Ecological Flows Below Dams

Balancing flow needs

Protects the ecological integrity of affected ecosystems

while meeting inter-generational human needs for water.

The goal is **not** to create optimal conditions for all species all of the time; rather, we want to create adequate conditions for all native species enough of the time.

Better ecological information needed to ensure the best design of future water projects

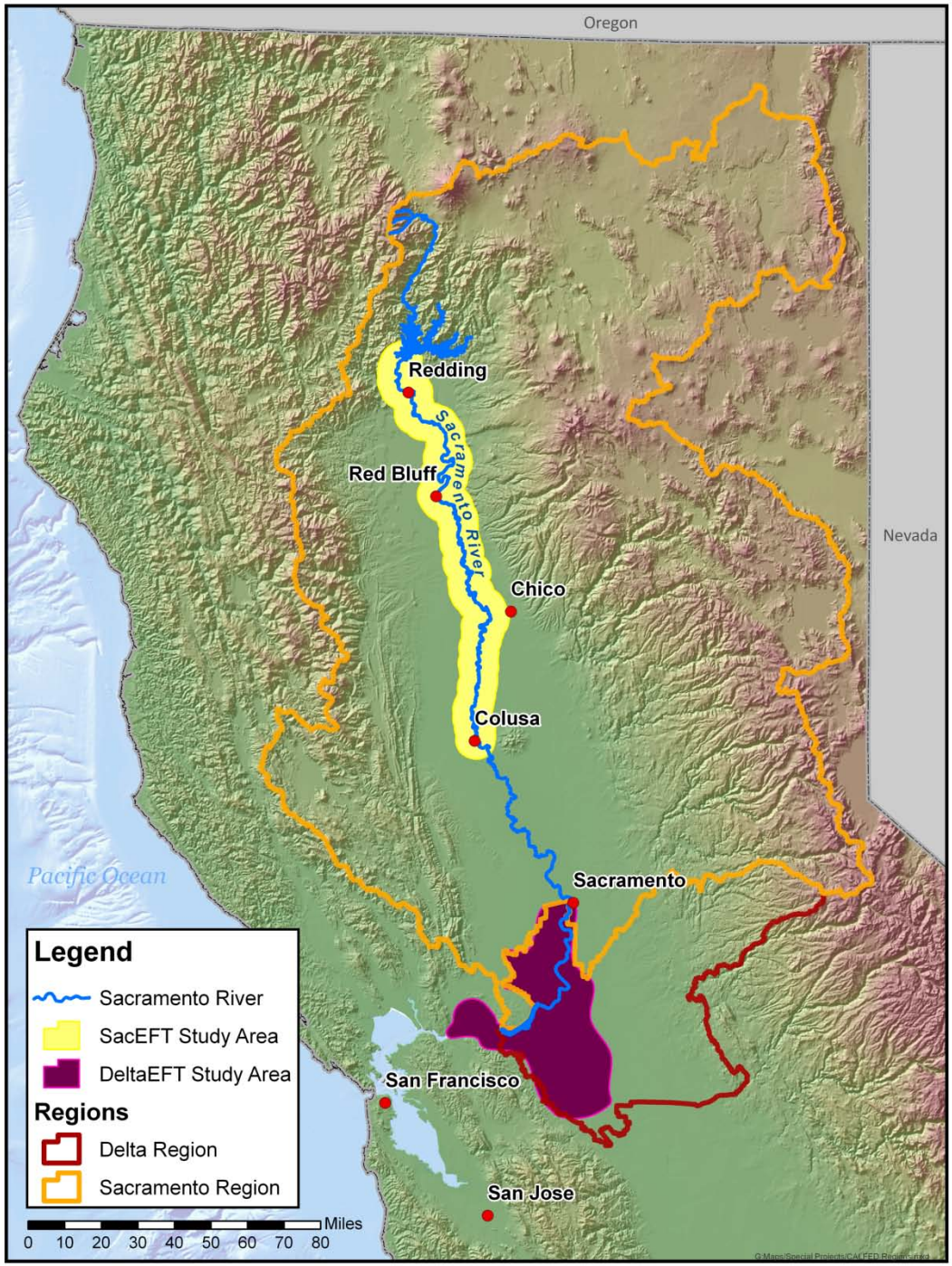
- Sites off-stream storage reservoir (NODOS)
- Raising Shasta Dam
- BiOps & OCAP
- Bay-Delta Conservation Plan

