



# Chief Joseph Hatchery 2021 Annual Program Review

## Chinook Spawning Grounds Summary

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## Objectives

### Monitor Status and Trends:

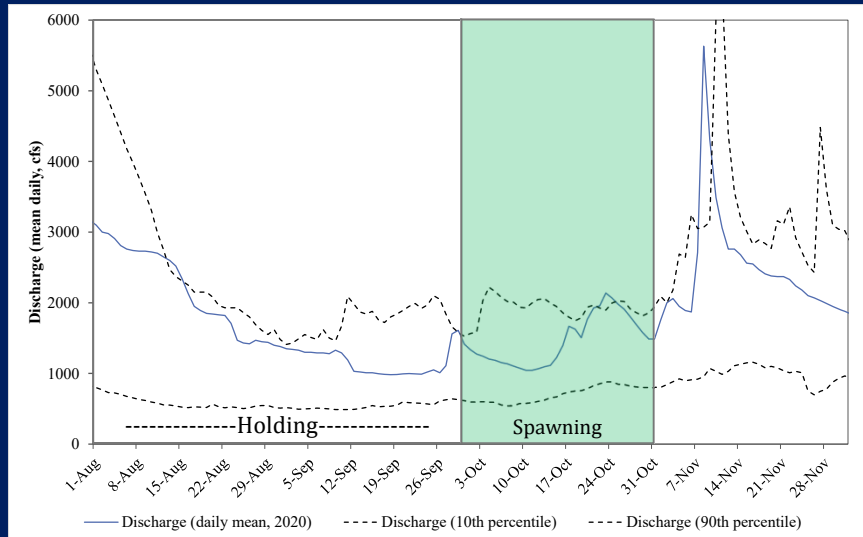
- Environmental Conditions
- Spawn timing
- Spatial distribution
- Pre-spawn mortality
- Age structure (scales, CWT)
- Stray rates
- Sex ratio
- Fish size

### Estimate:

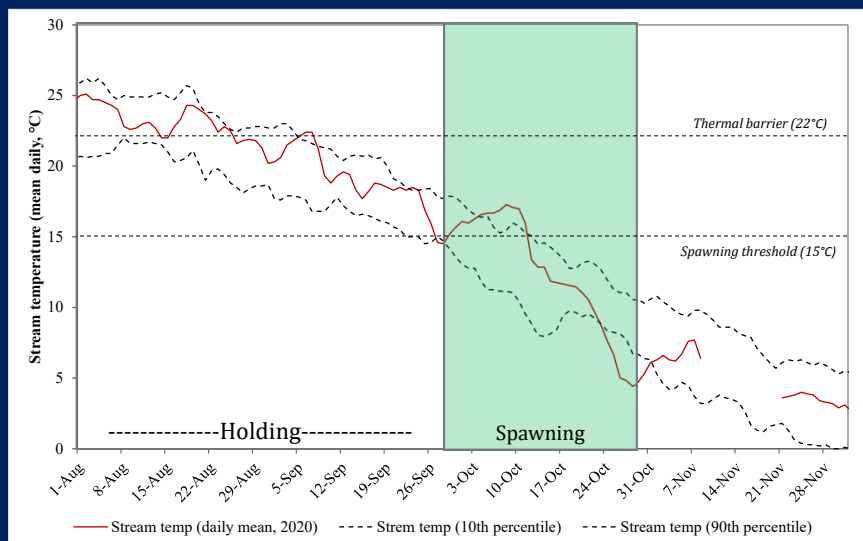
- Escapement
- Composition (pHOS)



