

**Periodic Review of the 1995 Water
Quality Control Plan for the San
Francisco Bay/Sacramento-San
Joaquin Delta Estuary**

Comments of

The Bay Institute

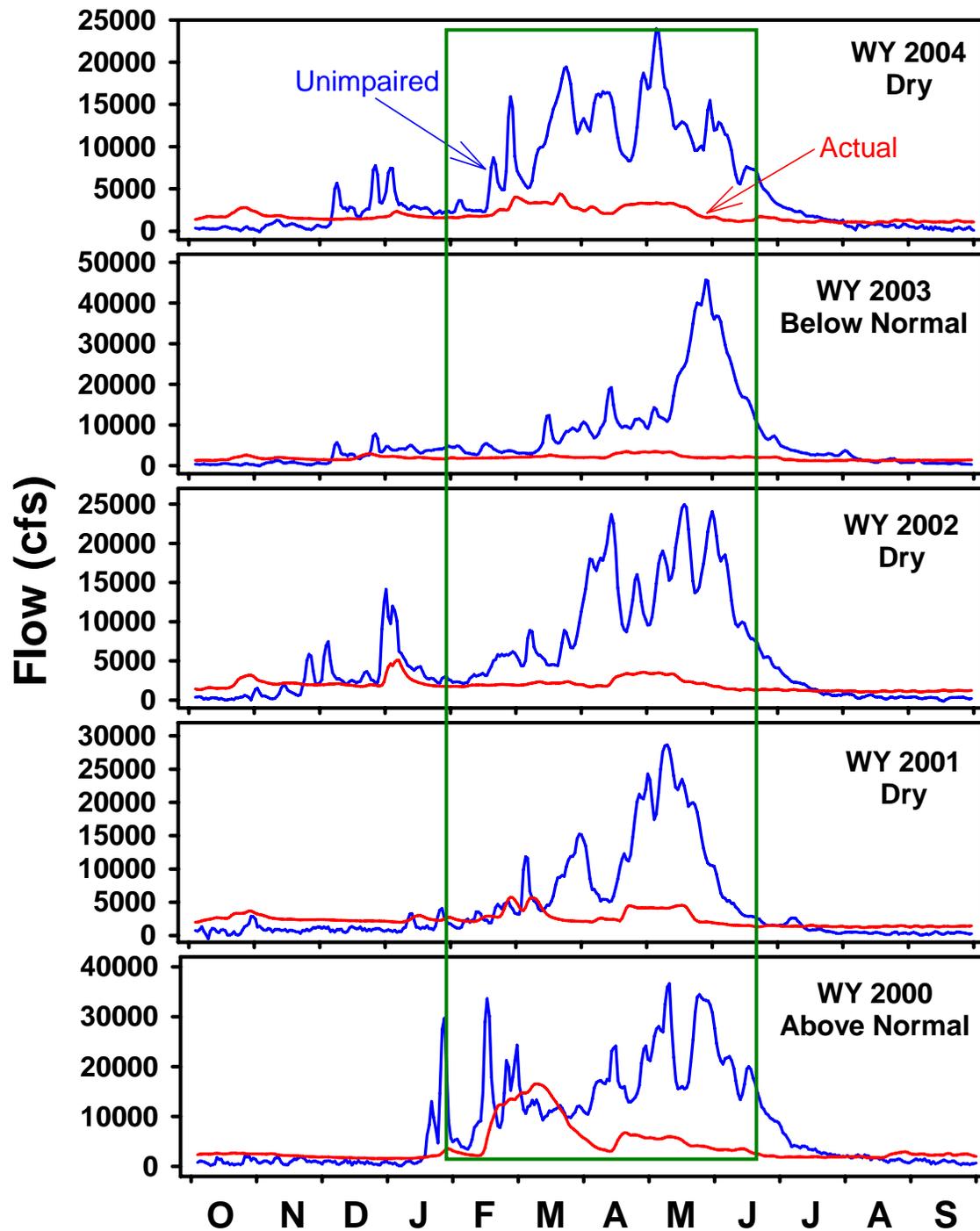
on

Vernalis Flow Objective

February-April 14 and May 16-June 30

March 21, 2005

**San Joaquin
River flows at
Vernalis are
subject to
greatest alteration
during
ecologically
critical February-
June period**



Actual Vernalis flows as % of unimpaired:

