



# CHIEF JOSEPH HATCHERY 2023 ANNUAL PROGRAM REVIEW

## 2022 SUMMER CHINOOK SPAWNING GROUNDS SUMMARY

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# Objectives

**Monitor Status and Trends:**

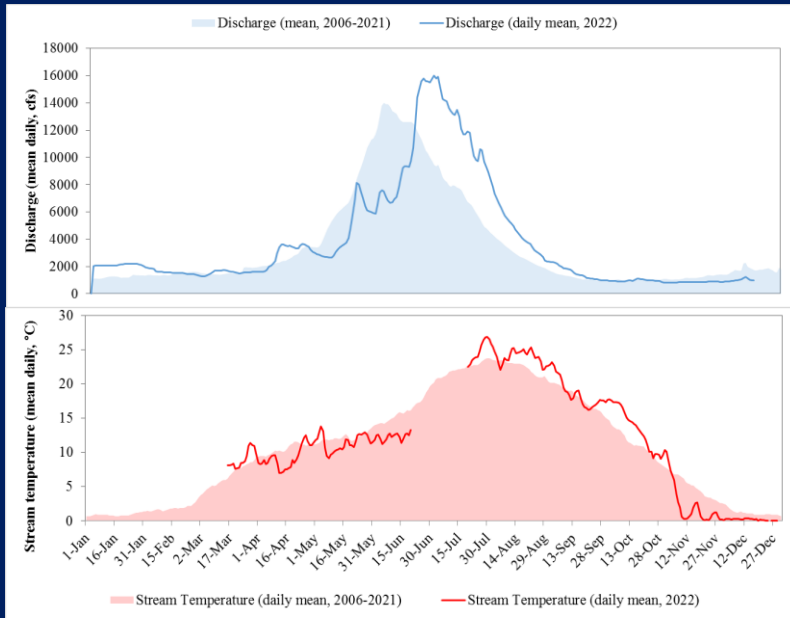
- Environmental Conditions
- Spawn timing
- Spatial distribution
- Pre-spawn mortality
- Age structure (scales, CWT)
- Stray rates
- Sex ratio
- Fish size

**Estimate:**

- Escapement
- Composition (pHOS)

