
Public participation and social considerations
The key to restoration at the watershed scale

Today's talk

I. Justify the need to address root causes of ecological degradation through transformative restoration at the watershed scale rather than continue to spend billions on site level technical fixes.

- Review goals of restoration programs.
- Provide data on how river restoration is practiced in California (most extensive effort in the US).
- Reveal the disconnect between our goals and actions.

II. Provide an example of watershed "restoration" that addresses social, physical, and ecological processes to increase ecological and community resilience.

- Involves collaborative conservation among local interests.
- Requires decision-support tools to evaluate environmental and economic trade-offs to reduce watershed cumulative effects and increase water security.

River restoration goals

- Clean water for drinking and swimming (EU WFD and US CWA)

- Improve ecological condition (EU WFD)
- Restore structure and function (CA CDFG)

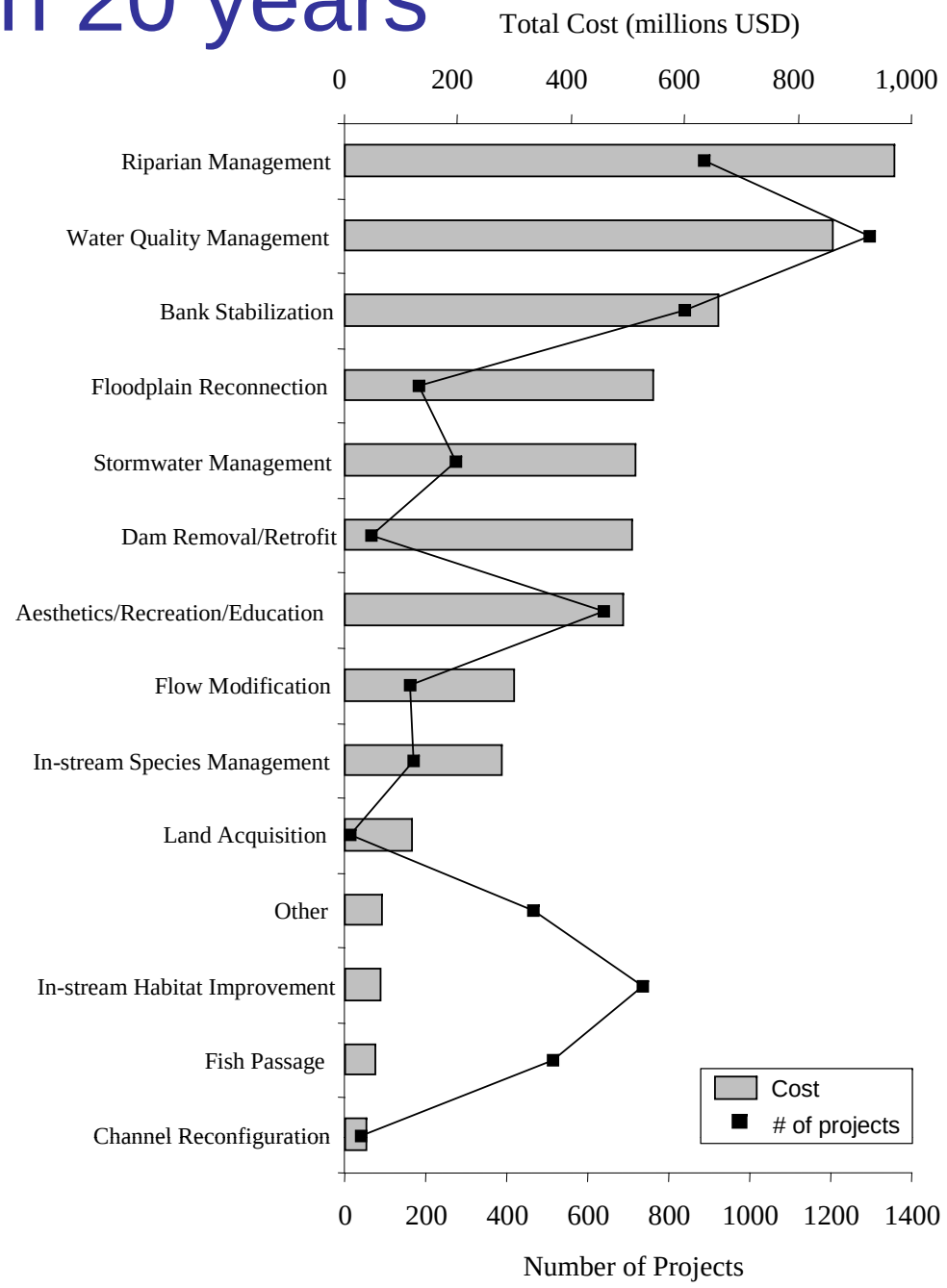
- Species recovery (US ESA)

How do we do river restoration?

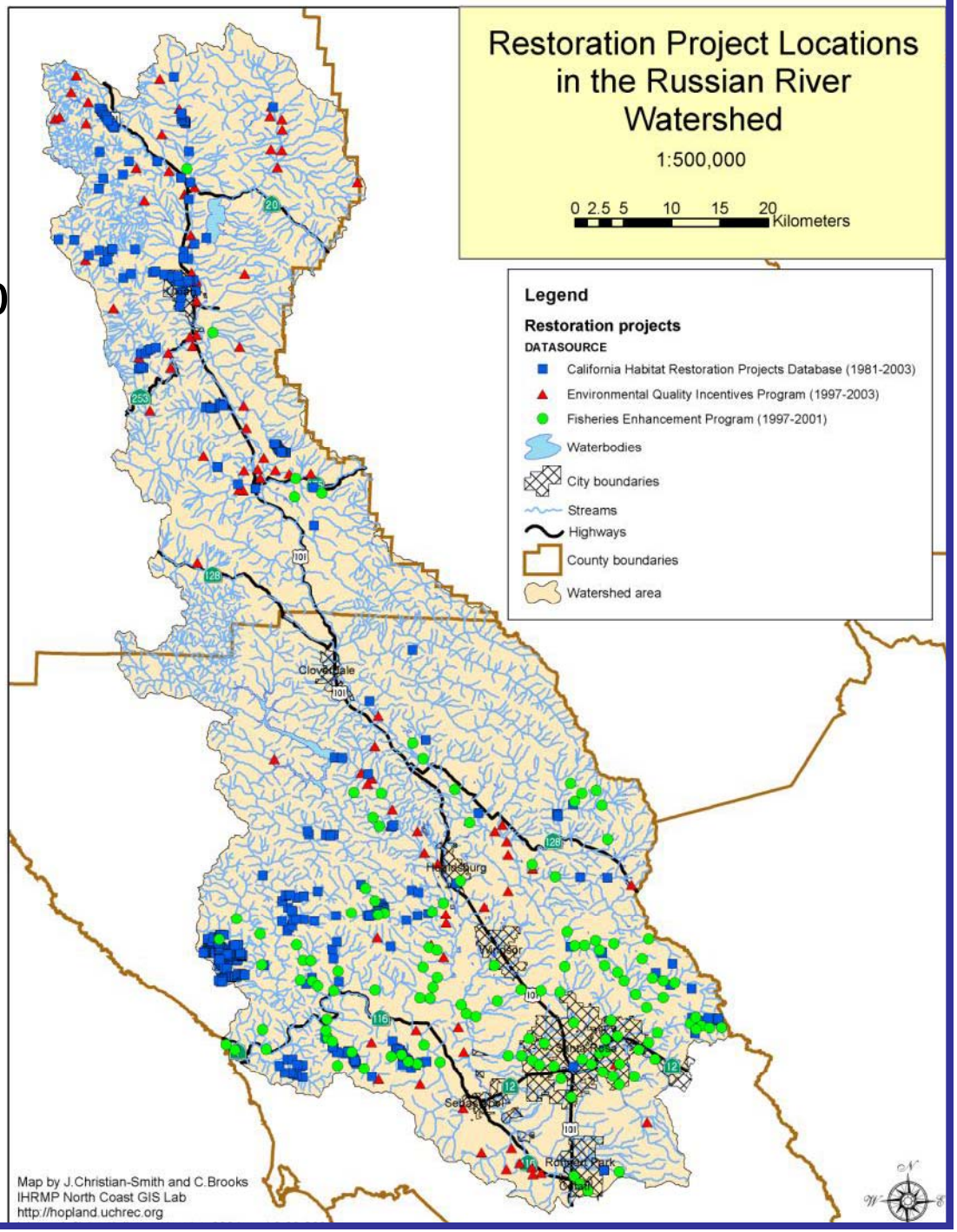
- Most funding is for doing site level restoration projects.
  - Channel reconfiguration
  - Bank stabilization
  - Riparian planting
  - Upslope road repair
  - Fish passage (remove barriers, add fish passage ways)