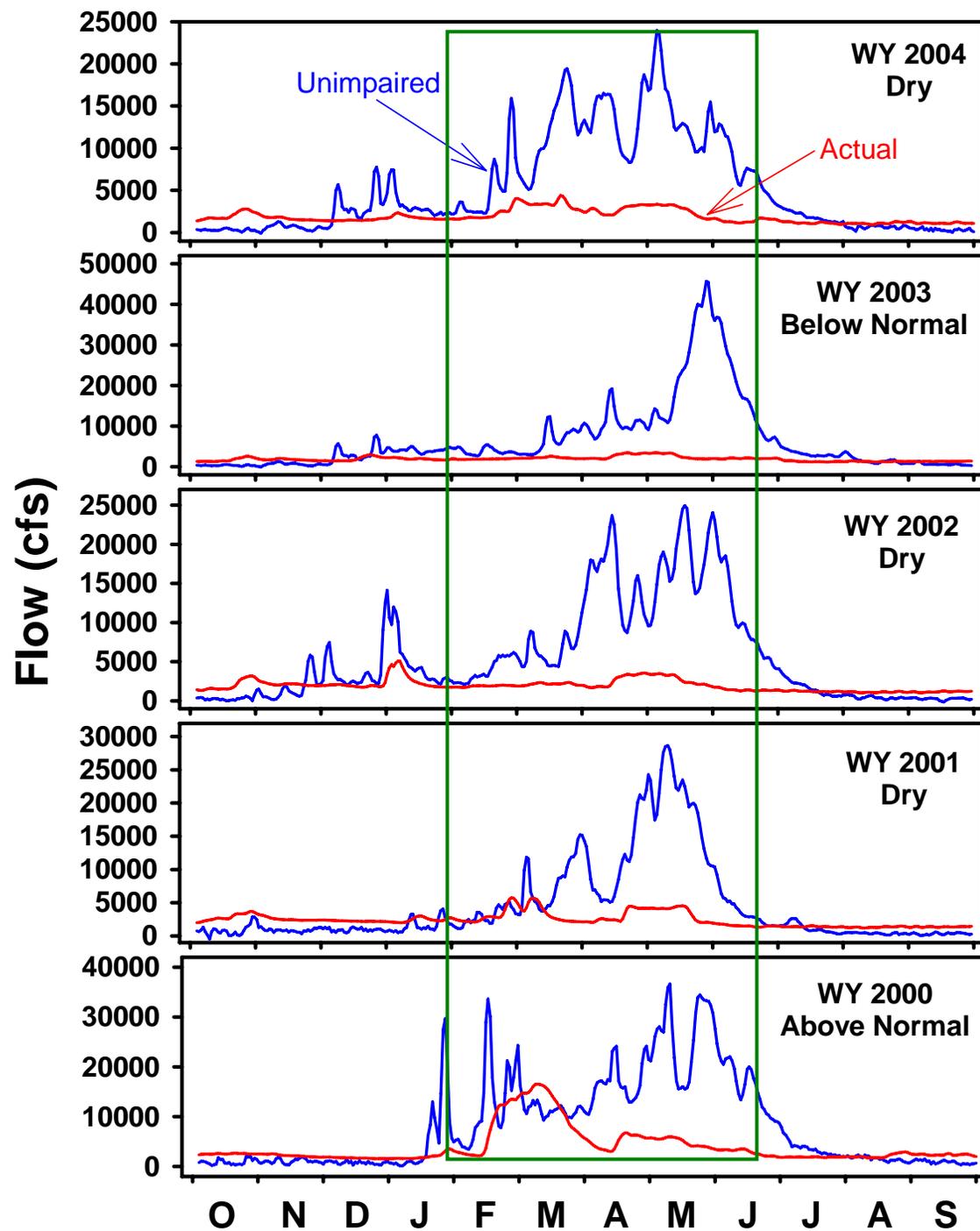
2004: 23.5%

2003: 17.7%

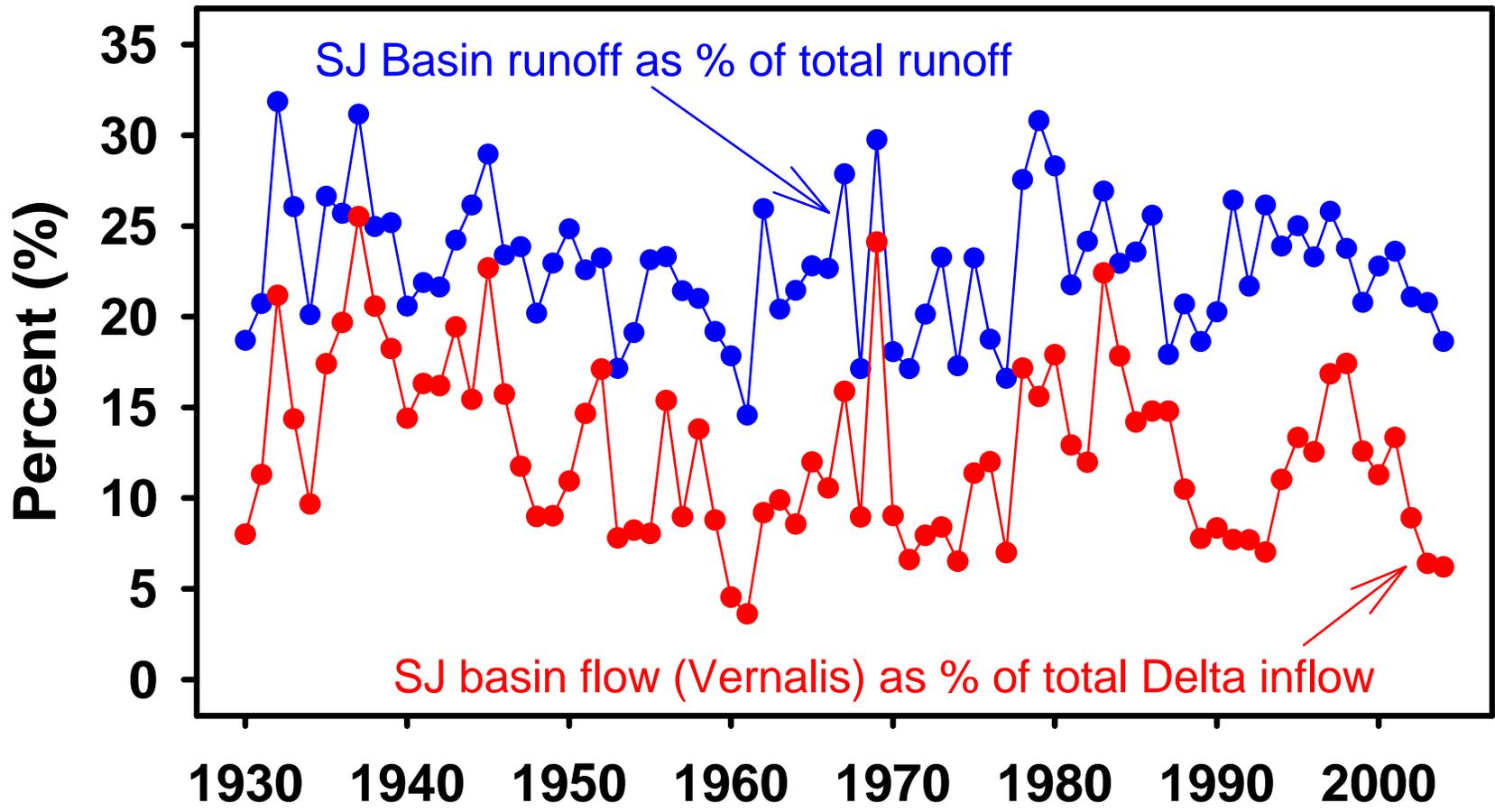
2002: 19.9%

2001: 31.2%

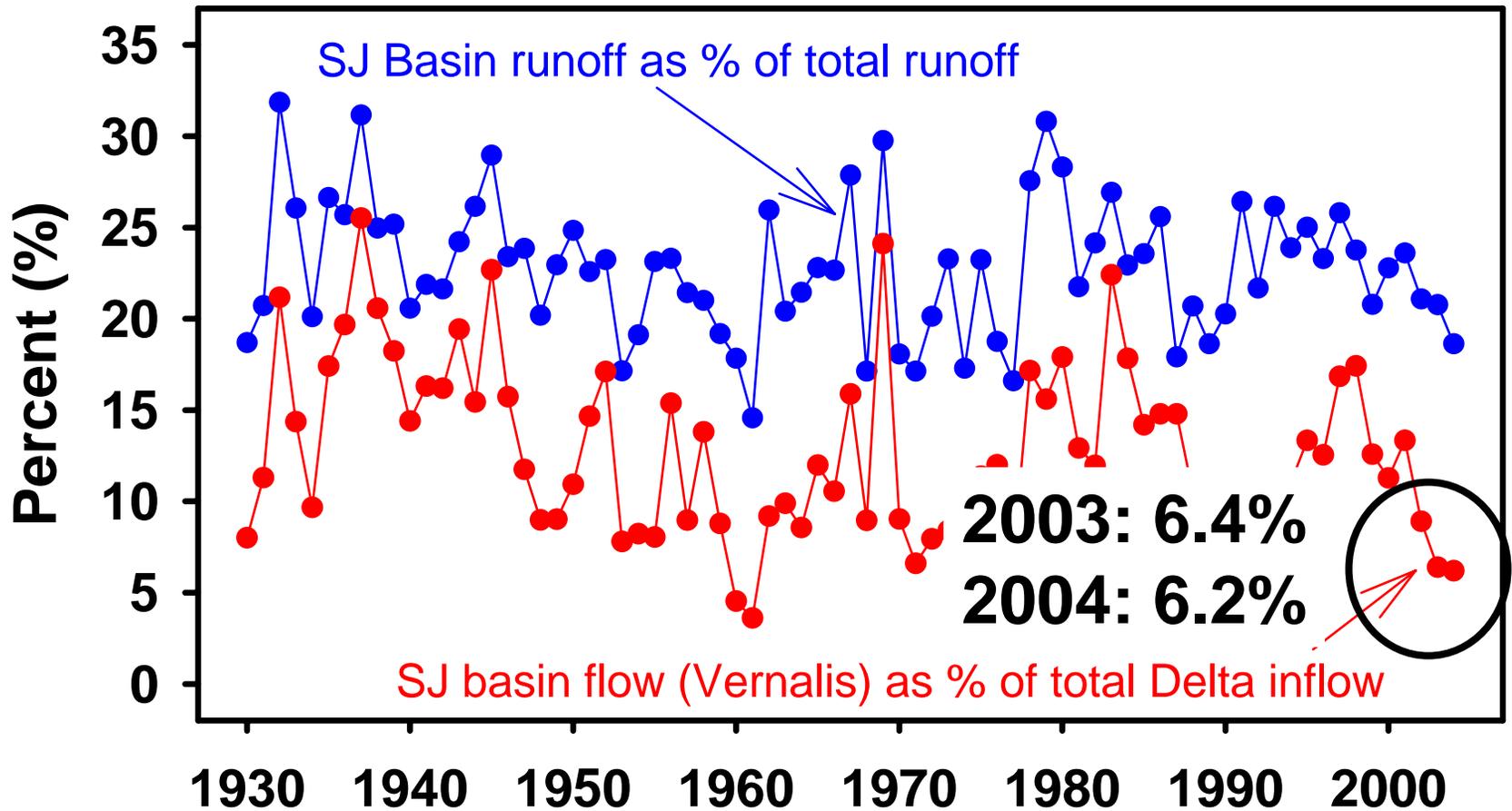
2000: 38.5%



Relative contribution of San Joaquin Basin to Delta inflow has declined