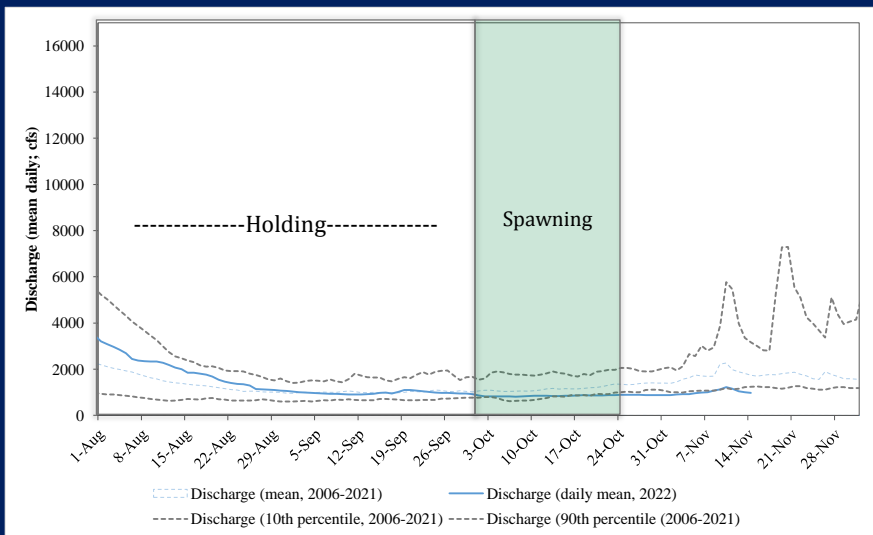
# Environmental Conditions

2022 compared to previous 16 years



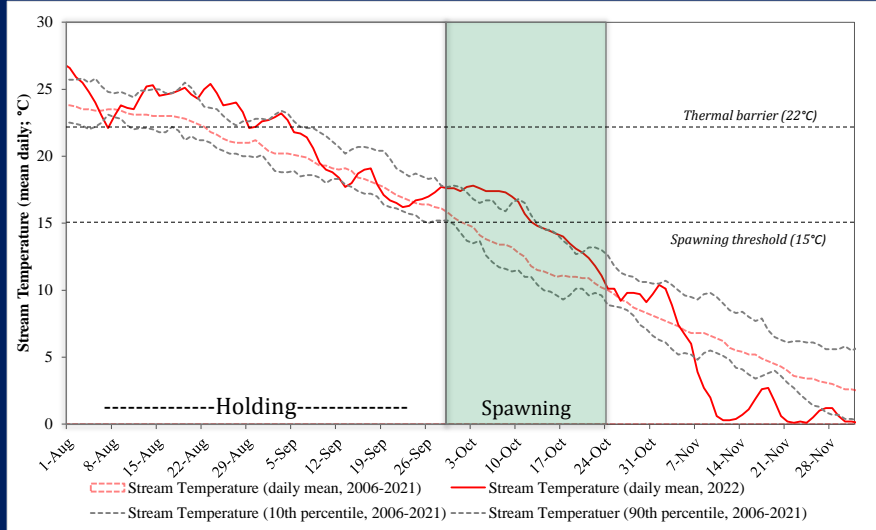
# Environmental Conditions

2022 compared to previous 16 years



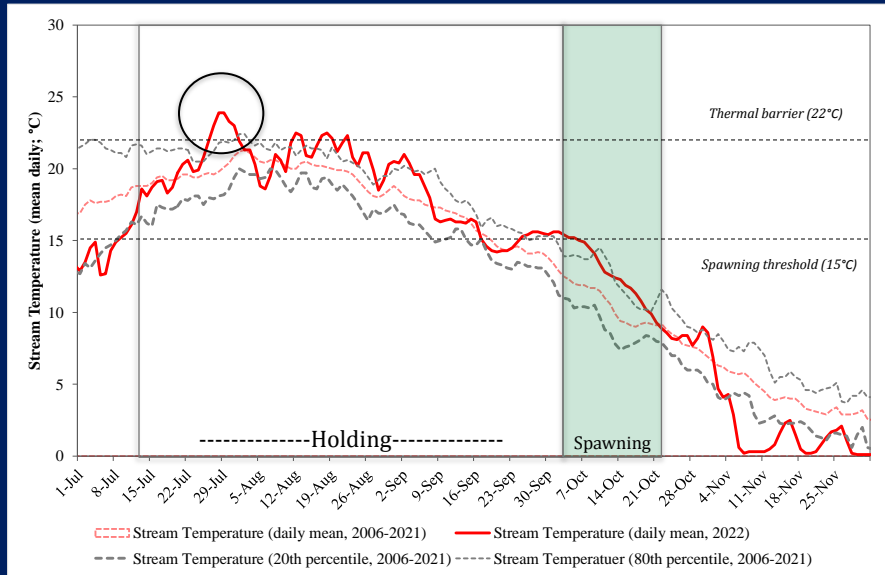
# Environmental Conditions

2022 compared to previous 16 years



# Environmental Conditions (Similkameen)

2022 compared to previous 16 years

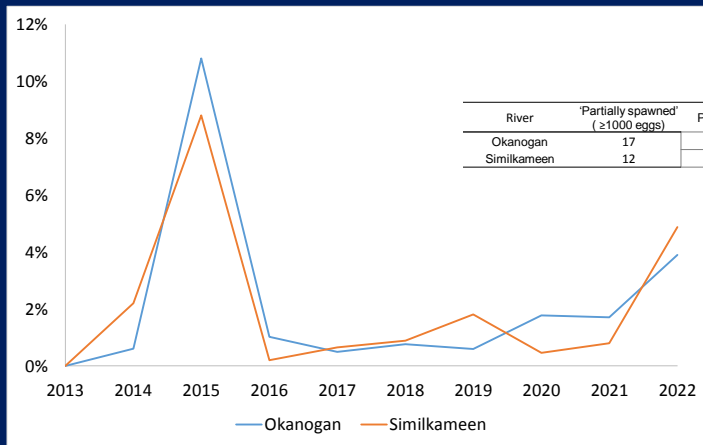


# Environmental Conditions (Similkameen)

2022 compared to previous 16 years

Year	Temp in C°				Rank of each metric					Sum of ranks	Overall Rank
	July Max	Aug Max	Jul Avg	Aug Avg	Year	July Max	Aug Max	Jul Avg	Aug Avg		
2014	19.5	20.6	19.62	19.62	2014	9	9	4	6	28	
2015	23.4	22.2	20.92	19.71	2015	3	8	2	4	17	4
2016	22.6	22.8	17.98	19.68	2016	4	4	7	5	20	
2017	22.6	22.6	20.63	20.51	2017	4	5	3	2	14	3
2018	22.5	22.6	19.47	18.57	2018	6	5	5	9	25	
2019	21.8	22.9	16.86	20.28	2019	7	3	8	3	21	
2020	21.6	22.3	16.86	19.52	2020	8	7	8	8	31	
2021	23.8	23.0	21.52	19.55	2021	2	2	1	7	12	2
2022	25.1	23.7	18.39	20.87	2022	1	1	6	1	9	1

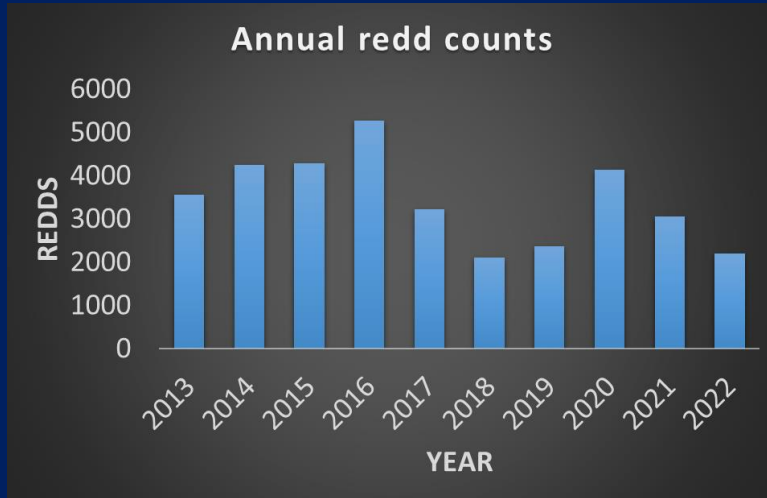
# Pre-spawn mortality (PSM)