California Restoration 20 years

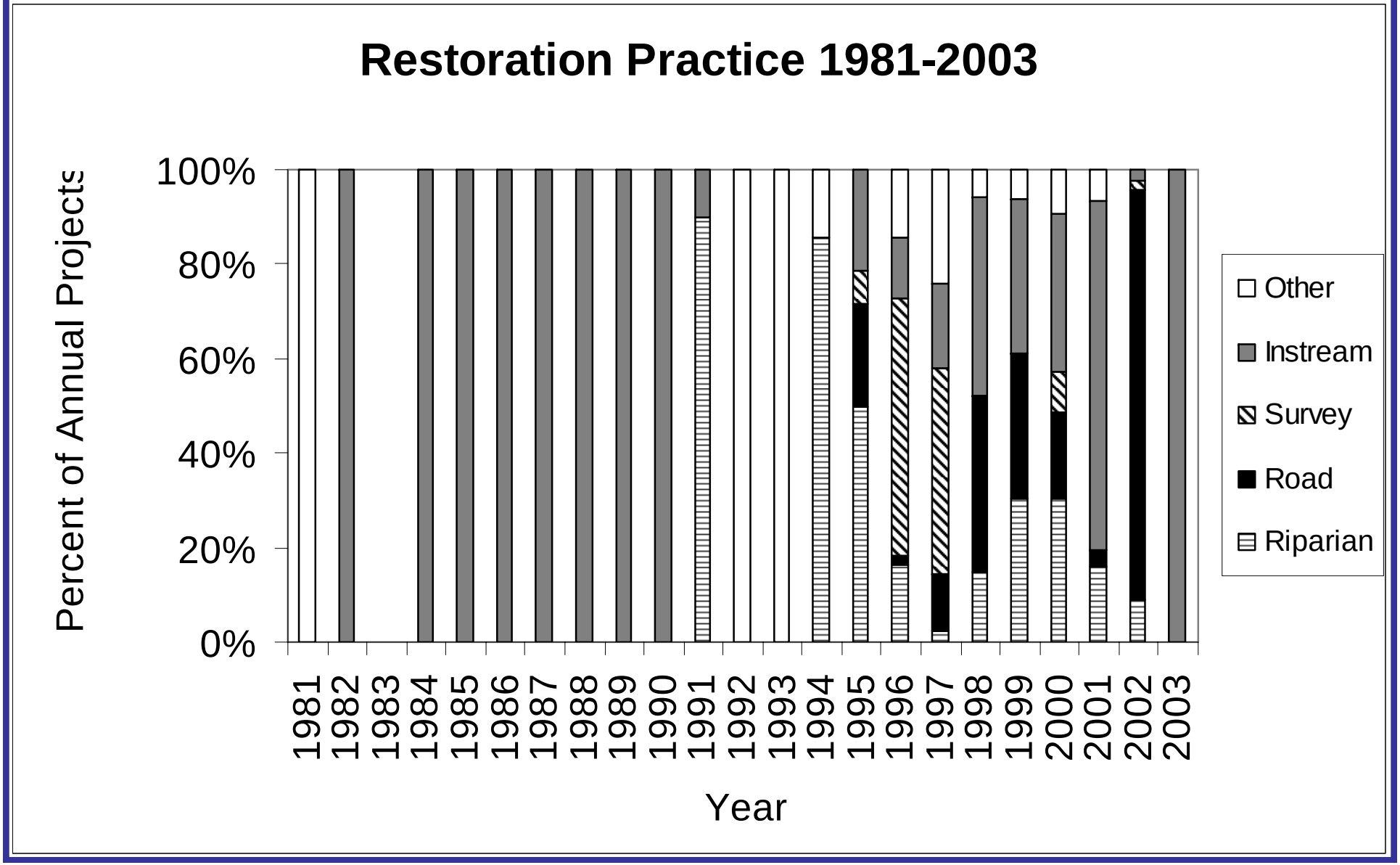
- 4,300 records
- >2 billion dollars



- Better data set for smaller area -- 40% more projects
- 787 restoration projects that have occurred between 1980-2003

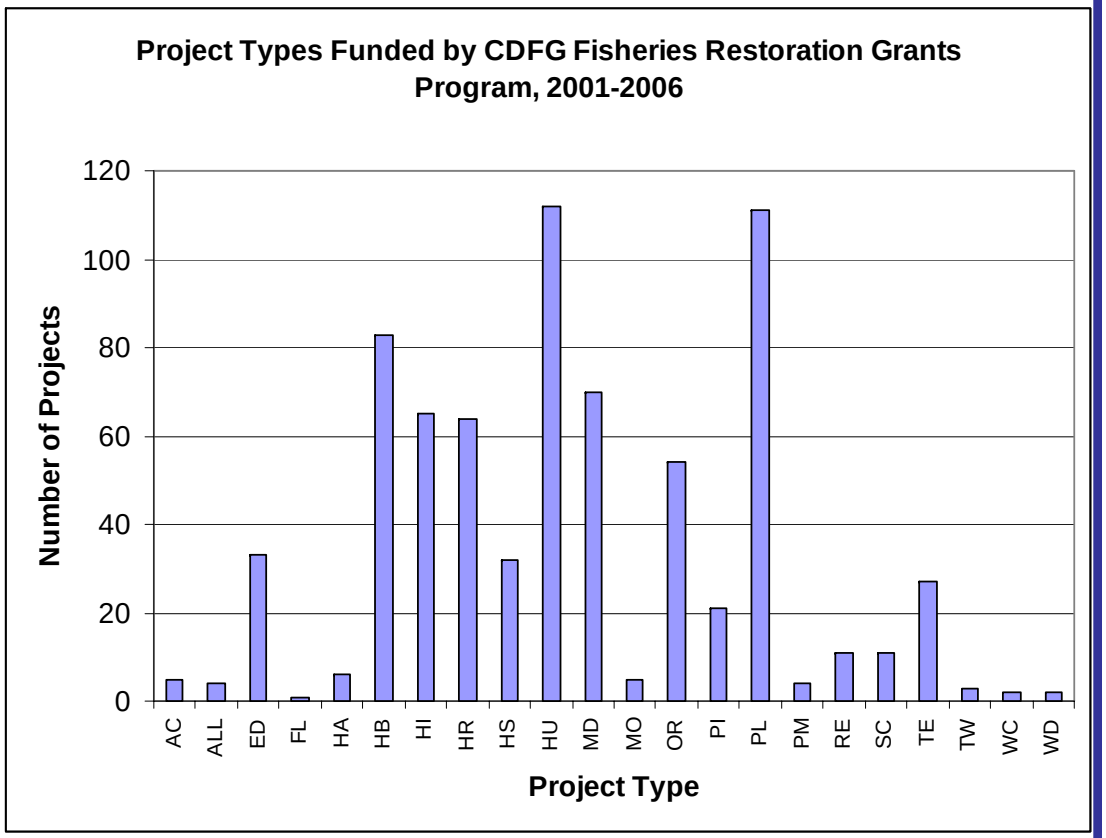


Russian River Restoration projects



Recent CDFG Fisheries Restoration Grants (2001-06)

CDFG PROJECT TYPES	CODES
AmeriCorps program	AC
Public school watershed and fishery conservation education	ED
Fish ladder	FL
Habitat acquisition and conservation easements	HA
Instream barrier modification	HB
Instream habitat restoration	HI
Riparian restoration	HR
Instream bank stabilization	HS
Watershed restoration (upslope)	HU
Monitoring projects (data)	MD
Project monitoring following project completion	MO
Cooperative rearing	RE
Fish screening of diversions	SC
Private sector technical training and education	TE
Watershed organization support and assistance	OR
Public involvement	PI
Watershed evaluation, assessment, and planning	PL
Project maintenance	PM
Water conservation measures	WC
Water measuring devices	WD
Water purchase	WP
Fits all categories	ALL



US Department of Agriculture 1997-2002 Russian River funded projects

- roads (44)
- fencing (53)
- riparian (63)
- structures for sediment control (107)


11. 14. 2003

What is missing?

From the CDFG 2001-2006 data fewer than 24 of the following types were funded.

- habitat acquisition
- conservation easements
- post-project monitoring and maintenance
- water conservation
- water measuring devices

This research shows

- Dominant forms of restoration treat the symptoms and are generally confined to a narrow set of site-specific practices.
- Need to reach farther in addressing the complex causal factors of watershed degradation that include historic and current land and water use for more transformative restoration.

Part II

Example of watershed “restoration” that addresses social, physical, and ecological processes to increase ecological and community resilience.

