

JOHN DAY DAM SMOLT AND JUVENILE LAMPREY CONDITION MONITORING DATA SUMMARIES - 2022

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PREFACE

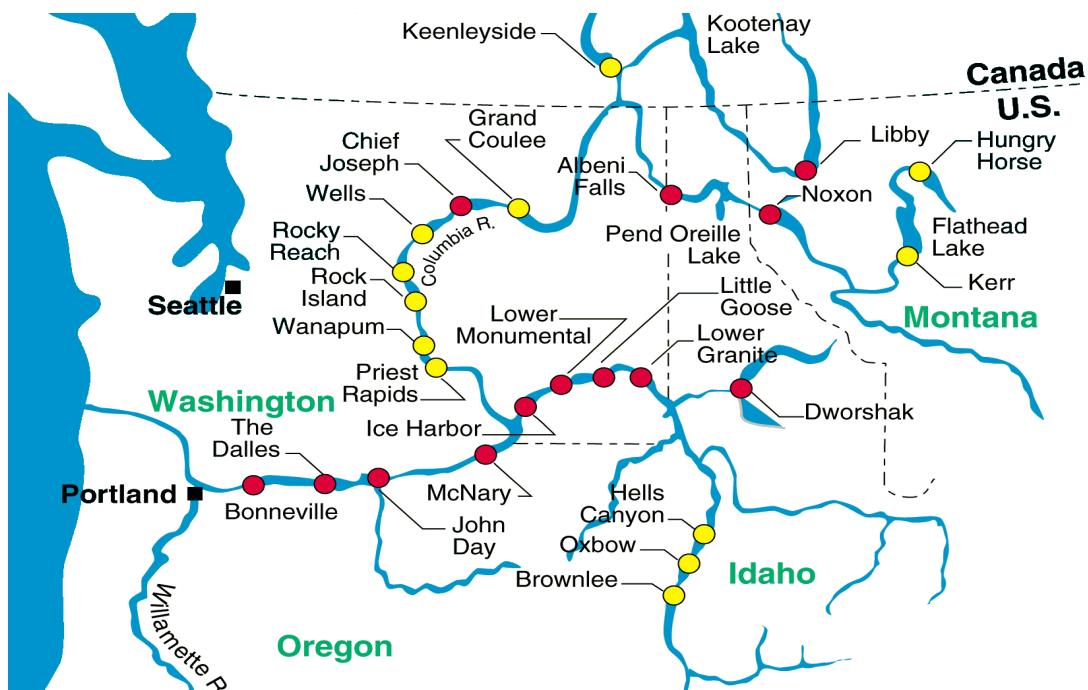
The Smolt and Juvenile Lamprey Condition Monitoring program at John Day Dam was funded by the Bonneville Power Administration in 2022. This Condition Exam work had previously been collected by the Smolt Monitoring Program personnel since 1998 at the Smolt Monitoring Facility. These data had been collected in earlier years (1985 to 1997) at John Day Dam utilizing a Gatewell airlift pump which sampled smolt from Main Unit 3B. Starting in the spring of 2020, due to Covid-19 caused staffing restrictions at the United States Army Corps of Engineers hydro-projects, no 24 hour sampling occurred at John Day Dam. An emphasis on examining smolt and juvenile lamprey for their condition through the bypass was required but the partial day data was no longer useful for Smolt Monitoring Program purposes. Samples were taken on an every other day basis and the sample duration targeted fish passing from approximately 0700 to 1300 hours. In 2021, sampling started on 2 March in an effort to determine if juvenile Pacific Lamprey were using the Juvenile Bypass System at that time of year. In addition, sampling started at 0300 twice a week in March to help give insight as to how many juvenile lamprey were passing in the very early hours of the morning. In 2022, sampling started 1 April and occurred from approximately 0700 to 1300 hours, 5 days a week in the spring and three days a week starting mid-June. Sampling is further reduced to twice a week when river water temperatures reach 70 degrees F. This report is a compilation of the data collected, presented in graphs and tables.

Some of the main goals of this program is to: 1) collect and report daily fish capture, fish condition, dam operations, and river flow data to Project biologists and State, Tribal, and Federal Fishery managers to improve the scientific information on which to base in-season operations of the dam and 2) analyze the collected data and to characterize juvenile fish passage at John Day Dam and transfer this information, learning, and understanding to the fisheries community through weekly and annual reports and to continue to build a data set for current and future reference.

INTRODUCTION

In 2022, the seaward migration of juvenile salmonids was monitored by the PSMFC at John Day Dam, located at river mile 216 (Figure 1). The goal of the Smolt and Juvenile Lamprey Condition Monitoring program at John Day Dam had the express purpose to sample enough fish throughout the outmigration period to evaluate passage conditions through the Juvenile Bypass System (JBS). This data had been collected by Smolt Monitoring Program personnel since the Smolt Monitoring Facility (SMF) was completed and operated for the first time in 1998. Sample times and frequency varied during the outmigration and an emphasis was placed on sampling more during the spring and less in summer and fall when less species variety was present.

Figure 1. Hydroelectric projects on the Snake and Columbia Rivers. This figure is reprinted courtesy of the U.S. Army Corps of Engineers, Portland District. Red circles are Corps of Engineers projects, yellow circles are privately owned or Bureau of Reclamation projects.



METHODS AND MATERIALS

JOHN DAY DAM

Sampling

In 2022, sampling at John Day Dam occurred 5 days a week from 1 April to mid-June. This frequency was reduced to three times a week until river water temperatures reached 70 deg. F., when sampling was reduced further to twice a week in an effort to reduce the number of fish handled. Sampling concluded on 15 September when historical data suggests that most of the later migrating subyearling Fall Chinook smolt have already moved past the project.