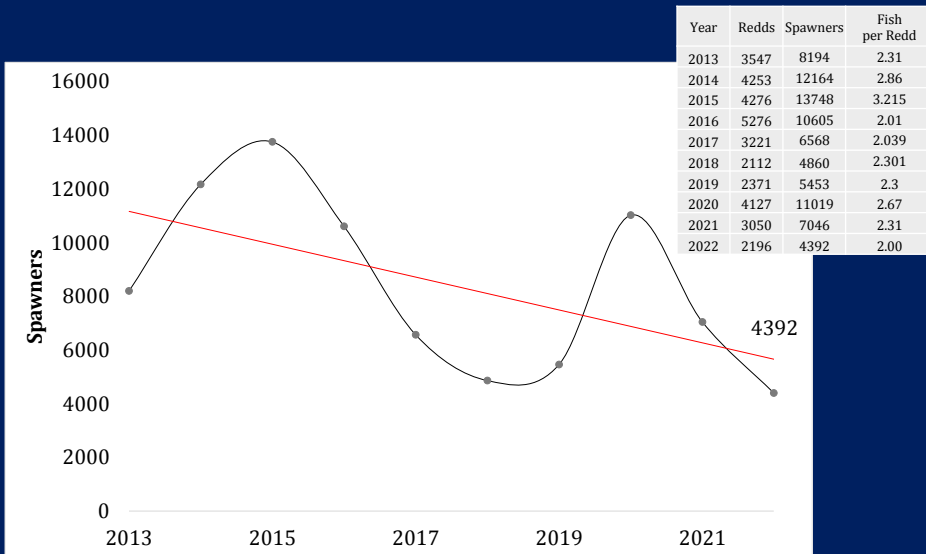
Count of Recovered Female Carcasses (i.e., sample size)

Basin	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Okanogan	314	621	398	786	412	261	170	734	469	385
Similkameen	249	681	923	1018	309	113	111	655	251	246
Total	563	1302	1321	1804	721	374	281	1389	720	631

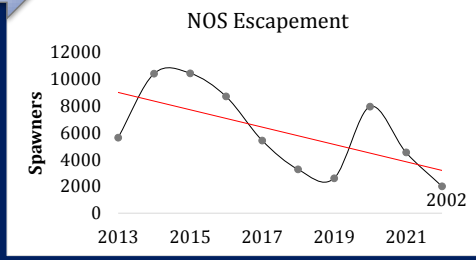
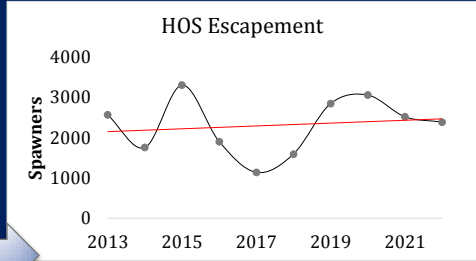
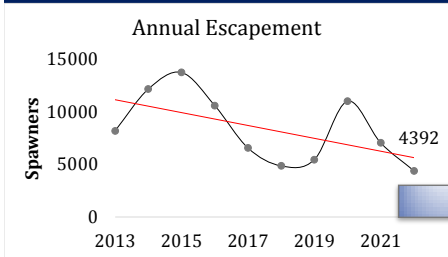
# Annual Redd Counts



