Columbia River Recreational Advisor Group Meeting

January 11, 2023
4:00-6:00p
Virtual

Prepared by: Columbia River Joint Staff

Columbia River Recreational Advisor Group Meeting

Join online: Click here to join the meeting ID: 252 948 499 614 Passcode: YS98sL
Or call in (audio only) +1 564-999-2000 Phone ID: 903 104 615#

4:00p – 6:00p January 11, 2023

Agenda	
• **Welcome and Introductions** o Ground rules o Introduction o Staff roles o Agenda review	(15 minutes)
• **Update on white sturgeon** o 2022 Lower Columbia population status and trends o 2023 Lower Columbia fishery discussion o Zone 6 recreational sturgeon management	(60 minutes)
• **Update on Eulachon smelt** o Population trend o 2023 outlook	(20 minutes)
• **Summary of 2022 Salmon Fisheries**	(10 minutes)
• **Ocean Conditions & Forecasts** o Ocean conditions o 2023 abundance forecasts (spring/summer Chinook and sockeye) o Preliminary 2023 spring season discussions	(10 minutes)
• **Future Meetings** o Compact Hearing (smelt), January 24, 2p o CRRAG February 8 (recreational spring Chinook), Ridgefield/virtual, 4-6p o Compact Hearing (Select Area commercial salmon), February 14, 10a o Joint State Hearing (recreational spring Chinook), February 22, 10a o North of Falcon, March 14 (tentative)	(5 minutes)

Ground rules

- For virtual meetings
    - *6 to mute/unmute
    - Chat will not be monitored or used except for technical assistance
- Focus on the task at hand – *stick to the agenda*
- One person at a time to speak – speak your name to be added to the speaking list
    - Non-advisers will observe meeting and stay on mute – *comments may be permitted at the end of the meeting if time permits*
- Be respectful of others
    - Mute phone or line
    - Be tough on issues and questions, not on people or organizations
    - No personal attacks, insults or threats
    - Listen

    - Speak and act professional – *no offensive, disrespectful, or derogatory language, including profanity*
    - Allow for a balance of speaking time – *limit length and number of times to speak on each topic*
- Be a conduit – *share information*

Columbia River Recreational Advisory Group (2021–2023)

First	Last	City	State
Harry	**Barber**	Washougal	WA
Suzi	**Beer**	Cascade Locks	OR
Pete	**Boone**	Forest Grove	OR
Jim	**Bridwell**	Cathlamet	WA
Nathan	**Grimm**	Pasco	WA
Kyle	**Hawes**	Vancouver	WA
Jeremy	**Hull**	Portland	OR
Rick	**La Griede**	Skamokawa	WA
Robert	**Moxley**	Dundee	OR
Pat	**O'Grady**	Astoria	OR
Bob	**Rees**	Clackamas	OR
Greg	**Short**	Hood River	OR
Kelly	**Short**	Hammond	OR
Butch	**Smith**	Ilwaco	WA
Eric	**Townsend**	Hermiston	OR
Jesse	**Vassar**	Tualatin	OR
Steve	**Watrous**	Battleground	WA
Chris (Clinton)	**Winn**	Kalama	WA
Randy	**Woolsey**	Tigard	OR

Joint State Staff roles

ODFW Staff
Columbia River Management

Tucker Jones (971-673-6067), Clackamas

- Ocean Salmon and Columbia River Program (OSCRP) Manager
  - Supervises OSCRP Program
- Policy level representation in various inter-jurisdictional forums
- OR's Commission/Director representative for Compact/Joint State hearings

Jeff Whisler (971-673-6024), Clackamas

- Columbia River Fisheries Manager
  - Design, recommend, and implement fisheries in Columbia/lower Willamette rivers
- Supervises ODFW Columbia River Management program/staff
- Lead technical staff for Compact/Joint State hearings
- *U.S. v OR* Technical Advisory Committee (TAC) representative

Jimmy Watts (rotation) (971-673-6054), Clackamas

- Columbia River Assistant Fisheries Manager
  - Assist with design/implementation fisheries in Columbia/lower Willamette rivers
- Primary technical analyst
- Technical staff for Compact/Joint State hearings
- TAC representative

Rob Reagan (971-673-6017), Clackamas

- Columbia and Willamette River Fisheries Project Leader
- Responsible for coordinating sampling of fisheries in lower Columbia/Willamette rivers
- Primary contact for Willamette Falls fishway/counts

Cameron Duff (971-673-6057), Clackamas

- Select Area /Estuary Fisheries Project Leader
- Primary contact for Select Area commercial fisheries
  - Responsible for implementing and evaluating Select Area fisheries
- Responsible for coordinating sampling of estuary and commercial fisheries in lower Columbia River

WDFW Staff
Columbia River Management Unit

- Columbia River cross-regional fisheries management
- FCRPS hydro-system

Charlene Hurst – Columbia River Management Unit Lead (360-605-5247), Ridgefield

- Columbia River Policy lead, supervises Ryan, Laura, Mark, Eric Winther (northern pikeminnow), Charlie Morrill (hydro)

- WA's Commission/Director representative for Compact/Joint State hearings
- *U.S. v OR* policy representative

Ryan Lothrop – Columbia River Fisheries Manager (360-701-3602), Olympia
- Columbia River fishery lead, supervise Quinten, Beth, and policy analyst position
- Fishery coordinator with eastside regions, ODFW, and tribes
- TAC representative and lead WA technical staff for Compact/Joint State hearings

Vacant – Columbia River Fishery Policy Analyst, TBD
- Technical support for CRMU fisheries
- TAC representative (WA lead)

Quinten Daugherty – Columbia River Fishery Management Biologist (360-844-0205), Ridgefield
- Technical analyst; design, recommend, and implement fisheries
- Technical staff for Compact/Joint State hearings and TAC representative

Beth Deacy – Columbia River Fishery Sampling Coordinator (360-600-7069), Ridgefield
- Coordinates fishery sampling and test fisheries, supervise Mack Hunter (field biologist) and Ken Keller (Pacific States Marine Fisheries Commission supervisor biologist)

Laura Heironimus – Sturgeon, Smelt, Lamprey lead (360-719-0677), Ridgefield
- Supervises sturgeon, smelt, and lamprey research/monitoring programs
- Lead on white sturgeon and eulachon conservation and management
- Provides support for Compact/Joint State Hearings
- Supervises Matt Sturza (sturgeon/smelt biologist) and Monica Blanchard (lamprey biologist)

Mark Sorel – Columbia River Fishery Analyst (607-351-7352), Ridgefield
- Provides analytical/statistical support
- TAC representative

Lower Columbia River White Sturgeon

Abundance and CPUE Trends

Table 1. Estimated and projected abundance of 38–54 inch FL (96–137 cm) white sturgeon in the LCR from 2008–2021 based on mark-recapture surveys. Historic method is the number of fish present at the start of July (2008–2009) or May (2010–2012), while the setline method is the number of fish present at the start of the year. Preliminary estimates are italicized.

Year	Historic method estimate	Setline method			Harvest guideline
		Estimate (95% C.I.)		Projection [1]	
2008	101,200	--		--	40,000
2009	95,000	--		--	40,000
2010	65,300	100,300		--	24,000
2011	72,800	80,600		77,000	17,000
2012	83,400	72,700		65,000	10,400
2013	--	113,900		74,300	10,105
2014	--	131,000	(75,500 – 186,480)	131,700	--
2015	--	143,900	(85,700 – 202,100)	138,200	--
2016	--	224,000	(118,300 – 329,600)	147,100	--
2017	--	199,800	(69,900 – 329,700)	237,900	6,235
2018	--	162,200	(93,400 – 230,950)	198,300	6,160
2019	--	168,200	(100,100-236,300)	164,100	6,160
2020 [2]	--	199,500	(40,100-358,800)	148,800	5,720
2021	--	110,100	(65,719-154,548)	206,100	6,160
2022		78,400	(40,411-116,368)	104,100	4,000
2023				76,300	TBD

[1] Projected abundance is based on the previous year's setline estimate. Projections do not include harvest.

[2] Due to sampling issue related to COVID-19 pandemic, the sample size was lower than standards and therefore the estimate of 199,500 during 2020 has considerable uncertainty.

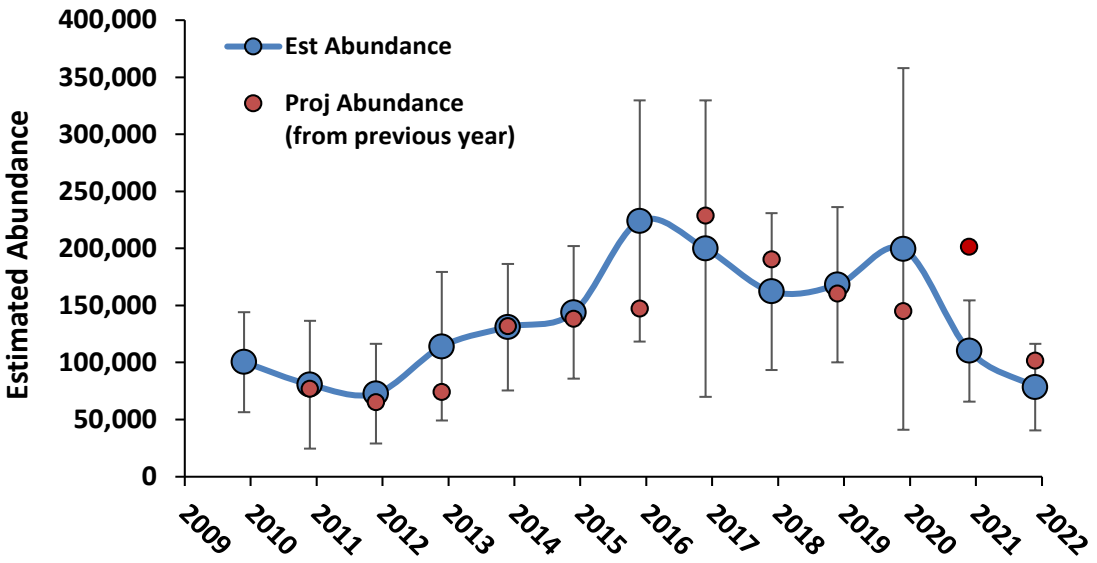


Figure 1. Estimated and projected abundance for 96–137 cm FL White Sturgeon from the LCR, 2010 – 2022. Error bars represent 95% CIs for the estimated abundance.