John Day Dam is equipped with a juvenile bypass system consisting of Submersible Traveling Screens (STSs), gatewells, 14-inch orifices, and a tainter gate. As fish exit the bypass channel under the tainter gate, they are directed either back to the river or down the elevated chute toward the Smolt Monitoring Facility (SMF), depending on the position of the crest gate. At the end of the elevated chute is the Primary Dewatering Structure (PDS). The PDS removes all but 30 cubic feet per second (cfs) of the roughly 450 cfs of flow entering it. This remaining 30 cfs and all the fish travel down a corrugated flume, through a full flow Passive Integrated Transponder (PIT) detector (installed and operational in 2007), and towards the switch gate, which directs the flow to either the bypass (back to river) or sample (to sampling facility) flumes. In sample mode, the fish pass over the Secondary Dewatering Structure (SDS) where an additional 29 cfs are removed. The remaining water and fish exit the SDS and enter the large fish and debris separator (FDS), designed as a series of parallel aluminum separator bars that allow the juveniles to pass through while the adults and debris slide off the end and return to the river. Under the separator bars is a collection area known as the hopper. A sloped floor directs the juveniles into the distribution flume leading to the facility subsample gate and PIT tag diversion systems.

A second set of PIT tag antennas is just upstream of the 3-way rotating gate, which is used to obtain the general sample and research fish. When rotated to the west, all fish are diverted to the sample tank, in the center or default position, all fish go directly to the river, and when rotated to the east, all fish are routed to the PIT tag research flume. All of these routes are equipped with PIT tag antennas. On the research flume there is a 2-way rotating gate capable of diverting specific PIT tagged fish, detected in the antennas just upstream, to either of two tanks, this feature is called the Separation by Code (S by C) system. These gates and flumes make it possible to collect fish for two different studies concurrently and hold them in separate tanks. A PIT tagged fish can also be diverted from the facility subsample using the Divert During Sample (DDS) protocol. This feature is only activated when the sample rate is 20% or above. Fish passage routes, equipment, and antenna locations are shown in Figure 9. The plan view of the facility is shown in Figure 10.

The sample day began at 0700 hours and went to 1300 hours or when approximately 100 of the most predominant species of out-migrant had been sampled. Sample rates were adjusted as needed to achieve target sample sizes. Furthermore, in an effort to keep handling numbers low, fish were sampled approximately every hour or even more frequently when river water was turbid or when debris loads were heavy. On most days, this period ranged from 4 to 6 hours and the average sample size was about 150 smolt. Depending on the sample rate, two to six timed subsamples were collected each hour using the 3-way rotating gate. The sample rates used in 2022 ranged from 1% to 100%. For a summary of sample rates, openings per hour, and other sampling details, see Table 1.

Sampling is reduced to twice a week when the daily average river water temperature reaches 70° F. Sample sizes are reduced to target about 100 smolts on these days, partially dependent on how many juvenile American shad are present at the time. Sampling returns to three times a week once river water temperatures fall to 69.5° F.

Fish collected at different sample rates were kept separated and their passage numbers expanded based on their respective sample rates and referred to as a sub-batch. This method allowed for an estimate of the total number of fish passing the Fish and Debris Separator (FDS) for that sample time period. For a list of the types of data collected, see Data Collected on page 5.

All sampled fish were collected in a 6,796 liter (1,795 gal) holding tank located in the sampling laboratory. At the end of a sample period, the crowder was moved forward and the next sample was collected behind it. Smolt were then crowded into a 20- by 24-inch pre-anesthetic (PA) chamber using a panel net. The number of smolts crowded into the PA chamber varies throughout the season, and from season to season. The number of fish targeted for each sorting event was based on several factors, including the fish size, total sample size in the holding tank, research request success, and the number of fish sorters present on that day. The water level in the PA chamber was lowered

to about 8 inches (48 liters) and the fish were anesthetized with MS-222 at a concentration of about 63 mg/l. In 2022, average induction time was approximately 2 minutes and sorting time was always less than 20 minutes. Once anesthetized, fish were routed via a 6-inch PVC pipe over a final dewatering screen and into the examination trough. MS-222 was added to the examination trough as needed to keep the smolts and any other fishes anesthetized. Following examination, the fish were routed via a 4-inch PVC pipe to one of two recovery tanks and held for a minimum of 60 minutes before being released. Upon release, the fish passed through one more set of PIT tag antennas before returning to the bypass flume and tailrace.

Subsampled Fish Condition Exams

Detailed smolt and juvenile lamprey condition monitoring examined up to 100 fish of the predominant species per day and detailed condition data was collected on all other sampled fish each sample day. A touch screen interface was used to record detailed condition exam data, including, species, age, fin clips, descaling, injuries, parasites, diseases, predation marks, and fork lengths. See Appendix A., pages 28 to 31, for examples of each condition exam category. In addition, all juvenile lamprey out-migrants were examined for these conditions (except descaling) and also weighed on a scale to the nearest 1/10th of a gram. Following examination, all sampled fish were routed to recovery tanks and held for a period of at least 60 minutes before being released. All holding and recovery tanks had a constant exchange of river water and temperatures were checked daily. Upon release, fish passed through one more set of PIT tag antennas before returning to the bypass flume.

Performance Monitoring

Tests and digital imaging were used to evaluate species identification, descaling assessment, and data recording accuracy of Condition Monitoring personnel. During tests, ten fish were randomly selected and placed into a compartmentalized divider located in the sorting trough. Each technician independently processed and recorded specific details for each fish including: 1) species, 2) fin clip, 3) level of descaling, and 4) presence of external marks or tags. Coworkers compared results, discussed discrepancies and referred back to the fish for clarification if needed. Digital images were used to document questionable characteristics, discrepancies, and oddities, which could be examined later with no risk to fish health.

Data Collected

The following is a list of data collected daily during Condition Exams at John Day Dam.