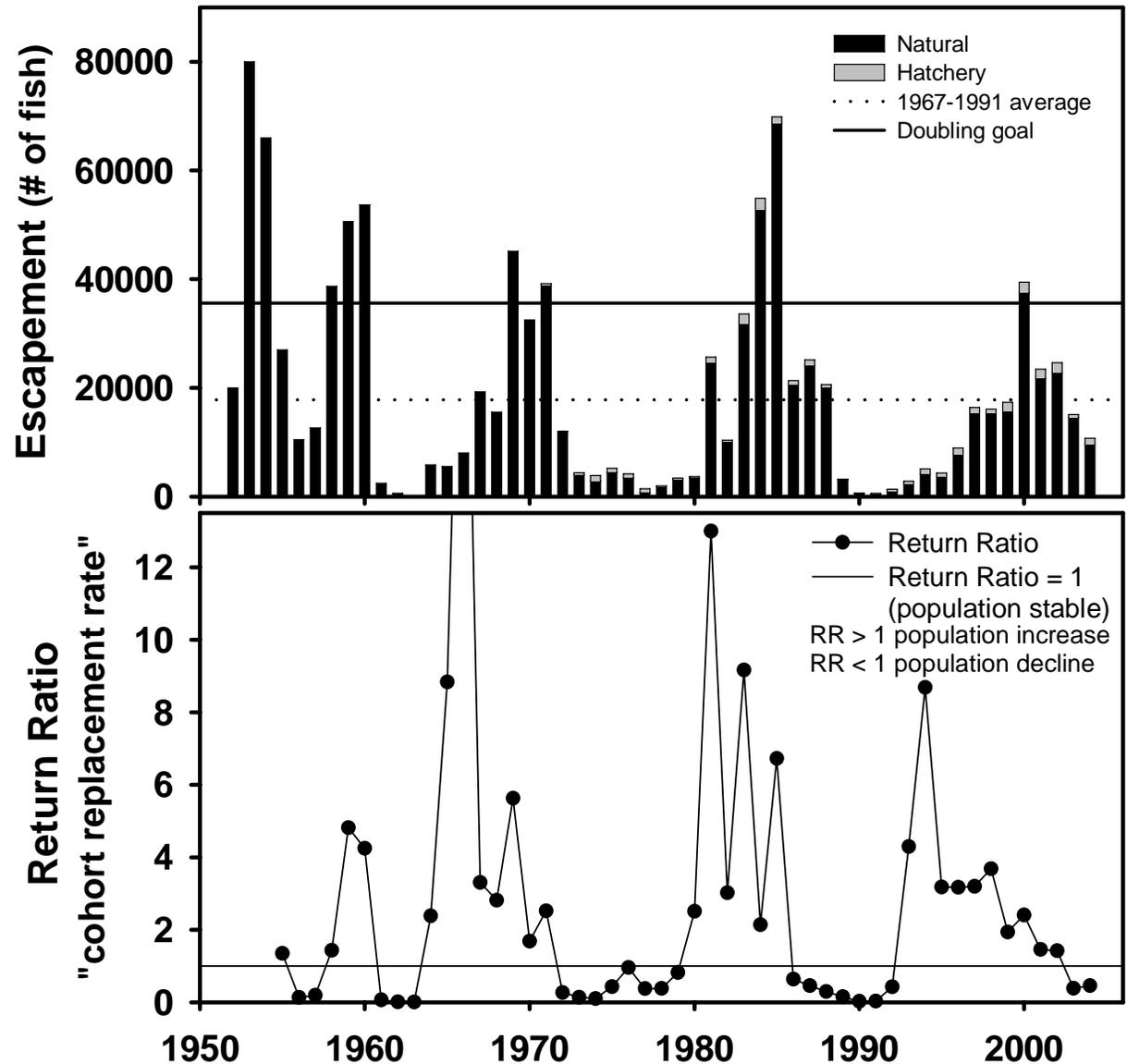


Relative contribution of San Joaquin Basin to Delta inflow has declined



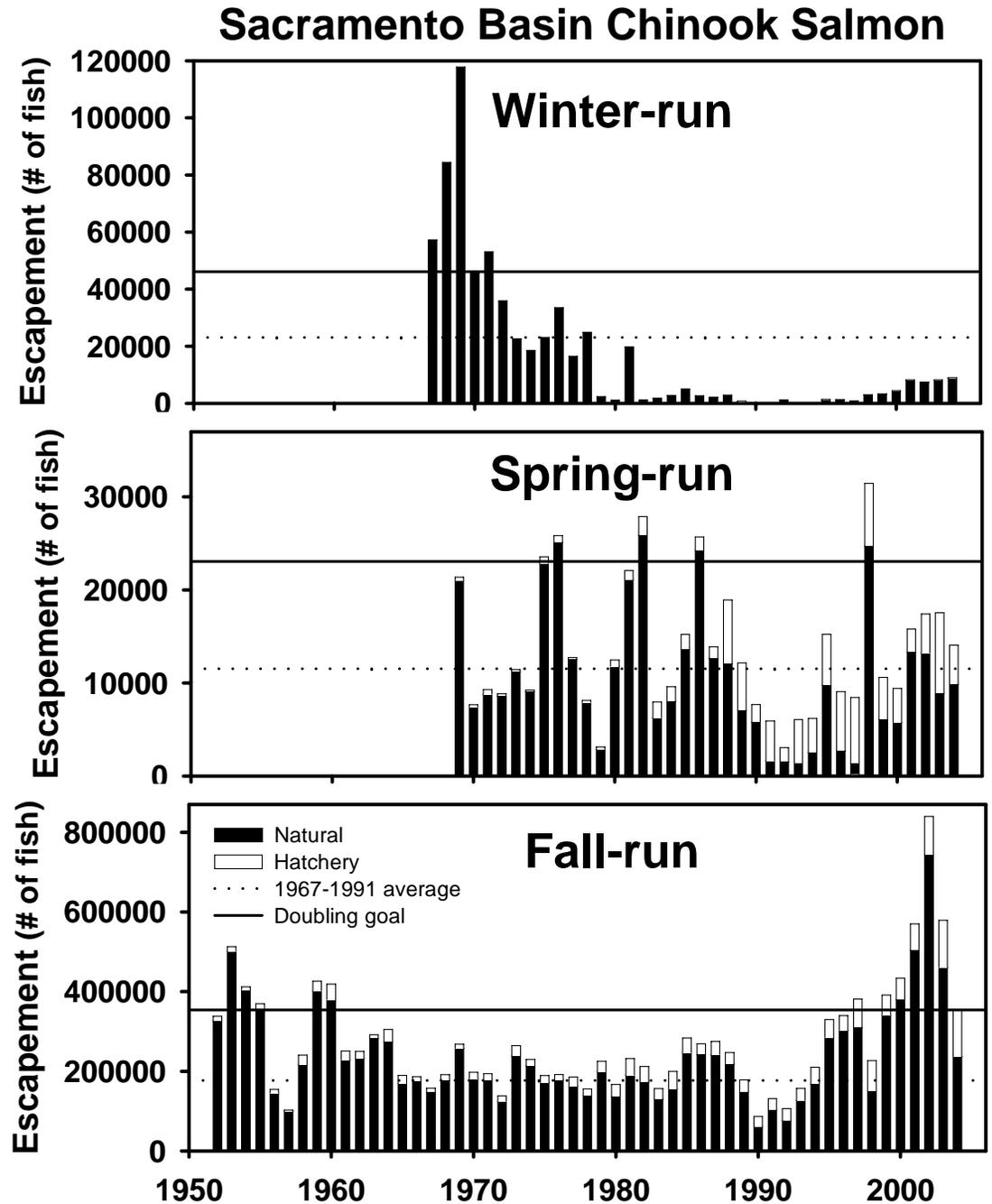
**San Joaquin
Basin Chinook
salmon
populations are
below the 1967-
1991 average
and declining**