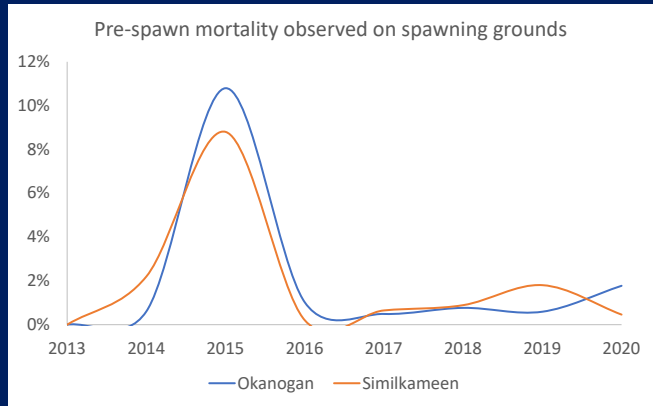
# Environmental Conditions



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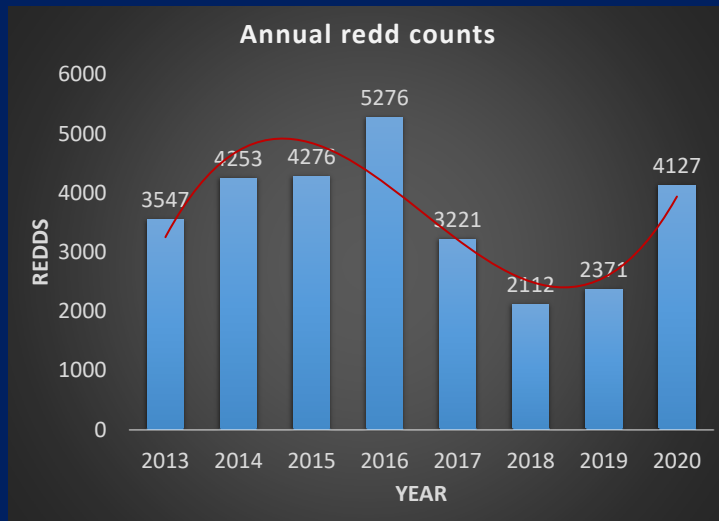
# Pre-spawn mortality (PSM)



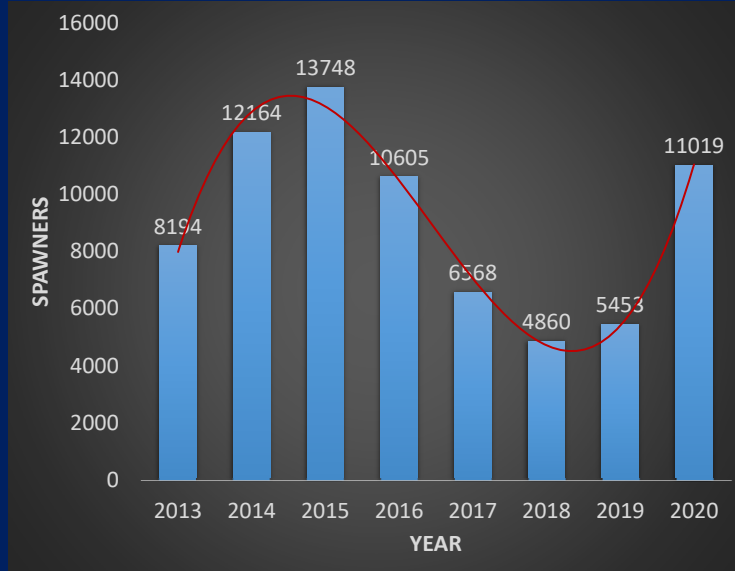
Count of recovered female carcasses (i.e., *sample size*)

River	2013	2014	2015	2016	2017	2018	2019	2020
Okanogan	314	621	398	786	412	261	170	734
Similkameen	249	681	923	1018	309	113	111	655
Total	563	1302	1321	1804	721	374	281	1389