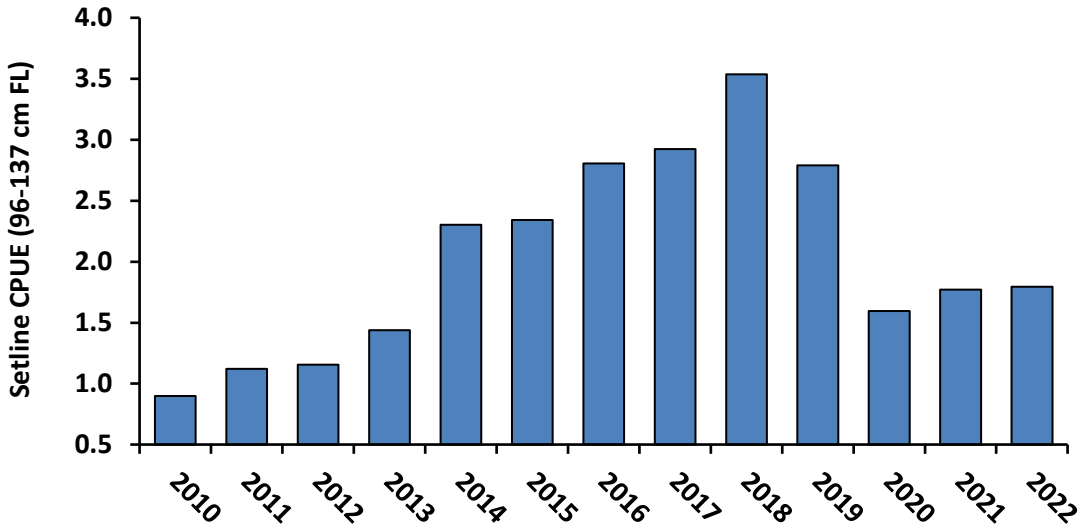


Figure 2. CPUE of 96 – 137 cm FL White Sturgeon caught with setlines in the LCR, 2010 – 2022.

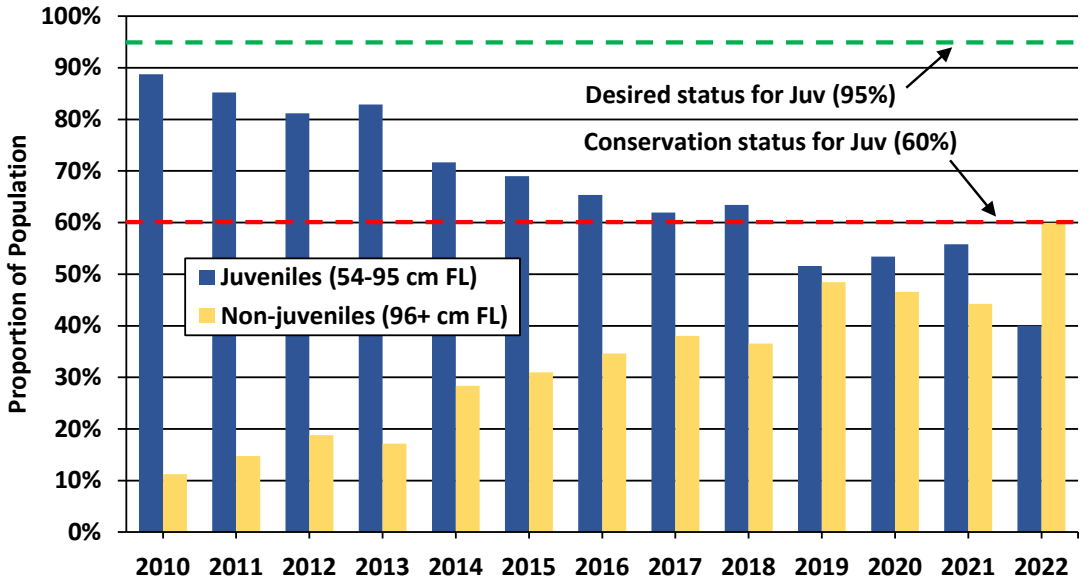


Figure 3. Lower Columbia River White Sturgeon population composition, 2010 – 2022.

Adult Abundance and CPUE Trends

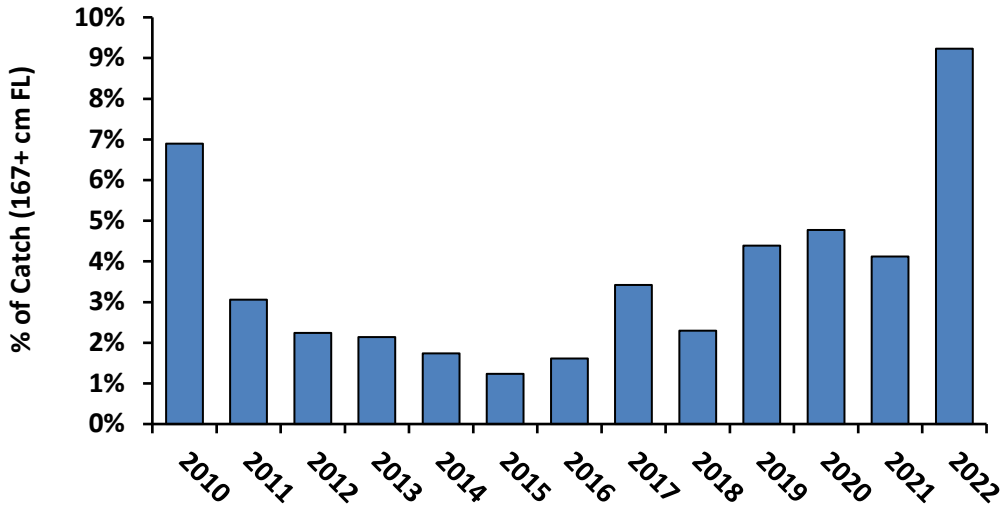


Figure 4. Percent of LCR setline catch comprised of White Sturgeon ≥ 167 cm FL, 2010 – 2022.

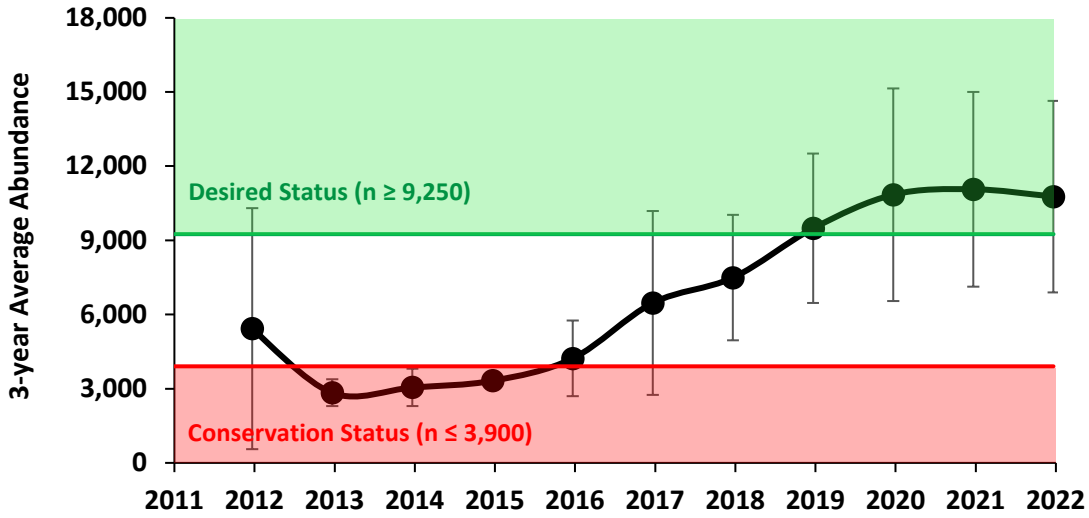


Figure 5. Three-year running average estimated abundance for White Sturgeon ≥ 167 cm FL from the LCR, 2012 – 2022. Less than three years of data were available prior to 2012, therefore no averages were calculated. Error bars represent one standard deviation.