EFT
Ecological Flows Tool

Make it easy to expand ecological considerations & science foundation used to evaluate water management alternatives for the Sacramento River and Delta.

EFT
Ecological Flows Tool

Linked eco-regions evaluated separately or jointly



Multiple management questions

External forcing: climate & human demands (population size)

Sacramento River

Gravel augmentation (TUGS model)

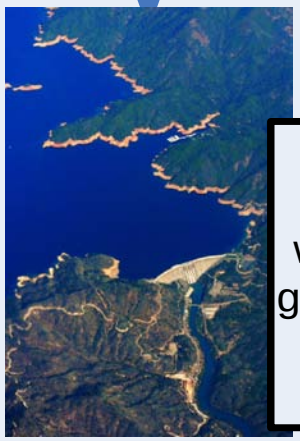
Rip-rap removal / levee setback (Meander Migration model)

Interaction

Delta Geometry

Interaction

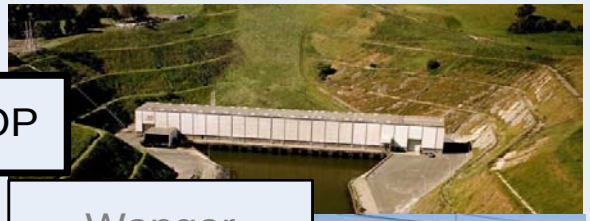
Flow / Diversion Operational Standards



D1641 operations (+1995)

BDCP + other "green" water operation rules and guidelines. (e.g., flood Yolo bypass more frequently)

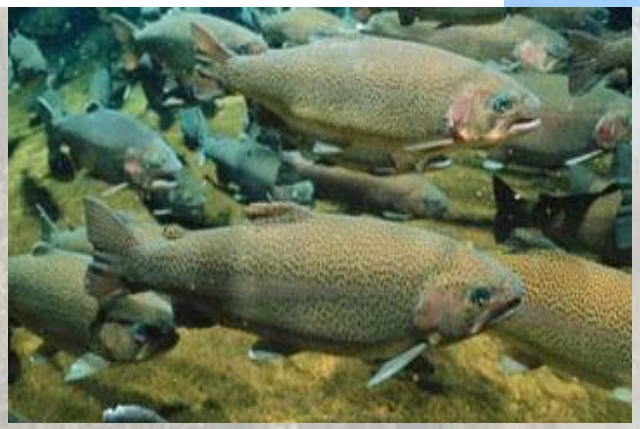
CVP-SWP BIOP



D1485 operations (<1995)