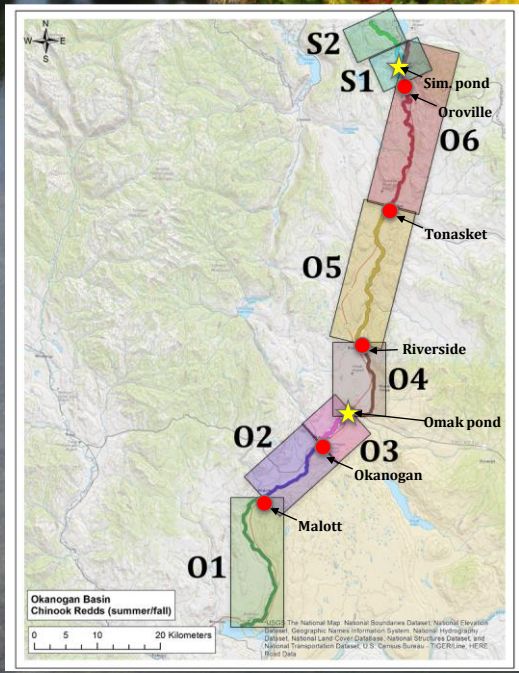
# Annual Escapement

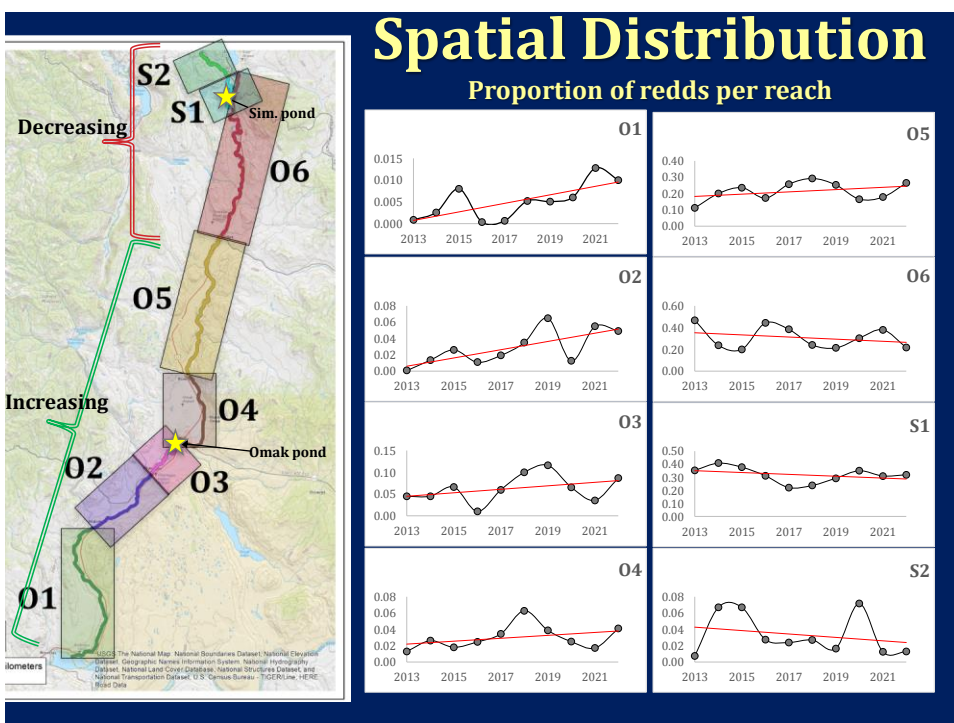
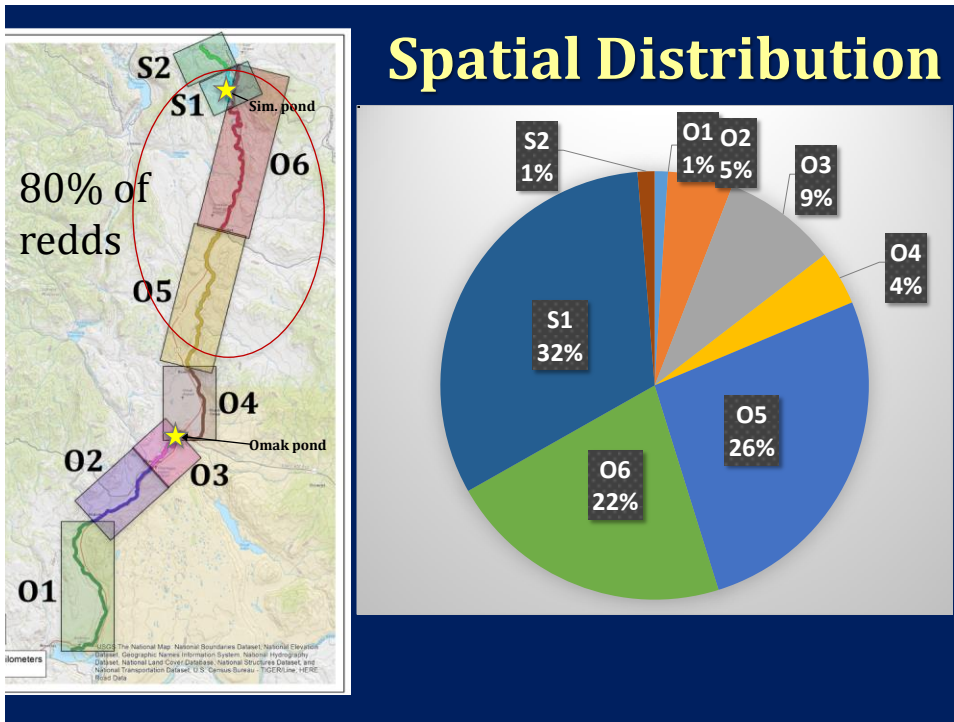


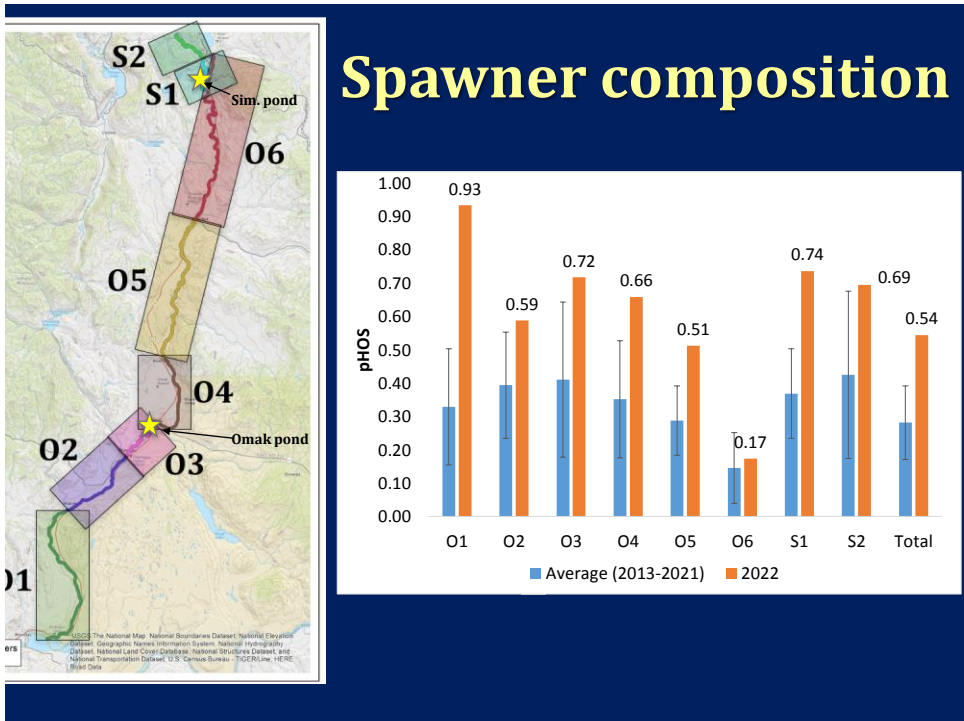
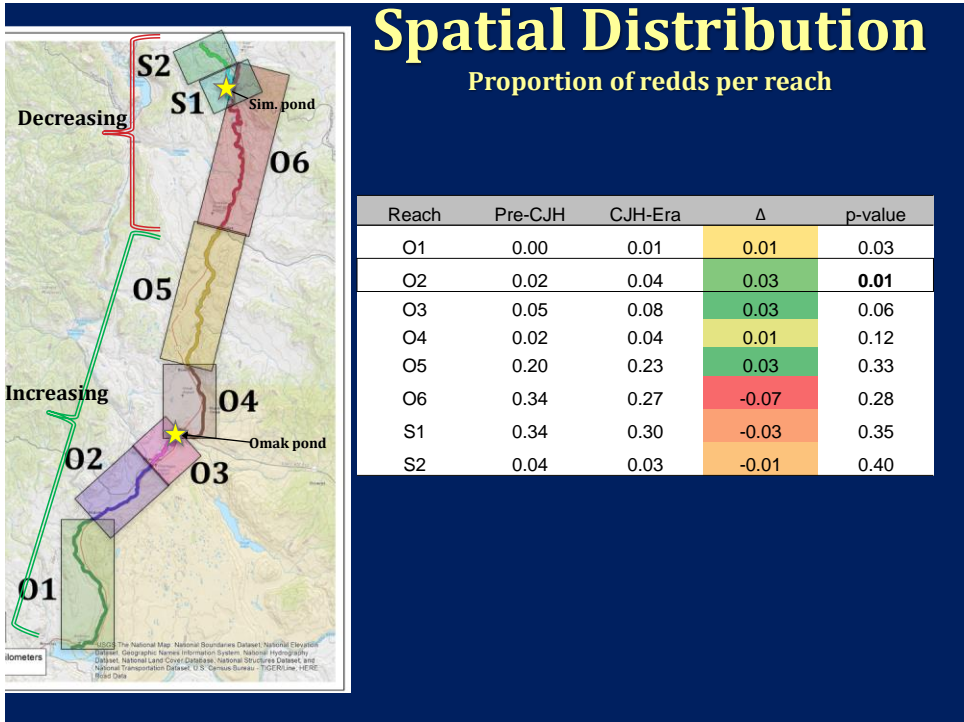
# Annual Escapement