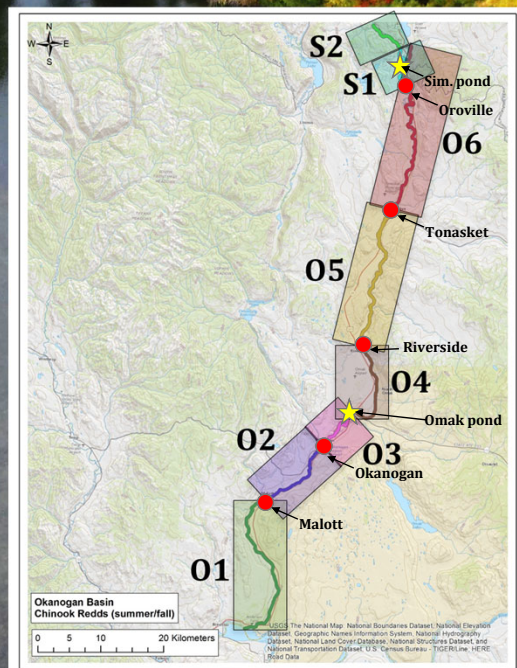
# Redd counts

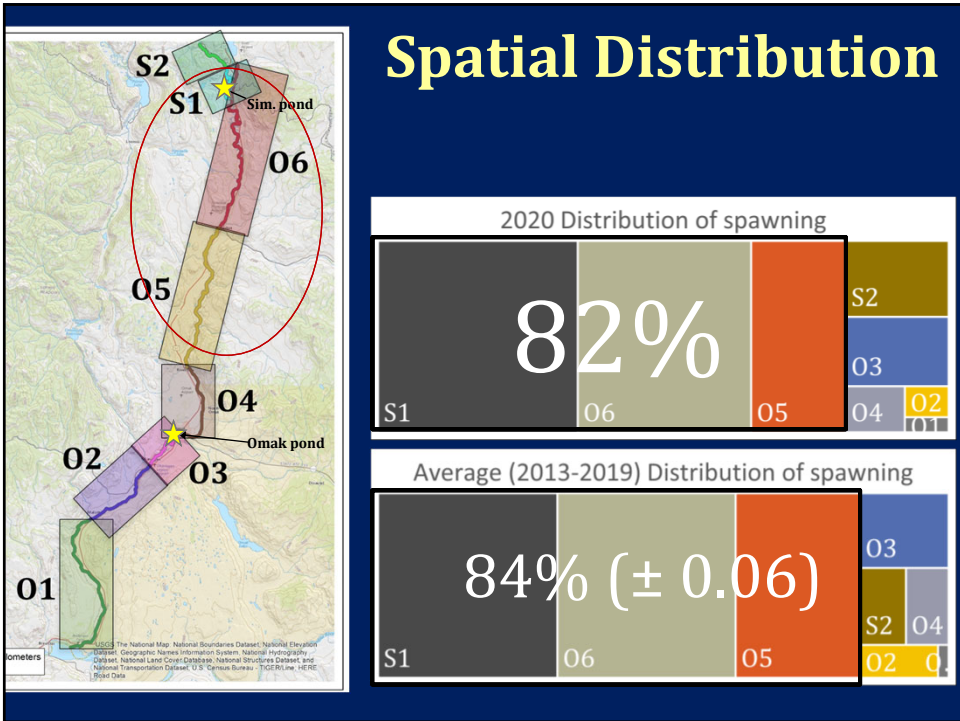
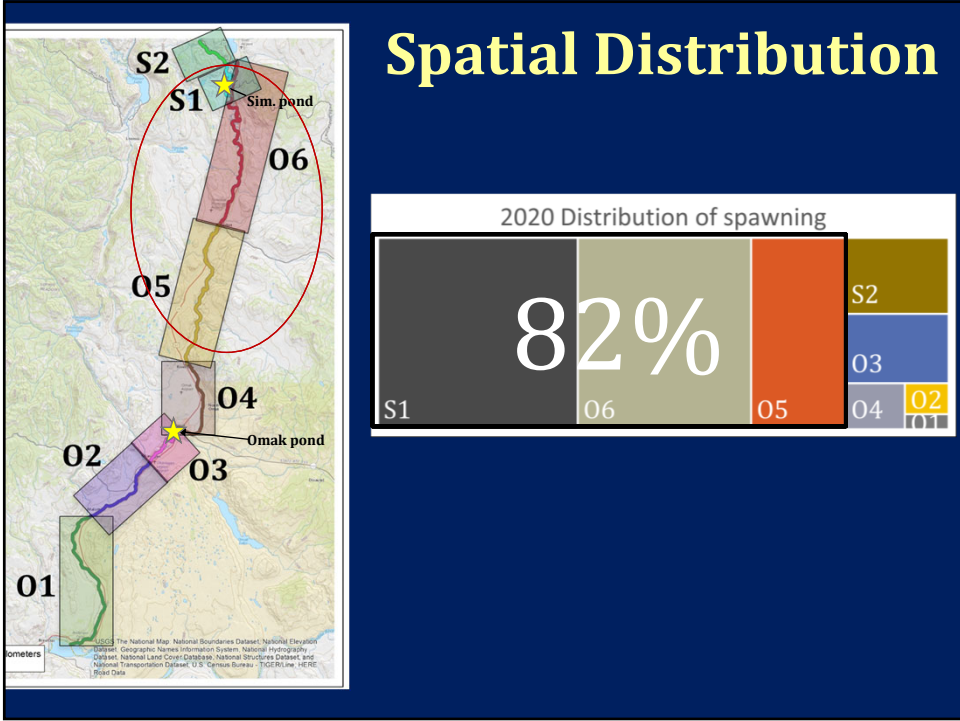