- 1) Species specific identification (all fishes), summarized into sub-batch and sample period totals.
- 2) Adipose fin presence or absence and eroded dorsal fins on non-adipose clipped steelhead.
- 3) Descaling, partial descaling, predator descaling, and mortality data.
- 4) Species specific length and condition data. Weight was recorded for juvenile Pacific lamprey.
- 5) Elastomer visual implant tag color, location, and fin clip data.
- 6) Research fish or genetic sample collection and allocation detail and summaries.
- 7) River, powerhouse, and spill data for sample period
- 8) Facility river water quality parameters (Temperature and percent Total Dissolved Gas).

DEFINITION OF TERMS

Three types of numbers are discussed in the report, defined as follows:

- 1) Total Sample: actual fish counts of the number of fish handled and anesthetized.
- 2) Estimated Collection: total sample number divided by sample rate, resulting in an estimated number of fish passing through the juvenile bypass system during the specific sample period only.
- 3) Fish Passage Index: estimated collection counts divided by the proportion of flow passing through the powerhouse resulting in a relative indicator of fish abundance. This index represents fish during the sample period only. No adjustments are made for species variability, fish guidance efficiency, orifice passage efficiency, or horizontal, vertical, or temporal fish distribution in the forebay.

Salmonid Common and Scientific Names: Throughout this report, salmonid species covered are cited by their common names only. Their respective scientific names are as follow: Chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*O. kisutch*), steelhead (*O. mykiss*), and sockeye salmon (*O. nerka*).

Table 1. Percent sample and associated metrics chart used by John Day Dam Condition Monitoring.

Estimated Daily Collection	Sample Rate, %	Multiplier, 1/sample rate	Sec./hour	Openings per hour	seconds per opening	Est. resulting sample size
> 150,000	0.50%	200	18	2	9	> 750
> 75,000	0.70%	143	25.2	2	12.6	> 525
50,000 - 75,000	1.00%	100	36	3	12	500 - 750
35,000 - 50,000	1.50%	66.6	54	4	13.5	525 - 750
25,000 - 35,000	2.00%	50	72	6	12	500 - 750
16,500 - 25,000	3.00%	33.3	108	6	18	495 - 750
12,500 - 16,500	4.00%	25	144	6	24	500 - 660
10,000 - 12,500	5.00%	20	180	6	30	500 - 625
7,500 - 10,000	7.00%	14.3	252	6	42	525 - 700
5,000 - 7,500	10.00%	10	360	6	60	500 - 750
4,000 - 5,000	12.50%	8	450	6	75	500 - 625
3,000 - 4,000	15.00%	6.66	540	6	90	450 - 600
2,500 - 3,000	20.00%	5	720	6	120	500 - 600
1,500 - 2,500	25.00%	4	900	6	150	375 - 625
500 - 1,500	50.00%	2	1800	6	300	250 - 750
≤ 500	100.00%	1	3600	1	3600	< 500

Maximum sample rate of 25% except when a higher rate is needed for research fish collection purposes.

RESULTS

THE NUMBERS

Table 2. John Day Dam Condition Monitoring, 2022 season summary, including descaling and mortality data.

Site	Species	Sample		Collection ¹		Fish Passage Index ²	Descaling ³		Mortality ⁴	
		Number	Percent Comp.	Number	Percent Comp.		#	%	#	%
John Day	Yearling Chinook	4,676	39.1	26,931	22.5	65,430	108	2.3	6	0.13
	Subyearling Chinook	4,197	35.1	69,482	58.2	116,497	61	1.5	5	0.12
	Unclipped Steelhead	304	2.5	1,532	1.3	3,878	7	2.3	0	-
	Clipped Steelhead	1,152	9.6	7,213	6.0	17,514	73	6.3	2	0.17
	Coho	484	4.0	9,054	7.6	24,177	9	1.9	1	0.21
	Sockeye	1,142	9.6	5,220	4.4	12,803	36	3.2	2	0.18
SEASON TOTALS		11,955	100.0	119,432	100.0	240,298	294	2.46	16	0.13