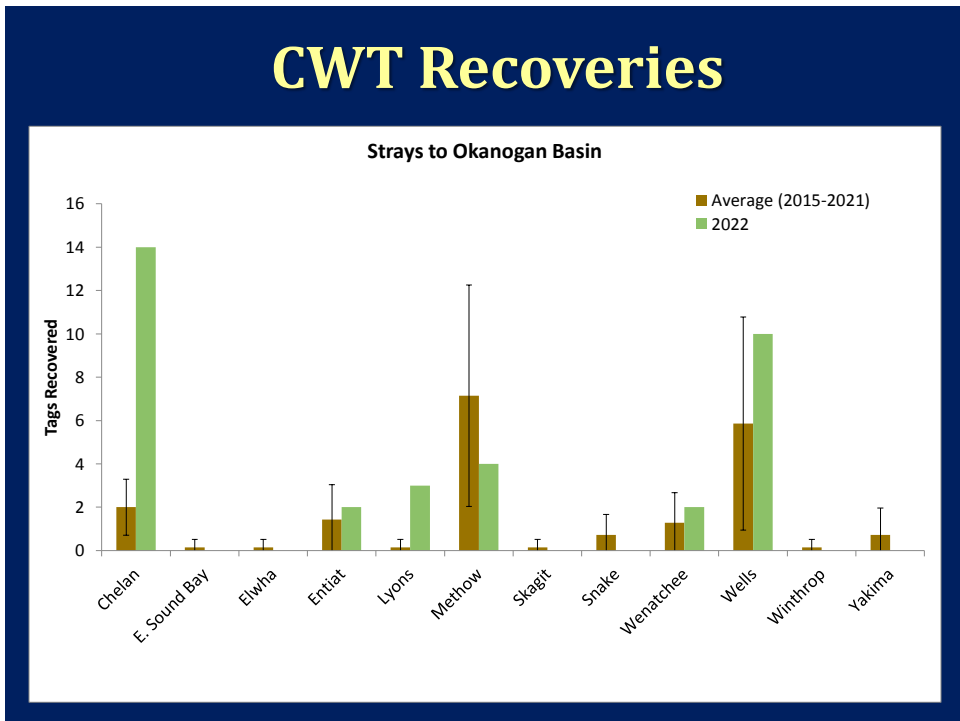
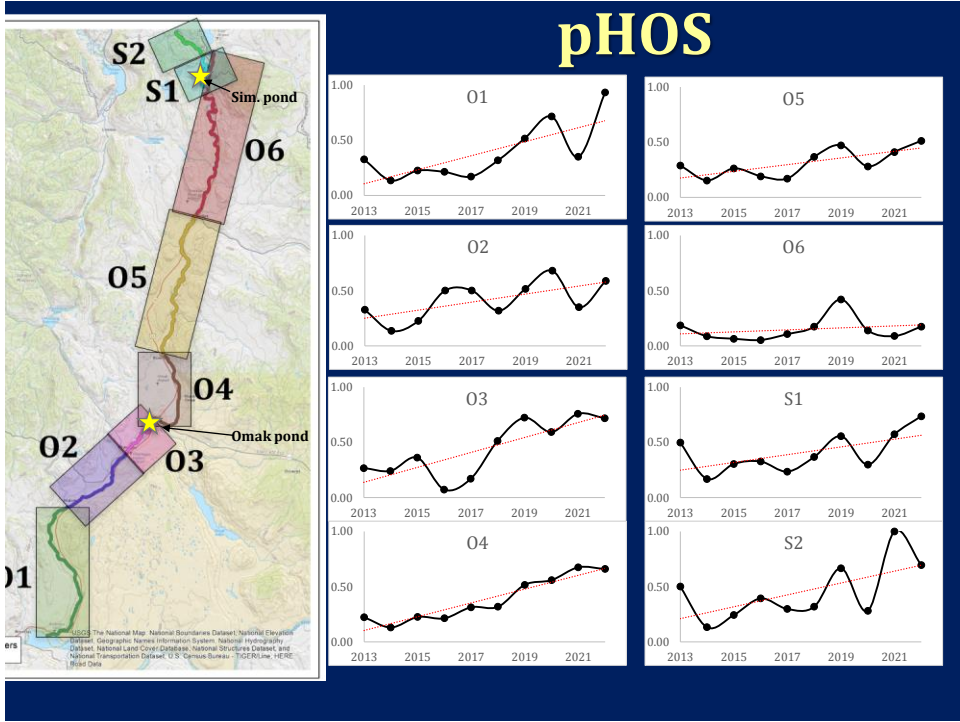
# Spatial Distribution - Spawning