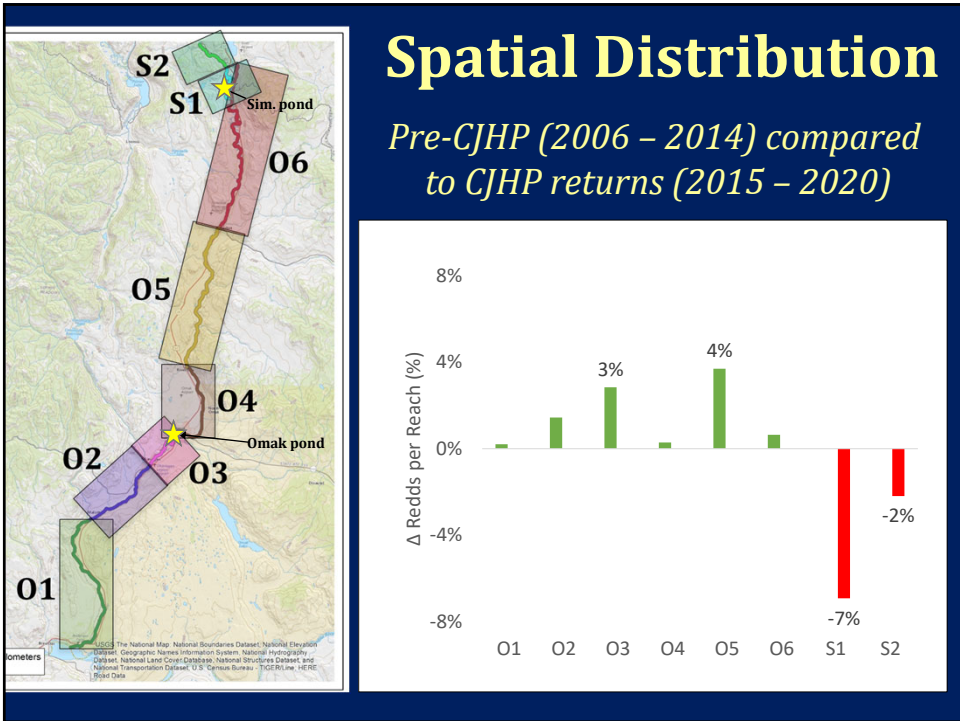
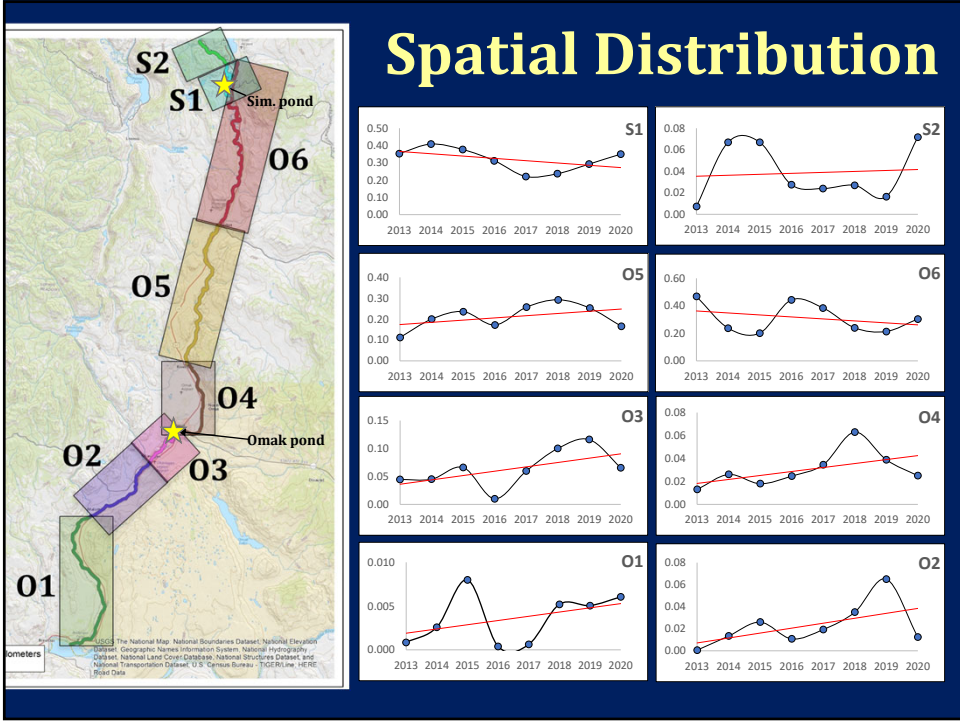
# Annual Escapement

