

BEYOND THE CRASH –

Evolving Conservation

Strategies for Lake

Sammamish Kokanee

Science Seminar
November 2019

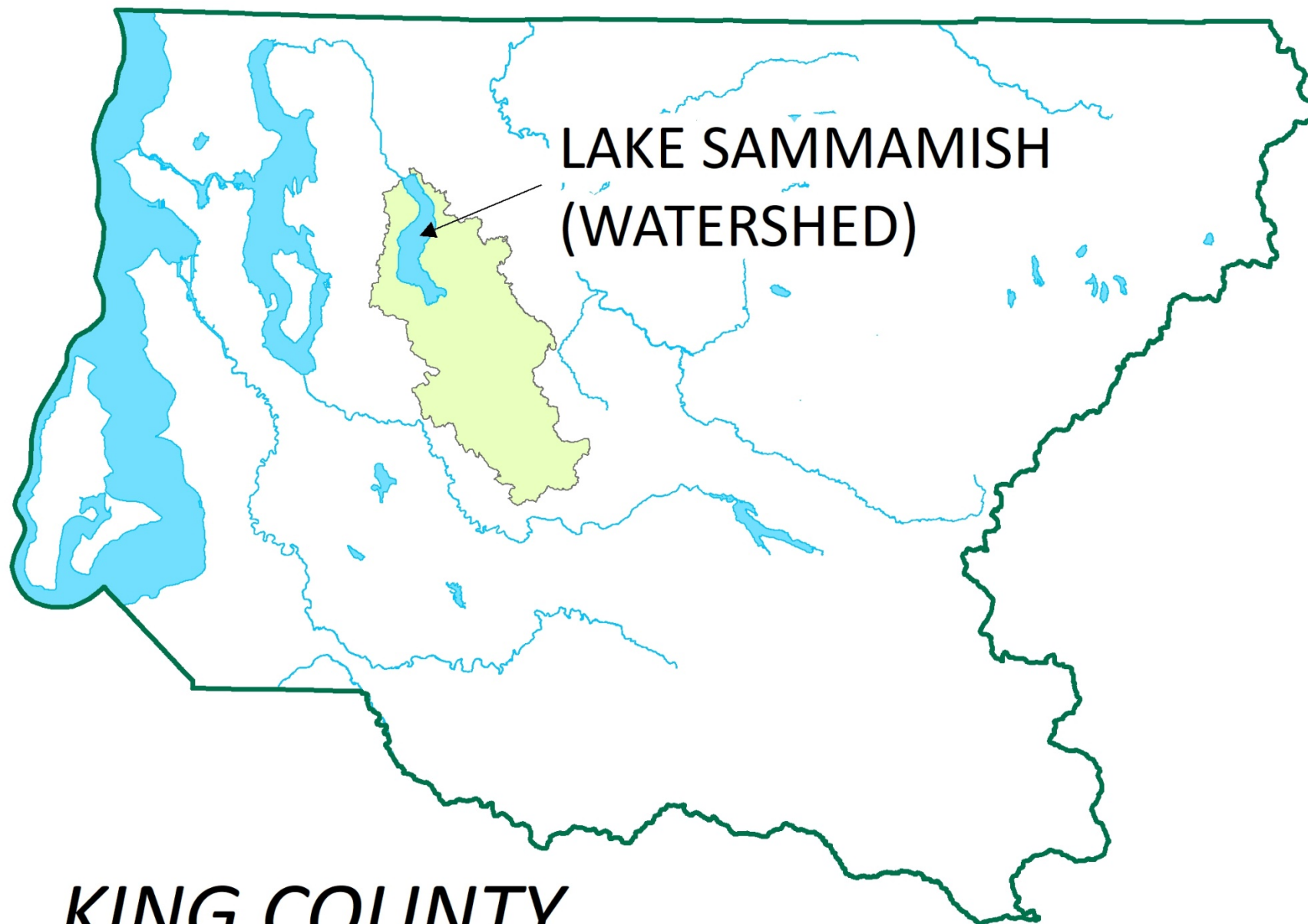