San Joaquin Basin Fall-run Chinook salmon

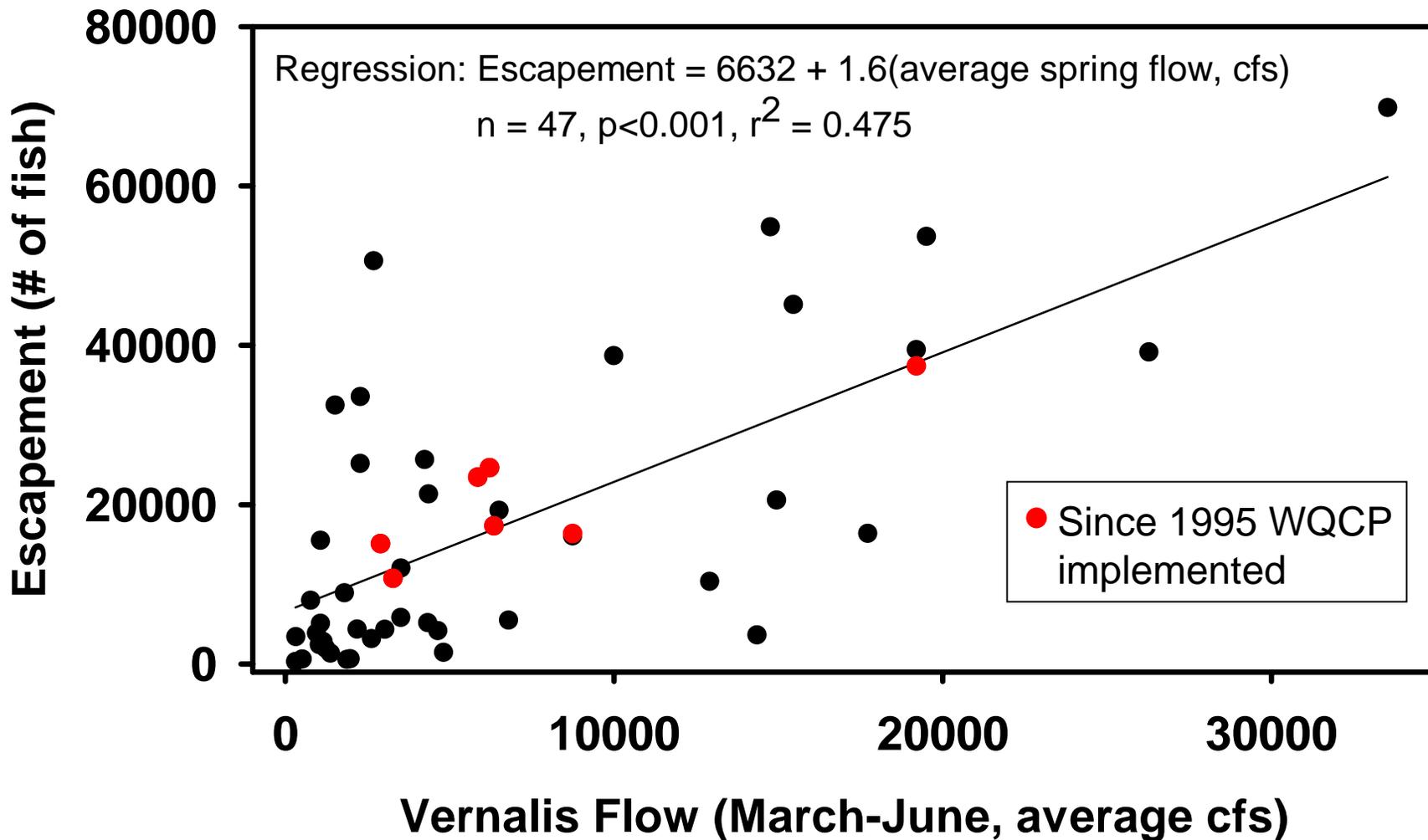


**In contrast,
Sacramento
Basin Chinook
salmon
populations
have stabilized
or increased**

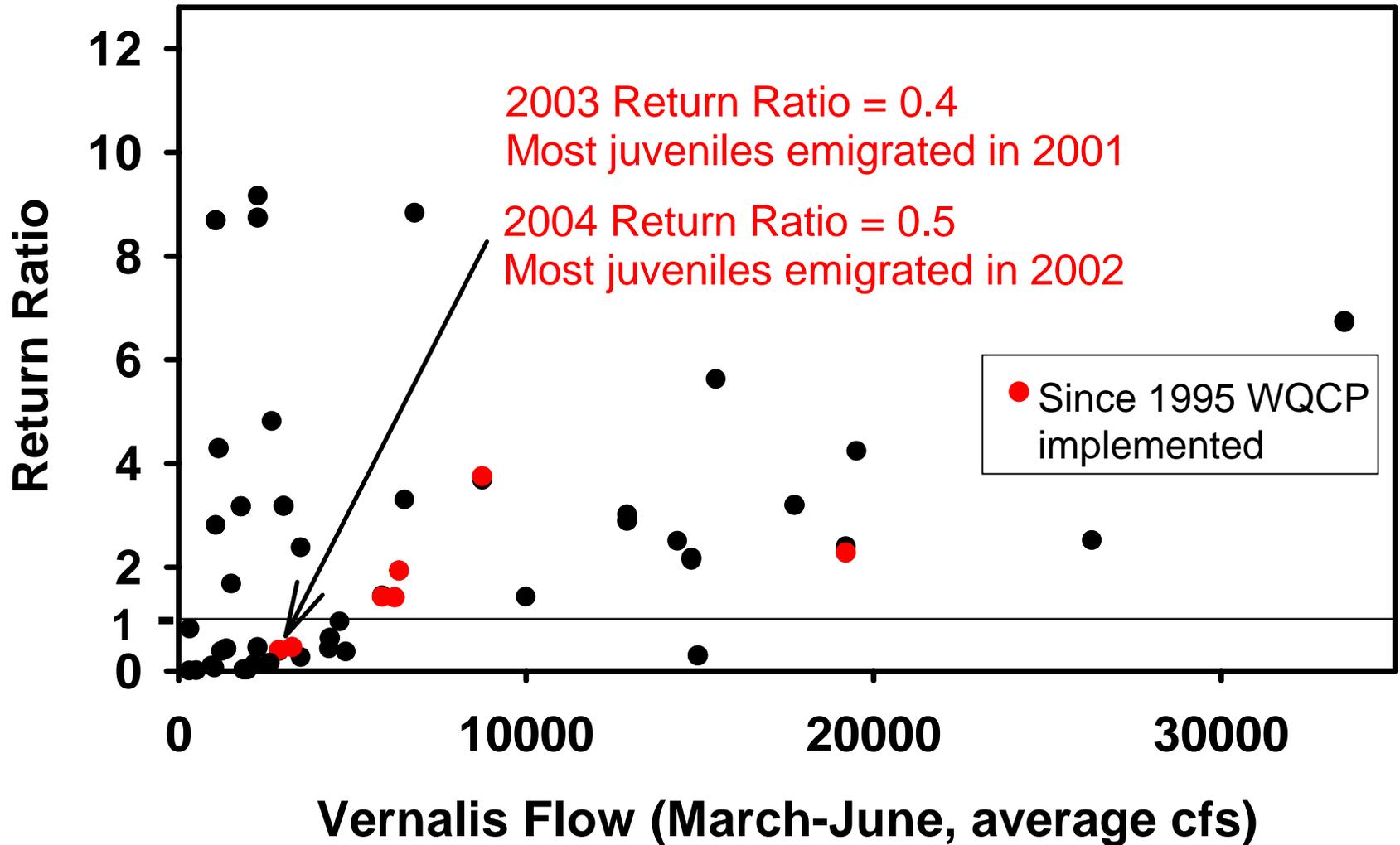
**Favorable ocean
conditions and
improvements in
freshwater flow
and habitat**



San Joaquin Basin Chinook salmon population size is directly related to Vernalis flows during the juvenile outmigration