1 Collection numbers are sample numbers divided by sample rate.

2 FPI (Fish Passage Index) is collection divided by the proportion of daily average river flow through the powerhouse.

3 Descaling numbers are based on sample numbers minus mortality numbers.

4 Mortality numbers are based on sample numbers.

SEASONAL PASSAGE TRENDS

		10 %	50%	90 %	# of Days			10 %	50%	90 %	# of Days
YEARLING CHINOOK	1998	28-Apr	16-May	2-Jun	36	SUBYEARLING CHINOOK	1998	11-Jun	30-Jun	29-Jul	49
	1999	22-Apr	13-May	31-May	40		1999	18-Jun	29-Jun	25-Jul	38
	2000	20-Apr	9-May	28-May	39		2000	6-Jun	29-Jun	3-Aug	59
	2001	6-May	27-May	20-Jun	46		2001	27-Jun	30-Jul	22-Aug	57
	2002	1-May	17-May	1-Jun	32		2002	20-Jun	30-Jun	20-Jul	31
	2003	3-May	19-May	2-Jun	31		2003	6-Jun	27-Jun	30-Jul	55
	2004	28-Apr	16-May	30-May	33		2004	14-Jun	28-Jun	23-Jul	40
	2005	25-Apr	12-May	22-May	28		2005	19-Jun	5-Jul	27-Jul	39
	2006	25-Apr	11-May	24-May	30		2006	14-Jun	3-Jul	18-Jul	35
	2007	2-May	13-May	25-May	24		2007	25-Jun	8-Jul	17-Jul	23
	2008	4-May	22-May	1-Jun	29		2008	24-Jun	9-Jul	5-Aug	43
	2009	27-Apr	17-May	1-Jun	36		2009	17-Jun	1-Jul	17-Jul	31
	2010	1-May	18-May	6-Jun	37		2010	14-Jun	1-Jul	20-Jul	37
	2011	2-May	17-May	28-May	27		2011	16-Jun	14-Jul	3-Aug	49
	2012	27-Apr	6-May	22-May	26		2012	27-Jun	13-Jul	29-Jul	33
	2013	27-Apr	12-May	24-May	28		2013	20-Jun	3-Jul	15-Jul	26
	2014	28-Apr	9-May	24-May	27		2014	21-Jun	5-Jul	20-Jul	30
	2015	20-Apr	13-May	24-May	35		2015	10-Jun	23-Jun	30-Jun	21
	**2016	18-Apr	30-Apr	10-May	23		**2016	13-Jun	29-Jun	7-Jul	25
	2017	24-Apr	8-May	18-May	25		2017	9-Jun	1-Jul	15-Jul	37
	***2018	20-Apr	8-May	20-May	31		***2018	4-Jun	29-Jun	19-Jul	46
	2019	19-Apr	7-May	23-May	35		2019	8-Jun	30-Jun	16-Jul	39
	2020	26-Apr	12-May	24-May	29		2020	7-Jun	27-Jun	22-Jul	46
	***2021	3-May	15-May	2-Jun	31		***2021	10-Jun	28-Jun	4-Jul	25
	2022	10-May	19-May	2-Jun	24		2022	7-Jun	27-Jun	25-Jul	49
	MEDIAN	28-Apr	14-May	29-May	32		* MEDIAN	16-Jun	29-Jun	28-Jul	43
	MIN	20-Apr	6-May	22-May	24		* MIN	6-Jun	27-Jun	20-Jul	31
	MAX	6-May	27-May	20-Jun	46		* MAX	27-Jun	30-Jul	22-Aug	59
UNCLIPPED STEELHEAD	1998	27-Apr	9-May	29-May	33	CLIPPED STEELHEAD	1998	4-May	15-May	1-Jun	29
	1999	26-Apr	23-May	5-Jun	41		1999	29-Apr	28-May	7-Jun	40
	2000	18-Apr	5-May	28-May	41		2000	15-Apr	2-May	24-May	40
	2001	28-Apr	5-May	30-May	33		2001	2-May	17-May	10-Jun	40
	2002	19-Apr	19-May	8-Jun	51		2002	24-Apr	14-May	6-Jun	44
	2003	30-Apr	28-May	4-Jun	36		2003	2-May	29-May	4-Jun	34
	2004	30-Apr	23-May	2-Jun	34		2004	7-May	20-May	29-May	23
	2005	1-May	14-May	24-May	24		2005	4-May	19-May	26-May	23
	2006	24-Apr	13-May	29-May	36		2006	28-Apr	10-May	29-May	32
	2007	29-Apr	13-May	28-May	30		2007	4-May	12-May	26-May	23
	2008	6-May	21-May	1-Jun	27		2008	7-May	16-May	30-May	24
	2009	26-Apr	11-May	28-May	33		2009	29-Apr	10-May	27-May	29
	2010	27-Apr	12-May	8-Jun	43		2010	3-May	11-May	9-Jun	38
	2011	25-Apr	19-May	31-May	37		2011	19-Apr	19-May	30-May	42
	2012	25-Apr	1-May	19-May	25		2012	25-Apr	3-May	15-May	21
	2013	21-Apr	13-May	27-May	37		2013	29-Apr	8-May	21-May	23
	2014	23-Apr	9-May	27-May	35		2014	30-Apr	8-May	21-May	22
	2015	16-Apr	18-May	28-May	43		2015	28-Apr	14-May	28-May	31
	**2016	18-Apr	28-Apr	12-May	25		**2016	22-Apr	30-Apr	10-May	19
	2017	24-Apr	6-May	28-May	35		2017	24-Apr	4-May	22-May	29
	***2018	22-Apr	8-May	30-May	39		***2018	20-Apr	2-May	22-May	33
	2019	21-Apr	27-Apr	21-May	31		2019	19-Apr	25-Apr	11-May	23
	2020	4-May	25-May	30-May	27		2020	2-May	12-May	28-May	27
	***2021	3-May	19-May	4-Jun	33		***2021	29-Apr	9-May	31-May	33
	2022	17-May	30-May	8-Jun	23		2022	10-May	18-May	7-Jun	29
	MEDIAN	26-Apr	13-May	29-May	34		MEDIAN	29-Apr	14-May	29-May	31
	MIN	16-Apr	1-May	19-May	24		MIN	15-Apr	2-May	15-May	21
	MAX	6-May	28-May	8-Jun	51		MAX	7-May	29-May	10-Jun	44
COHO	1998	10-May	22-May	2-Jun	24	SOCKEYE	1998	8-May	16-May	31-May	24
	1999	30-Apr	22-May	2-Jun	34		1999	10-May	17-May	1-Jun	23
	2000	5-May	13-May	8-Jun	35		2000	30-Apr	14-May	9-Jun	41
	2001	17-May	1-Jun	14-Aug	90		2001	1-Jun	14-Jun	27-Jun	27
	2002	7-May	1-Jun	12-Jun	37		2002	9-May	21-May	2-Jun	25
	2003	9-May	30-May	8-Jun	31		2003	10-May	19-May	2-Jun	24
	2004	12-May	27-May	12-Jun	32		2004	20-May	1-Jun	12-Jun	24
	2005	5-May	16-May	3-Jun	30		2005	16-May	21-May	31-May	16
	2006	10-May	26-May	5-Jun	27		2006	7-May	20-May	30-May	24
	2007	5-May	16-May	4-Jun	31		2007	9-May	25-May	7-Jun	30
	2008	11-May	25-May	6-Jun	27		2008	22-May	29-May	6-Jun	16
	2009	16-May	29-May	13-Jun	29		2009	10-May	25-May	7-Jun	29
	2010	9-May	3-Jun	16-Jun	39		2010	11-May	29-May	9-Jun	30
	2011	10-May	23-May	6-Jun	28		2011	10-May	22-May	2-Jun	24
	2012	6-May	21-May	5-Jun	31		2012	2-May	11-May	25-May	24
	2013	6-May	19-May	1-Jun	27		2013	10-May	19-May	28-May	19
	2014	3-May	17-May	31-May	29		2014	14-May	22-May	31-May	18
	2015	23-Apr	20-May	4-Jun	43		2015	11-May	20-May	27-May	17
	**2016	26-Apr	8-May	24-May	29		**2016	30-Apr	10-May	22-May	23
	2017	2-May	18-May	1-Jun	31		2017	30-Apr	14-May	24-May	25
	***2018	6-May	20-May	2-Jun	28		***2018	6-May	12-May	26-May	21
	2019	27-Apr	17-May	6-Jun	41		2019	5-May	19-May	31-May	27
	2020	26-Apr	4-May	30-May	35		2020	10-May	20-May	30-May	21
	***2021	5-May	17-May	4-Jun	31		***2021	9-May	23-May	2-Jun	25
	2022	10-May	23-May	9-Jun	31		2022	18-May	24-May	3-Jun	17
	MEDIAN	8-May	22-May	5-Jun	30		MEDIAN	10-May	21-May	2-Jun	24
	MIN	23-Apr	13-May	31-May	24		MIN	30-Apr	11-May	25-May	16
	MAX	17-May	3-Jun	14-Aug	90		MAX	1-Jun	14-Jun	27-Jun	41