Length Frequency Trend

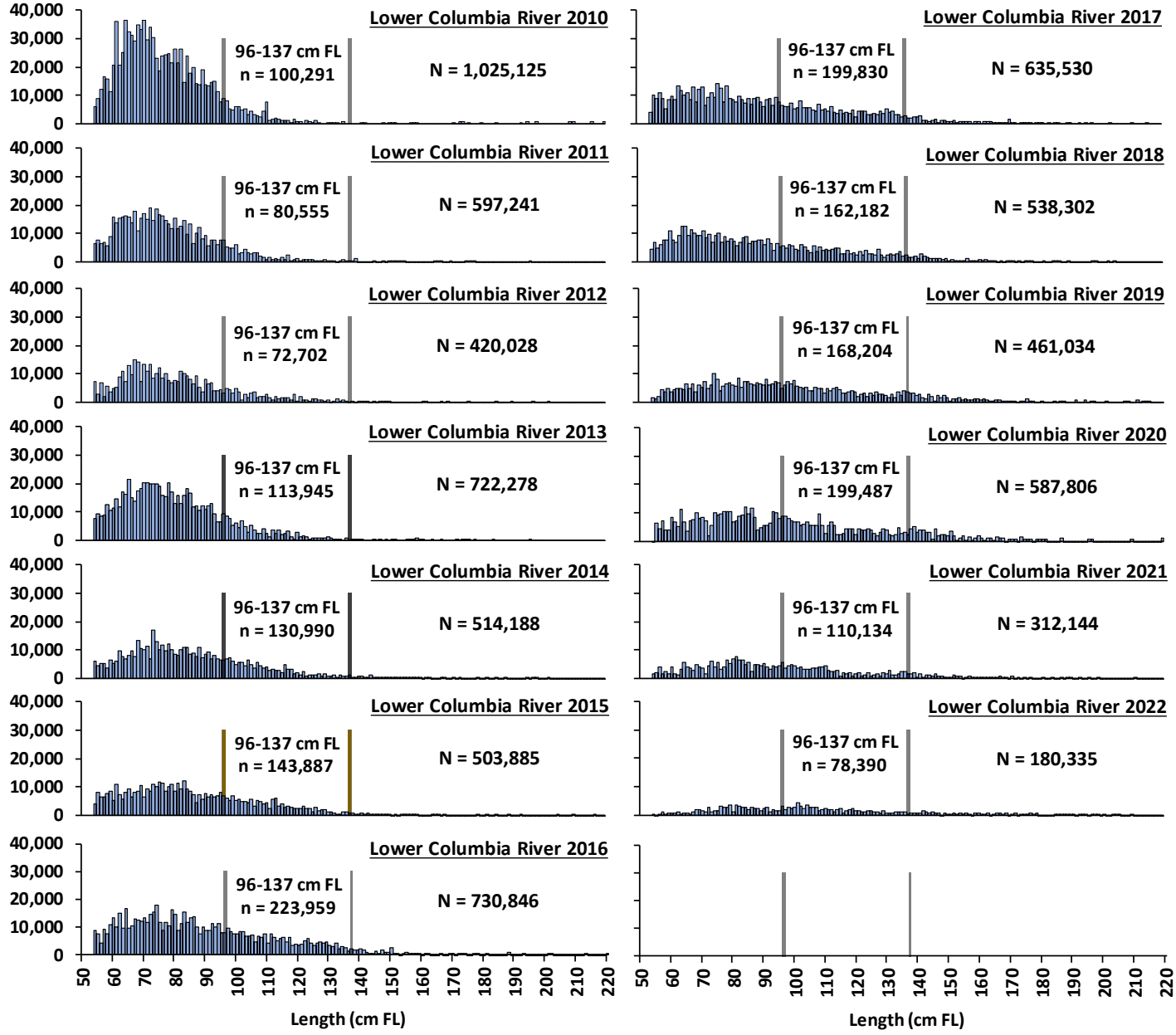


Figure 6. Estimated abundance by 1-cm length increments of White Sturgeon ≥ 54 cm FL from the LCR, 2010 – 2022.

Legal-size Abundance Forecasts

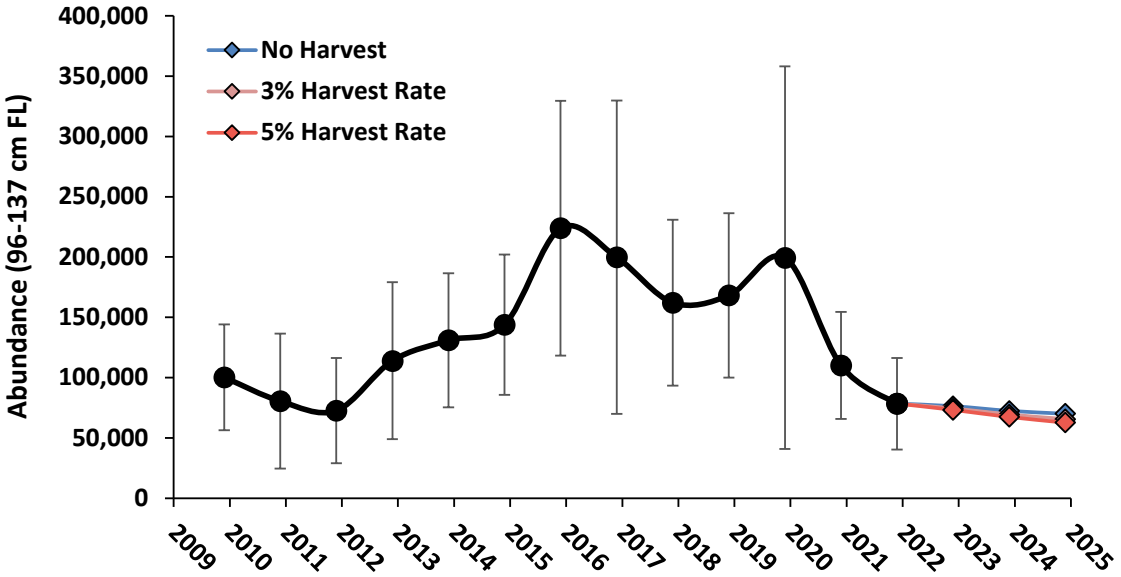


Figure 8. Projected abundance of White Sturgeon 96 – 137 cm FL in the LCR under different annual harvest rates.

Sub-yearling (Age-0) Production

Table 2. Annual recruitment index (E_p) and catch-per-net (CPN) for age-0 White Sturgeon from the Willamette River (Will R) and the lower Columbia River (LCR), 2004 – 2022.

Year	Will R E_p	Will R CPN	LCR E_p	LCR CPN
2004			0.44	1.29
2005			0.49	1.74
2006			0.52	1.88
2007[1]			--	--
2008			0.45	1.23
2009			0.78	5.66
2010	0.24	0.43	0.18	0.19
2011	0.06	0.06	0.34	0.58
2012	0.22	0.25	0.35	0.77
2013[2]	--	--	0.12	0.21
2014	0.38	1.38	0.31	0.56
2015	0.26	0.58	0.05	0.06
2016	0.50	0.75	0.14	0.20
2017	0.50	1.75	0.58	1.64
2018	0.83	3.96	0.27	0.43
2019	0.58	1.13	0.19	0.30
2020[1]	--	--	--	--
2021	0.17	0.17	0.02	0.02
2022	0.29	0.42	0.18	0.20

[1] No age-0 sampling in either the lower Columbia or Willamette rivers.
[2] No age-0 sampling in the Willamette River.

2023 Fisheries:

The states have met the goal of improving the adult portion of the population, thereby improving recruitment potential in the population. However, the low CPUE data associated with the 2022 YOY cohort is inconsistent with the improved environmental conditions observed during the Spring 2022 spawning window, indicating additional constraints affecting the production of juveniles in the population. The prolonged recruitment shortfall has reduced the abundance of legal-size fish, impacting our ability to prosecute meaningful retention fisheries.

Appendix
Predation and Harvest Data

Appendix Table 1. Estimated consumption of white sturgeon by pinnipeds at the Bonneville Dam tailrace, 2005–2021. The spring sampling period represents observations collected in January through July, whereas the fall sampling period represents observations collected in August through December. Data from U.S. Army Corps of Engineers observation program. (http://pweb.crohms.org/tmt/documents/FPOM/2010/Task%20Groups/Task%20Group%20Pinnipeds/).

	Spring Sampling Period [2]			Fall-Winter Sampling Period [3]
Year	Total hours observed	Observed sturgeon catch	Adjusted sturgeon catch estimate	Adjusted sturgeon catch estimate (95% CI)
2005	1,109	1	--	
2006	3,650	265	413	
2007	4,433	360	664	
2008	5,131	606	1,139	
2009	3,455	758	1,710	
2010	3,609	1,100	2,172	
2011	3,315	1,353	3,003	
2012	3,404	1,342	2,498	
2013	3,247	314	635	
2014	2,947	79	146	
2015	2,995	24	44	
2016	1,974	30	90	
2017	1,142	6	24	238 (183-281)
2018	1,410	46	148	359 (301-416)
2019	836	22	187	762 (583-915)
2020 [4]	331	9	57	589 (433-744)
2021	132	1	--	--

[1]*Data from U.S. Army Corps of Engineers observation program (http://pweb.crohms.org/tmt/documents/FPOM/2010/Task%20Groups/Task%20Group%20Pinnipeds/)*

[2]*Spring sampling period: January-July.*

[3]*Fall-Winter sampling period: August-December*

[4]*Data for spring 2020 limited to April 4 through May 20 due to the COVID-19 pandemic. Data for fall 2020 and spring 2021 not currently available.*

Appendix Table 2. Annual recreational white sturgeon catch and harvest guidelines in the lower Columbia River, 1994-2022.

	Below Wauna [1]		Above Wauna		Combined	
Year	Catch	Guideline [2]	Catch	Guideline [3]	Catch	Guideline
1994	15,578	N/A	17,893	N/A	33,471	
1995	29,714	N/A	15,423	N/A	45,137	
1996	27,694	N/A	15,068	N/A	42,762	
1997	24,511	N/A	13,646	N/A	38,157	53,840
1998	30,303	N/A	11,293	N/A	41,596	53,840
1999	29,238	N/A	10,561	N/A	39,799	40,000
2000	24,267	N/A	16,238	N/A	40,505	40,000
2001	21,619	N/A	19,597	N/A	41,216	39,500
2002	26,234	N/A	12,045	N/A	38,279	38,300
2003	18,367	19,200	13,565	12,800	31,932	32,000
2004	15,050	16,000	10,519	12,800	25,569	28,800
2005	17,911	17,783	11,891	11,560	29,802	29,343
2006	15,726	16,000	8,545	12,800	24,271	28,800
2007	19,131	16,274	10,675	13,852	29,806	30,126
2008	13,614	13,143	7,959	12,387	21,573	25,530
2009	13,109	15,529	4,599	11,430	17,708	26,959
2010	6,491	9,600	4,831	4,835	11,322	14,435
2011	6,117	6,800	2,908	3,410	9,025	10,210
2012	4,466	4,160	1,859	2,080	6,325	6,240
2013	4,559	4,042	1,942	2,021	6,501	6,063
2014 [4]	0	0	0	0	0	0
2015 [4]	0	0	0	0	0	0
2016 [4]	0	0	0	0	0	0
2017	3,235	3,000	430	1,245	3,665	4,245
2018 [5]	2,412	2,960	1,050	1,230	3,462	4,190
2019 [5]	2,838	2,960	735	1,230	3,573	4,190
2020 [5,6]	0	2,750	857	1,140	857	3,890
2021 [5]	2,549	2,960	885	1,230	3,434	4,190
2022 [5,7]	1,292	1,920	891	800	2,183	2,720

[1] *Recreational catch estimates for 1993-2002 are above and below the western tip of Puget Island (RM 38).*

[2] *The switch to a 45-inch min. (TL) size limit in 2004 required a 17% reduction in the base guideline.*

[3] *Actual in-season guidelines were different than represented here. Beginning in 2010, the guideline for the area above Wauna does not include the Willamette guideline.*

[4] *No sturgeon retention allowed during 2014-2016.*

[5] *The Cowlitz River was opened with the Above Wauna fishery in 2018–2022.*

[6] *No estuary sturgeon retention allowed during 2020.*

[7] *Preliminary.*

Appendix Table 2. Annual recreational white sturgeon catch and harvest guidelines in the lower Willamette River, 2004-2022.