Water and Land Resources Division



King County



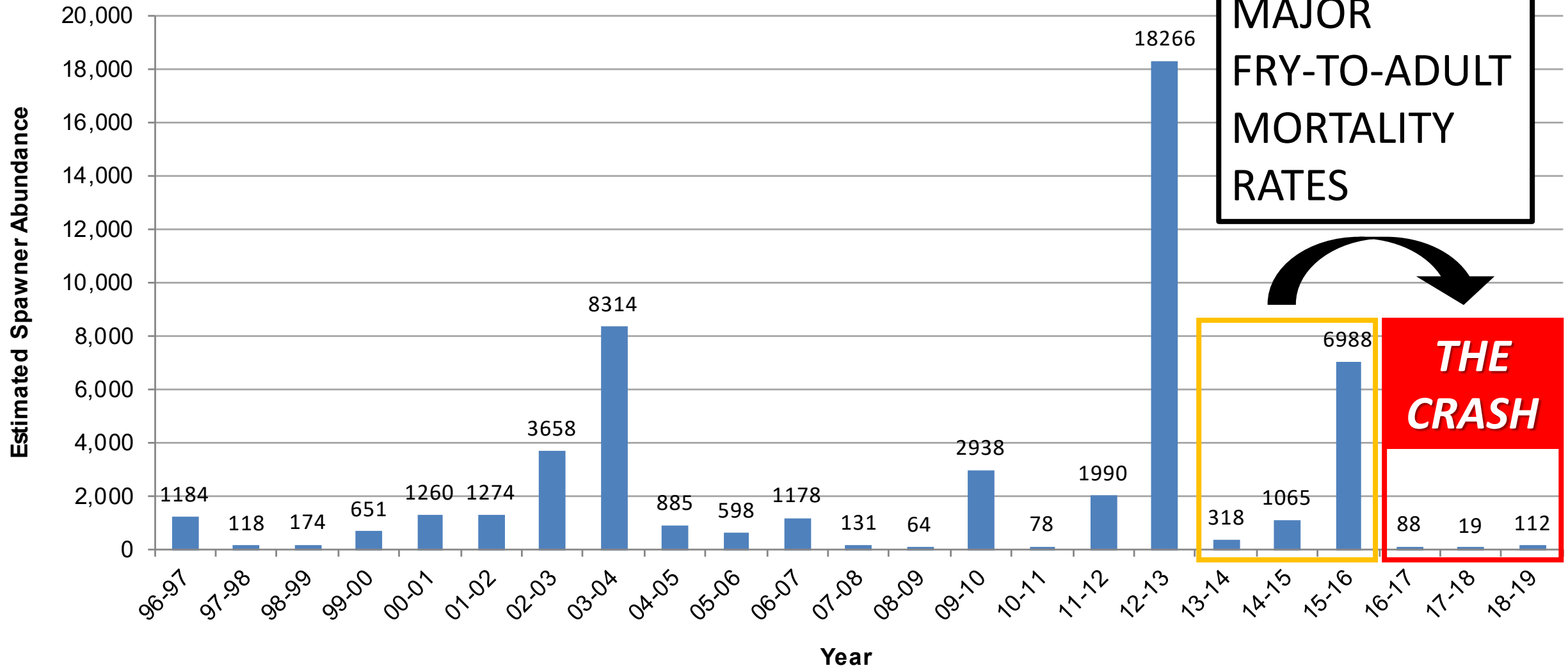




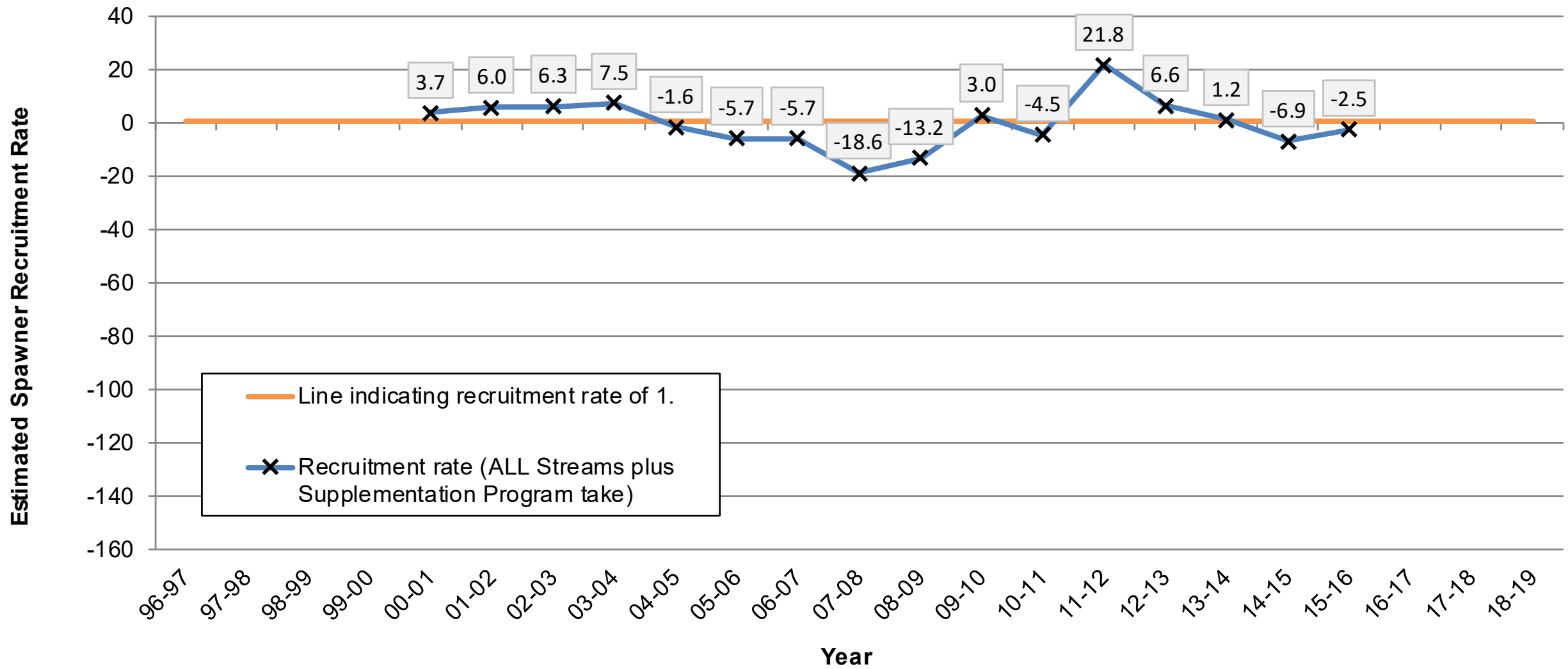
