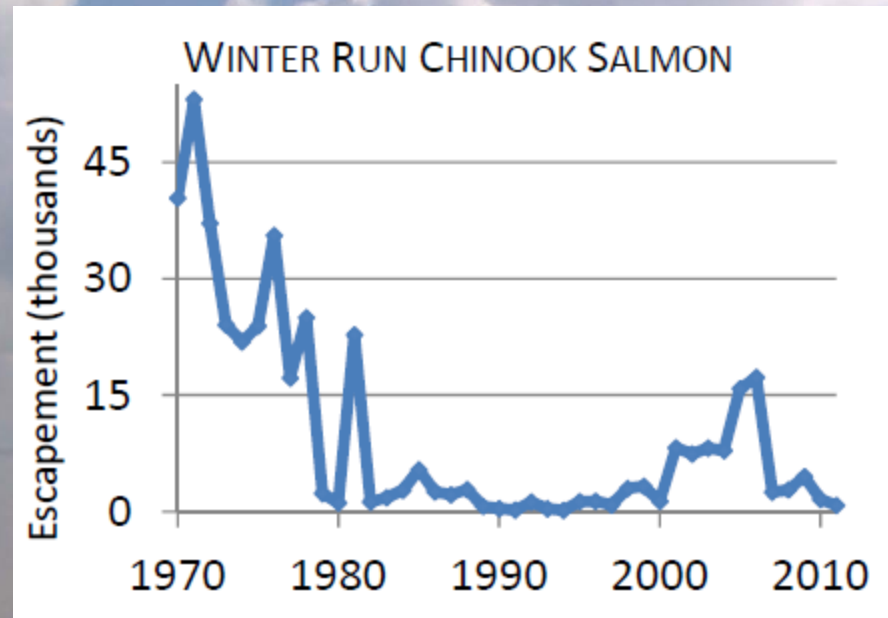
Key Points

Above all else:

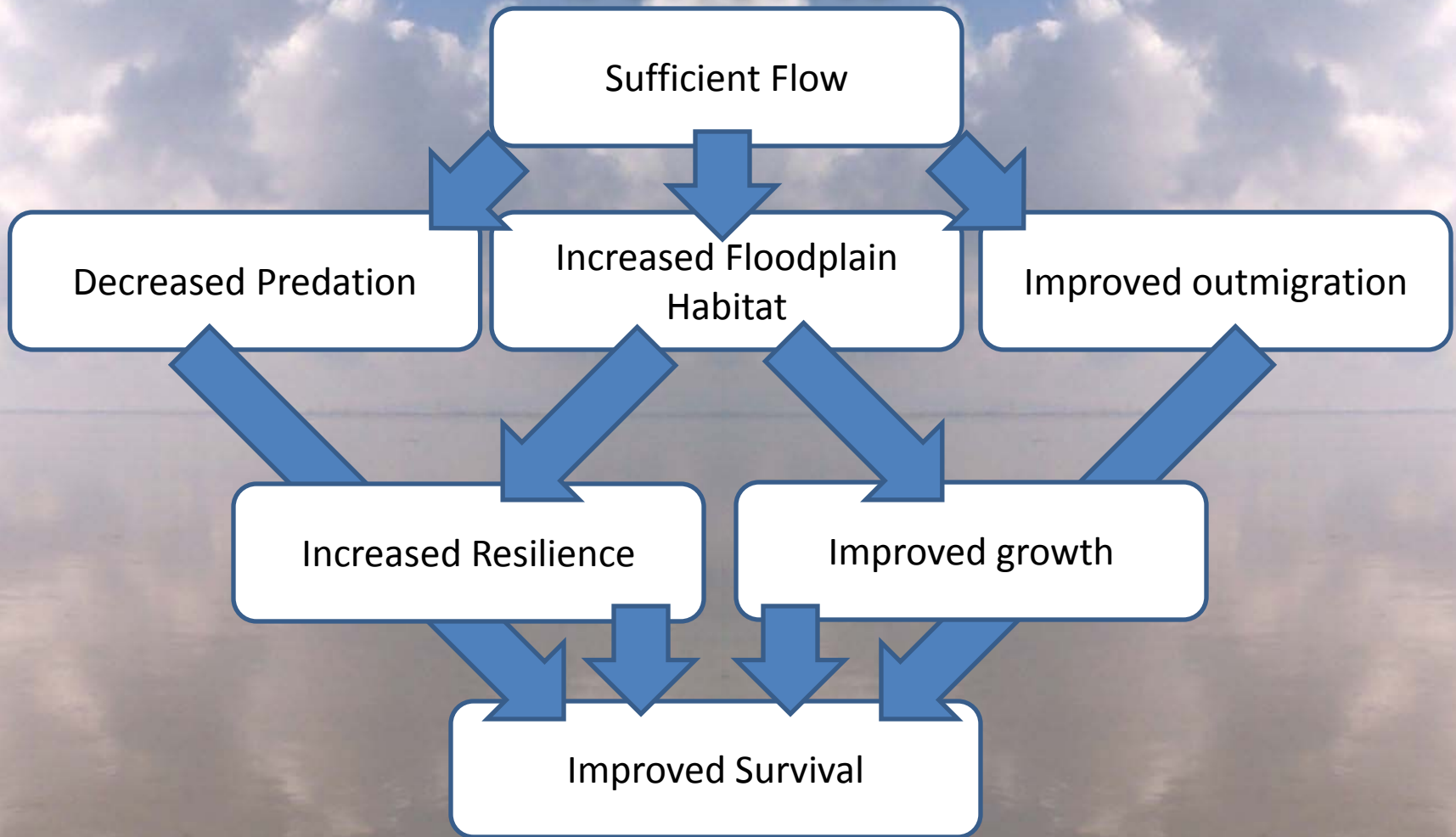**If you don't build it, they won't come!**