Year	Catch [1]	Catch in Excess of Baseline [2]	Catch in Excess of Baseline [3]	Guideline [3]	% of Guideline
2004	4,099	1,225	2,874	Na	
2005	2,327	1,225	1,102	Na	
2006	3,348	1,225	2,123	Na	
2007	6,555	1,225	5,330	Na	
2008	9,148	1,225	7,923	Na	
2009	7,346	1,225	6,121	Na	
2010	3,529	735	2,794	2,865	98%
2011	2,690	520	2,170	2,030	107%
2012	1,535	520	1,015	1,248	81%
2013	1,410	520	890	1,213	73%
2014 [4]	0	0	0	0	NA
2015 [4]	0	0	0	0	NA
2016 [4]	0	0	0	0	NA
2017 [5]	0	0	0	745	0%
2018 [5]	0	0	0	740	0%
2019 [5]	0	0	0	740	0%
2020	167	0	0	690	24%
2021	87	0	0	740	12%
2022	0	0	0	480	0%

[1] *Harvest estimates revised November 2011 based on updated punch card and existing creel information.*

[2] *Baseline harvest levels for the lower Willamette River were based on average harvest during 1986-1996 (1,225 fish). The lower Willamette River baseline decreased to 735 fish in 2010 and 520 fish in 2011 consistent with*

[3] *During 2003-2009, harvest in excess of the baseline was applied to the above Wauna recreational harvest guideline. Beginning in 2010, a separate harvest guideline was established for the lower Willamette River.*

[4] *No sturgeon retention allowed during 2014-2016.*

[5] *No retention fisheries occurred in 2017-2019 or 2022.*

Appendix Table 3. Annual commercial white sturgeon landings and harvest guidelines in the lower Columbia River, 2000-2022.

	Mainstem							Select Area				
Year	Winter Sturgeon [1]	Winter Salmon	Summer	Early August	Late August	Late Fall	Total	Winter/ Spring/ Summer	Fall	Total	Grand Total	Guideline
2000	2,260			2,490	300	5,130	10,180	540	160	700	10,880	10,000
2001	3,060			4,720	1,020	0	8,800	490	20	510	9,310	9,100
2002	2,720			1,340	380	4,200	8,640	650	330	980	9,620	9,800
2003	1,490	27		2,170	410	3,430	7,527	250	170	420	7,947	8,000
2004	1,696	174	9	1,550	917	3,219	7,565	184	117	301	7,866	8,000
2005	473	70	1,369	1,129	965	3,793	7,799	279	74	353	8,152	8,200
2006	288	1,651	544	1,548	363	3,492	7,886	317	109	426	8,312	8,000
2007	1,424	47	414	2,646	91	2,734	7,356	257	148	405	7,761	7,850
2008	869	17	523	2,706	103	3,170	7,388	337	134	471	7,859	7,927
2009	1,697	21	624	2,213	756	2,001	7,312	311	114	425	7,737	8,000
2010	518	28	289	1,578	297	1,348	4,058	211	116	327	4,385	4,800
2011	50	125	504	967	353	1,187	3,186	201	0	201	3,387	3,400
2012	40	14	281	585	409	368	1,697	225	0	225	1,922	2,080
2013	15	274	326	0	719	324	1,658	254	100	354	2,012	2,021
2014 [2]	0	0	0	0	0	0	0	0	0	0	0	0
2015 [2]	0	0	0	0	0	0	0	0	0	0	0	0
2016 [2]	0	0	0	0	0	0	0	0	0	0	0	0
2017	0	0	0	0	485	239	724	266	237	503	1,227	1,245
2018	0	0	0	0	413	0	413	296	117	413	826	1,230
2019	0	0	0	0	509	0	509	487	212	699	1,208	1,230
2020	0	0	0	74	332	161	567	547	0	547	1,114	1,140
2021	0	0	0	27	270	98	395	428	371	799	1,194	1,230
2022	0	0	0	7	177	85	269	260	168	428	697	800

[1] *Prior to 2003, values reflect all winter fisheries.*

[2] *No sturgeon retention allowed during 2014-2016.*

Zone 6 Recreational Sturgeon Management

Stock Status

- The states and tribes work cooperatively to complete White Sturgeon stock assessments, which are rotated among the Zone 6 reservoirs on a three-year annual basis. Young-of-year surveys are completed annually in all three reservoirs.
- The most recent stock assessment information available for each pool is summarized below:
    - Bonneville Pool—The 2021 survey indicated a 22% increase in the abundance of legal-sized sturgeon (38–54 inch fork length) and an 18% increase in the overall 38–65 inch fork length population. Young-of-year surveys indicate measurable recruitment on an annual basis over the past ten years, except 2015.
    - The Dalles Pool—The 2020 survey indicated a 54% increase in the abundance of legal-sized sturgeon (43–54 inch fork length), but a 21% decline in the overall 38–65 inch fork length population. Young-of-year surveys during the past 5-year period indicate generally low recruitment. Since 2012, measurable recruitment has been detected in seven out of 10 years.
    - John Day Pool—The 2019 survey indicated a 24% increase in the abundance of legal-sized sturgeon (43–54 inch fork length) and a 20% increase in the overall 38–65 inch fork length population. Since 2012, measurable recruitment has only been detected in two years (2012 and 2019). The spatial coverage of the spawning sanctuary was extended in 2020 to further protect reproductive adults and improve future recruitment. The results for the 2022 stock assessment in John Day Pool will be available in January 2023.

Management Guidelines

Table 1. Current white sturgeon harvest guidelines in Bonneville, The Dalles, and John Day reservoirs. Updated guidelines for John Day Pool will be considered in January 2023.

Pool	Recreational Guideline	Treaty Guideline	Total Guideline
Bonneville	675	675	1,350
The Dalles	190	560	750
John Day	105	175	280

- Since 2012, total harvest guidelines have generally decreased in all three reservoirs based on the abundance of legal-size fish available for harvest. There is no harvest guideline for the treaty subsistence catch of sturgeon, but these catches are accounted for and used in population assessments. Subsistence harvest typically occurs in association with fisheries targeting other species and is generally low.

Past Recreational Fisheries

- Over the past 5-year period (2018–2022), total harvest guidelines have increased in Bonneville Pool and The Dalles Pool, but have remained constant in John Day Pool.

- Bonneville Pool—Season length has averaged 42 days during the previous 5-year period but has been highly variable with a low of 7 days and a high of 102 days (Table 2).

Table 2. A summary of recreational sturgeon retention periods and harvest in Bonneville Pool.

Year	Retention Period(s)	Total Retention Days	Total Guideline	Recreational Harvest	Proportion of Guideline Harvested	Average Fish Kept Per Day
2018	1/1–2/3 & 6/15	35	325	452	139%	13
2019	1/1–4/12	102	500	448	90%	4
2020	1/1–2/13	44	500	431	86%	10
2021	1/1–1/7	7	500	655	131%	94
2022	1/1–1/19 & 3/9	20	675	622	92%	31

- The Dalles Pool—Season length has averaged 35 days during the previous 5-year period but has been the least consistent of the three pools (Table 3).

Table 3. A summary of recreational sturgeon retention periods and harvest in The Dalles Pool.

Year	Retention Period(s)	Total Retention Days	Total Guideline	Recreational Harvest	Proportion of Guideline Harvested	Average Fish Kept Per Day
2018	1/1–3/24 & 6/15	84	135	180	133%	2
2019	1/1–1/6	6	135	79	59%	13
2020	1/1–2/17	48	135	205	152%	4
2021	1/1–1/4	4	190	235	124%	59
2022	1/1–3/21 (M/W/Sa Only)	35	190	204	107%	6

- John Day Pool—Season length has averaged 70 days over the past 5-year period and has been both longer and more consistent relative to season lengths in Bonneville Pool and The Dalles Pool (Table 4).

Table 4. A summary of recreational sturgeon retention periods and harvest in John Day Pool.

Year	Retention Period(s)	Total Retention Days	Total Guideline	Recreational Harvest	Proportion of Guideline Harvested	Average Fish Kept Per Day
2018	1/1–2/11	42	105	81	77%	1.9
2019	1/1–4/2	92	105	129	123%	1.4
2020	1/1–3/9	69	105	102	97%	1.5
2021	1/1–3/18	77	105	98	93%	1.3
2022	1/1–3/9	68	105	94	90%	1.4

- Catch rates and season length have been highly variable in Bonneville Pool and The Dalles Pool due to a culmination of several factors, including variable water temperatures, weather, and on the water conditions. In contrast, catches in the John Day Pool tend to accrue more slowly, resulting in relatively consistent season lengths.
- In all pools, catch rates are often low at the start of the year and then can rapidly increase within a very short window, such as a day or weekend. The states' catch monitoring program provides catch estimates in a timely manner. However, some lead time is necessary to take appropriate management action and provide notice to the public.

2023 Recreational Fisheries

- John Day pool is open under permanent rules (opened January 1 for seven days per week) due to the lower risk for exceeding the guideline within a short timeframe.
- Due to the track record of short retention seasons and harvest in excess of the guideline, Bonneville and The Dalles pool fisheries were modified during the Joint State Hearing on November 9, 2022. The season set in Bonneville Pool includes open retention on Sunday January 1, and Mondays, Wednesdays, Saturdays from January 2 through March 22. Similarly, the season set in The Dalles Pool includes open retention on Sunday January 1, and Mondays, Wednesdays, Saturdays from January 2 through March 4.
    - Use of the days-per-week approach is expected to aide in increasing the length of the season and provide staff the opportunity to review fishery performance on a weekly basis.
    - Daily effort is expected to be higher on holidays and weekends than weekdays.
- The duration of the retention seasons will be adjusted if catch rates and effort are much different than projected, based on pool-specific catch guidelines. The recommended days-per-week approach will allow staff sufficient time to produce and monitor daily harvest estimates and recommend action necessary to stay within the harvest guidelines. If harvest is lower than projected, additional retention days may be considered during future hearings.