LAKE SAMMAMISH
(WATERSHED)

KING COUNTY

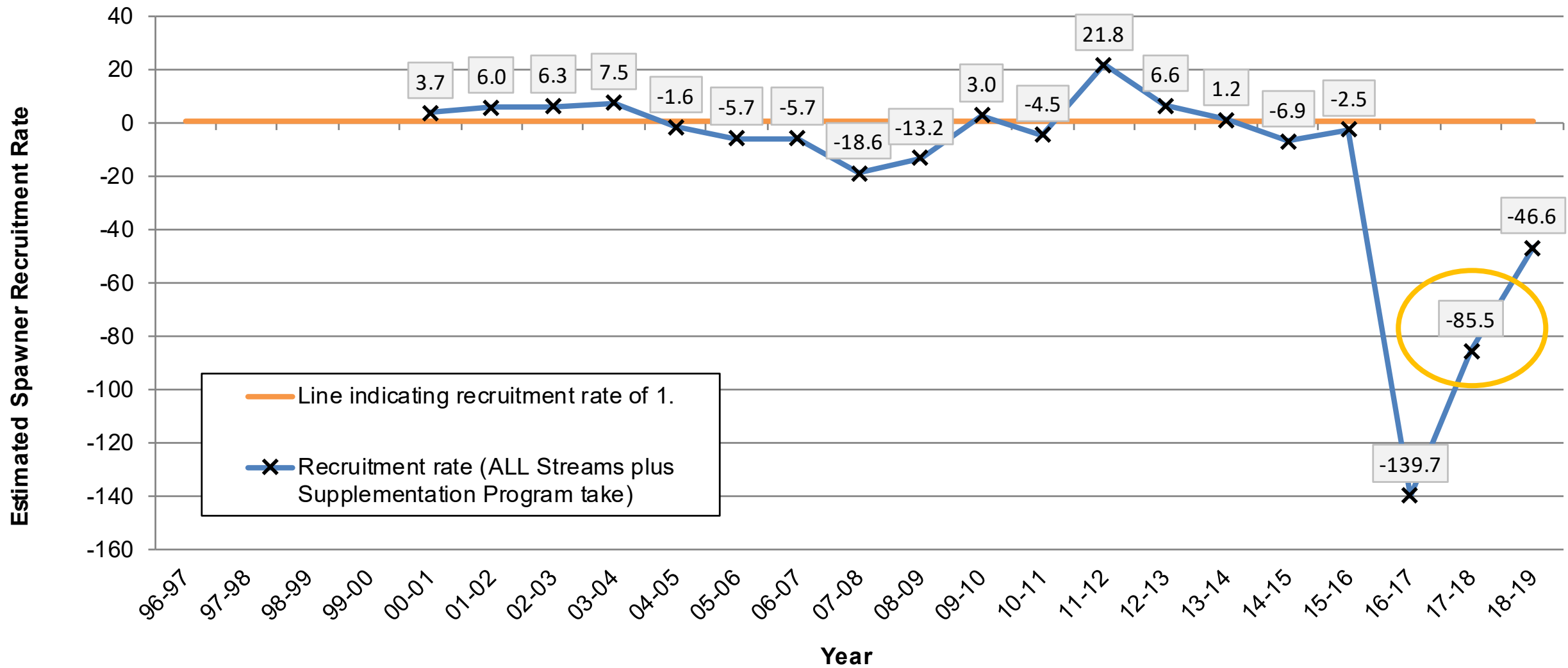
Late-Run Kokanee - Total Estimated Spawner Abundance