Wanger Requirements

EFT
Ecological Flows Tool



Steelhead

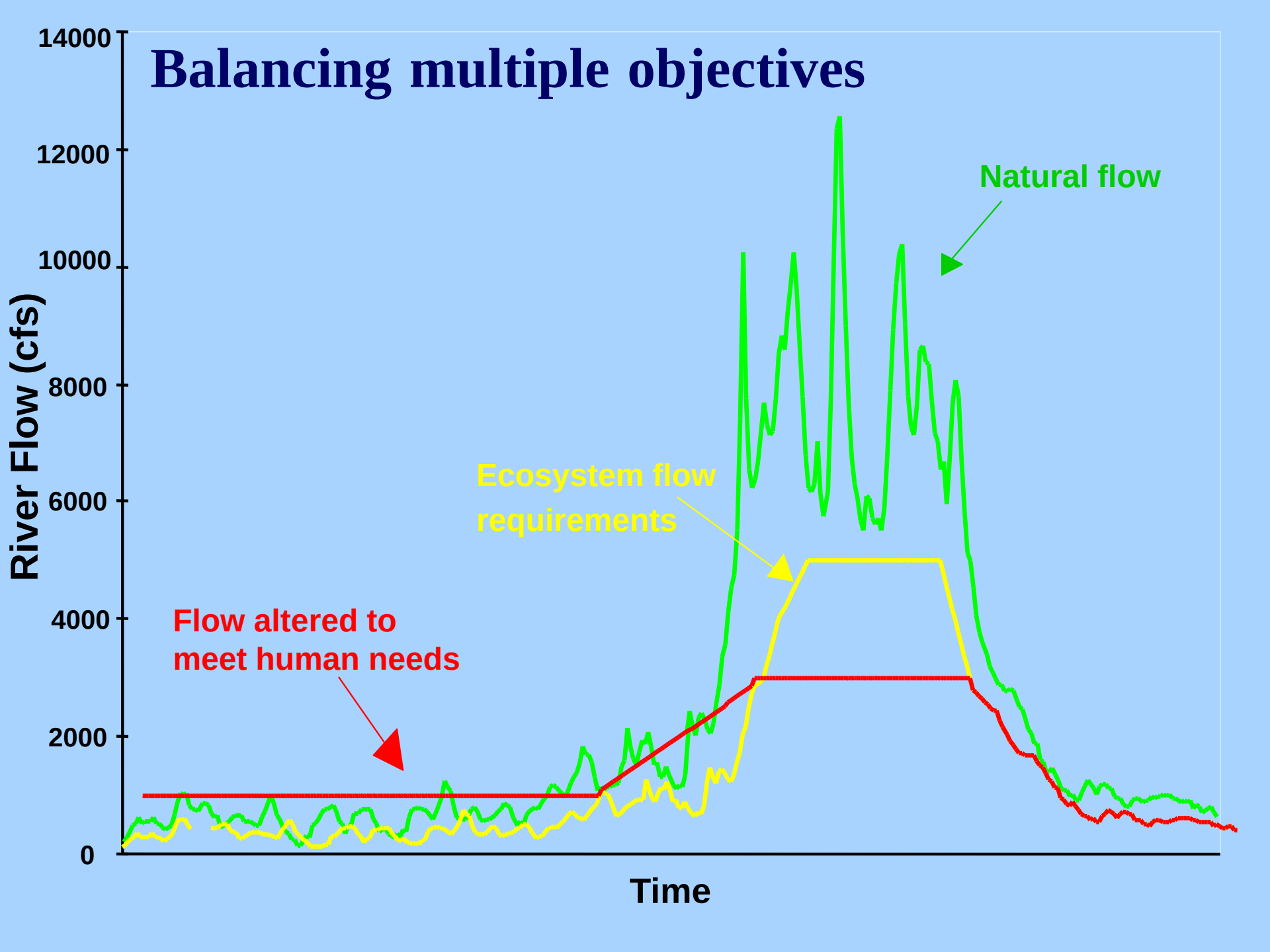
Chinook Salmon

Green Sturgeon

Bank Swallow

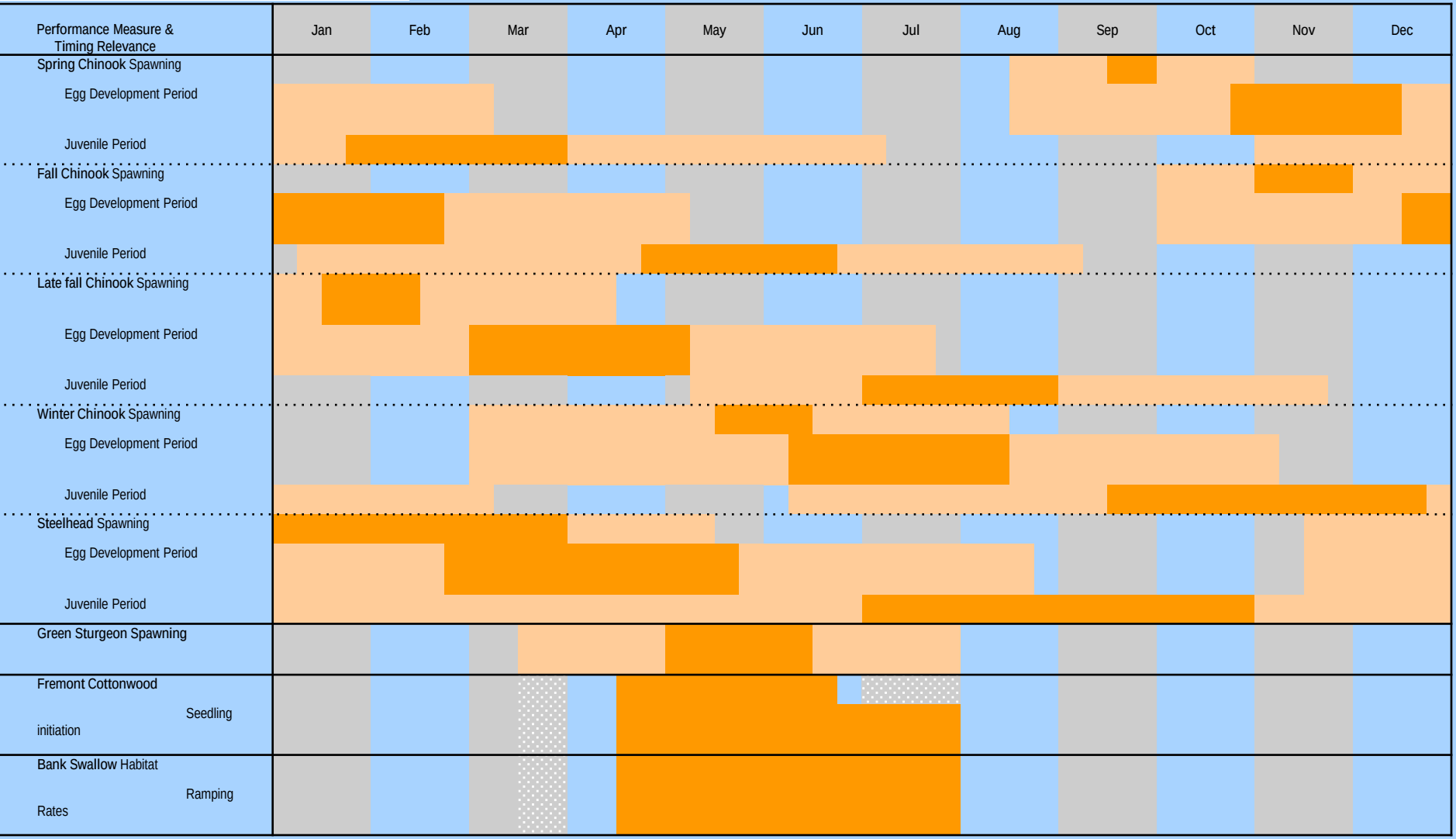
Large Woody Debris Recruitment

Fremont Cottonwood

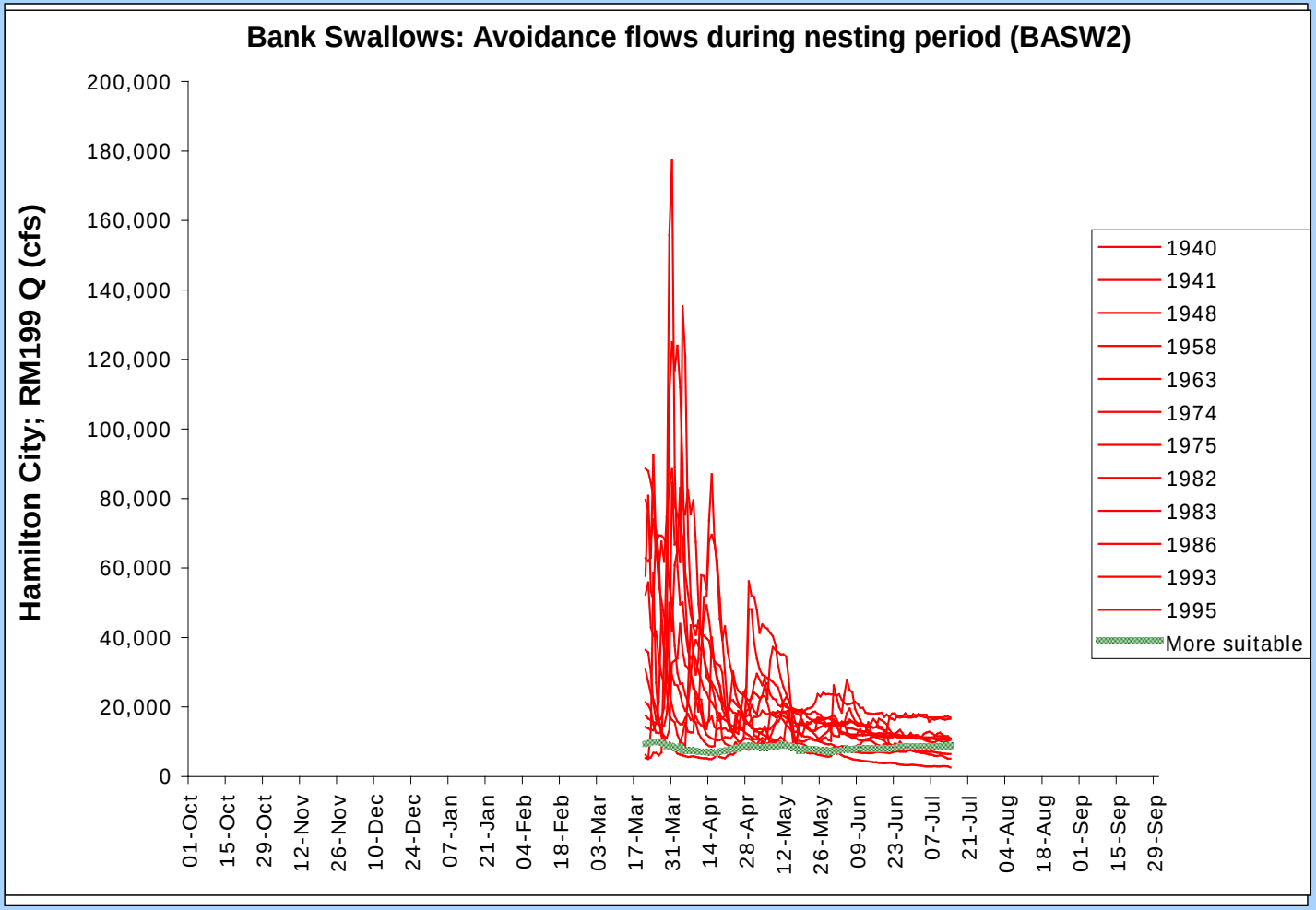

Balancing multiple objectives
14000
12000
10000
8000
6000
4000
2000
0
River Flow (cfs)
Natural flow
Ecosystem flow requirements
Flow altered to meet human needs
Time

Ecological flows require tradeoffs

EFT
Ecological Flows Tool



Create target and avoidance flows



NODOS Addresses Integration of CALFED ROD Objectives

- Improve water supply reliability for agricultural, urban, and environmental uses.
- Improve drinking, agricultural and environmental water quality in the Delta.
- Provide flexible hydropower generation to support integration of renewable energy sources.
- Increase survival of anadromous and endemic fish populations.