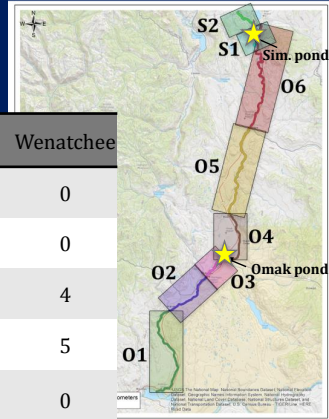






# Stray rate-into basin

(CWT-expansions)



Reach	Chelan	Methow	Snake R.	Entiat	Wells	Wenatchee
01	3	3	0	0	19	0
02	47	0	0	0	0	0
03	31	4	0	0	10	4
04	10	5	0	5	13	5
05	12	7	12	0	8	0
06	0	0	4	4	0	0
S1	0	0	0	0	0	0
S2	0	2	0	0	0	0
<b>Total</b>	<b>102</b>	<b>21</b>	<b>16</b>	<b>9</b>	<b>49</b>	<b>9</b>
Percent of spawning population	2.3%	0.5%	0.4%	0.2%	1.1%	0.2%

**Strays  
comprise  
4.7% of  
spawning  
population**

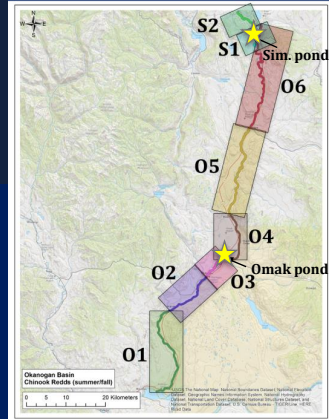
# CJHP strays to out-of-basin

Year	Escapement	Chelan	Wenatchee	Methow	Okanogan	Similkameen	Homing	Straying
2014	1033	7	0	4	374	648	98.94%	1.06%
2015	2470	4	4	5	939	1518	99.47%	0.53%
2016	2585	4	0	4	365	2212	99.69%	0.31%
2017	857	11	0	0	510	336	98.72%	1.28%
2018	193	4	0	4	116	69	95.85%	4.15%
2019	1460	12	0	0	846	602	99.18%	0.82%
2020	2035	0	0	33	1083	919	98.38%	1.62%
2021	1688	4	4	15	713	952	98.64%	1.36%

\*RMIS query data from February 2023

## CJHP-origin returns to the Okanogan spawning grounds (CWT expansions)

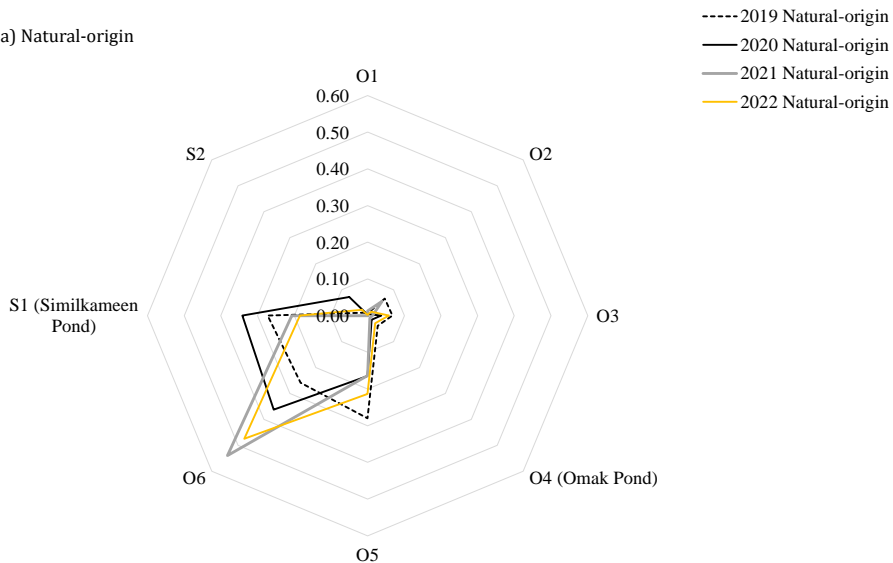
Reach	CJH (seg)	Omak Pond (CJH Int.)	Similkameen Pond (CJH Int.)
O1	12	4	0
O2	8	72	0
O3	77	115	32
O4	0	82	0
O5	61	397	100
O6	37	51	70
S1	0	163	801
S2	68	4	33
<b>Total</b>	<b>263</b>	<b>886</b>	<b>1036</b>
Percent of spawning population	6.0%	20.2%	23.6%