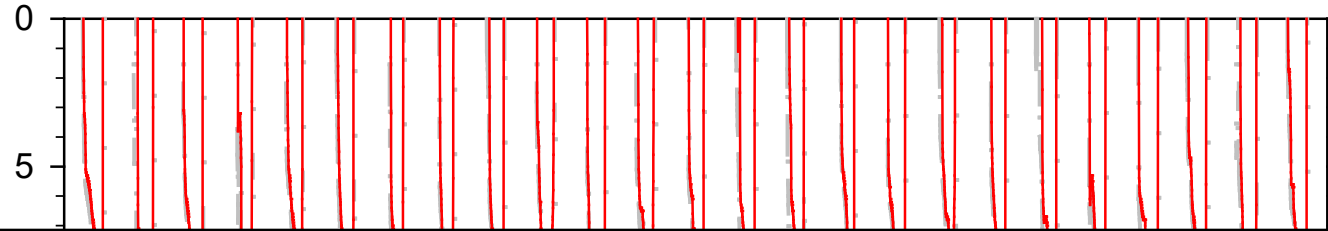
Late-Run Kokanee - Estimated Spawner Recruitment Rate



Late-Run Kokanee - Estimated Spawner Recruitment Rate

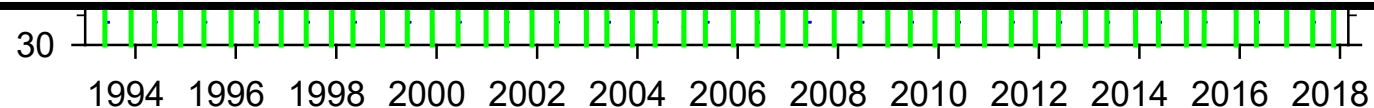
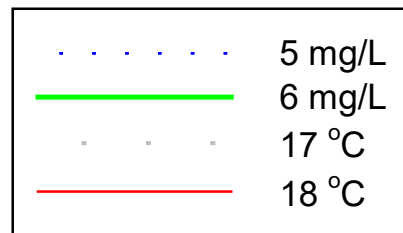


Temperature and Dissolved Oxygen Isopleths



AND.....A hard look at our own hatchery supplementation practices.....

ARE WE CONTRIBUTING TO OR EXACERBATING LAKE PROBLEMS?



Evolving Conservation Strategies for Lake Sammamish Kokanee

Two Primary Goals .....

- 1) Address **HIGH RISK** of population ABUNDANCE and GENETIC “BOTTLENECKS”
- 2) Maximum ADAPTIVE MANAGEMENT flexibility

Evolving Conservation Strategies for Lake Sammamish Kokanee

Synthesis of .....