Table 3. Current recreational sturgeon harvest summary in Zone 6 reservoirs (January 1-9, 2023).

Pool	Estimated Harvest	% of guideline	Guideline
Bonneville	554	82%	675
The Dalles	61	32%	190
John Day	33	31%	105

- Permanent regulations allow for catch-and-release sturgeon angling all year, except angling for sturgeon is prohibited May 1 through August 31 within the sanctuary areas designated downstream of each of the dam tailraces. Daily and annual sturgeon bag limits apply to all fisheries statewide.
- Consideration to modify permanent rules for future years requires a sufficient amount of time, communication, and coordination with staff and the public. Therefore, it is expected that the 2024 seasons will still be set by the current permanent rules and could be modified by the Compact/Joint State Hearing.

Columbia River Eulachon Smelt

Stock Status

- In the last decade, the adult run size has ranged from a low of 370,000 pounds in 2018 to 18,300,000 pounds in 2022 (Figure 1).
- In 2022, a complete field season was conducted with sampling occurring over 21 weeks from January 13 through May 24. The spawning-stock biomass (SSB) for 2023 is estimated at 18,300,000 pounds, which is the highest SSB recorded using the current SSB sampling methodology.

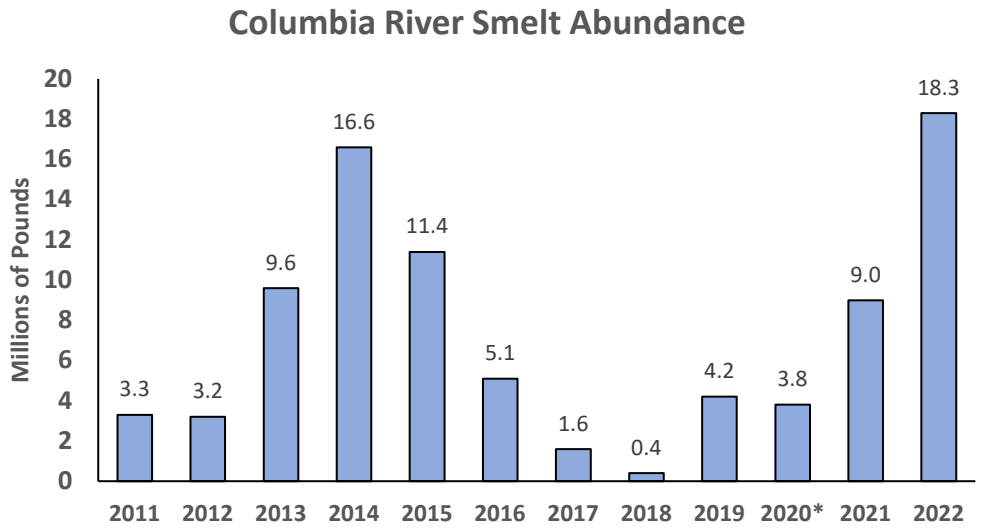


Figure 1. Columbia River Eulachon abundance, in millions of pounds, by year. The 2020 run size estimate is unreliable due to an incomplete sampling season.

Abundance indicators for 2023

- A strong 2022 return of Eulachon adults from brood years 2018 and 2019 may indicate another strong return from these cohorts in 2023.
- Improved in-river environmental conditions during outmigration for the 2018 (Age-5), 2019 (Age-4), and 2020 (Age-3) cohorts likely improved survival to the ocean:
    - January through March, river temperatures were cool to warm and the flow quick, which may have led to normal or late yolk sac absorption.
    - March through June, estuary water particle residence time was shorter than average, which might lead to an early to normal ocean arrival time.
    - April through June, the volume of the Columbia River plume was large, which may have improved conditions for larvae entering the ocean environment.
- Conversely warm water temperatures during the 2021 larval outflow period could have negatively impacted early survival of this cohort.
- Ocean Indices such as PDO, SOI, and ONI improved from 2020 through 2022 to the most productive values in over a decade; however, marine upwelling in 2022 was extremely weak and combined with warming sea surface temperatures indicates some uncertainty for marine survival through the last year.

- The overall copepod richness anomaly has improved from 2020 through 2022, although the biomass of nutritionally richer northern species of copepod began to decline in 2022.

Table 1. Summary of factors to forecast the Columbia River Eulachon adult return in 2022.

Brood Year	Age at Spawn	Cohort Survival Factors		Forecasted Contribution
		Freshwater Phase	Ocean Phase	
2018	5	+	+	+
2019	4	+	+	+
2020	3	0	+	+
2021	2	-	+	0

2022-23 Observations

- Sightings of smelt eggs/larvae were reported in the Cowlitz in late-November and December.
- One observation of an adult Eulachon in Kennedy Creek, in South Puget Sound on December 21.
- Pinniped activity observed in the lower Columbia and Cowlitz rivers in early January.

Use of the commercial fishery data

- The biological data collected during the commercial fishery allow for investigation of the structure of the annual Eulachon run into the Columbia River including run distribution, run strength, weight distribution, age composition, sex ratio, stage of maturity, and fecundity.
- Fishery assessment provides data to evaluate the utility of SSB calculations and provides context to historical landings data. For example, there appears to be a correlation between the pounds per landing data provided by the mainstem commercial fishery and the data from the larval density survey (Figure 2).

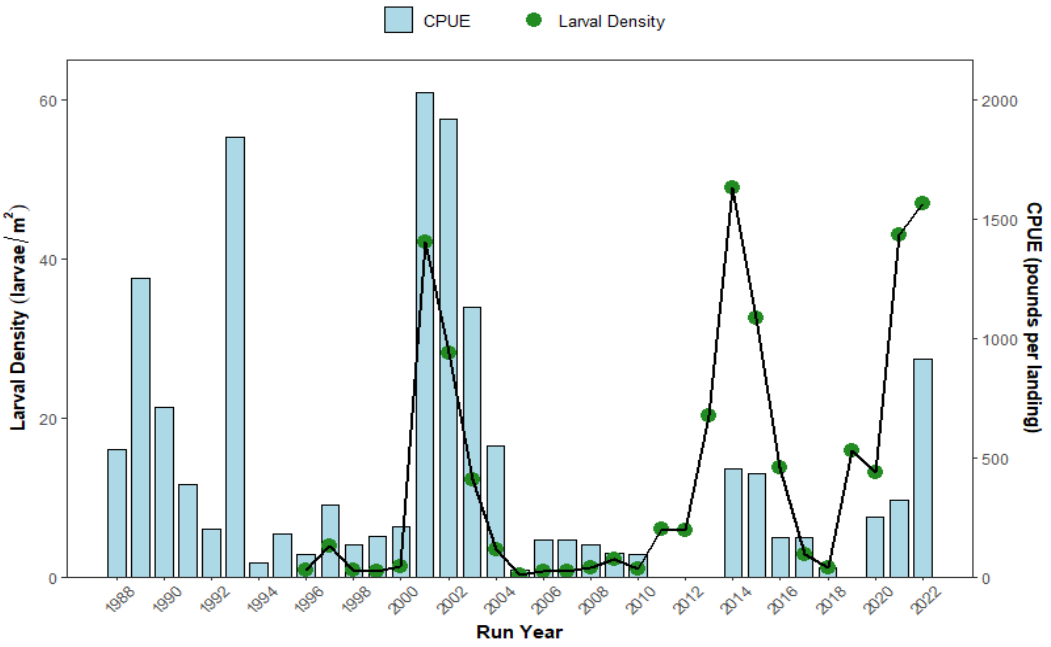


Figure 2. Comparison of adult Eulachon catch per unit effort (CPUE) in terms of total pounds per landing in the mainstem Columbia River commercial gillnet fishery and mean larval densities captured at mainstem Columbia index sites using plankton tow nets, 1988–2022.

Table 2. Columbia River Eulachon run size and harvest estimates, 2011–2022.

Year	Weeks sampled for SSB	Run size (SSB plus harvest in pounds) [1]	Harvest (pounds)				
			Commercial				
			Mainstem	Tributary	Sport	Tribal	Combined
2011	19	3,300,000	--	--	--	--	0
2012	25	3,200,000	--	--	--	--	0
2013	29	9,600,000	--	--	--	7,470	7,470
2014	22	16,600,000	18,560	--	203,880	6,970	229,410
2015	33	11,400,000	16,550	--	290,770	10,400	317,720
2016	25	5,100,000	4,820	--	141,050	8,560	154,430
2017	18	1,600,000	5,019	--	541	1,900	7,531
2018	13	400,000	110	--	--	--	110
2019	16	4,205,000	--	--	--	23,660	23,660
2020	10	-- [2]	10,255	--	35,040	23,900	69,195
2021	17	9,000,000	10,997	--	91,250	55,940	158,187
2022	19	18,300,000	27,398	--	169,543	27,385	224,326

[1] *Rounded to the nearest 100,000 pounds.*

[2] *The 2020 SSB estimate is incomplete due to truncated sampling during March*

2023 Management Considerations

- **2023 Forecast:** Overall, the 2023 run is expected to be similar to the 2022 run, though some declining ocean conditions leave some uncertainty in that forecast.
- **2023 Fisheries:**
    - Commercial Harvest:
        - Staff are considering a 2023 fishery season structure as follows:
            - Season: M & Th, late January-early March
            - Area: Zones 1-3
            - Gear: Gill net only

        **Commercial fishing season subject to decision at the Compact hearing, scheduled for January 24th, 2023.*
    - Recreational Fisheries:
        - Requires a minimum daily CPUE of 200 pounds per delivery for at least one period from the commercial fishery.
        - Similar to previous years, we plan to use additional observations of smelt within the Cowlitz River to ensure adequate fish exist to prosecute a fishery.
        - Staff are preparing to consider 1-3 recreational smelt dipping days between the Cowlitz and Sandy rivers.