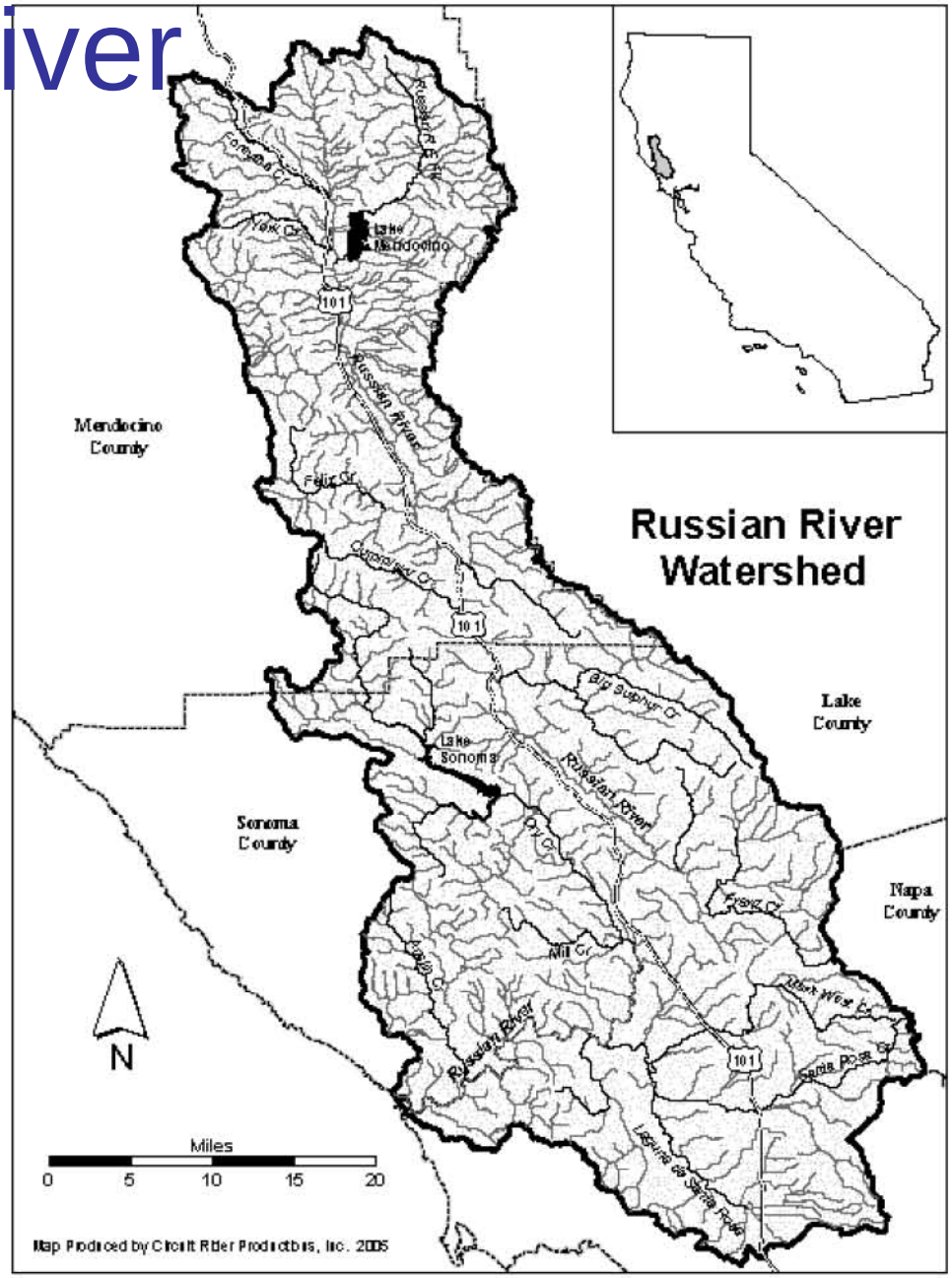
- Considers year-year variability in rainfall (climate change)
- Involves collaborative conservation among local interests.
- Provides decision-support tools to evaluate environmental and economic trade-offs to reduce watershed cumulative effects and increase water security.

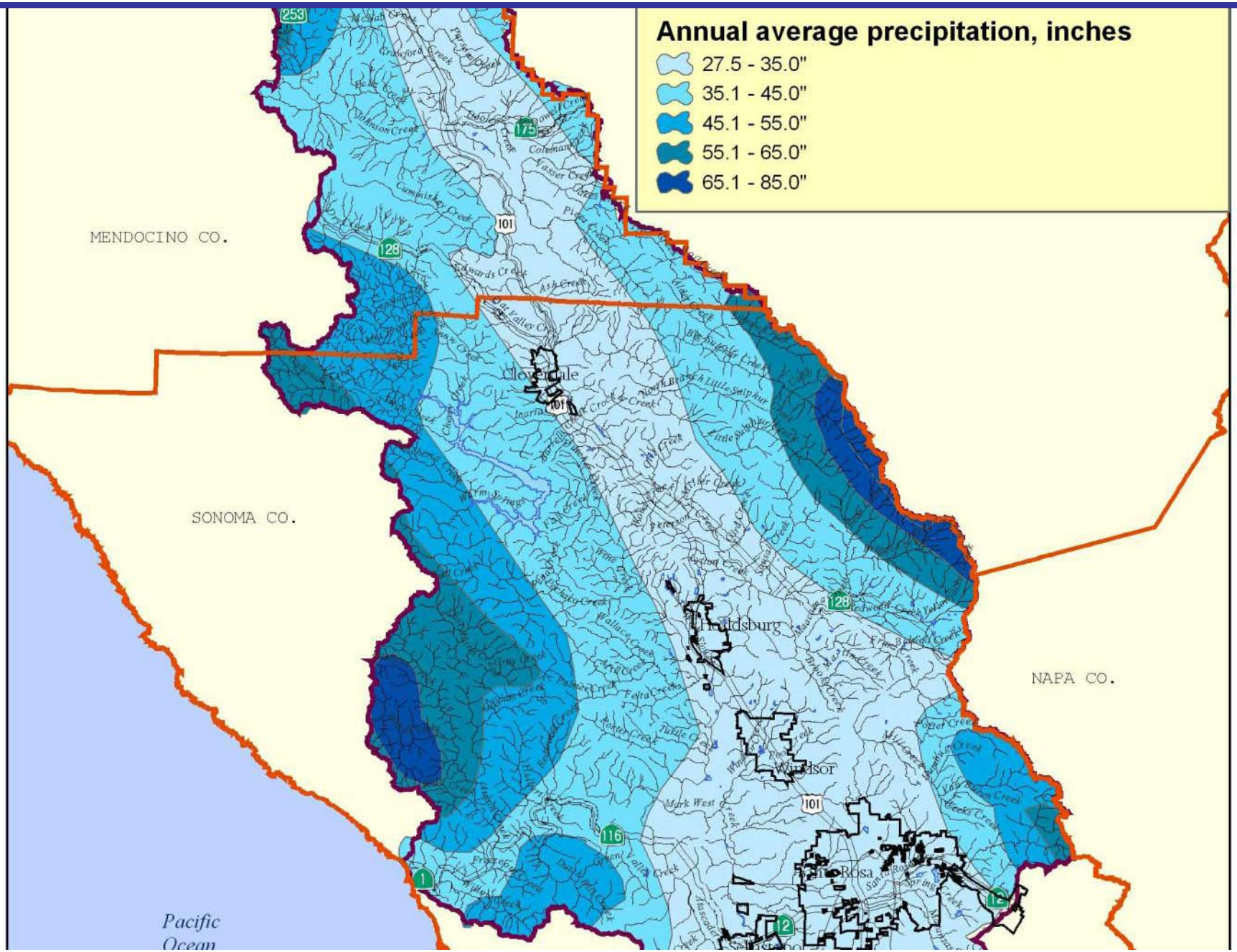
The Russian River

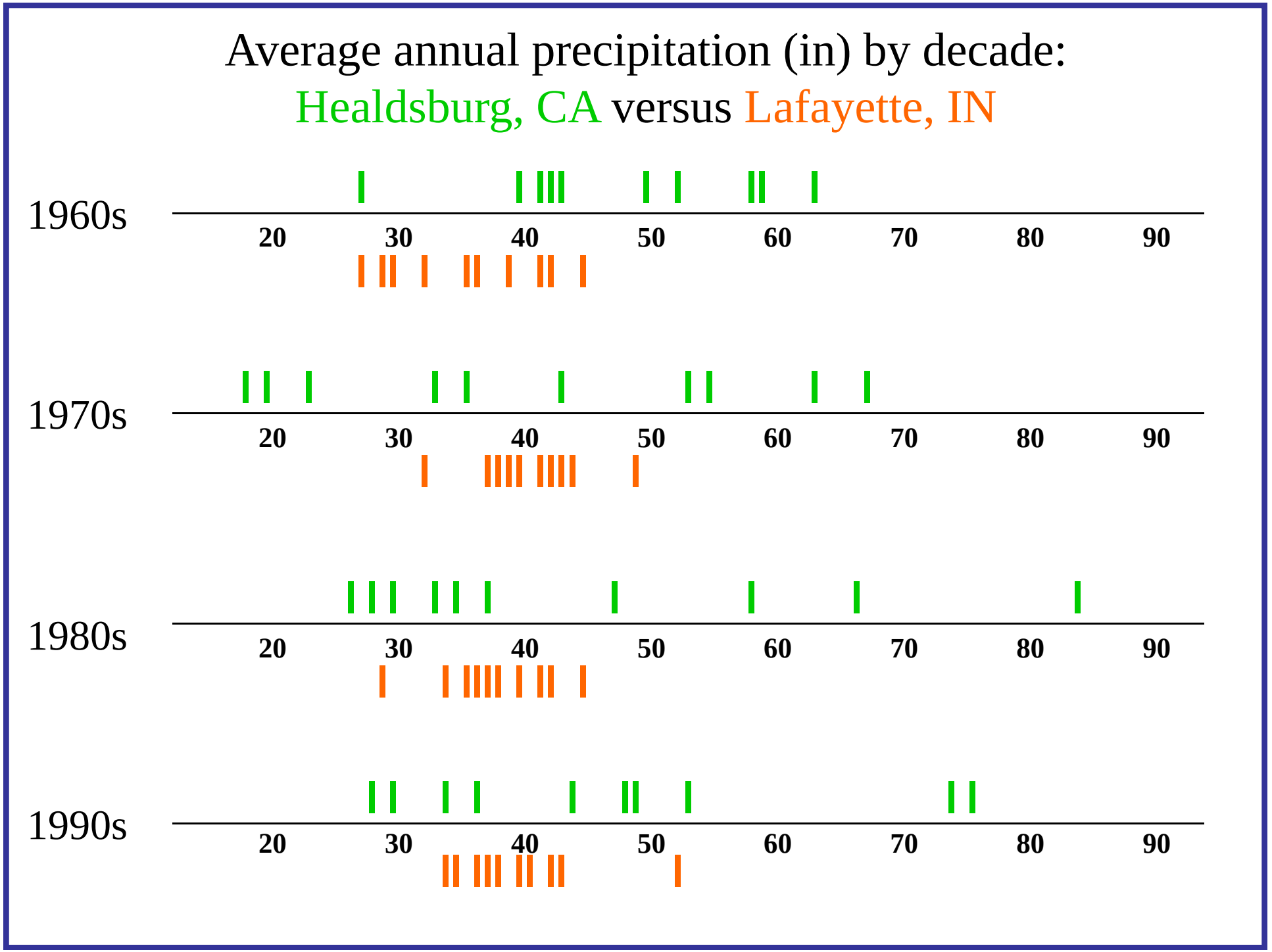
- 128km long
- Drains 3,846 square kms
- Avg. annual discharge 1.6 million acre-feet