**Conservation Supplementation Plan for
Lake Sammamish Late-run (Winter-run) Kokanee**

**Lake Sammamish Kokanee Work Group
Supplementation Technical Working Group**

December 18, 2013 Draft

INTEGRATED HATCHERY SUPPLEMENTATION STRATEGIES

- Emulate natural production
- Decrease ↓ take for hatchery supplementation
- Increase ↑ proportion of natural production
- Deliberate, intensively-monitored tactics with fewer eggs

Photo – Roger Tabor



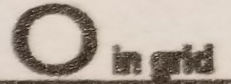
PICKET WEIRS

CRYOBANKING



RAPID GENETICS ANALYSIS

Place a piece of fin
tissue, about this size



Name _____

Sheet # and WDFW Code: _____

Location and Date: _____

11/14/19

Target Species: LK SAMMAMISH KOKANEE

1	2	3	4	5	6
# <u>1</u> M <u>X</u> F <u> </u>	# <u>2</u> M <u>X</u> F <u> </u>	# <u>3</u> M <u>X</u> F <u> </u>	# <u>4</u> M <u>X</u> F <u> </u>	# <u>5</u> M <u>X</u> F <u> </u>	# <u>6</u> M <u>X</u> F <u> </u>
# <u>7</u> M <u>X</u> F <u> </u>	# <u>8</u> M <u>X</u> F <u> </u>	# <u>9</u> M <u>X</u> F <u> </u>	# <u>10</u> M <u>X</u> F <u> </u>	# <u>11</u> M <u>X</u> F <u> </u>	# <u> </u> M <u> </u> F <u> </u>

Ebright
Laughing Jacobs
Lewis

Bear Kokanee **X**
Bear Sockeye **X**
Issaquah Early Kokanee
Issaquah Sockeye **X**
Cedar Sockeye **X**

Webster Lk
Lake Whatcom Kokanee
Baker sockeye **X**
Crooked **X**
Olsens **X**
Siwash **X**
Umbrella **X**
Burton

Caribou
Chain Lake
Chelan Sockeye
Christina
Deer
Drimmie
Halfway
Hellsgate
Hill

Keenleyside
Halfway
Hellsgate
Hill
Keenleyside
Lake Coeur d Alene
Lake Pend O Reille
Lincoln
Meadow

Mosquito
Nespelem
Norns
Palmer Lk
Redfish
San Poil
Swawilla
Upper Lk FDR
Wenat Sockeye