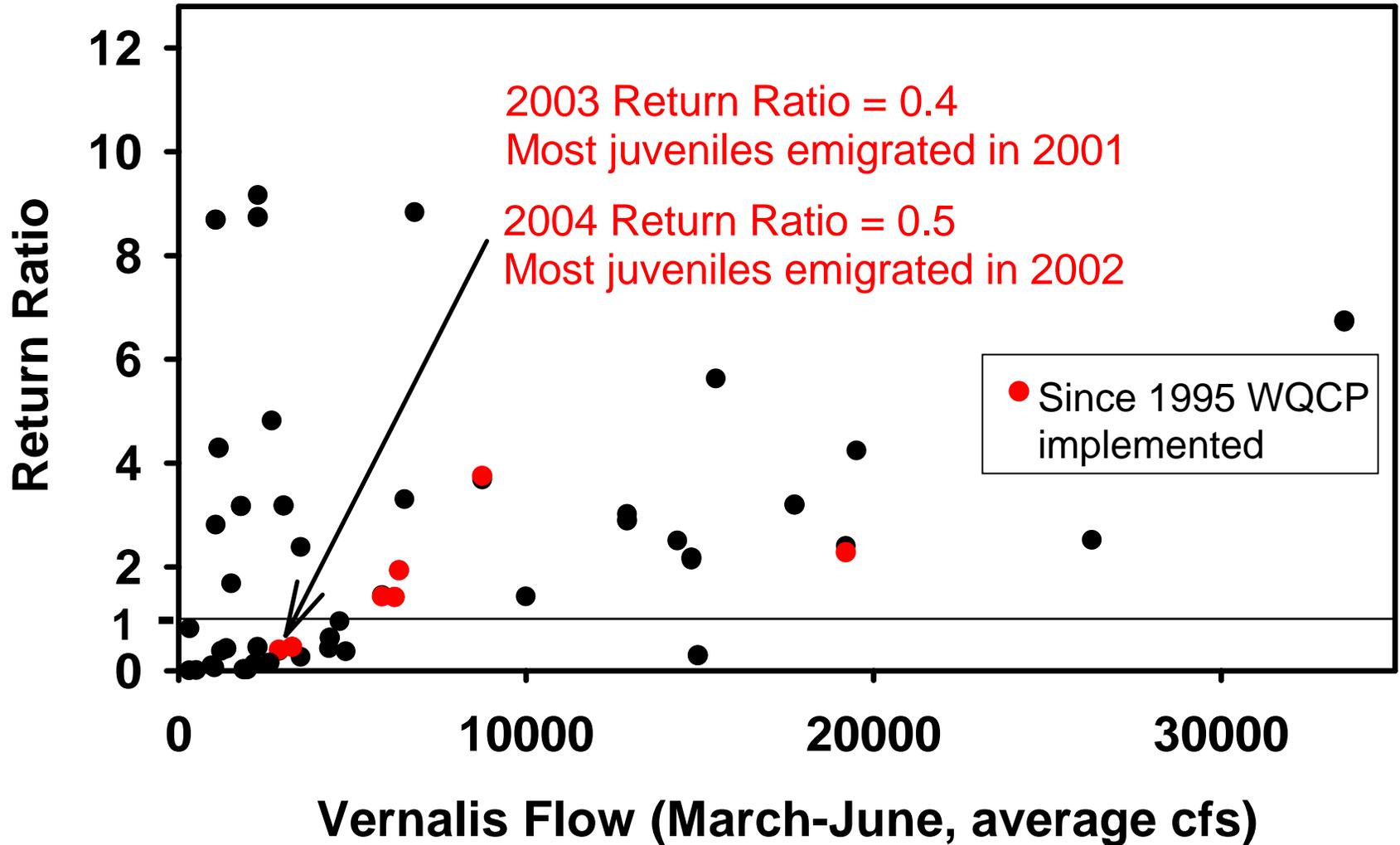


Population growth (return ratio) is also related to Vernalis flows during juvenile outmigration