*Median, Min and Max dates for subyearlings use 1998 - 2005 due to bias from warm water sampling protocols.

**For Spring migrants, Median, Min and Max dates use data through 2015, after that, every other day and partial day sampling skews the dates.

*** 2018 and 2021 dates include data from March.

Table 3. Historical 10-50-90 percent passage dates, John Day Dam, 1998 – 2022.

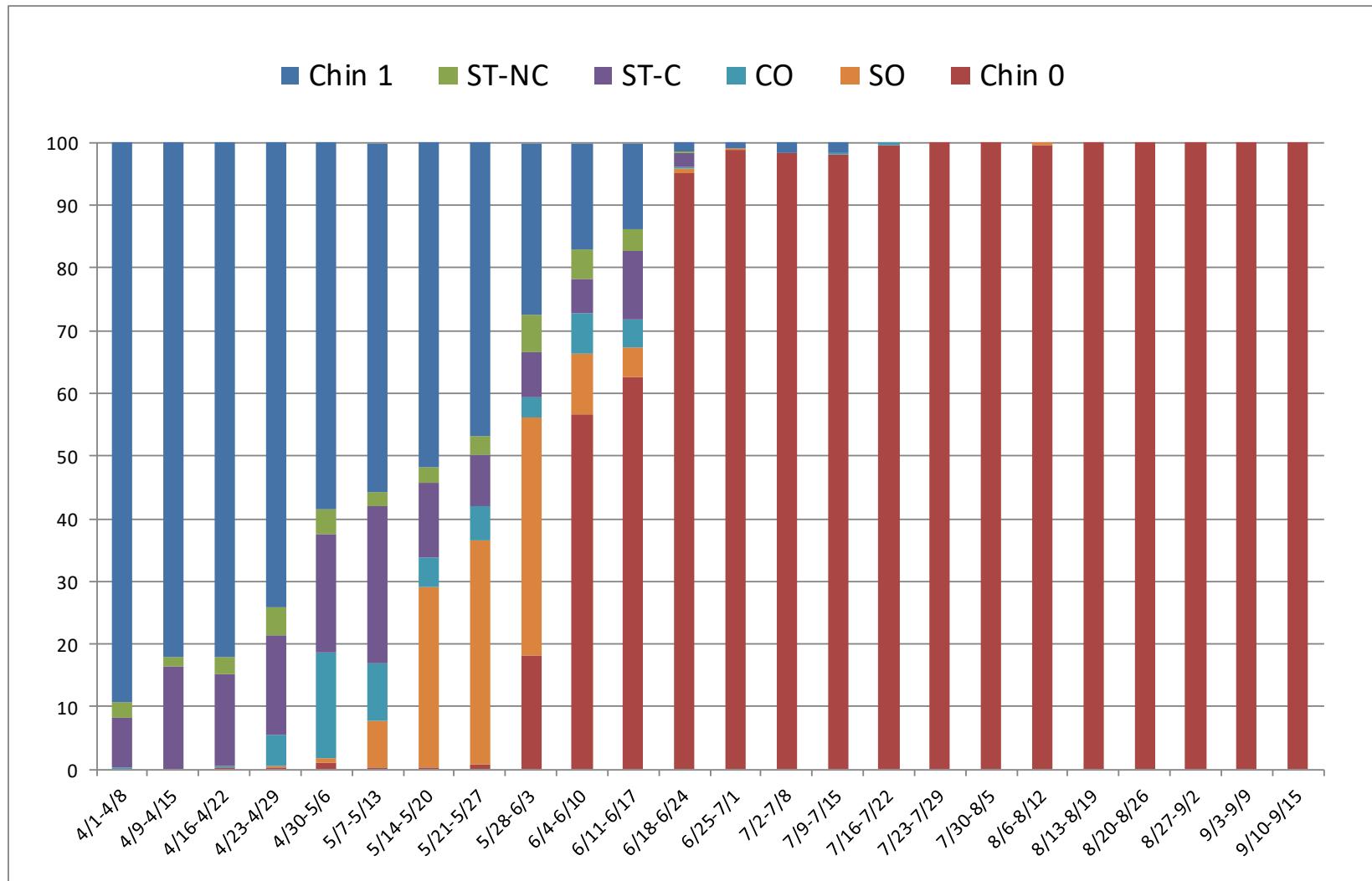


Fig. 1 John Day Dam Condition Monitoring, Species Composition by Sample Week, 2022.