1. UNFED FRY (Volitional release)



2. UNFED FRY (Non-volitional release)



3. EXTENDED REARING (Private property; Ebright Creek)



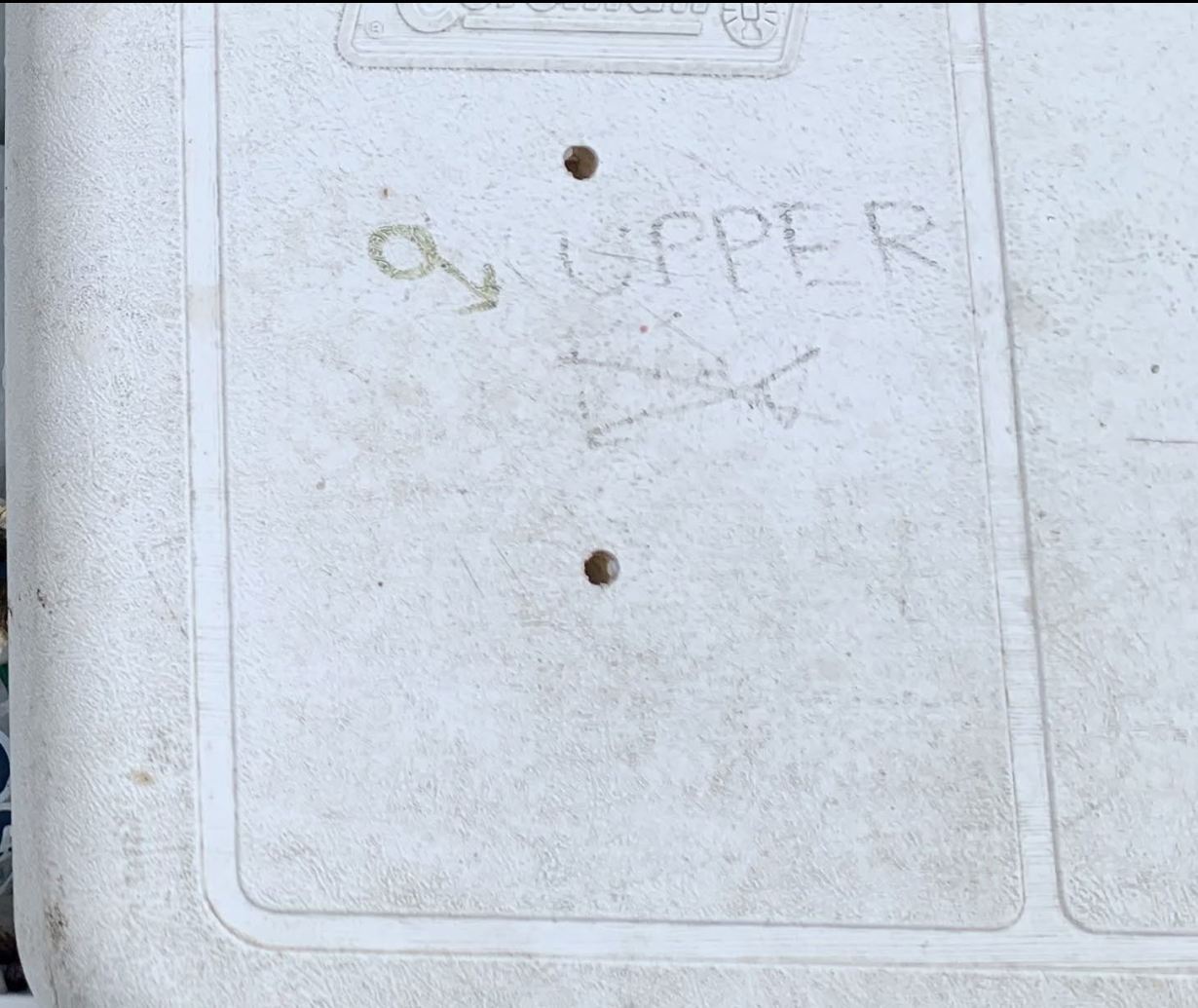
4. EXTENDED REARING (Issaquah Hatchery; Lewis Creek)



The image shows two large, blue, circular plastic tanks, likely for aquaculture, situated inside a wooden building. Each tank is equipped with white PVC piping for water circulation, including vertical risers and horizontal outlets with red-handled valves. The tanks are elevated on wooden pallets over a bed of gravel. The building has a rustic wooden interior with horizontal siding and several windows that look out onto a wooded area. A small poster is visible on the wall between the tanks. In the foreground, there are wooden walkways made of planks.

CAPTIVE BROODSTOCK

STRATEGIES TO ADDRESS KNOWLEDGE GAPS





FISH DISEASE ANALYSIS (1)