Summary of 2022 Salmon Fisheries (all data considered preliminary)

Lower Columbia River Recreational Fisheries Summary

Lower Columbia River Recreational Fisheries Summary, 2022.

Time Period	Area	Species Allowed	Days for Chinook	Salmonid Anglers	Adult Chin. Kept	Adult Chin. Rel'd	Jack Chin. Kept	Jack Chin. Rel.	Sthd Kept 3/	Sthd Rel'd.	Sockeye Kept 4/	Sockeye Rel'd	Adult Coho Kept	Adult Coho Rel'd	Jack Coho Kept	Jack Coho Rel.
Feb	Buoy 10 to I-5	ChS, StW		1,885	4	3	0	0	0	24	0	0	Closed	0	Closed	0
March	LCR	ChS, StW	31	24,231	1,991	316	16	4	252	161	0	0	Closed	0	Closed	0
April	LCR	ChS, StW	6	17,940	3,321	401	34	4	17	14	0	0	Closed	0	Closed	0
May	TP to I-5/LCR	ChS, StS	19	28,151	4,306	1,920	1,354	263	402	80	0	9	Closed	0	Closed	0
June 1-15	TP to I-5	ChS, StS	15	16,238	3,053	1,463	541	137	538	136	0	366	Closed	0	Closed	0
ChS Totals 1/	**(February 1-June 15)**		**71**	**88,445**	**12,675**	**4,103**	**1,945**	**408**	**1,209**	**415**	**0**	**375**	**0**	**0**	**0**	**0**
June 16-30	Astoria Br-BO	ChR, StS	7	8,978	1,306	951	182	132	626	335	0	1,317	Closed	0	Closed	0
July 1-31	Astoria Br-BO	ChR, Sok, StS	31	22,706	1,938	1,081	111	99	2,312	1,544	1,077	124	Closed	0	Closed	0
ChR Totals 2/	**(June 16-July 31)**		**38**	**31,684**	**3,244**	**2,032**	**293**	**231**	**2,938**	**1,879**	**1,077**	**1,441**	**0**	**0**	**0**	**0**
Spring/Summer Totals				**120,129**	**15,919**	**6,135**	**2,238**	**639**	**4,147**	**2,294**	**1,077**	**1,816**	**0**	**0**	**0**	**0**
Aug	TP-BO	ChF, Co	31	32,264	4,643	723	344	152	3	393	0	8	158	131	0	11
Sep	TP-BO	ChF, Co	17	11,250	4,471	382	1,473	160	0	23	0	0	211	197	23	33
Oct	TP-BO	ChF, Co	7	9,479	749	220	340	128	0	36	0	0	1,263	287	102	52
ChF Totals 5/	**(August 1-October 31)**		**55**	**52,993**	**9,863**	**1,325**	**2,157**	**440**	**3**	**452**	**0**	**8**	**1,632**	**615**	**125**	**96**
LCR Spring Summer and Fall			**164**	**173,122**	**25,782**	**7,460**	**4,395**	**1,079**	**4,150**	**2,746**	**1,077**	**1,824**	**1,632**	**615**	**125**	**96**
OR Buoy 10	B10-TP	ChF, Co	**30**	60,041	22,738	18,222	0	0	0	79	0	0	6,542	3,796	0	0
WN Buoy 10 (Preliminary)	B10-TP	ChF, Co	**30**	25,146	5,617	3,711	0	0	0	0	0	0	2,305	1,426	0	0
Buoy 10 Total	**(August 1- October 31) 7/**			**85,187**	**28,355**	**21,933**	**0**	**0**	**Closed**	**79**	**0**	**0**	**8,847**	**5,222**	**0**	**0**
B10 and Mainstem Fall Totals				**138,180**	**38,218**	**23,258**	**2,157**	**440**	**Closed**	**531**	**0**	**8**	**10,479**	**5,837**	**125**	**96**
LCR and B10 Grand Totals				**258,309**	**54,137**	**29,393**	**4,395**	**1,079**	**4,147**	**2,825**	**1,077**	**1,824**	**10,479**	**5,837**	**125**	**96**

1/ Spring Chinook was open February 1-28 between Buoy 10 and the I-5 Bridge; March 1-April 6 from Buoy 10 to Beacon Rock plus the banks between Beacon Rock and Bonneville; May 12-22 and May 24-June 3 between Tongue Point and Beacon Rock plus the banks between Beacon Rock and Bonneville Dam, and June 4-15 from Tongue Point to Bonneville Dam. Two fish daily bag limit for Chinook June 4-15.

2/ Retention of adult hatchery summer Chinook was allowed June 16-22 and July 1-31. Retention of hatchery Chinook jacks allowed June 16-July 31.

3/ The retention of hatchery steelhead was allowed February 1-April 6 between Buoy 10 and Bonneville Dam; May 16- May 22 from Tongue Point- Bonneville Dam, May 23 from Tongue Point-I-5, May 24-June 15 from Tongue Point to Bonneville Dam, and June 16-July 31 from the Astoria-Megler Bridge to Bonneville Dam. One steelhead bag limit effective June 16-July 31.

4/ Sockeye retention was allowed July 1-31 from the Astoria_Megler Bridge to Bonneville Dam.

5/ Fall Chinook was open during Aug 1-24 under MSF and Aug 25-30 from TP-West Puget Island, Aug 1-Sept 1 from WPI to Bonneville Dam, Sepetember 15-30 from East Reed Island to Bonneville Dam and October 1-7 from Tongue Point to Bonneville Dam. Only one Chinook in the daily bag limit.

6/ Coho was open during Au g 1-30 from TP-WPI, August 1-September 1 from WPI to Bonneville Dam, Sepetember 15-30 from East Reed Island to Bonneville Dam and October 1-31 from Tongue Point to Bonneville Dam.

7/ Buoy 10 was open during August 1-24 for hatchery Chinook and hatchery coho, August 25-August 30 and October 1-7 for Chinook and hatchery coho, and August 31-September 1, September 15-30 and October 8-December 31 for hatchery coho. Three fish bag limit starting September 6, but not more than one adult Chinook when retention was allowed.. Three adult coho bag limit September 15-30 and October 8-31.

Zone 6 Recreational Fisheries Summary

2022 Zone 6 (Bonneville Dam - McNary Dam) Spring, Summer, and Fall Salmon Fisheries. Final, post-season estimates from ODFW creel monitoring program.

Area/Pool	Time Period	Species Allowed	Salmonid Anglers	Adult Chin. Kept	Adult Chin. Rel'd	Jack Chin. Kept	Total Sthd Kept	Total Sthd Rel'd	Adult Coho Kept	Adult Coho Rel.	Jack Coho Kept	Sockeye Kept	Sockeye Rel'd
Bonneville			459	161	26	0	0	2	0	0	0	0	0
The Dalles	Apr 1 - Jun 15	Chinook, steelhead	2,227	449	142	28	0	0	0	0	0	0	0
John Day			2,481	589	307	61	0	0	0	0	0	0	0
Spring Management Period Total 1/	**(Jan 1 - June 15)**		**5,167**	**1,199**	**475**	**89**	**0**	**2**	**0**	**0**	**0**	**0**	**0**
Bonneville		Chinook,	587	7	0	7	0	29	0	4	0	67	0
The Dalles	Jun 16 - Jul 31	steelhead,	413	0	33	0	0	0	0	0	0	0	4
John Day		sockeye	114	0	0	0	0	3	0	0	0	0	0
Summer Management Period Total 2/	**(June 16-July 31)**		**1,114**	**7**	**33**	**7**	**0**	**32**	**0**	**4**	**0**	**67**	**4**
Bonneville			17,026	5,258	1,247	1,217	3	25	4,168	384	39	0	0
The Dalles	Aug 1 - Nov 20	Chinook, steelhead, coho	7,286	2,510	212	768	3	16	547	16	4	0	0
John Day			1,773	136	39	83	6	15	50	18	17	0	0
Fall Management Period Total 3/	**(August 1-December 31)**		**26,085**	**7,904**	**1,498**	**2,068**	**12**	**56**	**4,765**	**418**	**60**	**0**	**0**
Grand Total			**32,366**	**9,110**	**2,006**	**2,164**	**12**	**90**	**4,765**	**422**	**60**	**67**	**4**

1/ The Z6 recreational spring Chinook fishery was open from Tower Island power lines to McNary, plus the banks between Bonneville Dam to Tower Island, during April 1-May 3, May 26, May 28 and June 4-15. Two fish bag limit June 4-15

2/ The Z6 Summer Chinook fishery was open from Bonneville -McNary during June 16-July 31. Sockeye was open July 1-31.

3/ The Z6 Fall Chinook fishery was open for Chinook during August 1-October 7. Summer steelhead was open in TD and JD pools during August. Coho was open during August 1-December 31.