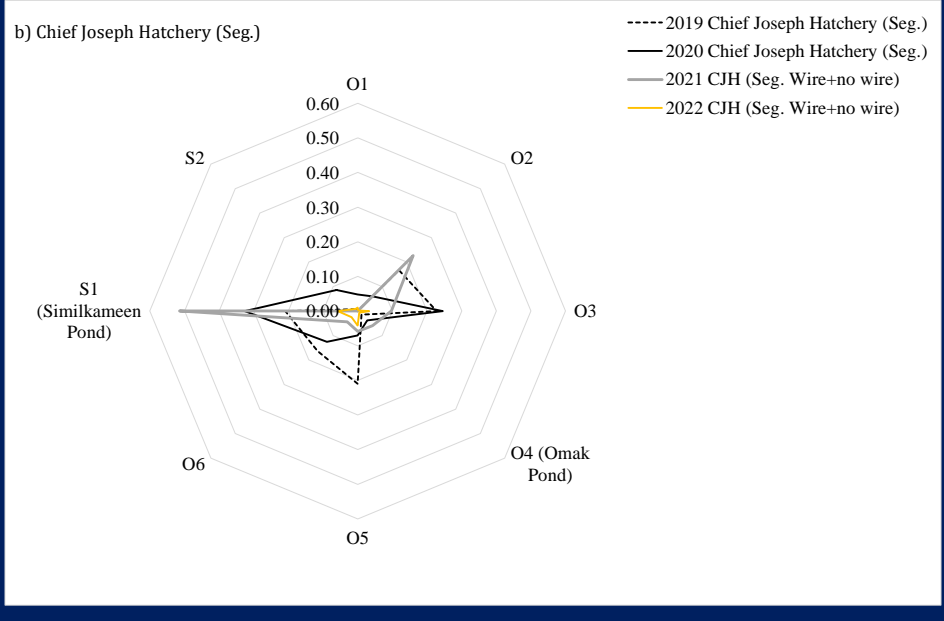
**CJH-origin fish comprise 49.8% of spawning population**