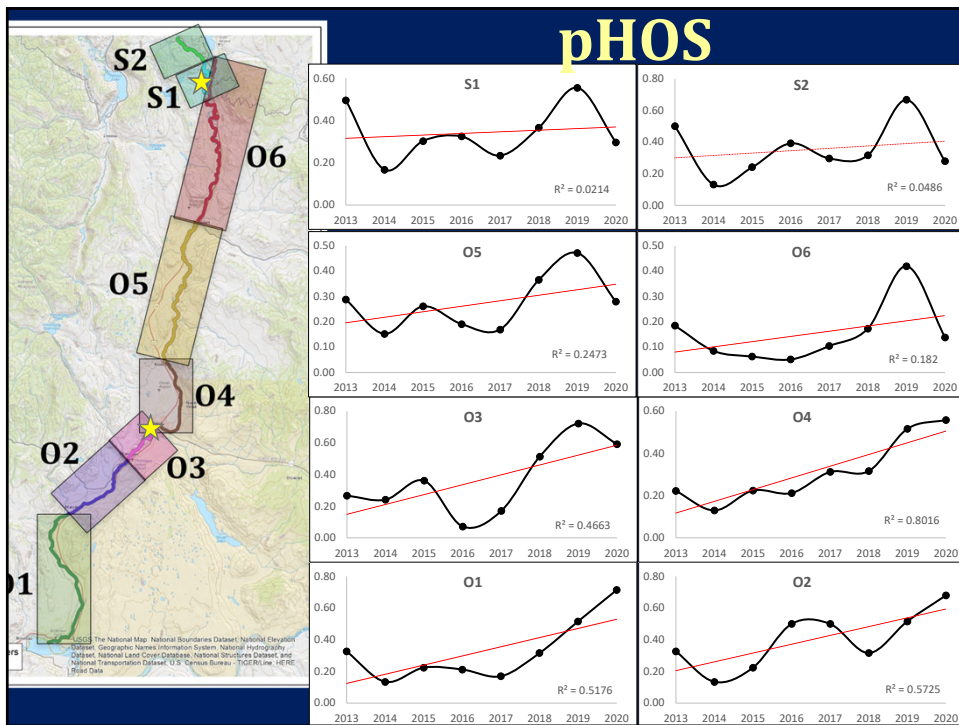
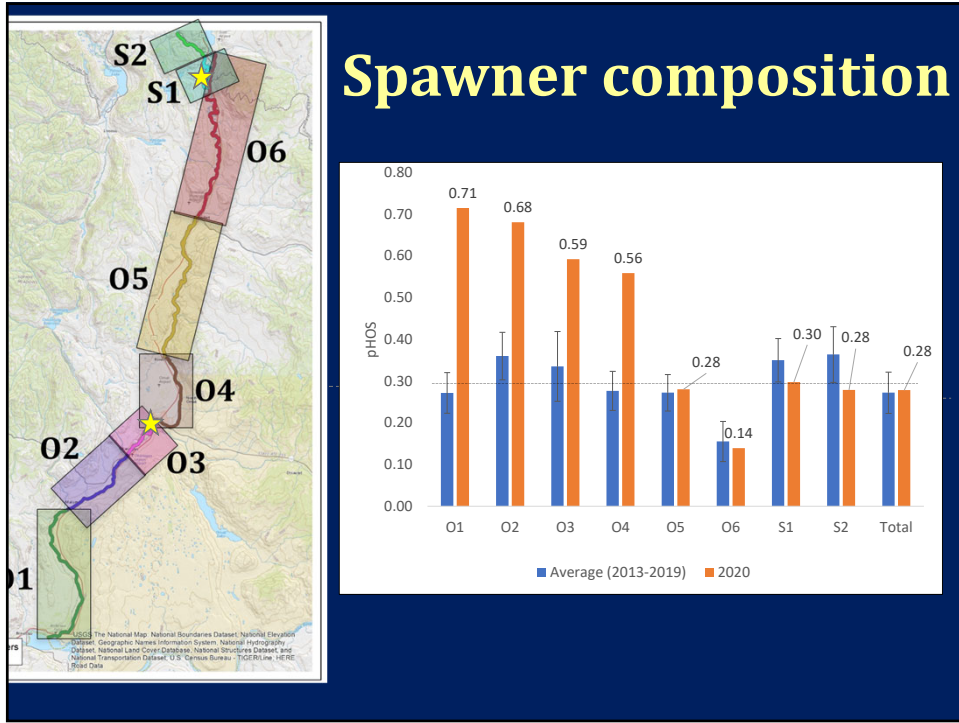