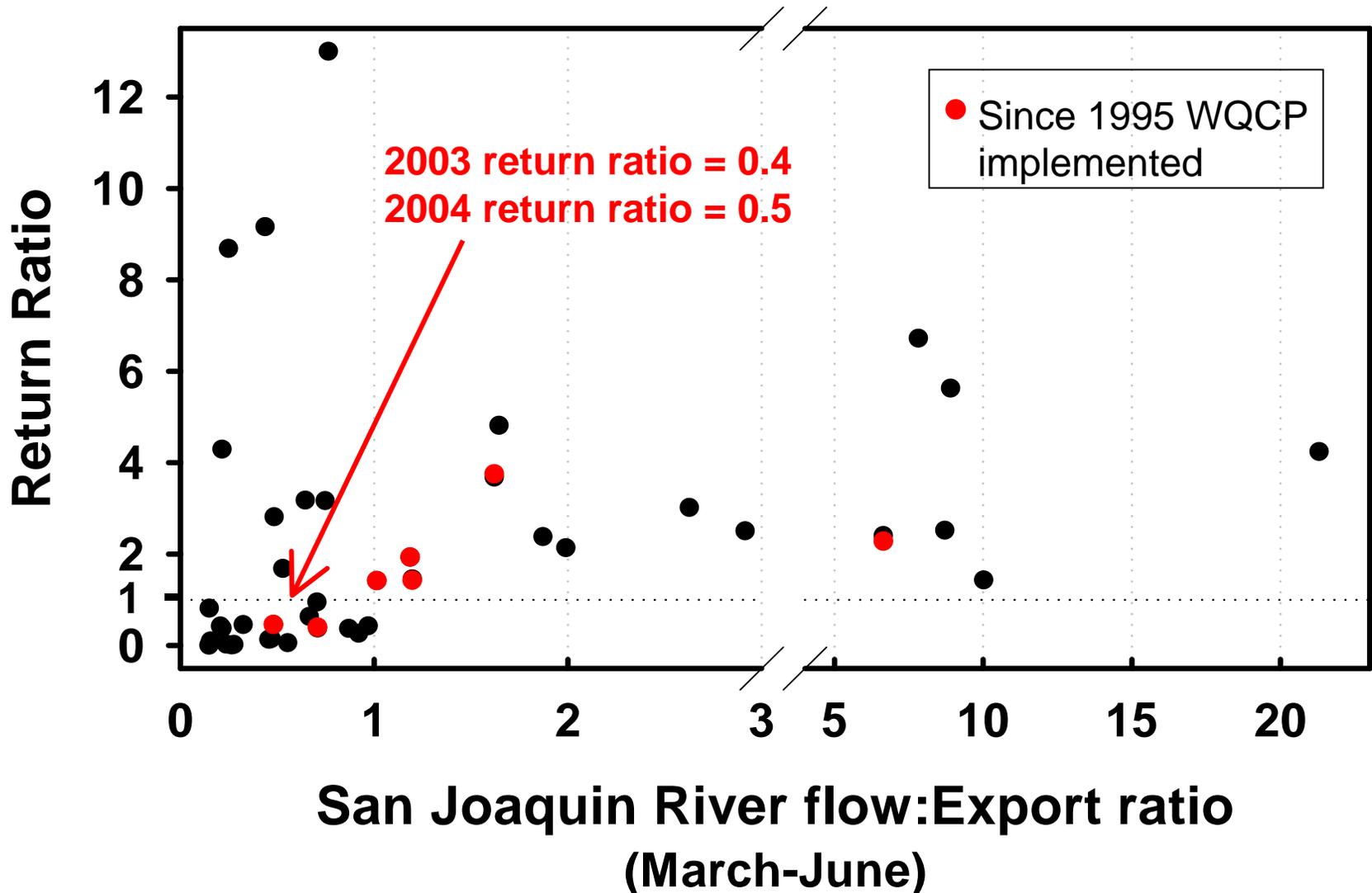


Population increase: 94% of years with flows >5000cfs

Population decrease: 60% of years with flows <5000 cfs

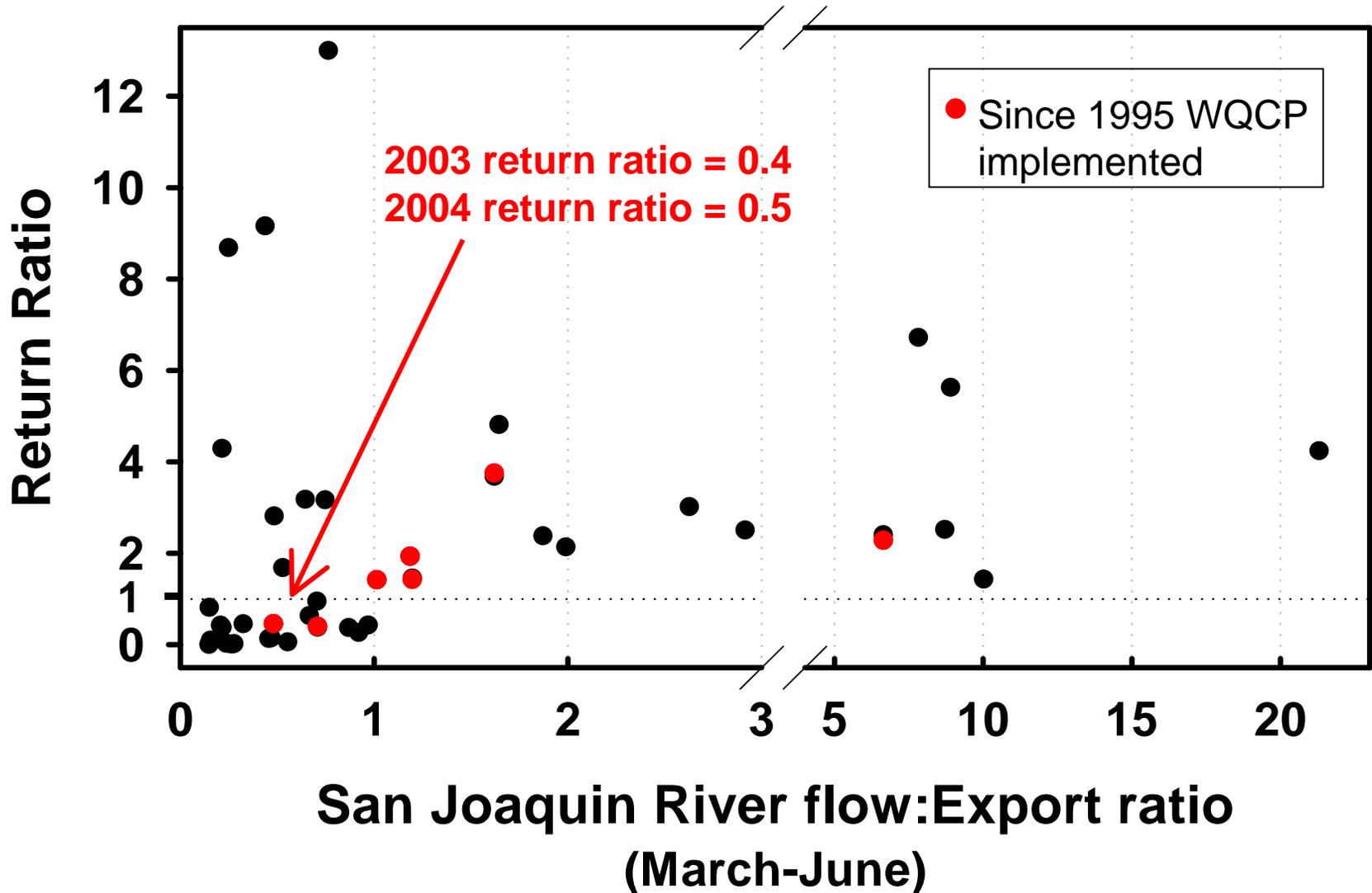


Ratio of Vernalis flows to Delta export rates also affects population growth (return ratio)



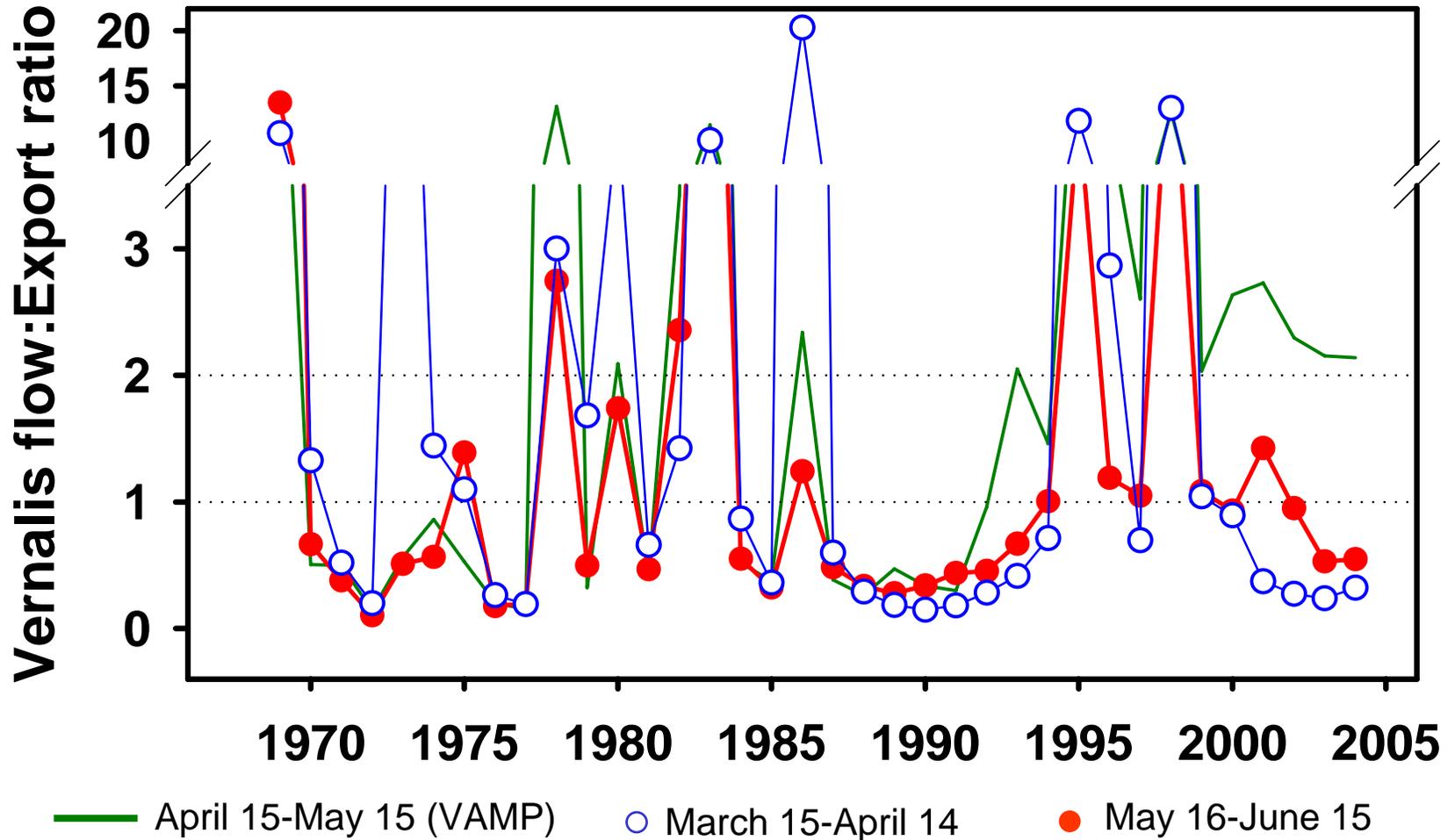
Population increase: 95% of years with flow:export >1.0

Population decrease: 67% of years with flow:export <1.0



Flow:export ratio conditions before and after the 31-day pulse flow are poor and worsening