Target Pathogens

Epizootic haematopoietic necrosis virus

Infectious haematopoietic necrosis virus

Viral haemorrhagic septicemia virus

Infectious Pancreatic Necrosis virus

Spring Viraemia of Carp virus

Oncorhynchus masou virus

Aeromonas salmicide

Yersinia ruckeri

Piscirickettsia salmonis

Renibacterium salmoninarum

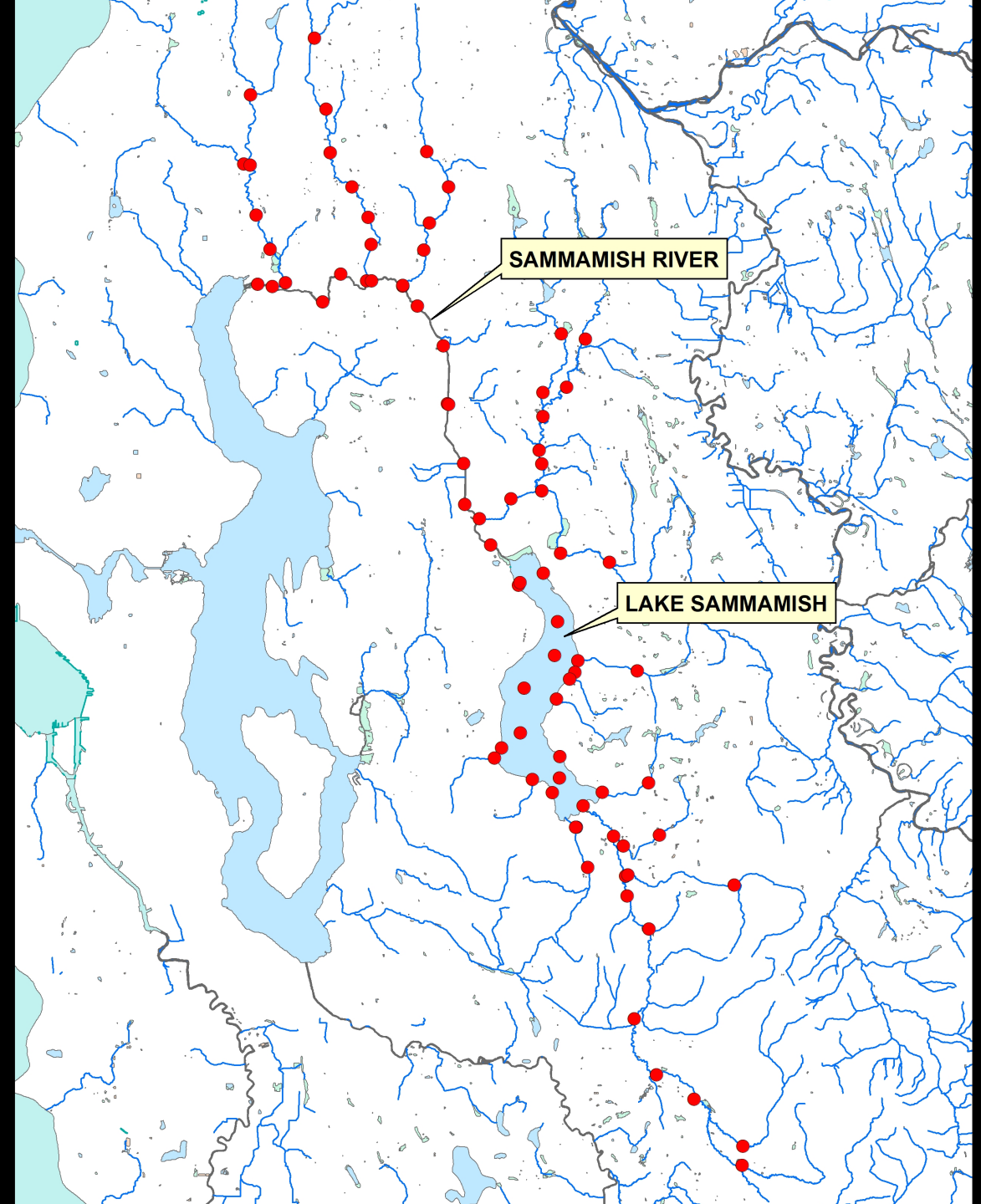
Parvicapsula minibicornis

Tetracapsula bryosalmonae

Ceratomyxa shasta

FISH DISEASE ANALYSIS (2)