# Spatial Distribution - Spawning

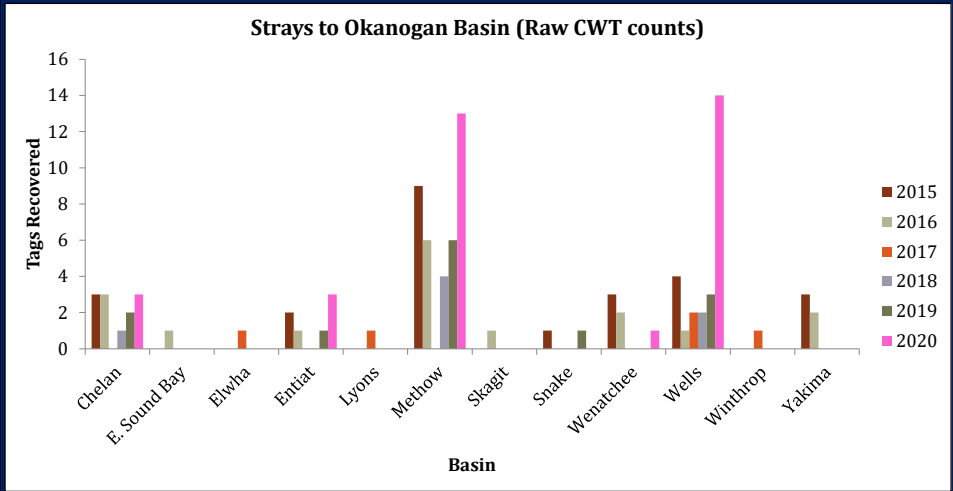






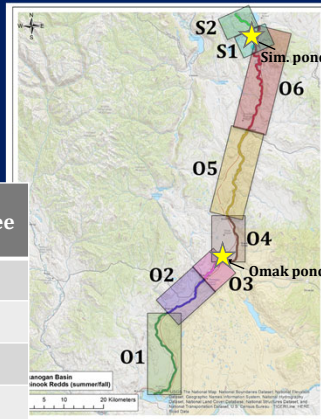


# CWT Recoveries



## Stray rate-into basin (CWT-expansions)

Reach	Chelan	Entiat	Methow	Wells	Wenatchee
01	0	0	0	0	0
02	0	0	6	18	0
03	5	17	11	33	5
04	8	0	0	8	0
05	5	0	24	10	0
06	0	0	10	5	0
S1	0	0	4	4	0
S2	0	0	6	0	0
Grand Total	18	17	61	78	5
<b>Percent of spawning population</b>	<1%	<1%	<1%	<1%	<1%



**Strays  
comprise  
1.7% of  
spawning  
population**

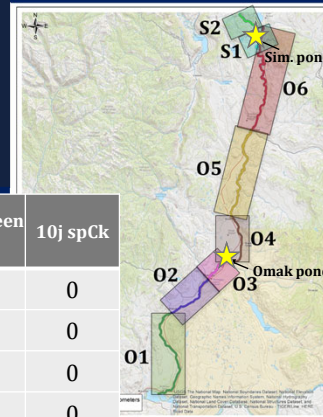


## CJHP strays to out-of-basin

Year	Escapement	Chelan	Cowlitz	Methow	Okanogan	Similkameen	Homing	Straying
2014	241	0	0	0	121	120	100.0%	0.0%
2015	1789	4	0	0	687	1097	99.8%	0.2%
2016	2391	4	0	4	328	2005	99.7%	0.3%
2017	576	11	3	0	370	192	97.5%	2.5%
2018	191	4	0	4	116	68	95.6%	4.4%
2019	1460	12	0	0	846	602	99.2%	0.8%