Salmon are in peril
The status quo is not sufficient

- *Adult winter run escapement in 2011 was only 824 Spawners (DFG 2012)*
  - *lowest level since 1994.*

WINTER RUN CHINOOK SALMON

- *The status quo = rapid decline*
- **Stabilization requires more than the status quo**
  - **Recovery more than that!**

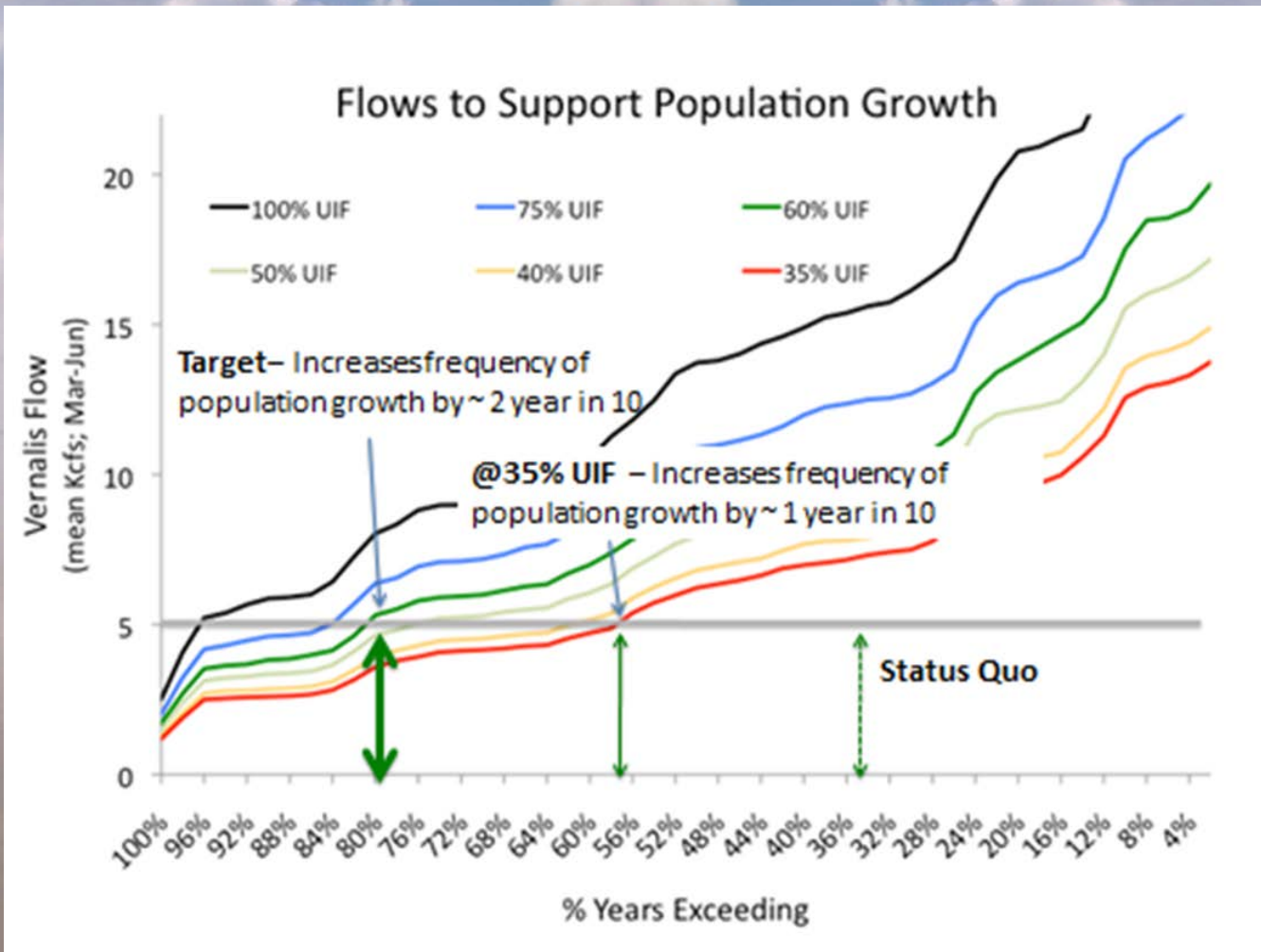# Improved flows support multiple benefits

Sufficient Flow

Decreased Predation

Increased Floodplain Habitat

Improved outmigration

Increased Resilience

Improved growth

Improved Survival

It all gets back to flow!

Use criteria to measure progress towards targets

- **Salmon population targets provide a critical bar** *against which to measure success of flows*
  - *TBI model for incremental progress towards targets*
- **Physical and biological criteria**
  - *Provide measurable concrete milestones towards achieving targets*
  - *Highlight what is and isn't happening*
  - *Allow flow to be adaptively managed/ ratcheted back if targets are met.*

Use criteria to measure progress towards targets

Flows to Support Population Growth

Legend:
- 100% UIF
- 75% UIF
- 60% UIF
- 50% UIF
- 40% UIF
- 35% UIF

Vernalis Flow (mean Kcfs; Mar-Jun)

Target– Increases frequency of population growth by ~ 2 year in 10

@35% UIF – Increases frequency of population growth by ~ 1 year in 10

Status Quo

% Years Exceeding

Use criteria to measure progress towards targets

- *Bio-criteria example – Fall run Chinook Salmon*

Attribute	Goal	Objective	Timeframe
Abundance	Increase	Achieve AFRP Target	15 years
Life History Diversity	Expand distribution of size and timing of outmigrants	Meet or exceed outmigrant timing and Maximum outmigrant size in CV	15 Years (fractionated in generations)
Productivity	Increase	CCR >1 in ~7 of 10 years (75%)	15years (Measured annually)

Use criteria to measure progress towards targets

- *Physical criteria example - Fall run Chinook Salmon*

| Attribute	Goal	Objective	Timeframe
Floodplain Habitat	Increase	Increase floodplain habitat to meet needs of population targets	15 years (Annual increments)
Temperature	Optimize	Achieve optimal temperatures for more than half of the outmigrantion period (except CD)	Annually