- ❖ eDNA sampling targeting Myxosporean parasites



FISH ASSEMBLAGE

❖ Compare 2002-2003
and 2019 analyses



POPULATION LEVEL GENETICS ANALYSIS

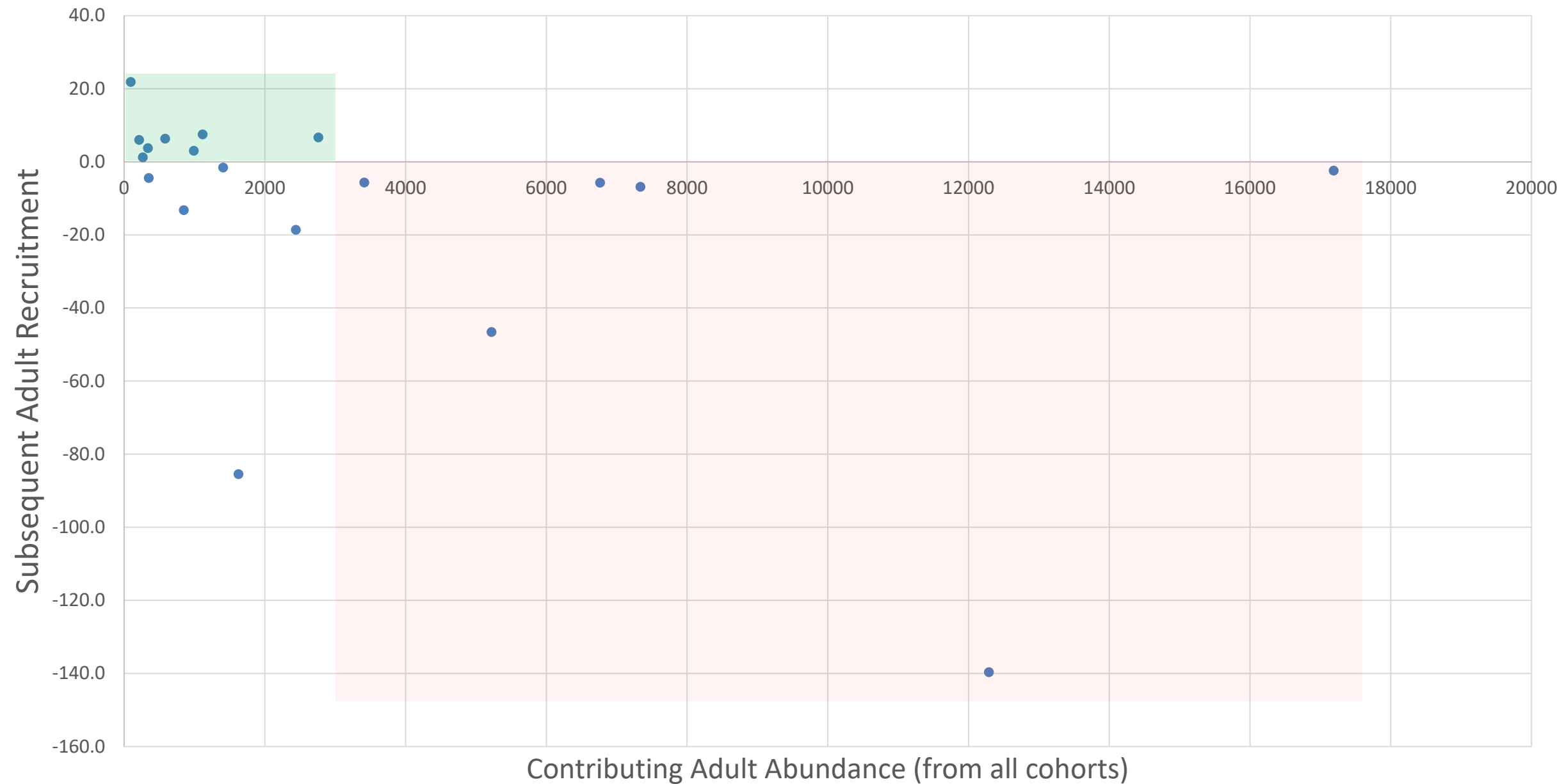
- ❖ WDFW Molecular Genetics Lab
- ❖ All samples 1999-2019
- ❖ **Year-to-year heterozygosity (diversity)**
- ❖ **Trend in allele frequency (“good” mutations)**
- ❖ Rationale and guidance for using cryobanked samples

Evolving Conservation Strategies for Lake Sammamish Kokanee

Future Adaptive Management.....

- 1) Manage for optimal cohort abundance

Contributing Adult Abundance - Subsequent Adult Recruitment



Evolving Conservation Strategies for Lake Sammamish Kokanee

Future Adaptive Management.....

- 1) Manage for optimal cohort abundance
- 2) If interested in long-term kokanee ecology, we may need to understand perch ecology even better!

Conservation Partners include:

- Trout Unlimited
- USFWS
- WDFW
- Washington State Parks
- Snoqualmie Tribe
- City of Sammamish
- City of Issaquah
- City of Bellevue
- City of Redmond
- Long Live the Kings
- LightHawk
- USGS Western Fisheries Science Center
- Wally Pereyra, Gary Mahn and Mary Ellen Stone, William Hoag
- Friends of Issaquah Salmon Hatchery
- Friends of Lake Sammamish State Park
- Friends of Pine Lake
- Save Lake Sammamish
- Charleston Place HOA
- Meadowbrook Pointe HOA
- *and many others*



King County

Thank you.

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Water and Land Resources Division
King County Department of Natural Resources and Parks