Table 4. John Day Dam Smolt and Condition Monitoring Summary, 1998-2022.

Year	Dates	# Sample Days	SR Range	Yearling Chinook			All Subyearling Chinook			Fry Portion			Coho		
				Sample #	Collection	Index	Sample #	Collection	Index	Sample #	Collection	Index	Sample #	Collection	Index
1998	4/9-10/31	204	.67-25	27,732	758,689	1,147,861	31,178	1,584,083	2,155,479	159	4,229	5,330	370,277	572,762	
1999	4/1-10/31	205	.67-50	160,378	1,597,819	2,193,904	232,131	3,090,201	3,962,632	675	7,012	37,941	388,932	543,318	
2000	4/2-9/18	168	.67-100	124,788	579,810	827,047	197,340	1,132,204	1,681,685	1,021	6,555	57,716	172,742	263,724	
2001	3/30-9/17	172	.67-25	41,659	948,154	1,006,079	40,215	2,840,619	2,848,404	54	1,352	3,037	79,576	81,644	
2002	3/18-9/16	182	.7-100	70,901	1,470,332	2,104,942	127,980	2,357,720	3,465,719	315	4,979	9,248	205,548	315,279	
2003	4/1-9/15	168	.7-100	36,096	1,557,882	2,074,699	109,404	2,020,393	2,713,873	118	1,343	3,532	195,591	258,281	
2004	4/1-9/15	167	.7-100	103,699	714,176	1,007,069	260,484	1,205,759	1,721,238	240	3,584	12,431	123,836	175,316	
2005	4/1-9/15	167	.7-100	77,605	1,052,464	1,409,476	75,545	1,624,903	2,300,844	443	4,606	13,062	141,772	192,566	
*2006	4/4-9/14	142	.7-100	21,153	1,376,974	2,250,567	49,857	1,935,993	2,824,991	890	33,066	4,585	189,556	316,789	
2007	4/3-9/13	122	.7-100	36,601	3,150,848	4,262,624	25,335	2,146,676	3,006,184	50	2,159	2,571	257,747	347,365	
2008	4/3-9/13	156	.7-100	29,184	1,130,695	1,694,106	29,276	1,182,979	1,780,678	906	63,772	3,895	239,714	362,540	
2009	4/3-9/14	128	.7-100	20,518	695,504	1,032,266	18,926	1,008,525	1,507,260	143	4,474	4,142	166,037	240,425	
2010	4/3-9/14	147	.7-100	27,115	671,103	1,034,557	25,632	1,483,933	2,240,561	48	2,336	2,006	72,153	111,181	
2011	4/3-9/14	156	.7-100	32,162	1,822,781	2,936,468	29,071	2,139,092	3,296,670	1,128	81,055	4,230	283,884	477,003	
2012	4/1-9/15	159	.7-100	37,463	2,623,236	4,290,560	41,807	2,558,038	3,974,620	282	14,541	4,562	180,673	287,516	
2013	4/1-9/15	131	.7-100	17,081	1,291,293	2,057,123	20,374	1,653,322	2,553,972	28	1,575	1,644	116,717	188,510	
2014	4/1-9/15	138	.7-100	36,984	1,464,852	2,329,084	31,647	1,693,968	2,591,939	176	7,164	3,397	139,139	255,430	
2015	4/1-9/15	119	.7-100	18,420	443,624	664,379	12,471	547,861	826,329	3	121	1,781	46,559	70,109	
**2016	4/1-9/14	75	.7-100	12,624	976,324	1,456,048	13,733	610,040	939,672	66	6,088	637	38,828	58,657	
2017	4/1-9/15	73	.7-100	11,707	1,064,680	1,720,239	10,766	676,379	1,067,673	588	31,345	707	58,580	96,619	
2018	3/1 - 9/15	97	.7-100	10,098	668,059	1,257,456	10,993	681,799	1,068,599	424	29,705	927	61,248	120,098	
2019	3/14 - 9/13	81	.7-100	8,386	369,374	701,920	10,556	332,139	533,035	37	1,339	936	36,540	71,450	
****2020	4/2-9/15	74	.7-100	6,417	29,039	58,794	10,483	31,930	57,367	92	367	1,873	6,580	14,069	
****2021	3/2-9/15	89	.7-100	3,259	26,931	65,430	3,541	69,482	116,497	2	2	882	9,054	24,177	
****2022	4/1-9/15	91	1-100	4,676	47,784	114,702	4,197	96,146	168,922	32	389	484	5,780	13,654	