(1,974,000,000 m^3/yr)

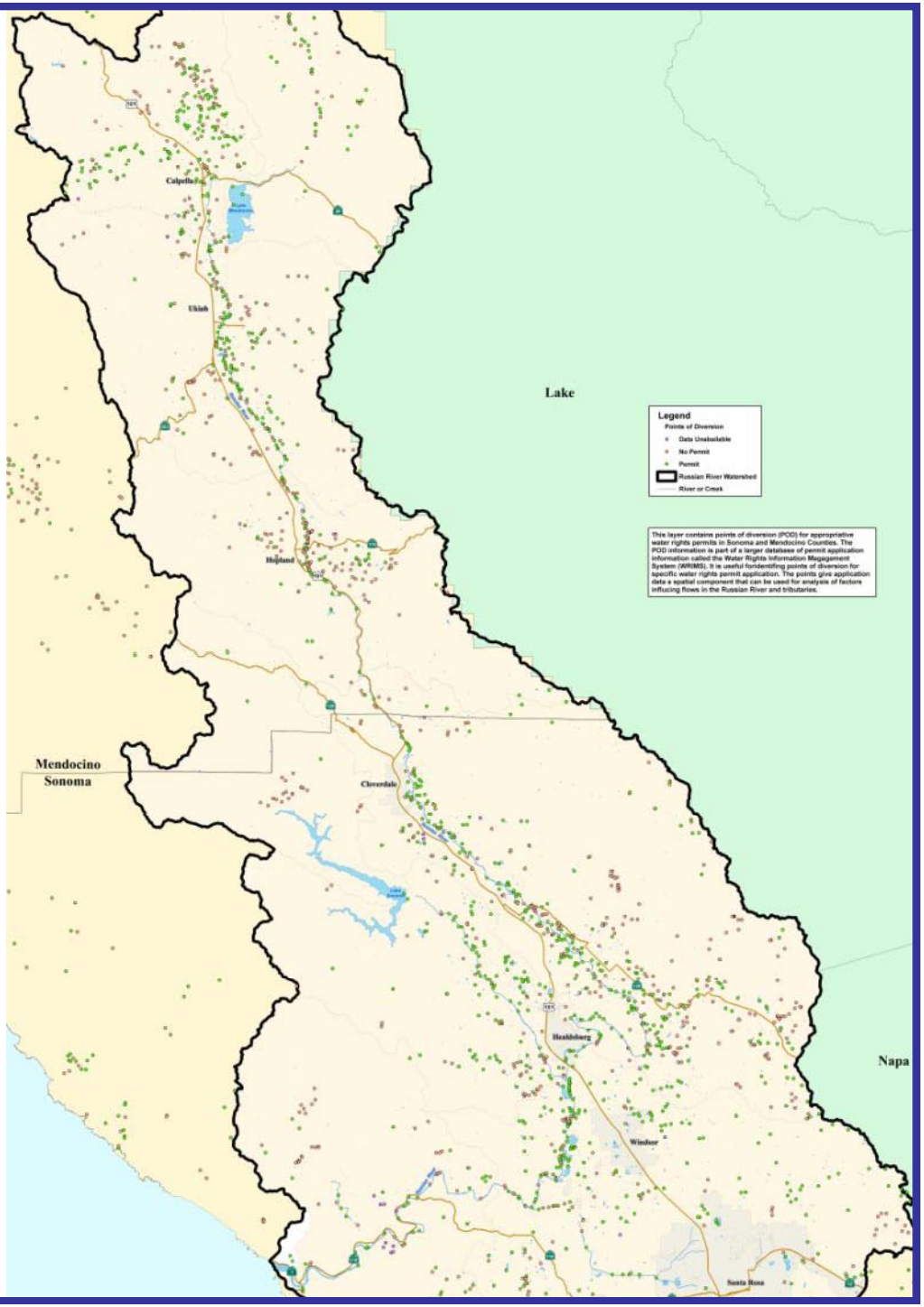
- Impaired water body



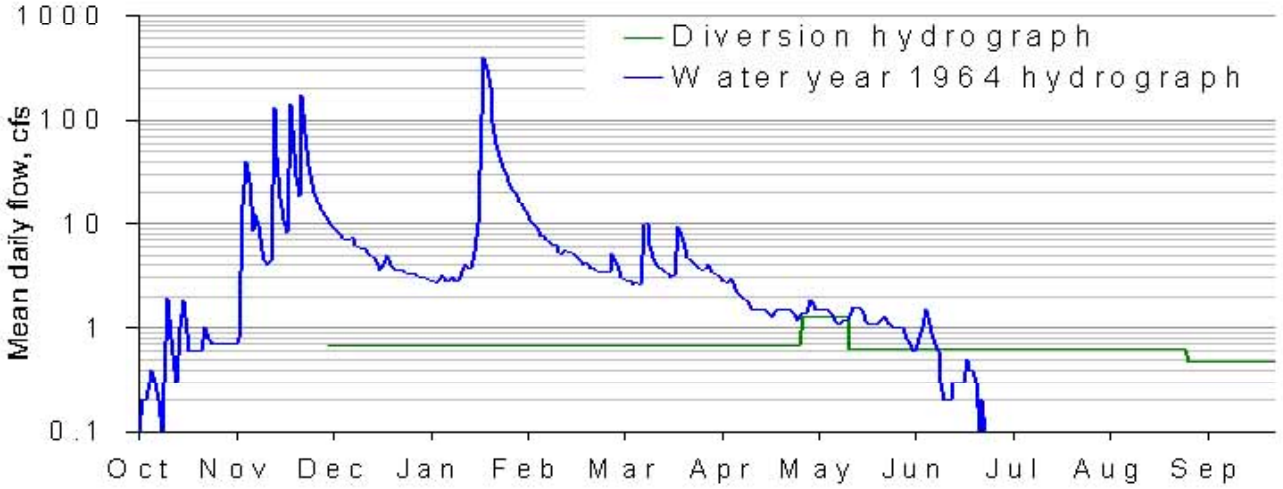

Annual average precipitation, inches
27.5 - 35.0"
35.1 - 45.0"
45.1 - 55.0"
55.1 - 65.0"
65.1 - 85.0"
MENDOCINO CO.
SONOMA CO.
NAPA CO.
Pacific Ocean
Cloverdale
Healdsburg
Windsor
Santa Rosa
253
175
101
128
116
1
12

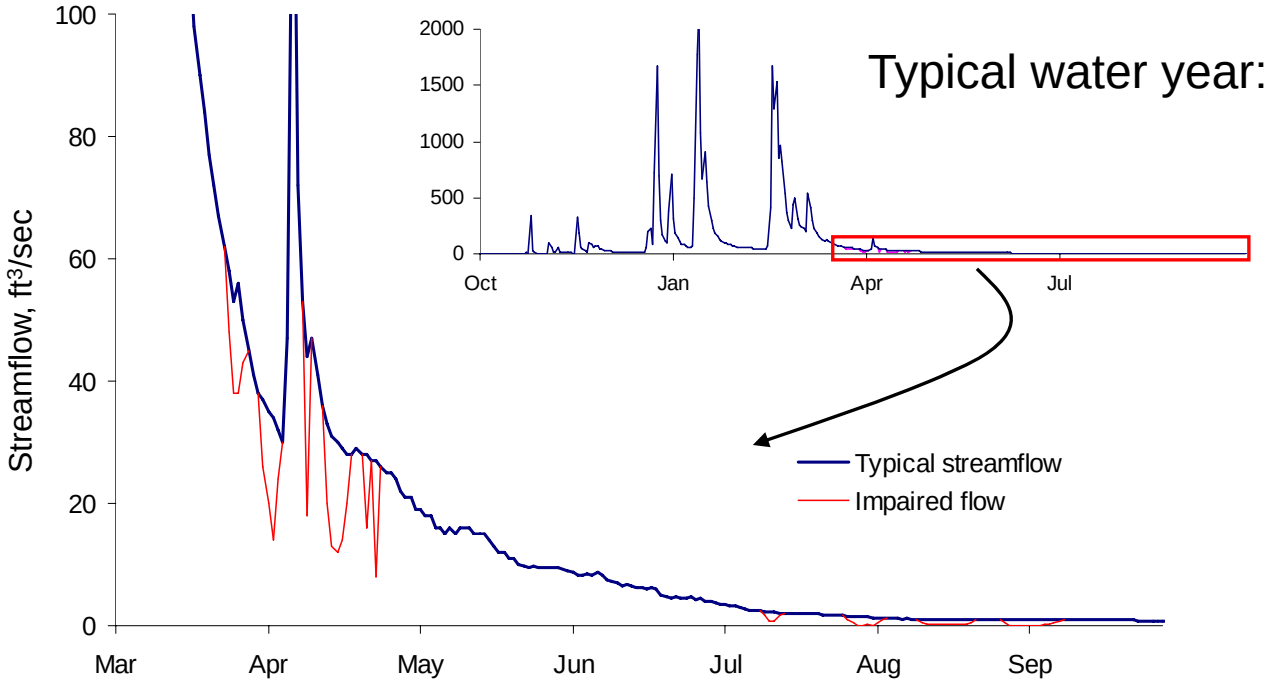

Average annual precipitation (in) by decade:
Healdsburg, CA versus Lafayette, IN
1960s
1970s
1980s
1990s
20
30
40
50
60
70
80
90