# Use criteria to measure progress towards targets

*Linking Floodplain and Fish - Example from the Upper San Joaquin River*

Multiple Approaches:
1. **Fish driven**: *Calculate habitat needs as a function of territory size.*
2. **Habitat driven**: *Apply ratio of historic habitat/ historic population size to solve for habitat need based on population targets.*
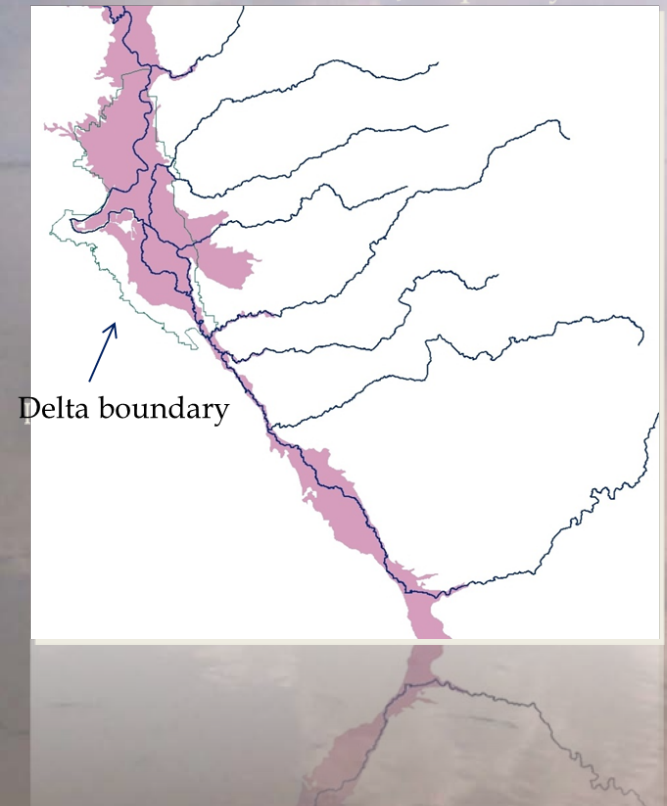   - *Region Specific*
3. **Reference system**: *Yolo Bypass*