## Spawner distribution

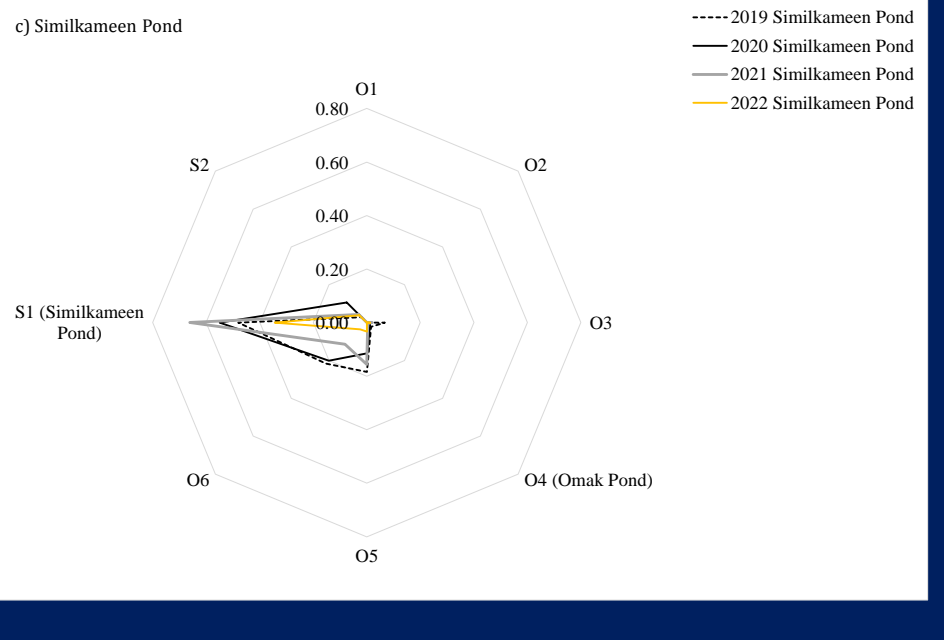
a) Natural-origin



# Spawner distribution



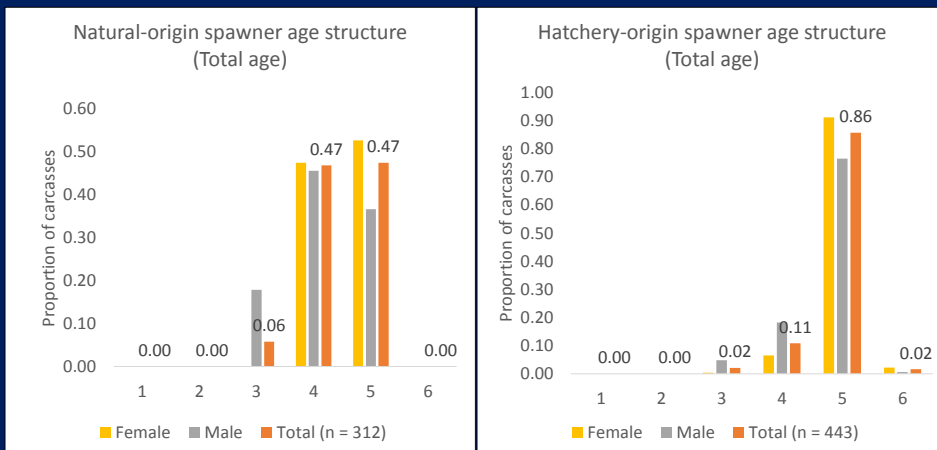
# Spawner distribution



# Spawner distribution



# Age Structure

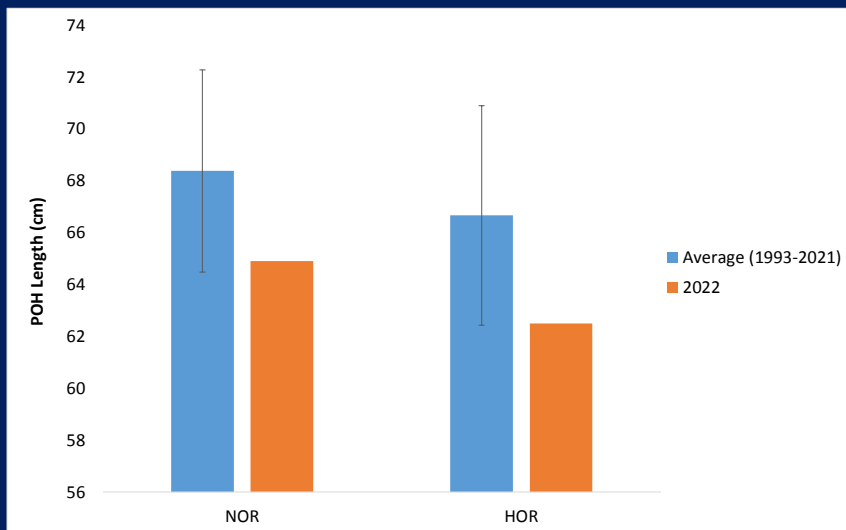


## 2022 Jacks

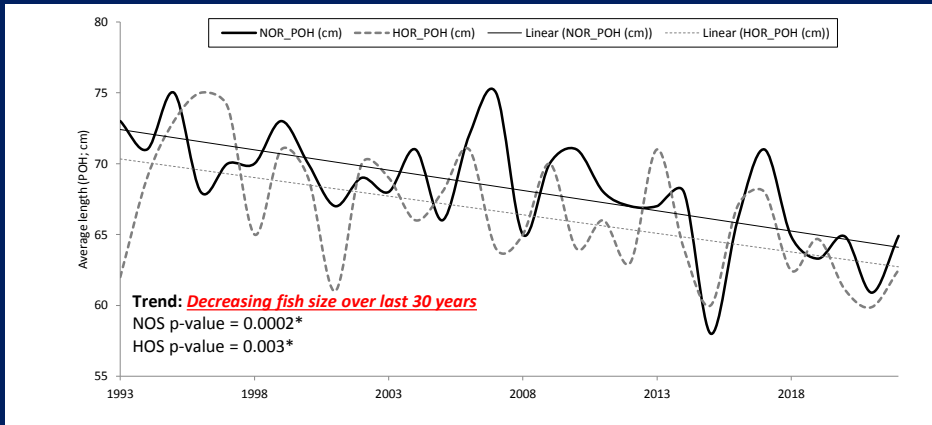
	Jacks	Adults	Total	Jack Rate
HOS	9	434	443	2.0%
NOS	18	294	656	5.8%

*HOS Age Sample Rate 10.1%*  
*NOS Age Sample Rate 7.1%*

## Fish size



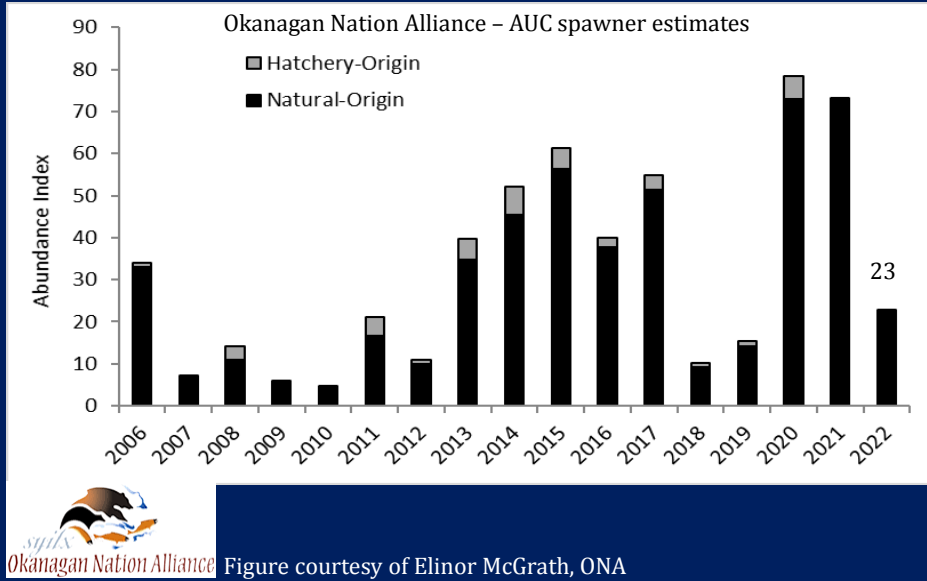
## Length trend



## Spawner Abundance (USA portion of basin only)

2022	Redds	Spawners	HOS	NOS	pHOS
Okanogan	1467	2934	1320	1614	0.45
Similkameen	729	1458	1071	387	0.73
U.S. Total	2196	4392	2390	2002	0.54

# Chinook escapement to Canada



# U.S. pHOS