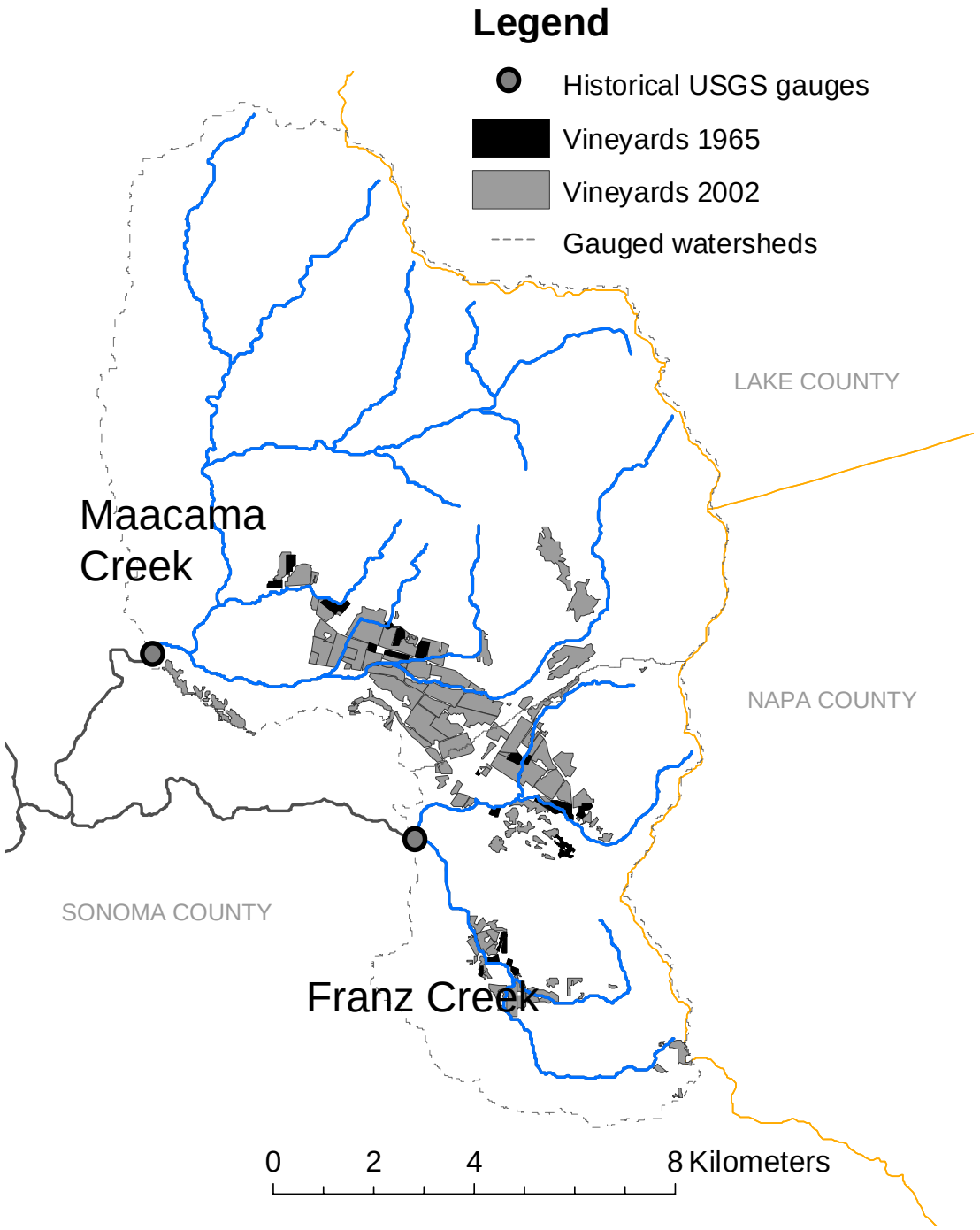
Points of diversion



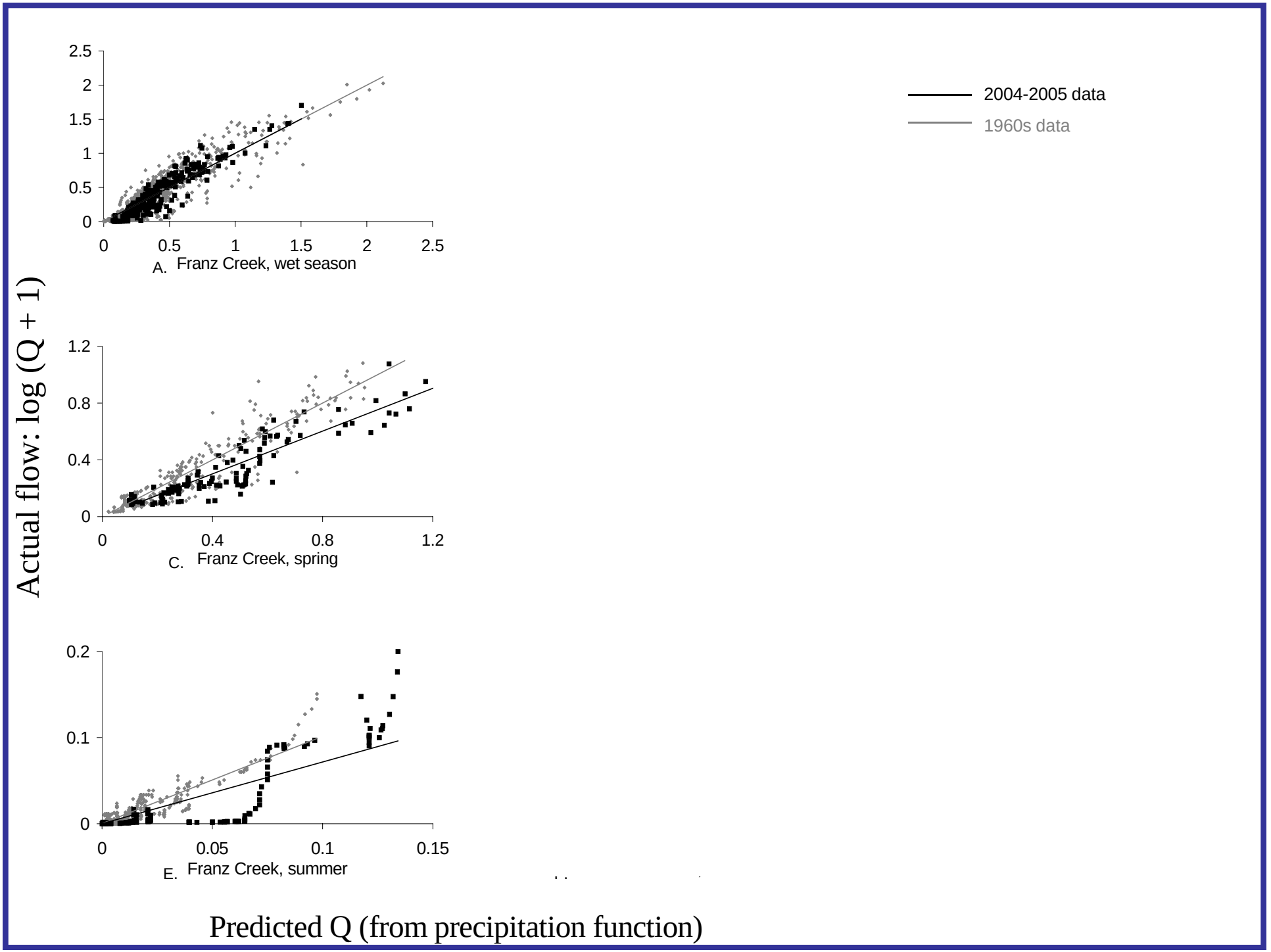
Water demand







Vineyard development in the Maacama and Franz Creek watersheds above historical USGS gauges, in 1965 and in 2002 (based on air photos). Vineyard coverage is almost 100 times greater today than it was in the 1960s.