Upstream of McNary Dam Recreational Summary

Fishery	Kept Adults	Released Adults	Chinook Season
Spring Chinook: Snake R.	1,388	352	May 3-6, 10-13, 17-20, 24-25, 27 & June 10
Spring Chinook: McNary – OR/WA border	1,223	485	April 1 – May 3, 26, 28 & June 4-15
Summer Chinook: HWY 395 – PRD	222	67	June 16 – August 15
Sockeye: Hwy 395 – PRD	7,702	8	
Summer Chinook: Above PRD+tribs	6,355	1,373	July 1 – October 15
Sockeye: Above PRD	55,540	526	
Fall Chinook: Hanford Reach	10,317	236	August 16 – December 31

Fall Recreational Fishery Summary

Fall Season Buoy 10	Chinook open 8/1-24 (MSF), 8/25-8/30, 10/1-10/7, 2 fish/1 CHF 8/1-8/30; 2 Coho 8/31-9/1; 3 Coho 9/15-30; 3 Fish/1 CHF 10/1-10/7, 3 Coho 10/8-12/31 Coho open 8/1-9/1, 9/15-12/31 STH retention closed Aug-Oct 85,187 trips, 28,355 Chinook kept – 5th highest (21,933 rel) 8,847 Coho kept (5,222 rel) LRH handle higher than preseason expectation
Fall Season LCR Sport TP/RP - BON	Chinook and Coho open WPI - Warrior R. 8/1-9/1, 10/1-10/7, Coho only 10/8-10/31 Warrior R. - BON: 8/1-9/1, 10/1-10/7, Coho only 10/8-10/31 E. Reed Is. - BON open 9/15-30 STH retention closed Aug-Oct 52,993 trips Aug-Oct 9,863 adult Chinook kept 1,325 rel 1,632 Coho kept 615 rel 3 STH kept (452 rel H+W) SRW and LRH handle lower than preseason expectation
Fall Season BON - McNary	Chinook and Coho open 8/1-10/7 1 CHF bag, Coho only 10/8-12/31 STH closed Aug-Oct BON Pool; Sep-Mar TDA/JD/McN pools 25,143 trips Aug-Dec 31; 7,897 adult Chinook kept (1,498 rel) 4,839 Coho kept (420 rel); 12 STH kept (56 rel H+W) SRW HR much higher than preseason expectation
Fall Season McNary-Hwy 395	Same season as JD-McN 447 trips; 140 Chinook, 78 Coho and 45 STH kept 27 Chinook, 7 Coho and 170 STH (H+W) released
Fall Season Hanford Reach	Fall Chinook open 8/16-12/31; 6 fish/2 adults 28,446 trips; 10,317 adults and 933 jack Chinook kept; 187 Coho kept; 236 Chinook and 23 Coho released ~10% decrease in Chinook harvest from 2021 fishery

Lower Columbia River Commercial Landings Summary

Season	Fishing Period	Week	Hours	Zones	Mesh Size	WSTG Limit [1]	Del.	Chinook	Coho	Sockeye	Pink	Chum	White Sturgeon
								ChS Adults	*ChS Jacks*				
Spring	May 23, 10 AM - 9 PM	*22*	11	4–5	4-1/4" max tangle-net	3	4	19	9	Prohibited	Prohibited	Prohibited	0
	Spring Season Totals (and average number of deliveries):						**4**	**19**	**9**	**--**	**--**	**--**	**0**
								Chinook	Coho				
Summer	No season.	--	--	--	--	--	—	—	—	—	—	Prohibited	—
	Summer Season Totals (and average number of deliveries):						**0**	**0**	**0**	**0**	**0**	**--**	**0**
August	Aug 10, 9 PM - Aug 11, 6 AM	*33*	9	4–5	9"–9 3/4"	4	13	161	0	0	0	Prohibited	7
	Aug 15, 9 PM - Aug 16, 6 AM	*34*	9	4–5	9"–9 3/4"	4	28	735	14	0	0	Prohibited	29
	Aug 17, 9 PM - Aug 18, 6 AM	*34*	9	4–5	9"–9 3/4"	4	38	593	9	0	0	Prohibited	9
	Aug 22, 9 PM - Aug 23, 6 AM	*35*	9	4–5	9"–9 3/4"	4	50	2,557	4	0	0	Prohibited	41
	Aug 24, 9 PM - Aug 25, 6 AM	*35*	9	4–5	9"–9 3/4"	4	58	4,109	38	0	0	Prohibited	29
	Aug 28, 9 PM - Aug 29, 6 AM	*36*	9	4–5	9"–9 3/4"	4	62	5,730	224	0	0	Prohibited	26
	Aug 30, 9 PM - Aug 31, 6 AM	*36*	9	4–5	9"–9 3/4"	4	58	7,301	498	0	0	Prohibited	21
	Sep 1, 9 PM - Sep 2, 6 AM	*36*	9	4–5	9"–9 3/4"	4	54	3,033	142	0	0	Prohibited	22
	August Season Totals (and average number of deliveries):						**45**	**24,219**	**929**	**0**	**0**	**--**	**184**
Late-Fall	Sep 18, 8 PM - Sep 19, 6 AM	*39*	10	4–5	8"–9 3/4"	6	47	2,481	511	0	0	Prohibited	29
	Sep 20, 8 PM - Sep 21, 6 AM	*39*	10	4–5	8"–9 3/4"	6	34	1,320	339	0	0	Prohibited	13
	Sep 22, 8 PM - Sep 23, 6 AM	*39*	10	4–5	8"–9 3/4"	6	25	1,017	192	0	0	Prohibited	23
	Sep 25, 7 PM - Sep 26, 7 AM	*40*	12	4–5	8"–9 3/4"	6	17	731	122	0	0	Prohibited	13
	Sep 26, 4 AM - 10 PM	*40*	18	1–3	3-3/4" max tangle-net	6	13	66	253	0	0	Prohibited	0
	Sep 27, 4 AM - 10 PM	*40*	18	1–3	3-3/4" max tangle-net	6	5	13	79	0	0	Prohibited	0
	Sep 28, 4 AM - 10 PM	*40*	18	1–3	3-3/4" max tangle-net	6	4	10	54	0	0	Prohibited	0
	Sep 28, 7 PM - Sep 29, 7 AM	*40*	12	4–5	8"–9 3/4"	6	7	381	25	0	0	Prohibited	5
	Sep 29, 4 AM - 10 PM	*40*	18	1–3	3-3/4" max tangle-net	6	15	34	285	0	0	Prohibited	0
	Sep 30, 4 AM - 6 PM	*40*	14	1–3	3-3/4" max tangle-net	6	7	3	111	0	0	Prohibited	0
	Oct 2, 7 PM - Oct 3, 7 AM	*41*	12	4–5	8"–9 3/4"	6	6	374	29	0	0	Prohibited	1
	Oct 3, 4 AM - 10 PM	*41*	18	1–3	3-3/4" max tangle-net	6	10	26	158	0	0	Prohibited	0
	Oct 4, 4 AM - 10 PM	*41*	18	1–3	3-3/4" max tangle-net	6	6	5	149	0	0	Prohibited	0
	Oct 5, 4 AM - 10 PM	*41*	18	1–3	3-3/4" max tangle-net	6	12	32	337	0	0	Prohibited	0
	Oct 5, 7 PM - Oct 6, 7 AM	*41*	12	4–5	8"–9 3/4"	6	4	204	5	0	0	Prohibited	1
	Oct 6, 4 AM - 10 PM	*41*	18	1–3	3-3/4" max tangle-net	6	13	9	684	0	0	Prohibited	0
	Oct 7, 4 AM - 6 PM	*41*	14	1–3	3-3/4" max tangle-net	6	9	9	214	0	0	Prohibited	0
	Oct 10, 4 AM - 10 PM	*42*	18	1–3	3-3/4" max tangle-net	6	0	0	0	0	0	Prohibited	0
	Oct 11, 4 AM - 10 PM	*42*	18	1–3	3-3/4" max tangle-net	6	3	4	66	0	0	Prohibited	0
	Oct 12, 4 AM - 10 PM	*42*	18	1–3	3-3/4" max tangle-net	6	1	0	1	0	0	Prohibited	0
	Oct 13, 4 AM - 10 PM	*42*	18	1–3	3-3/4" max tangle-net	6	4	2	206	0	0	Prohibited	0
	Oct 14, 4 AM - 6 PM	*42*	14	1–3	3-3/4" max tangle-net	6	6	4	416	0	0	Prohibited	0
	Oct 17, 4 AM - 10 PM	*43*	18	1–3	3-3/4" max tangle-net	6	0	0	0	0	0	Prohibited	0
	Oct 18, 4 AM - 10 PM	*43*	18	1–3	3-3/4" max tangle-net	6	4	0	166	0	0	Prohibited	0
	Oct 19, 4 AM - 10 PM	*43*	18	1–3	3-3/4" max tangle-net	6	1	0	6	0	0	Prohibited	0
	Oct 20, 4 AM - 10 PM	*43*	18	1–3	3-3/4" max tangle-net	6	1	0	10	0	0	Prohibited	0
	Oct 21, 4 AM - 6 PM	*43*	14	1–3	3-3/4" max tangle-net	6	5	2	76	0	0	Prohibited	0
	Oct 24, 4 AM - 10 PM	*44*	18	1–3	3-3/4" max tangle-net	6	0	0	0	0	0	Prohibited	0
	Oct 25, 4 AM - 10 PM	*44*	18	1–3	3-3/4" max tangle-net	6	6	1	292	0	0	Prohibited	0
	Oct 26, 4 AM - 10 PM	*44*	18	1–3	3-3/4" max tangle-net	6	3	0	148	0	0	Prohibited	0
	Oct 27, 4 AM - 10 PM	*44*	18	1–3	3-3/4" max tangle-net	6	3	1	79	0	0	Prohibited	0
	Oct 28, 4 AM - 6 PM	*44*	14	1–3	3-3/4" max tangle-net	6	1	0	7	0	0	Prohibited	0
	Late-Fall Season Totals (and average number of deliveries):						**9**	**6,729**	**5,020**	**0**	**0**	**--**	**85**

	Ave.Del.	Chinook	Coho	Sockeye	Pink	Chum	White Sturgeon
FALL TOTALS:	**15**	**30,948**	**5,949**	**0**	**0**	Prohibited	**269**

	Chinook	Coho	Sockeye	Pink	Chum	White Sturgeon
2022 Grand Totals:	**30,976**	**5,949**	**0**	**0**	Prohibited	**269**

