Ecosphere

Early evidence for establishment of a Chinook salmon population in a restored watershed

Appendix S1

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Table S1. Instrument operating conditions of the Nu Plasma HR (Nu032) and New Wave Research UP213 Nd:YAG 213 nm laser.

Instrument parameters	
Nu Plasma HR (Nu032) MC-ICP-MS	
Forward power	1300 W
Extraction voltage	6000 V
Analyzer pressure	< 5e-8 mbar
Cones	Nickel dry plasma high sensitivity sampler cone (HS1-9)+ high sensitivity skimmer cone (HS1-7)
Torch depth	5 mm
Detector array	12 Faraday cups, 10^{11} Ω resistors 3 Ion Counters
Detector configuration	H4 (88), H2(87), Ax (86), L2 (85), IC0 (104), L3 (84), L4 (83)
Mass resolution	500 (0.3 mm slit)
Gas flows	
Coolant gas	13 L/min
Argon makeup gas	0.85 L/min
Helium gas to cell	0.6 L/min
Auxiliary gas flow	0.85 L/min
New Wave Research UP213 laser	
Nd:YAG	213 nm
Supercell	Low volume laminar flow cell
Laser fluence	~ 3-5 J/cm^2
Repetition rate	10 Hz
Spot size	40 µm
Scanning speed	5 µm/s

Table S2. Instrument operating conditions of the Agilent 7700x and 193nm ArF Excimer Laser.

Instrument parameters	
Agilent 7700x Quadrupole ICPMS	
Forward power	1350 W
Extraction Lens 1	neg 142.5 V
Extraction Lens 2	neg 175 V
Omega Lens	2.1 V
Analyzer pressure	0.000227 Pa
Cones	Nickel Sampler
	Nickel Skimmer
Torch depth	5.5 mm
Detector array	Discrete Dynode Electron Multiplier
Detector configuration	Single
Gas flows	
Coolant gas	15 L/min
Aux gas	0.9 L/min
Argon makeup gas	1.05 L/min (post SQUID smoothing)
Helium gas to cell (MFC1)	0.65 L/min
Helium gas to cell (MFC 2)	0.45 L/min
Photon Machines 193 nm ArF Excimer laser	
ArF Excimer	193 nm
HelEx	dual-volume LA cell
Laser fluence	5.0 mJ
Repetition rate	10 Hz
Pre-ablation spot size	150 µm
Pre-ablation scanning speed	100 µm/s
Ablation spot size	40 µm
Ablation scanning speed	5 µm/s
Method parameters	
Isotopes analyzed	Dwell time (s)
^{24}Mg	0.1
^{43}Ca	0.03
^{44}Ca	0.03
^{55}Mn	0.3
^{66}Zn	0.3
^{88}Sr	0.1
^{137}Ba	0.1
Cycle time (s)	0.96