2004-2005 data
1960s data
Actual flow: log (Q + 1)
Predicted Q (from precipitation function)
A. Franz Creek, wet season
C. Franz Creek, spring
E. Franz Creek, summer
2.5
2
1.5
1
0.5
0
1.2
0.8
0.4
0.2
0.1
0.05
0.15

Salmonid in the Russian River System

Coho, Chinook and Steelhead

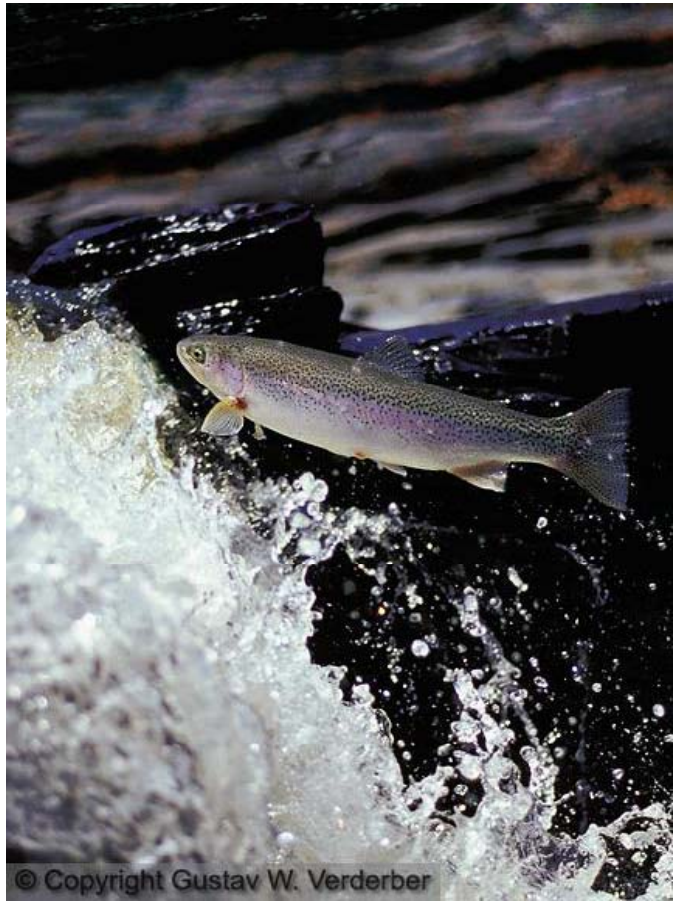
- Peak immigration period between Nov and April
- Use high winter flows to access upland tributaries

Population Trends

- Dramatic declines
- ESA listed

Threats

- Habitat loss and degradation
- Water impoundments and diversions



Collaborative conservation

- Ecosystem recovery is devolving from government resource agencies to public stake-holders
- place or community-based (e.g. Russian River Watershed Council)
- interest-based (address a specific policy or initiative) (e.g. Salmon Coalition)

“Beyond the Hundredth Meeting:
A Field Guide to Collaborative Conservation on the West’s Public Lands (Cestero 1999)

Collaborative conservation works best…

- if led by local participants rather than by government representatives
- takes place in an open and inclusive process that can accommodate a full range of perspectives
- includes government representatives
- better if participants do not try to represent too large of an interest group

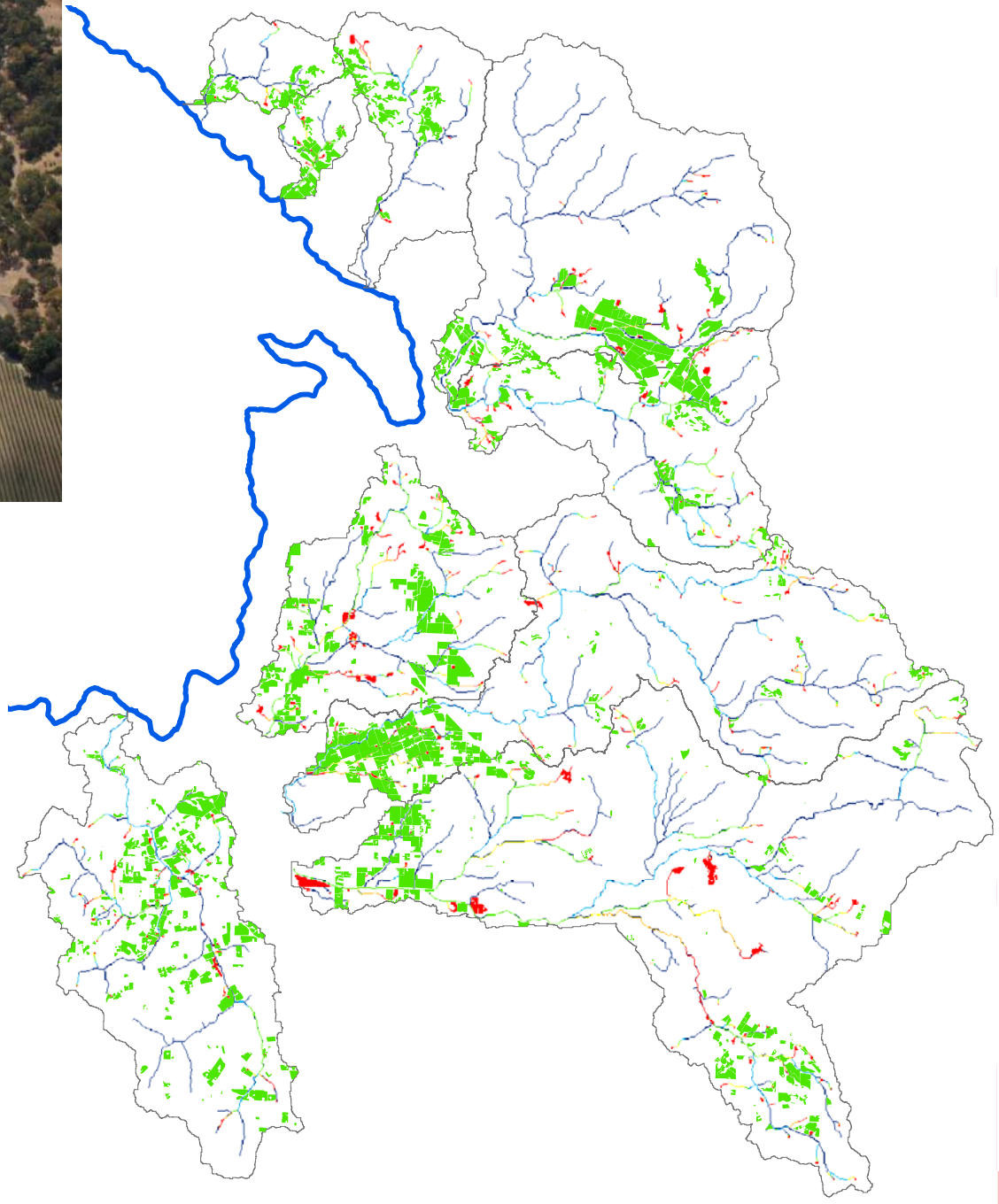
Lots of work for what?

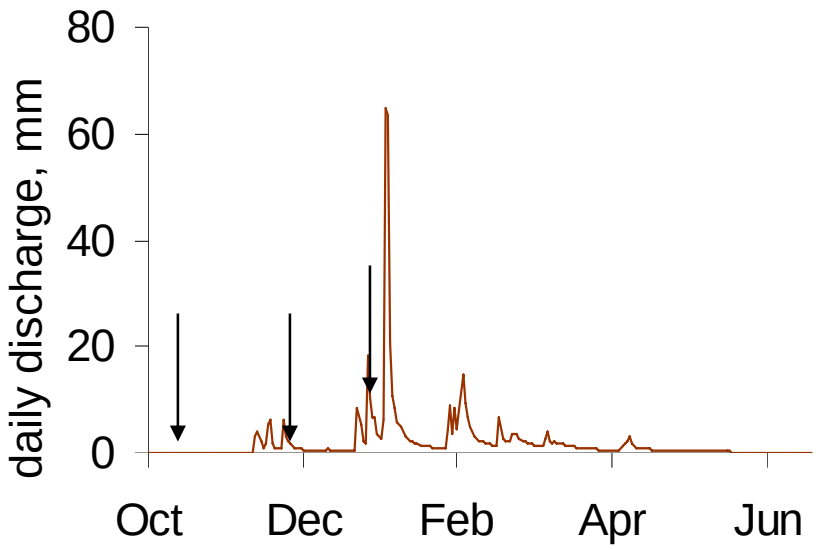
- Can lead to increased capacity of community members to respond to external and internal stresses that will inevitably arise.
  - This capacity can help avoid future problems from becoming crises.