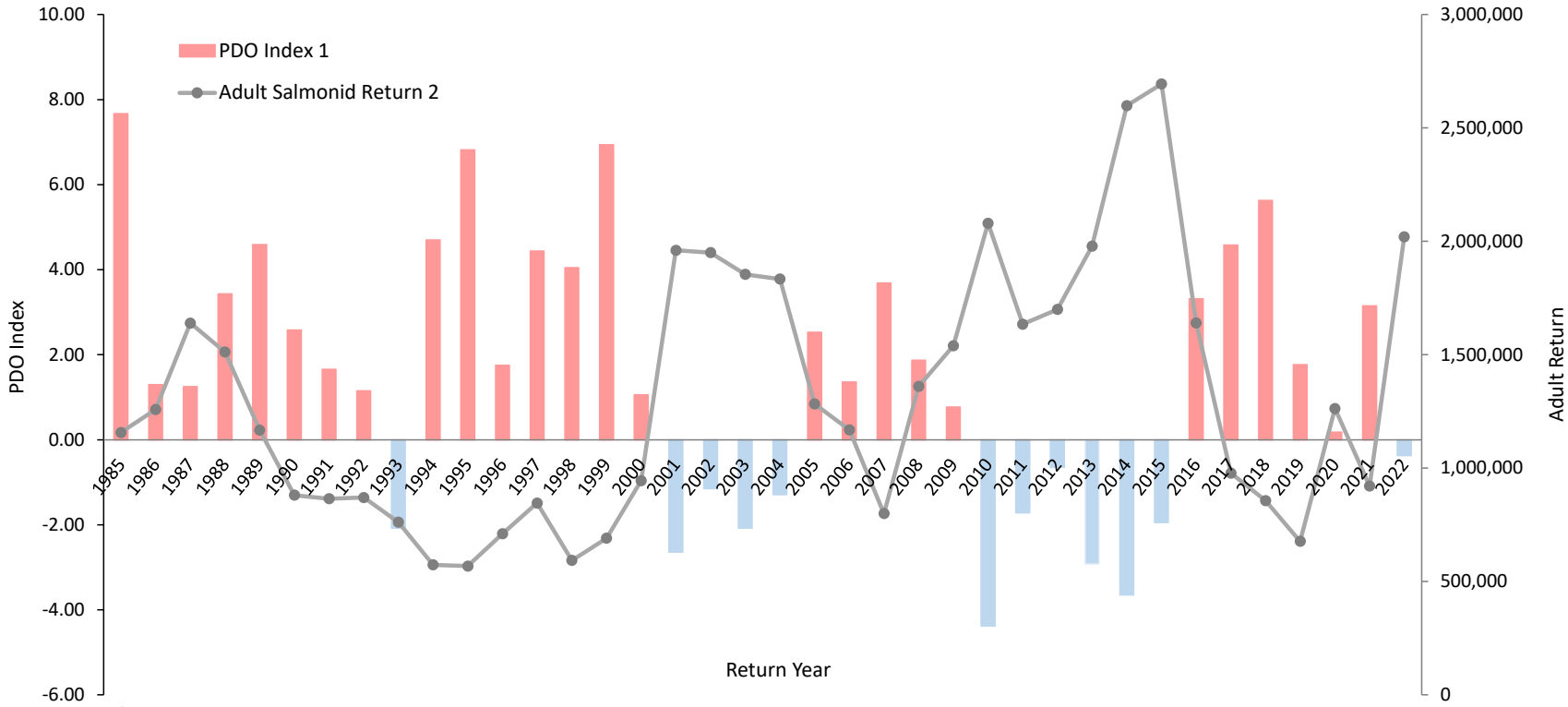
[1] A white sturgeon possession and sales limit applied during mainstem fishing periods that occurred on May 23 and during August 10 through October 28.

Ocean Conditions and Forecasts

	Year																								
Ecosystem Indicators	*1998*	*1999*	*2000*	*2001*	*2002*	*2003*	*2004*	*2005*	*2006*	*2007*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*	*2018*	*2019*	*2020*	*2021*	*2022*
PDO (Sum Dec-March)	22	8	4	16	9	24	15	20	17	12	6	1	19	5	3	10	13	25	23	21	14	18	11	7	2
PDO (Sum May-Sept)	13	6	8	7	14	20	19	21	15	17	3	12	9	5	2	10	23	25	24	18	16	22	11	4	1
ONI (Average Jan-June)	24	1	1	9	16	18	17	20	10	14	3	13	21	6	8	10	12	22	25	15	7	23	19	5	4
SST NDBC buoys (°C; May-Sept)	20	7	9	5	6	13	25	14	2	16	1	12	3	8	10	18	23	22	21	15	17	24	11	4	19
Upper 20 m T (°C; Nov-Mar)	24	13	10	12	7	18	19	16	15	6	1	11	21	5	4	9	3	25	23	22	17	20	2	8	14
Upper 20 m T (°C; May-Sept)	16	11	13	5	1	3	25	20	9	10	2	6	17	8	7	18	23	19	14	12	15	24	22	4	21
Deep temperature (°C; May-Sept)	24	7	9	5	1	11	13	17	12	6	2	8	15	10	4	16	23	21	14	19	20	18	25	3	22
Deep salinity (May-Sept)	24	4	12	5	6	19	20	13	8	2	3	17	22	15	16	14	25	18	10	9	7	11	23	1	21
Copepod richness anom. (no. species; May-Sept)	23	3	1	10	9	18	17	22	19	13	11	12	21	6	8	4	14	24	25	20	16	15	7	5	2
N. copepod biomass anom. (mg C m^{-3}; May-Sept)	23	18	13	14	6	20	17	24	19	15	9	12	11	3	5	7	8	21	25	22	10	4	2	1	16
S. copepod biomass anom. (mg C m^{-3}; May-Sept)	25	2	7	4	3	17	19	24	16	13	1	9	20	12	10	8	14	22	23	21	15	18	11	5	6
Biological transition (day of year)	22	14	9	3	12	18	15	23	17	4	1	2	20	5	13	7	7	24	24	21	16	18	9	11	6
Nearshore Ichthyoplankton Log(mg C 1,000 m^{-3}; Jan-Mar)	20	4	13	7	1	24	25	19	10	21	3	16	2	9	5	12	22	17	18	15	11	23	8	6	14
Nearshore & offshore Ichthyoplankton community index (PCO axis 1 scores; Jan-Mar)	11	6	5	8	10	13	19	23	1	16	3	12	17	4	2	7	9	21	24	25	20	22	18	15	14
Chinook salmon juvenile catches Log(no. km^{-1}; June)	22	2	7	19	6	10	18	24	14	12	1	8	5	16	3	4	9	17	21	25	20	15	23	13	11
Coho salmon juvenile catches Log(no. km^{-1}; June)	23	12	20	5	7	6	22	24	18	2	4	9	10	19	14	1	11	17	16	25	3	15	21	13	8
Mean of ranks	21.0	7.4	8.8	8.4	7.1	15.8	19.1	20.3	12.6	11.2	3.4	10.0	14.6	8.5	7.1	9.7	14.9	21.3	20.6	19.1	14.0	18.1	13.9	6.6	11.3
Rank of the mean rank	24	5	8	6	3	18	20	22	13	11	1	10	16	7	3	9	17	25	23	20	15	19	14	2	12
Ecosystem Indicators not included in the mean of ranks or statistical analyses																									
Physical Spring Trans. UI based (day of year)	4	8	23	20	5	15	18	24	15	1	7	3	10	13	21	11	22	12	6	19	13	15	9	2	25
Physical Spring Trans. Hydrographic (day of year)	24	4	14	9	6	13	16	25	7	10	1	10	20	4	12	2	18	8	19	23	16	15	21	2	21
Upwelling Anomaly (April-May)	12	4	20	8	11	17	15	24	12	6	9	10	18	20	18	14	22	1	3	23	7	5	15	2	25
Length of Upwelling Season UI based (days)	6	2	22	14	1	16	12	25	5	3	9	3	18	21	18	17	23	13	8	15	7	10	20	10	23
Copepod Community Index (MDS axis 1 scores; May-Sept)	24	5	7	10	4	19	17	23	20	12	1	9	16	11	8	6	14	22	25	21	15	18	13	3	2

* NOAA ocean condition scorecard for outmigrating salmon with ratings from 1 (best) to 24 (worst). The years shown correspond to the years the smolts entered the ocean.

** This table is easier to interpret if printed in color. Green represents more favorable indicators. Yellow is intermediate and Red indicates unfavorable.



[1] *Sum of May–July PDO values two years prior to adult return; adjusted to return year.*

[2] *Includes species returning as adults primarily two years after ocean entry (Chinook, Sockeye, and summer steelhead).*

Figure X. Annual return of adult salmonids to the Columbia River mouth and corresponding PDO Index, 1985–2022. Positive (red) PDO represents relatively poor (warm) ocean conditions and negative (blue) PDO represents relatively good (cool) ocean conditions.

Columbia River Adult Salmon Returns: Actual and Forecasted				
		2022 Forecast	**2022 Return**	**2023 Forecast**
Spring Chinook	**Upriver Total ***	**122,900**	**185,209**	**198,600**
	Upper Columbia	21,700	29,605	41,400
	Upper Columbia natural-origin	*2,800*	*5,264*	*5,800*
	Snake River Spring/Summer **	73,400	103,025	85,900
	*Snake River natural-origin***	*13,200*	*23,331*	*13,200*
	Lower River Total	**74,100**	**99,575**	**117,000**
	Total Spring Chinook	**197,000**	**284,784**	**315,600**
	Area-specific detail			
	Willamette River	51,200	55,391	71,000
	Sandy River	5,600	10,289	7,800
	Select Areas***	8,800	16,726	22,100
	Cowlitz River	4,100	7,146	9,000
	Kalama River	2,000	3,148	2,400
	Lewis River	2,400	6,875	4,700
	Wind River***	4,200	6,530	4,400
	Drano Lake/Little White Salmon River***	3,800	11,491	8,000
	Hood River***	n/a	n/a	n/a
	Klickitat River***	1,800	2,088	1,400
	Deschutes River***	n/a	2,435	n/a
	John Day River***	n/a	1,529	n/a
	Umatilla River***	3,000	3,332	2,500
	Yakima River***	4,700	6,155	5,500
Summer Chinook	**Upper Columbia**	**56,300**	**78,444**	**84,800**
Sockeye	**Total Sockeye**	**198,700**	**664,935**	**234,500**
	Wenatchee	19,200	147,473	44,300
	Okanogan	175,700	513,317	187,400
	Yakima	3,500	157	100
	Deschutes	100	35	100
	Snake River	200	2,329	2,600

* Upriver totals are developed by TAC for use in management of *U.S. v. OR* fisheries. Wild components are included in the stock total. Area-specific estimates for upriver tributaries detailed here are provided by other agencies/entities and may not sum to TAC's upriver abundance estimates.

** 2022 return is based on current TAC run reconstruction methodology.

*** Return to tributary mouth. *12/20/2022*