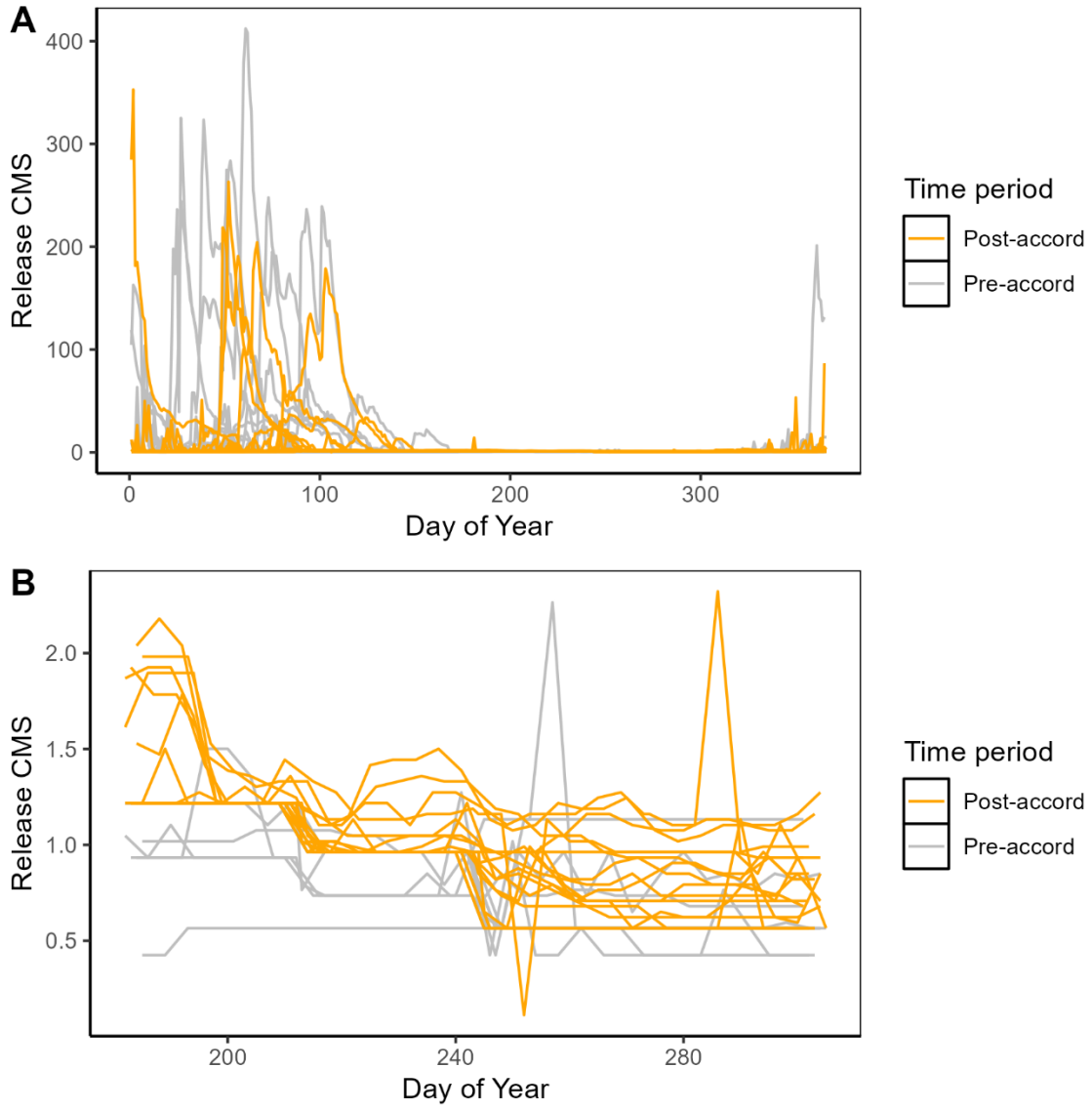

Figure S1. Hydrographs of daily discharge (in cms, cubic meters per second) from Putah Diversion Dam before and after the implementation of a functional flow regime as part of the Putah Creek Accord (2000). The (A) panel presents daily discharge for the full calendar year (in which the pre- and post-Accord difference is less noticeable), and the (B) panel presents daily discharge for just the summer months (July – October) when Accord impacts on required summer minimum flows are more distinct. Data from Jacinto et al. 2023.