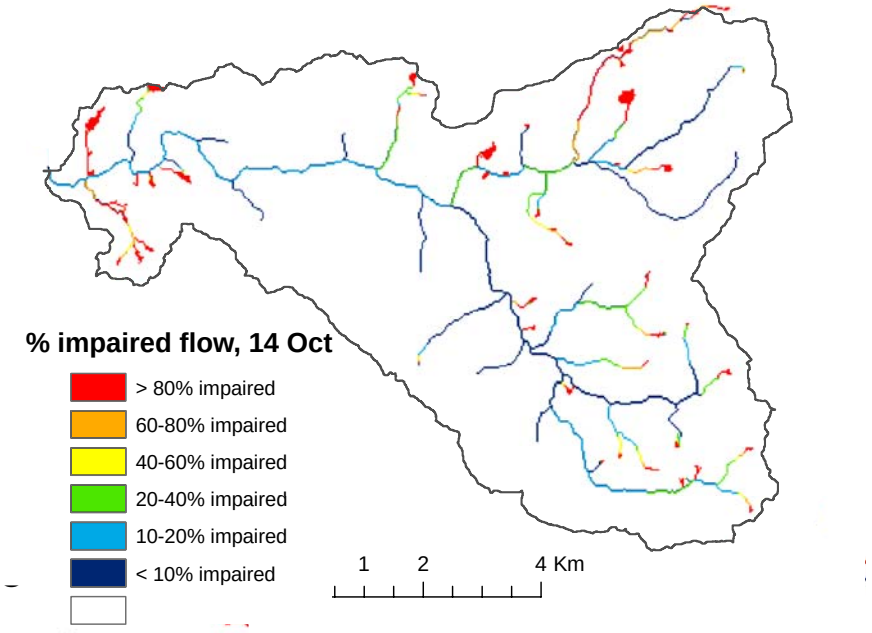
➢ outcomes generally remain untested

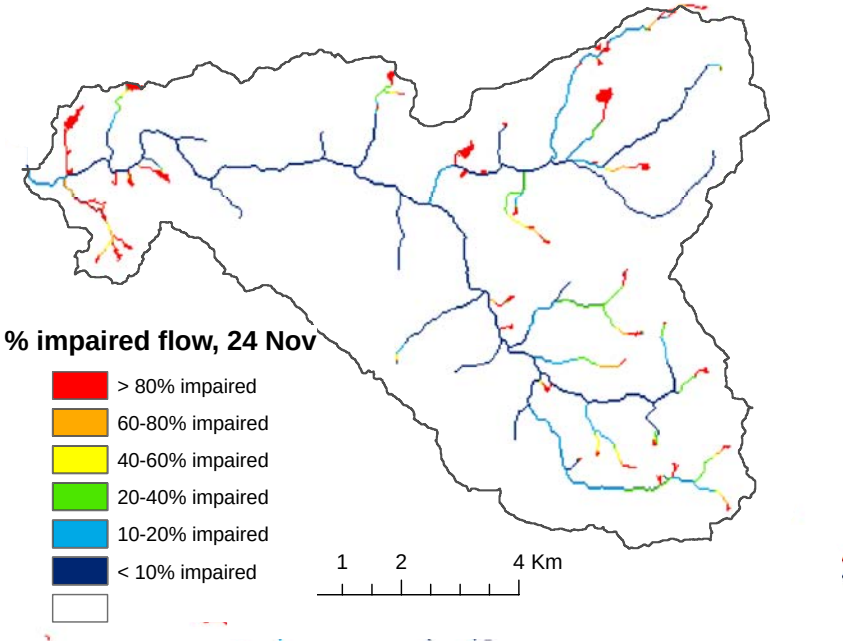
Decision-support tools

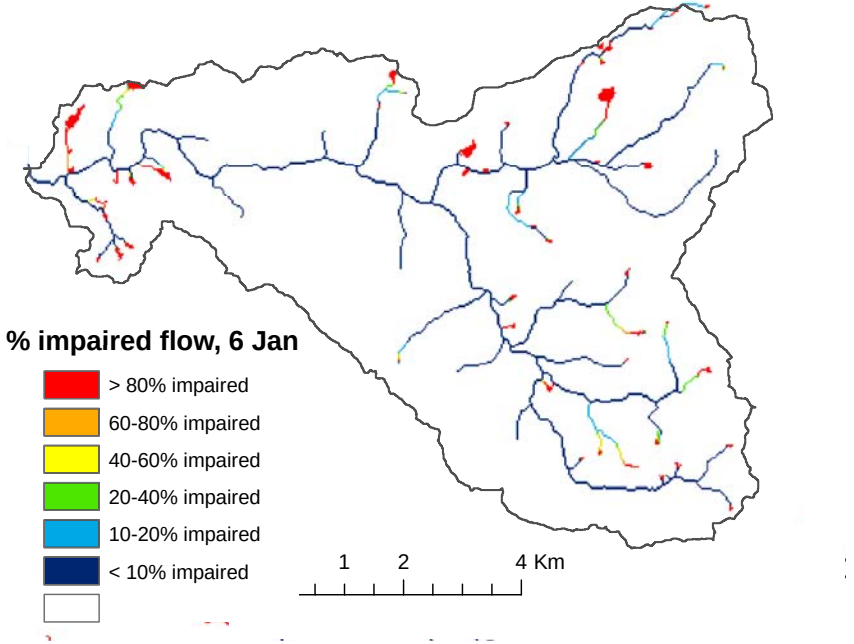
- Decision are difficult to make when uncertainty is high (Mediterranean-climate).
- Tools that provide collaborative conservation groups and decision-makers to view scenarios based on options for change are very useful.
- These modeling tools require increased understanding of causal relationships between human activities and watershed responses.



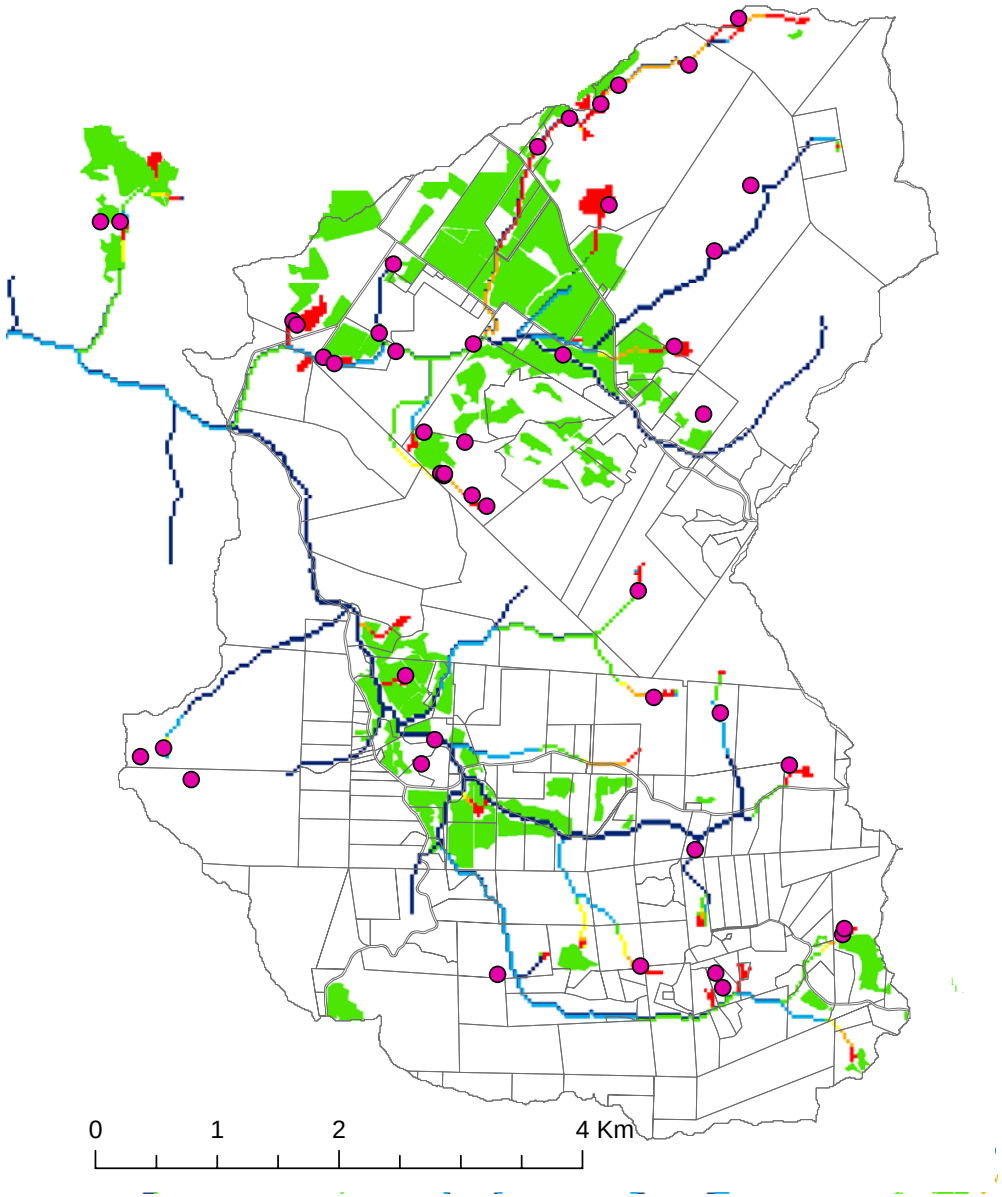

daily discharge, mm
80
60
40
20
0
Oct
Dec
Feb
Apr
Jun


% impaired flow, 14 Oct
> 80% impaired
60-80% impaired
40-60% impaired
20-40% impaired
10-20% impaired
< 10% impaired
1
2
4 Km


% impaired flow, 24 Nov
> 80% impaired
60-80% impaired
40-60% impaired
20-40% impaired
10-20% impaired
< 10% impaired
1
2
4 Km


% impaired flow, 6 Jan
> 80% impaired
60-80% impaired
40-60% impaired
20-40% impaired
10-20% impaired
< 10% impaired
1
2
4 Km