Year	Dates	# Sample Days	SR Range	Unclipped Steelhead			***Clipped Steelhead			Sockeye			Total		
				Sample #	Collection	Index	Sample #	Collection	Index	Sample #	Collection	Index	Sample #	Collection	Index
1998	4/9-10/31	204	.67-25	8,378	296,969	455,339	6,214	408,195	634,446	4,479	338,099	523,866	83,311	3,756,312	5,489,754
1999	4/1-10/31	205	.67-50	33,545	299,072	418,515	42,003	586,952	820,431	54,710	407,398	574,062	560,708	6,370,374	8,512,862
2000	4/2-9/18	168	.67-100	44,416	188,601	271,975	38,475	182,036	250,020	17,012	41,126	59,951	479,747	2,296,519	3,354,403
2001	3/30-9/17	172	.67-25	7,567	123,614	124,829	3,394	64,287	66,302	3,023	96,207	103,973	98,895	4,152,457	4,232,594
2002	3/18-9/16	182	.7-100	9,837	170,478	245,070	10,842	210,649	300,695	28,933	653,006	934,107	257,741	5,067,733	7,365,812
2003	4/1-9/15	168	.7-100	4,373	167,807	218,855	4,983	253,047	334,668	7,821	547,403	726,179	166,209	4,742,123	6,326,556
2004	4/1-9/15	167	.7-100	13,930	110,653	156,342	9,523	70,898	100,934	12,730	167,900	235,931	412,797	2,393,222	3,396,829
2005	4/1-9/15	167	.7-100	14,402	211,022	287,080	10,772	173,766	239,559	3,907	60,632	84,483	195,293	3,264,559	4,514,009
*2006	4/4-9/14	142	.7-100	6,312	320,358	539,319	10,391	679,098	1,142,925	5,573	320,084	529,311	97,871	4,822,063	7,603,903
2007	4/3-9/13	122	.7-100	2,848	161,917	218,626	4,830	548,753	742,744	6,869	589,692	790,334	79,054	6,855,633	9,367,877
2008	4/3-9/13	156	.7-100	5,339	245,645	369,639	9,633	503,380	763,304	3,334	220,441	331,943	80,661	3,522,854	5,302,210
2009	4/3-9/13	128	.7-100	5,052	169,570	252,851	9,119	454,027	687,789	1,833	76,332	111,960	59,636	2,569,995	3,832,551
2010	4/1-9/15	147	.7-100	4,479	117,337	178,562	8,196	272,628	416,260	14,037	423,846	656,079	81,465	3,041,000	4,637,201
2011	4/1-9/15	156	.7-100	7,801	444,790	726,780	21,442	1,169,975	1,893,438	3,161	218,941	364,039	97,867	6,079,463	9,694,398
2012	4/1-9/15	159	.7-100	6,419	489,335	804,443	12,552	1,231,676	2,030,531	7,862	522,389	851,019	110,665	7,605,347	12,238,689
2013	4/1-9/15	131	.7-100	2,546	112,714	177,492	3,441	350,591	554,896	2,626	252,317	414,782	47,712	3,776,954	5,946,776
2014	4/1-9/16	138	.7-100	3,914	112,781	176,481	10,339	543,055	860,659	11,775	349,462	578,091	98,056	4,303,257	6,761,683
2015	4/1-9/15	119	.7-100	1,184	25,789	38,006	3,523	107,113	163,079	1,670	67,366	104,374	39,049	1,238,321	1,866,276
**2016	4/1-9/15	75	.7-100	996	57,952	85,708	2,614	277,660	417,110	2,767	197,850	303,206	33,371	2,158,654	3,260,402
2017	4/1-9/15	73	.7-100	2,177	164,002	263,757	9,072	660,421	1,053,318	680	71,485	117,046	35,109	2,695,547	4,318,653
2018	3/1 - 9/15	97	.7-100	926	63,599	118,222	3,609	307,070	563,049	1,828	188,159	383,717	28,381	1,969,934	3,511,142
2019	3/14 - 9/13	81	.7-100	977	67,656	133,016	4,158	345,433	691,749	1,101	43,145	89,746	26,114	1,194,287	2,220,917
****2020	4/2-9/15	74	.7-100	734	4,024	8,106	2,905	18,799	39,771	323	2,560	4,971	22,735	92,932	183,078
****2021	3/2-9/15	89	.7-100	238	1,532	3,878	1,033	7,213	17,514	478	5,220	12,803	9,431	119,432	240,298
****2022	4/1-9/15	91	1-100	304	3,854	9,638	1,152	12,620	30,479	1,142	24,151	60,007	11,955	190,335	397,402

* First year os warm water sampling protocols.