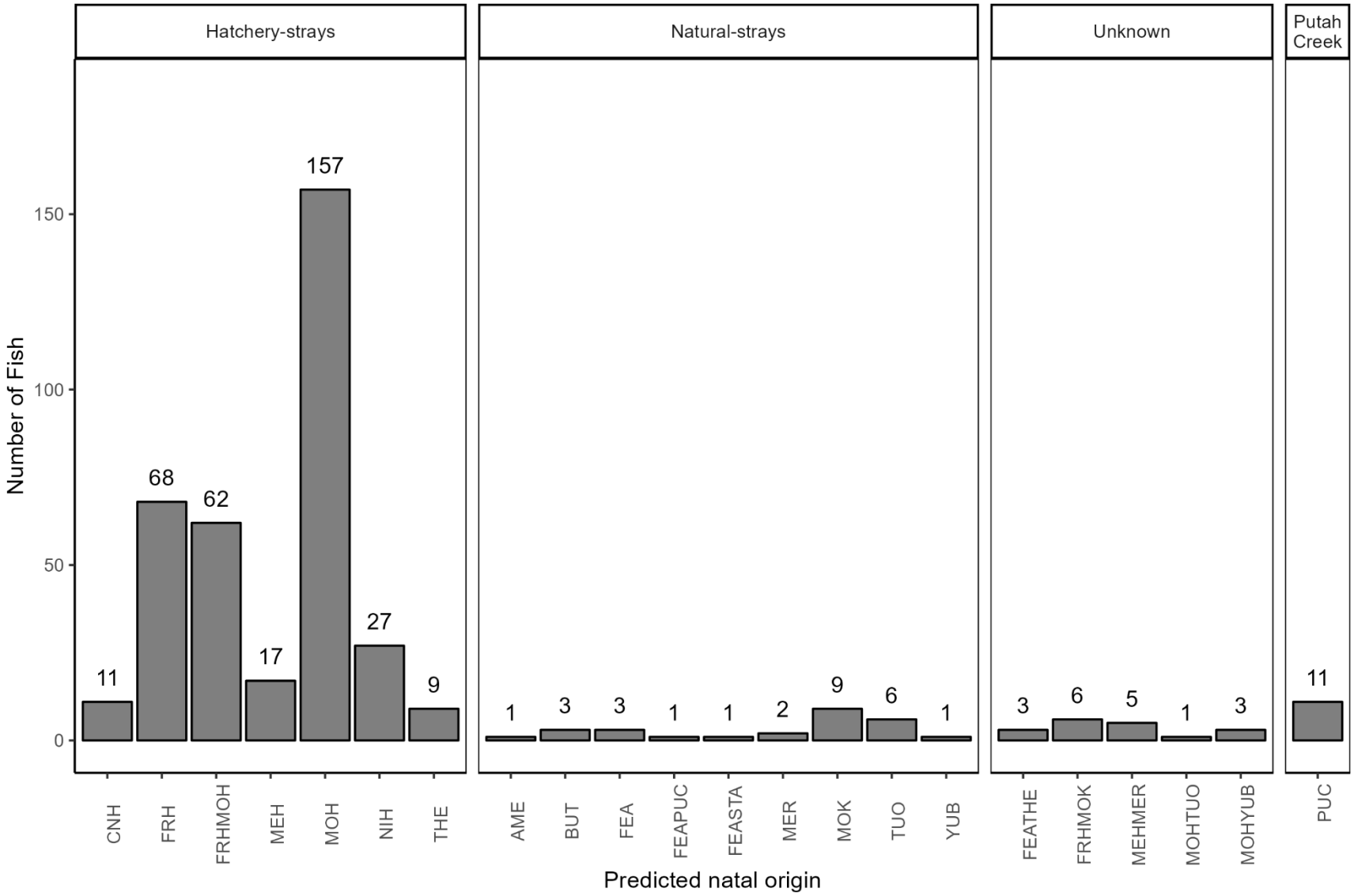
Hatchery-strays
Natural-strays
Unknown
Putah Creek
Number of Fish
0
50
100
150
11
68
62
17
157
27
9
1
3
3
1
1
2
9
6
1
3
6
5
1
3
11
CNH
FRH
FRHMOH
MEH
MOH
NIH
THE
AME
BUT
FEA
FEAPUC
FEASTA
MER
MOK
TUO
YUB
FEATHE
FRHMOK
MEHMER
MOHTUO
MOHYUB
PUC
Predicted natal origin

Figure S2. Number of fish for each natal origin classification. The 2016 data is from Willmes et al. (2021). The acronyms are CNH (Coleman National Fish Hatchery), FRH (Feather River Hatchery), MEH (Merced River Hatchery), MOH (Mokelumne River Hatchery), NIH (Nimbus Fish Hatchery), THE (Thermalito Annex, part of the Feather River Hatchery), AME (American River), BUT (Butte Creek), FEA (Feather River), MER (Merced River), MOK (Mokelumne River), STA (Stanislaus River), TUO (Tuolumne River), YUB (Yuba River). Combined acronyms indicate an uncertain classification among those two potential sources.