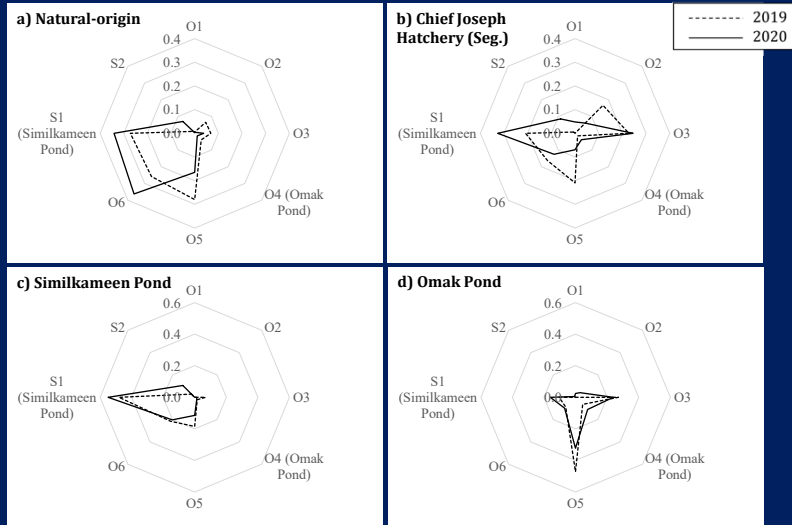
\*RMIS query data from 24 March 2020

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

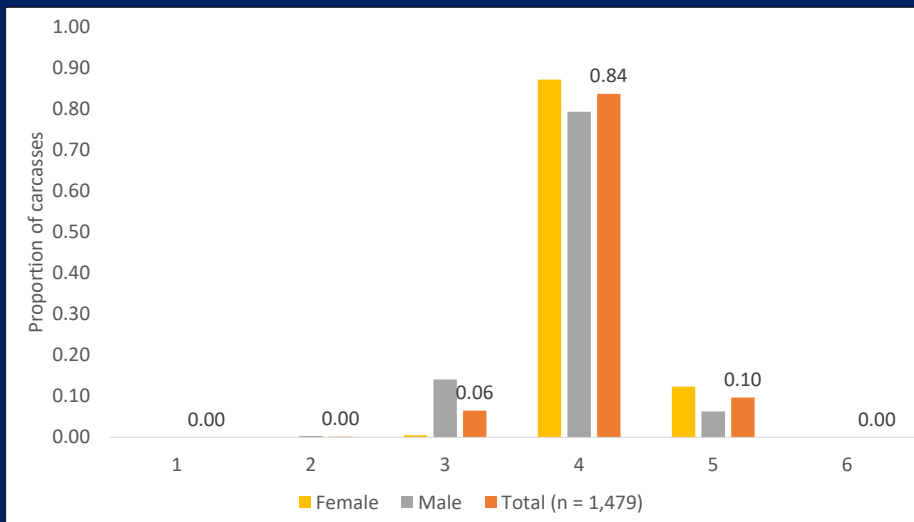


Reach	CJH (Seg.)	Omak Pond	Similkameen Pond	10j spCk
01	28	20	0	0
02	36	34	0	0
03	145	194	17	0
04	23	88	26	0
05	41	262	169	0
06	74	80	296	0
S1	193	130	807	4
S2	51	6	156	0
Grand Total	589	813	1470	4
Percent of spawning population	5.3%	7.4%	13.3%	<1%

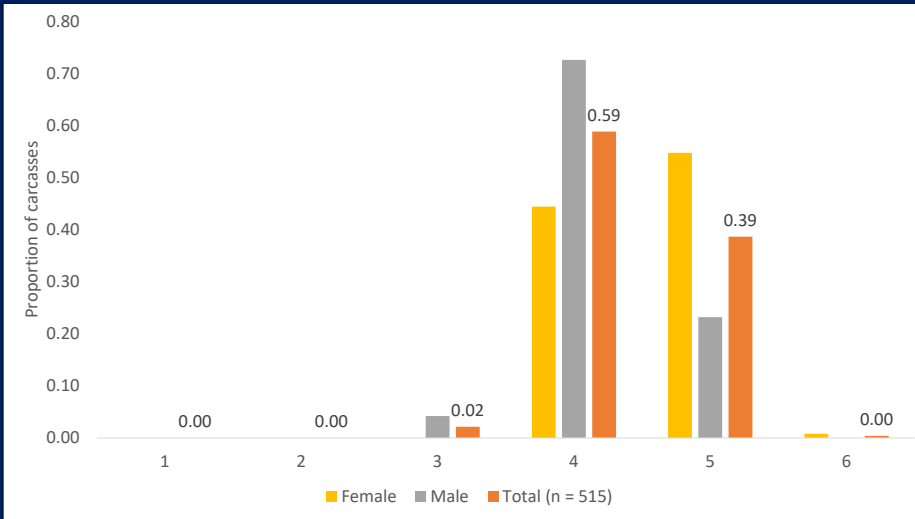
# Spawner Distribution



# Natural-origin spawner Age Structure



## Hatchery-origin spawner Age Structure

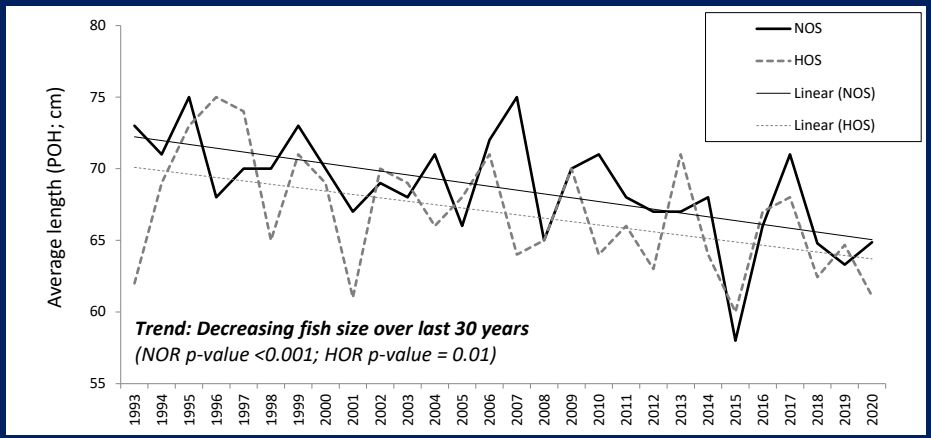
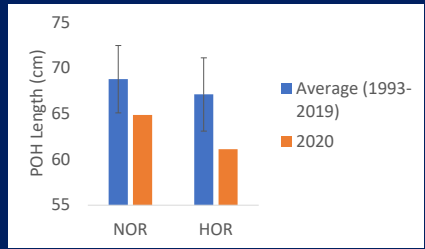