Restricted migration period reduces genetic and phenotypic diversity



**Inadequate Vernalis flows degrade
estuarine habitat in the south and central Delta**

**Prevalence of non-native species is a well-
documented indicator of degraded habitat**

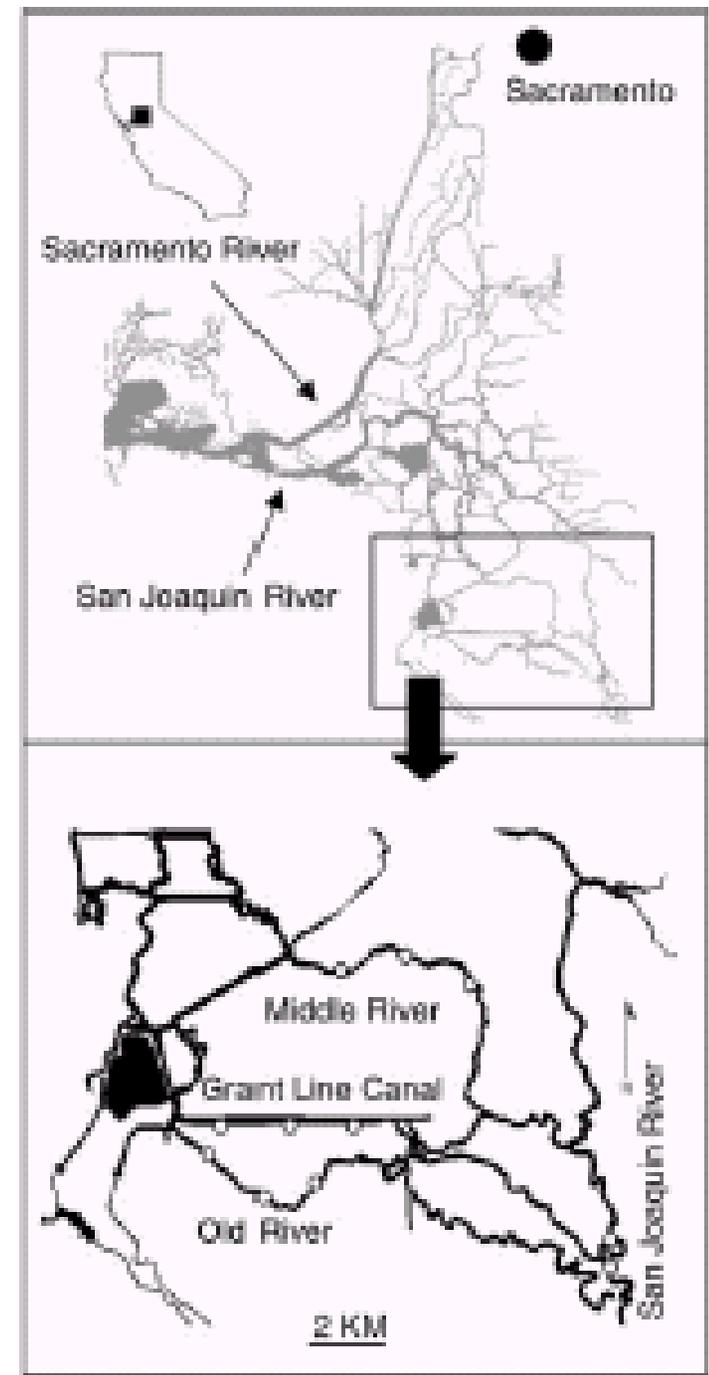
**CDFG Fall
Midwater
Trawl
Survey**

Region	% of Fishes That Are Native Species 1967-2001 mean (± 1 standard error)
South Delta	0.3% (± 0.4)
Central Delta	10% (± 2)
North Delta	29% (± 3)
West Delta	49% (± 4)

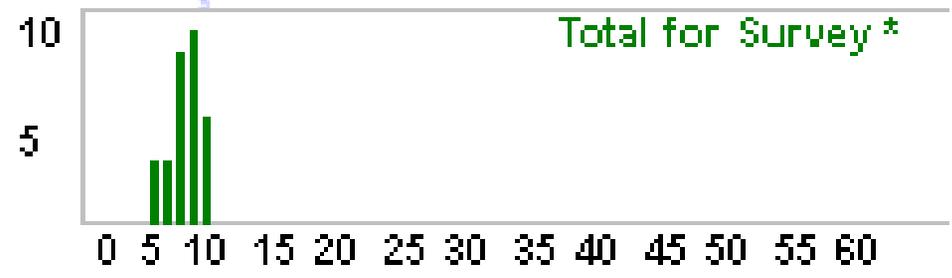
Freyer and Healey (2003)

**Sampled: March-November
1992-1999**

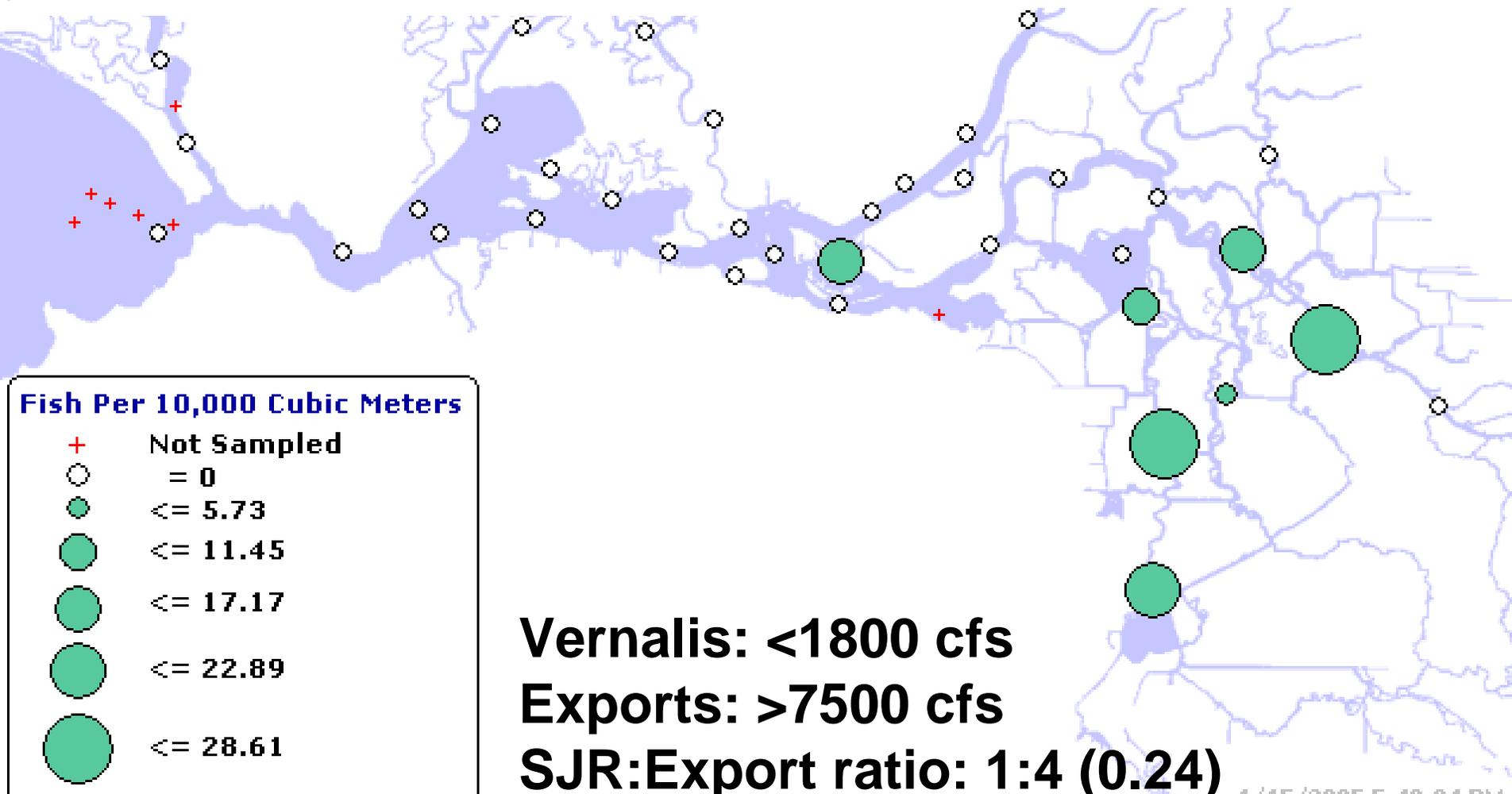
- **Only 24% of species and 0.5% of fish in south Delta were native species**
- **Fish species composition in south Delta related to flow**
- **Native fishes associated with higher flows**



Delta Smelt 2002
SURVEY 2 (4/2/2002 - 4/7/2002)