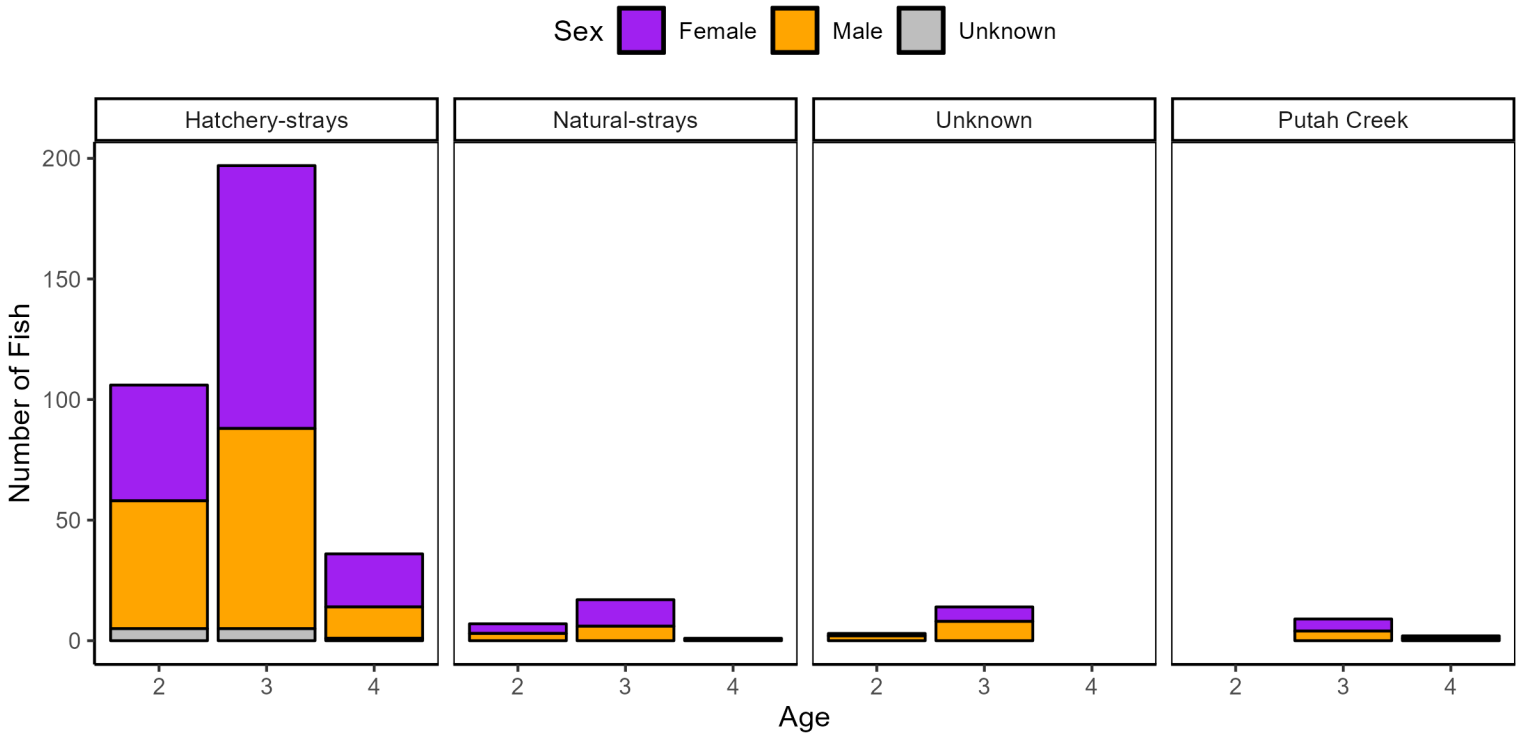

Figure S3. Sex ratios of spawners by fish age and natal origin.