## 2020 Jacks

	Minijacks	Jacks	Adults	Total	Jack Rate
HOS	0	11	504	515	2%
NOS	2	96	1381	1479	7%

*HOS Age Sample Rate 5%*  
*NOS Age Sample Rate 13%*

# Length trend



# Spawner Abundance (USA portion of basin only)

	Redds	Spawners	HOS	NOS	pHOS
<b>Okanogan</b>	2,386	6,371	1,695	4,675	0.27
<b>Similkameen</b>	1,741	4,648	1,366	3,281	0.29
<b>U.S. Total</b>	4,127	11,019	3,061	7,957	0.28*

\*Note: effectively 0.24

# Chinook escapement to Canada

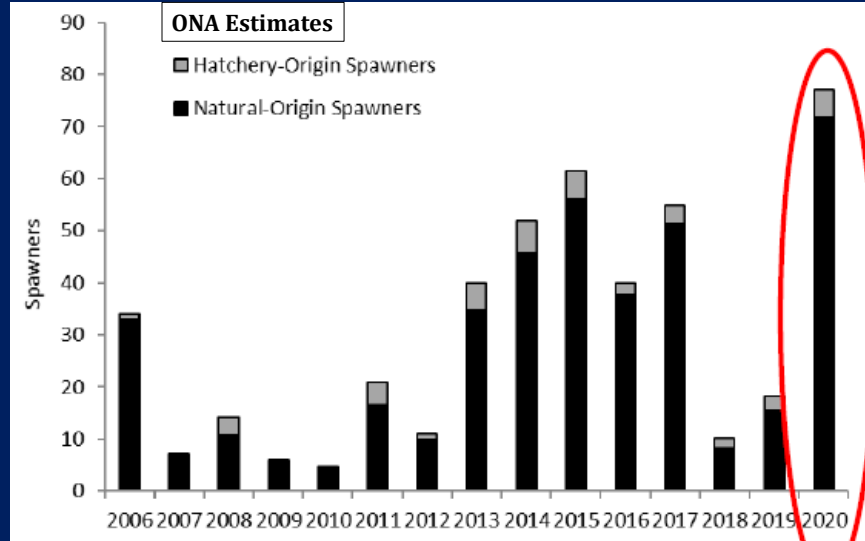
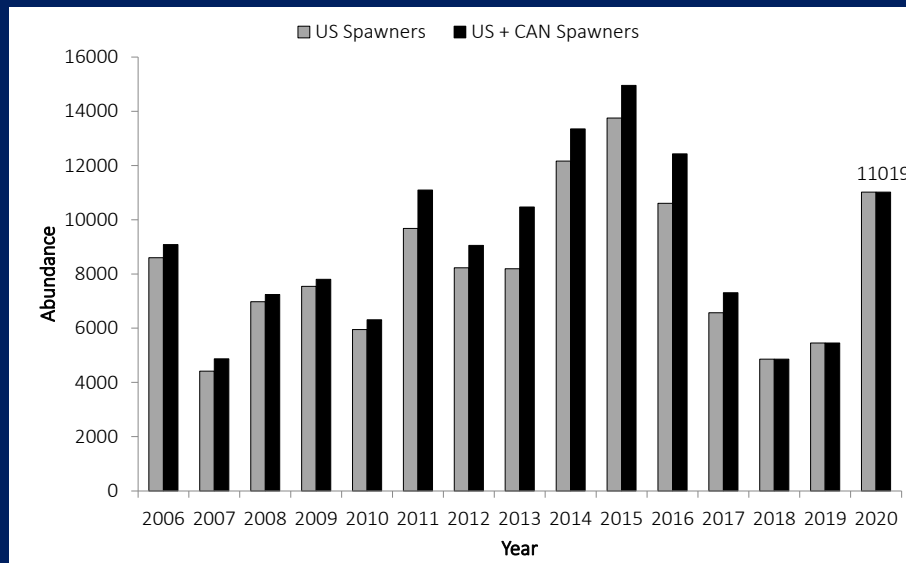


Figure courtesy of Elinor McGrath, ONA

# Spawner Abundance (U.S. + CAN)



# pHOS