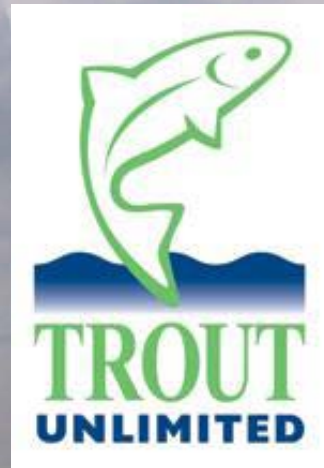San Joaquin Valley Historical River Floodplain Ecosystem
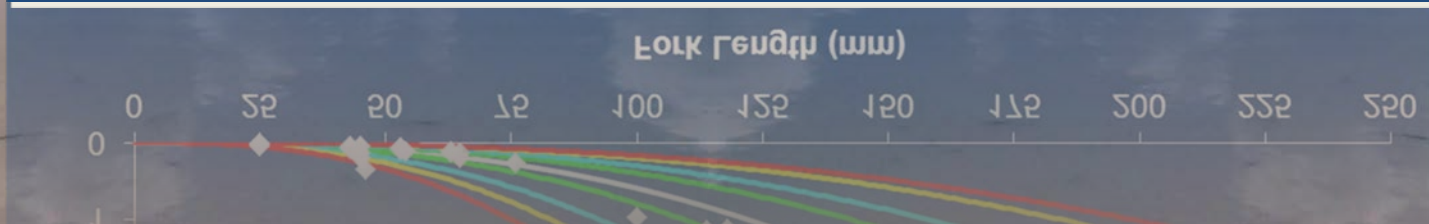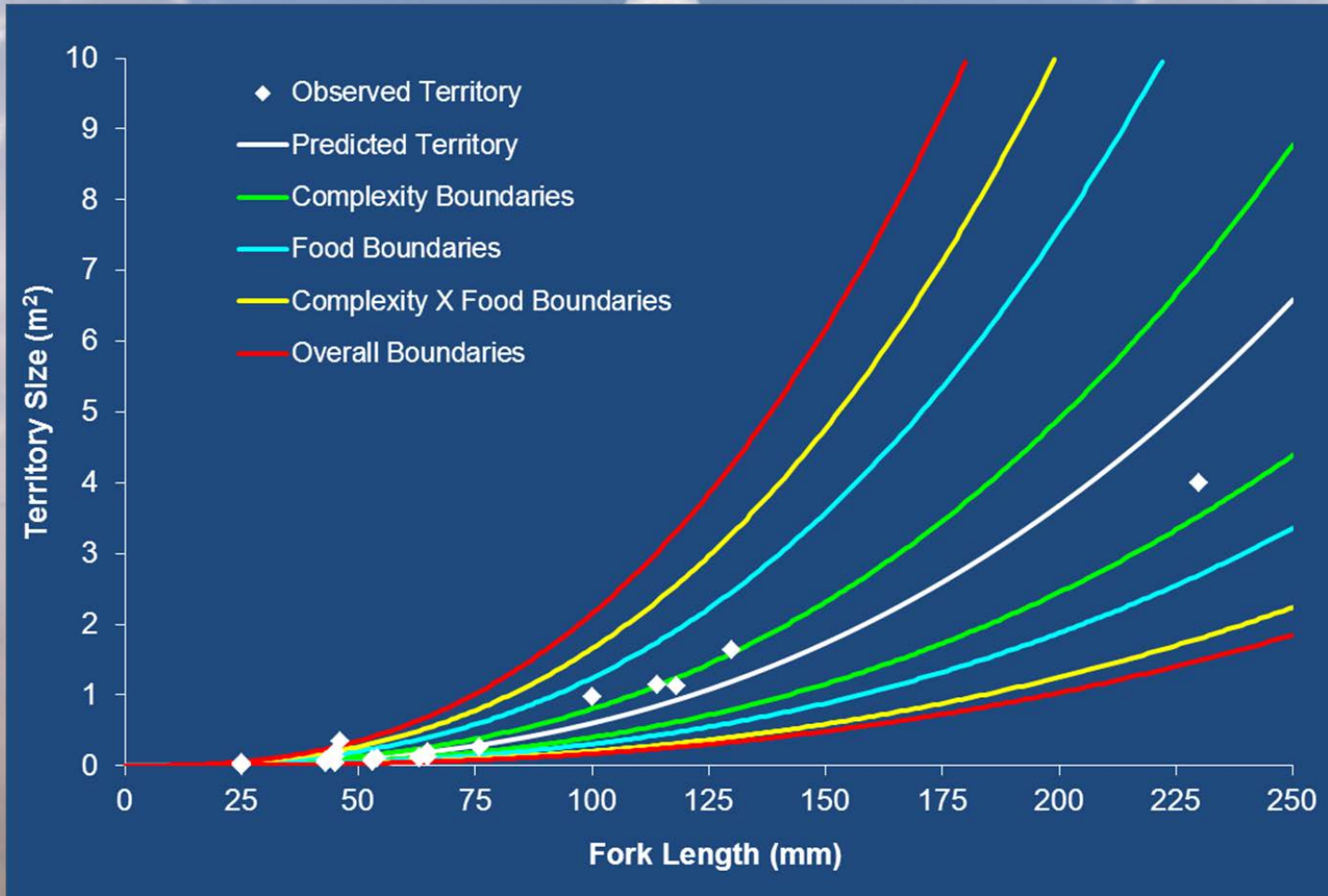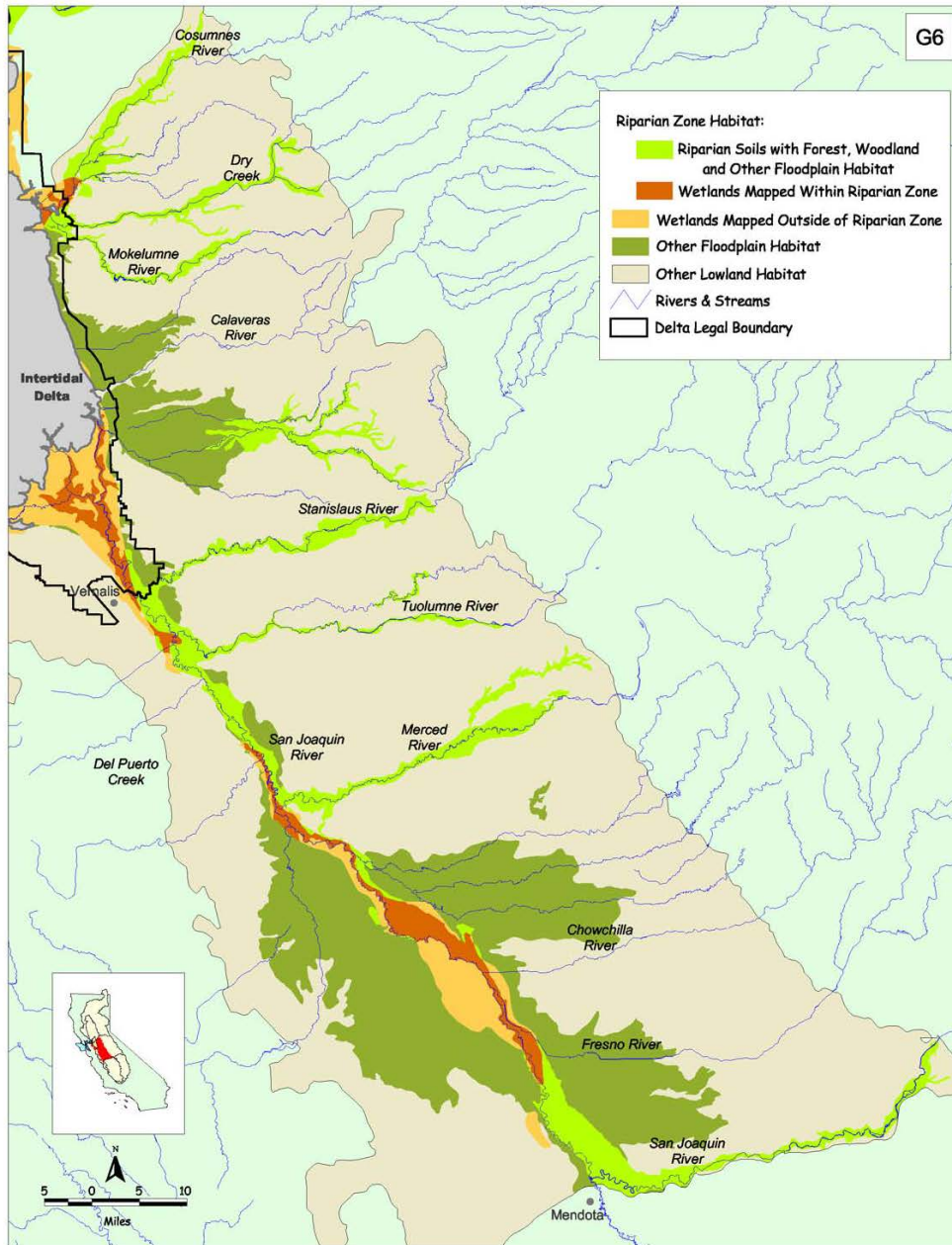
San Joaquin system

Delta boundary

Recommendations

- **Include salmon population targets in Narrative objective**

- **Increase winter/spring flows** *to a* **minimum of 50% UIF**, *as a base of a range that allows for even greater flows, to recover salmon and other fish.*

- **Continue and expand enhancement actions** *as a complement to flow (e.g. floodplain restoration)*

- **Establish biological and physical criteria** *necessary to track progress towards targets and trigger adaptive management*

Thank You