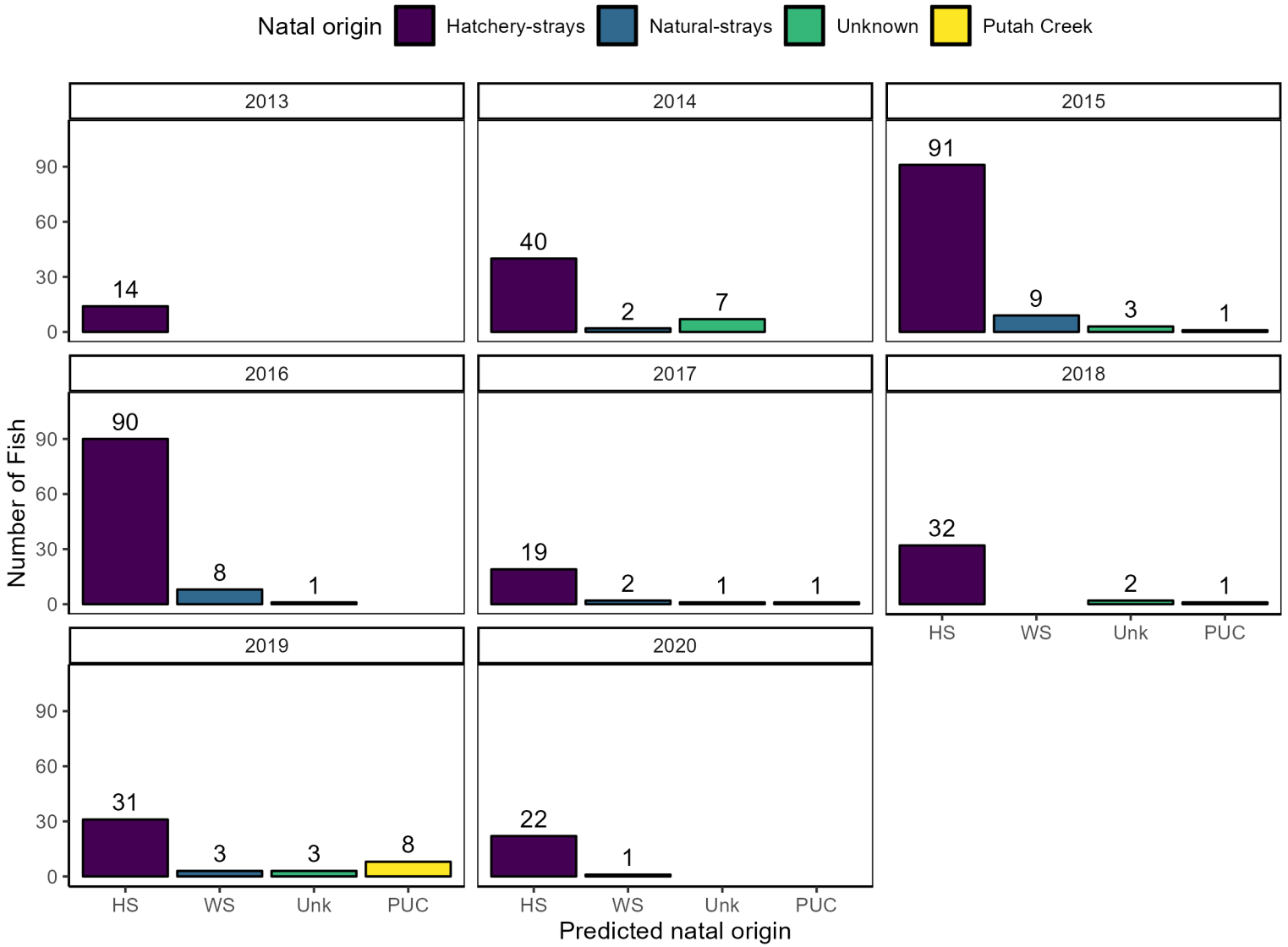

Figure S4. Number of fish for each natal classification group by brood year.

Works Cited

Jacinto, E., Fangue, N.A., Cocherell, D.E., Kiernan, J.D., Moyle, P.B., Rypel, A.L., 2023. Increasing stability of a native freshwater fish assemblage following flow rehabilitation. Ecol. Appl. 33, e2868. https://doi.org/10.1002/eap.2868