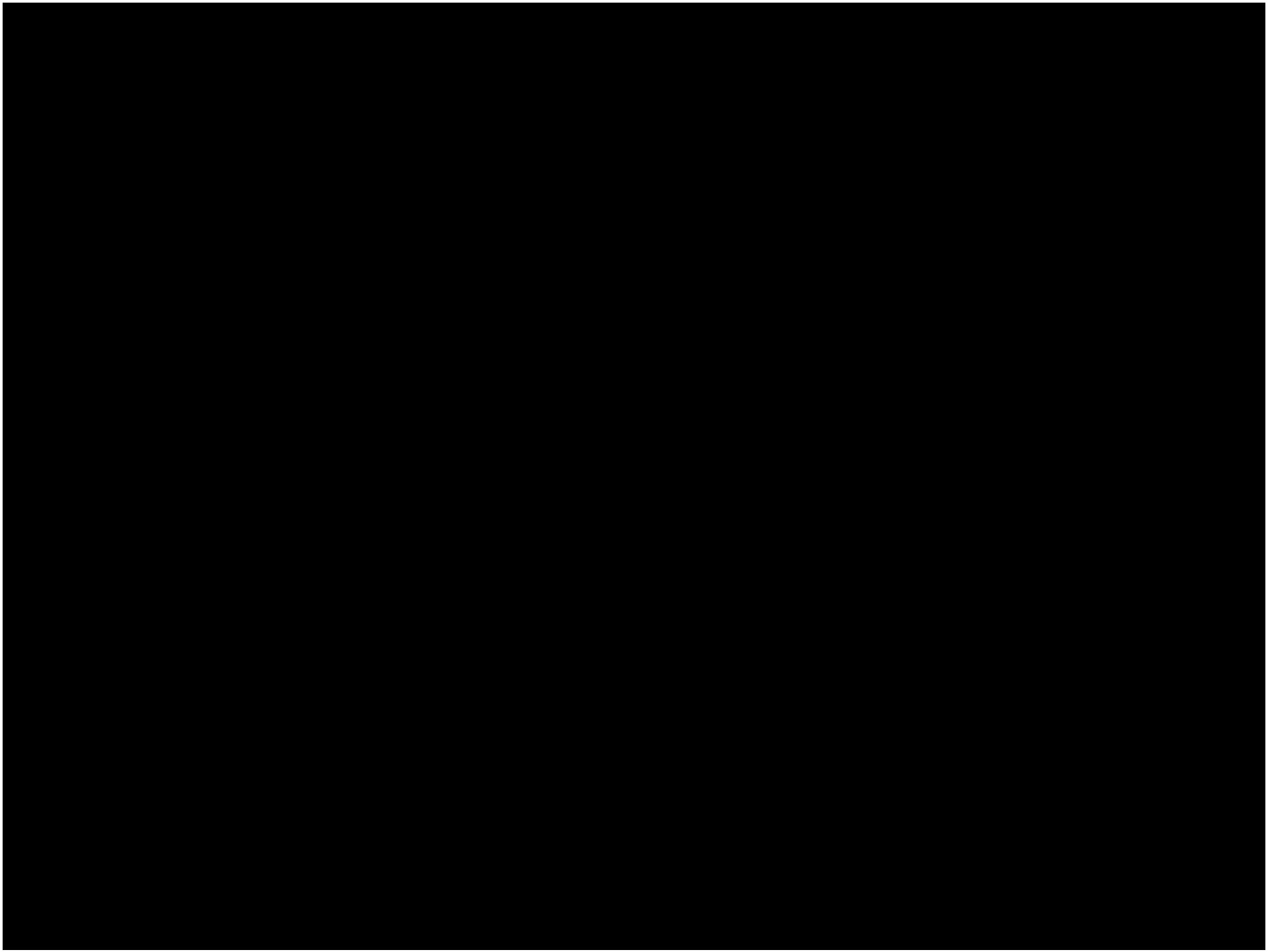
Calculating the deficit (storage – demand) for each land owner and sum this along streams.



Conclusions

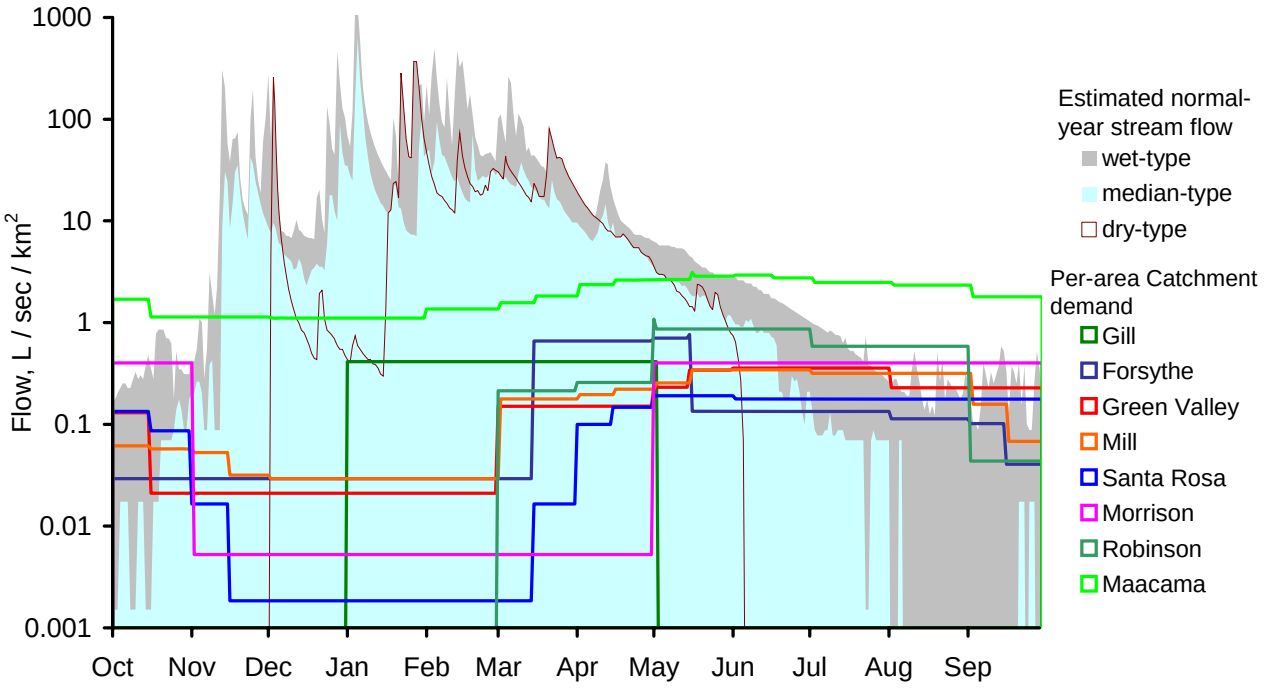
- Real solutions will only be found when restoration looks beyond the stream to address the entire watershed as a combination of social and ecological forces that interact to produce watershed conditions.
- Bridging the disconnect between restoration goals and practices will require public participation and better coordination among agencies involved in restoration to focus on larger, watershed-scale concerns.

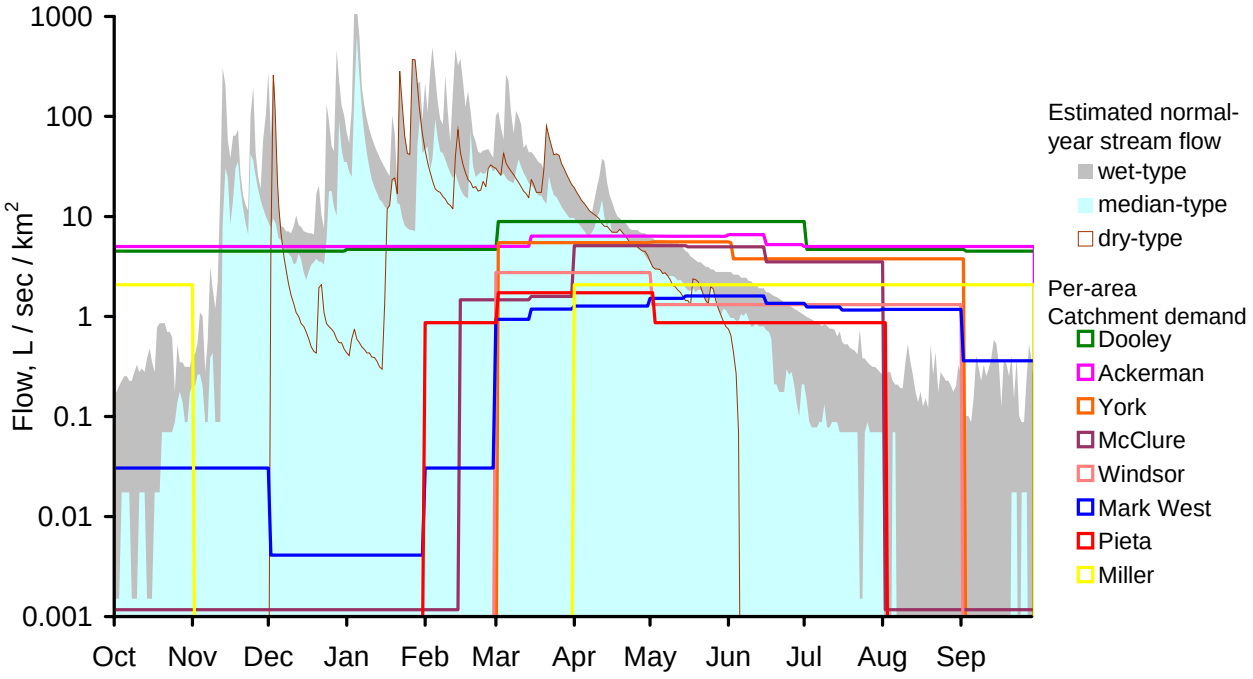
http://nature.berkeley.edu/ihrmp



For example

- Collaborative conservation planning efforts
- Changes in water and land management
- Land conservation (easements and agreements)
- Education (household chemicals, riparian management, pumping practices)


1000
100
10
1
0.1
0.01
0.001
Flow, L / sec / km2
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Estimated normal-year stream flow
wet-type
median-type
dry-type
Per-area Catchment demand
Gill
Forsythe
Green Valley
Mill
Santa Rosa
Morrison
Robinson
Maacama


1000
100
10
1
0.1
0.01
0.001
Flow, L / sec / km2
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Estimated normal-year stream flow
wet-type
median-type
dry-type
Per-area Catchment demand
Dooley
Ackerman
York
McClure
Windsor
Mark West
Pieta
Miller