Freshwater inflows to south Delta are important to many estuarine fishes

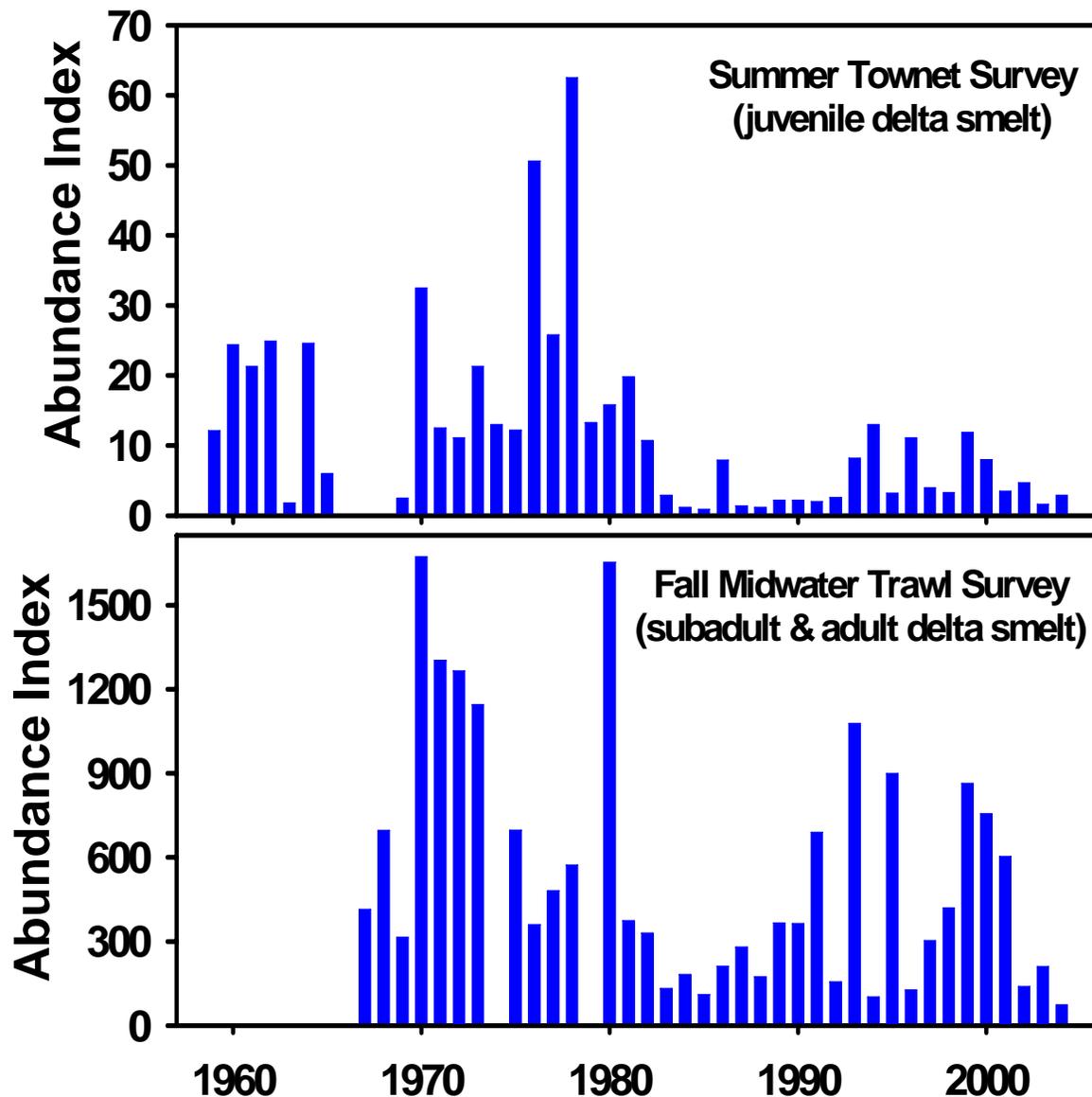


Fish Per 10,000 Cubic Meters

- + Not Sampled
- = 0
- ≤ 5.73
- ≤ 11.45
- ≤ 17.17
- ≤ 22.89
- ≤ 28.61

Vernalis: <1800 cfs
Exports: >7500 cfs
SJR:Export ratio: 1:4 (0.24)

**Delta smelt
population
has declined
to record low
levels**



Recommendation

SWRCB should revise the Bay-Delta Plan to adopt more protective Vernalis flow objectives for the February-April 14 and May 16-June period.

Monthly Vernalis objectives should be based on criteria relating to hydrology, San Joaquin Basin contributions to Delta inflow, and fish and estuarine habitat needs.

Vernalis flows should be:

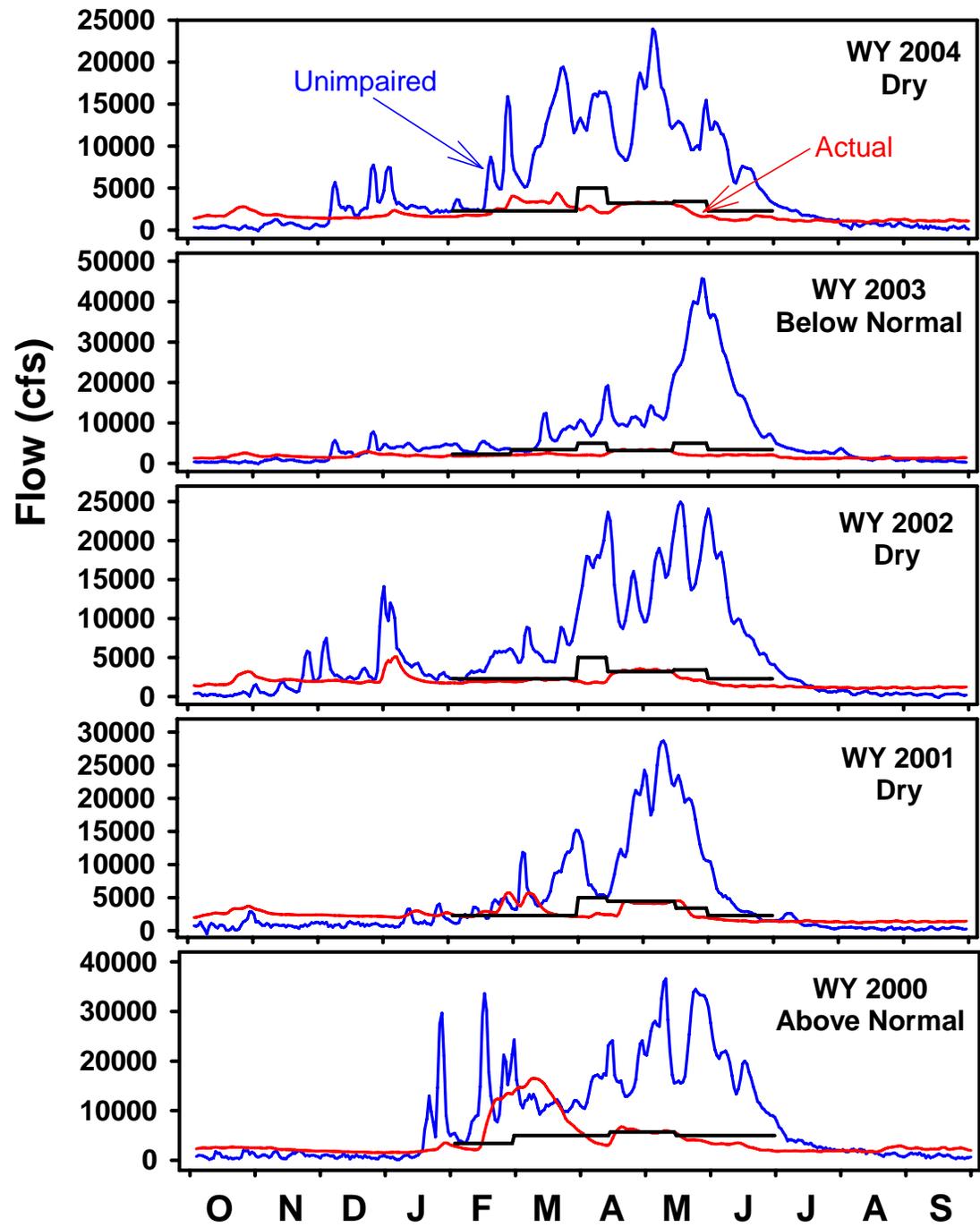
- 1. Based on annual and monthly hydrology**
- 2. Based on relative contribution of San Joaquin Basin to Delta inflow ($\geq 20\%$ of total minimum require Delta inflow in BN, D and C years; $\geq 10\%$ of actual Delta inflow in W, AN, and BN years)**
- 3. ≥ 5000 cfs for three consecutive months in W and AN years, ≥ 5000 cfs for two consecutive months in BN years**
- 4. ≥ 1500 cfs in all months, all years**
- 5. ≤ 7000 cfs to allow installation of the Head of Old River Barrier**
- 6. Linked to export rates to achieve March-June Vernalis:export ratio ≥ 1.0**

Proposed Vernalis flows (monthly average)

February-April 14, May 16-June

Month	Water Year Type				
	W	AN	BN	D	C
Feb	3420	3420	2280	2280	1500
March	5000	5000	3420	2280	1500
April 1-14	7000	5000	5000	5000	2000
April 15- May 15	31-day flow objective as determined by VAMP experimental design				
May 16-31	7000	5000	5000	3420	2000
June	5000	5000	3420	2280	1500

Proposed Vernalis flows for Water Years 2000-2004



2004: 108 TAF
27% (v 24%)
of unimpaired

2003: 357 TAF
27% (v 18%)

2002: 204 TAF
26% (v 20%)

2001: 54 TAF
33% (v 31%)

2000: 0 TAF
38% (v 38%)