*** Clipped Steelhead numbers include eroded dorsal fin steelhead numbers.

**** Numbers low due to reduced sampling, 5 days/4day/s/3day/s/2day/s per week, 0700 - 1300.

RIVER CONDITIONS

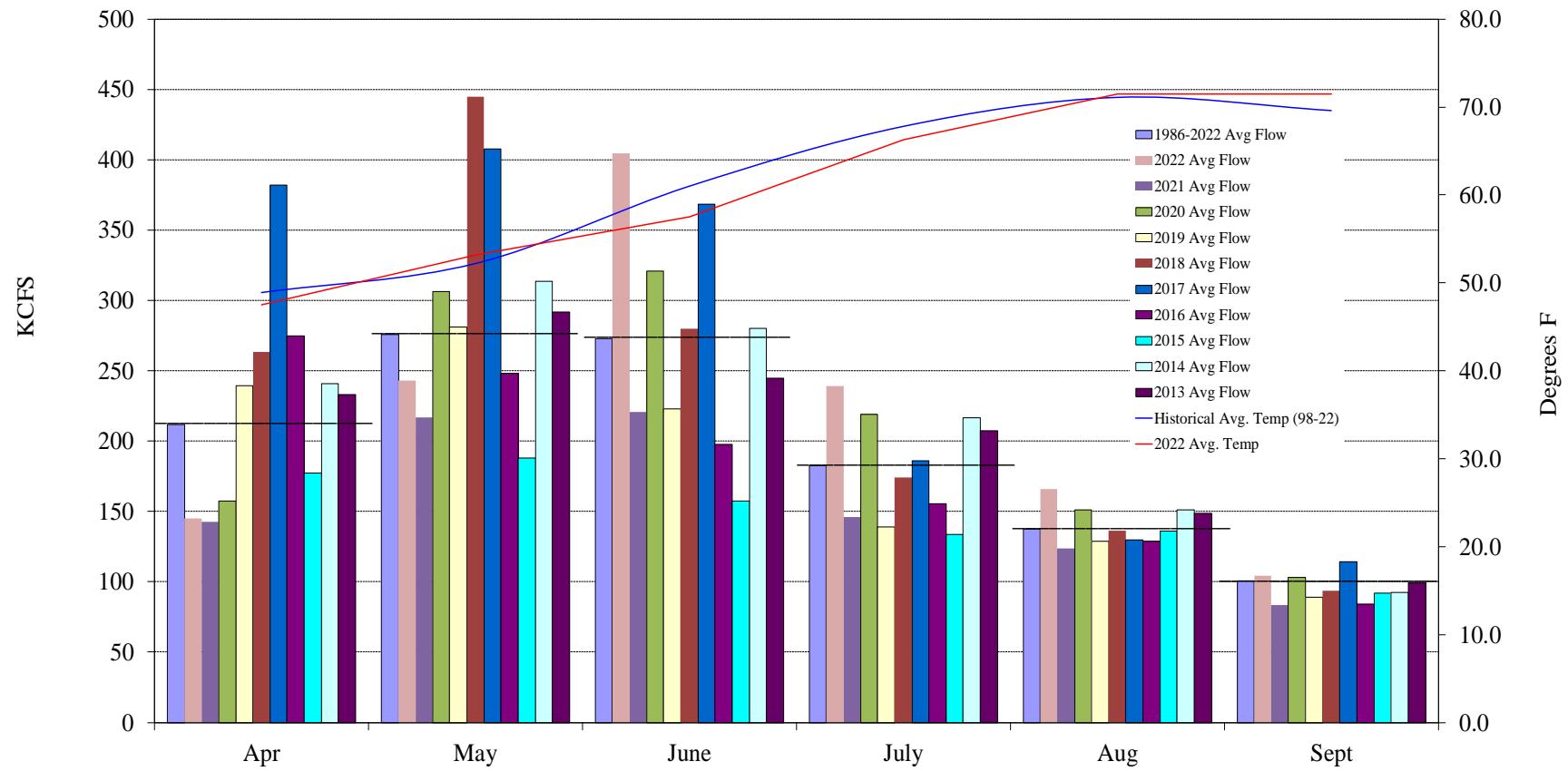


Figure 2. John Day Dam average monthly flows and temperature, 2013 - 2022, includes historical averages.

SMOLT AND JUVENILE PACIFIC LAMPREY CONDITION EXAM RESULTS

CONDITION INDEX

The Condition Index (CI) is derived by averaging all the sub-sampled condition incidence rates for a particular species for a given year. The higher the index value number, the worse the fish condition. The current year CI can be compared to the historical averages and between different years to give a relative indicator of whether fish were better or worse during their out-migration. The minimum and maximum values give the best and worst year estimates, but are also helpful in defining a known range of what to expect for a particular run of smolt.

Table 5. Yearling Spring Chinook (clipped and unclipped) Condition Exam Summary, 1998 - 2022.

YEAR	NO. SMPLD	PRED DESC	3-19% DESC	Yearling Chinook- (percent of sample)								PREDATION BIRD	OT ⁺⁺	CI		
				INJURY				DISEASE								
				HD*	OP	PE	BD**	HM ⁺	PAR	COL	FUN	BKD				
Avg	3,790	1.5	6.9	0.5	0.6	0.2	3.0	1.2	0.7	0.0	1.0	0.5	1.6	1.1	1.5	
Min	2,541	0.7	2.3	0.1	0.1	0.0	0.9	0.1	0.0	0.0	0.3	0.0	0.6	0.2	0.9	
Max	6,021	2.7	18.2	1.6	1.1	0.6	9.2	4.2	3.7	0.1	2.5	1.3	3.1	3.5	2.9	
1998	2,606		11.2	0.3	0.6	0.5	1.1	1.9	0.1	0.1	0.7	0.9	1.1	0.3	1.6	
1999	2,753		15.7	0.3	0.7	0.4	1.6	2.1	0.4	0.0	0.8	0.7	1.2	0.8	2.1	
2000	2,541		8.9	0.2	0.2	0.2	1.8	0.1	0.0	0.0	1.2	0.7	1.4	0.2	1.3	
2001	3,955		6.6	0.1	0.1	0.1	0.9	0.3	0.4	0.1	0.3	1.0	1.9	0.2	1.0	
2002	3,917		6.1	0.7	0.7	0.2	1.0	0.6	1.7	0.0	1.6	0.7	2.1	0.3	1.3	
2003	3,869		7.8	0.6	0.9	0.5	1.7	1.1	2.4	0.0	1.1	0.3	1.4	1.2	1.6	
2004	3,185		4.8	0.2	0.3	0.2	1.4	0.5	0.5	0.0	0.5	0.2	1.0	0.6	0.9	
2005	3,712		12.0	0.4	0.9	0.2	2.9	2.0	0.3	0.0	0.4	0.2	1.2	0.8	1.8	
2006	4,294		18.2	0.8	1.1	0.6	4.2	4.2	0.5	0.0	0.9	0.5	2.5	1.2	2.9	
2007	3,988		11.7	0.2	0.6	0.2	2.5	2.5	0.5	0.0	0.3	0.3	1.9	1.2	1.8	
2008	3,617		5.1	0.2	0.5	0.2	2.2	0.9	0.1	0.0	0.5	0.6	1.1	0.5	1.0	
2009	3,525	1.5	9.9	1.6	0.6	0.1	4.2	0.7	0.9	0.0	1.0	0.8	1.9	1.2	1.9	
2010	3,992	0.9	7.7	0.4	0.5	0.1	3.7	0.5	0.8	0.1	2.0	0.2	1.5	0.8	1.5	
2011	3,360	1.2	7.7	0.6	0.6	0.1	9.2	1.2	0.6	0.1	1.5	0.6	2.2	1.8	2.1	
2012	4,589	1.3	5.7	0.4	0.7	0.0	3.6	1.2	0.4	0.0	0.8	0.5	2.1	1.0	1.4	
2013	3,599	0.7	4.8	0.7	1.0	0.1	3.0	0.8	1.1	0.0	1.3	0.2	1.9	0.5	1.2	
2014	3,649	1.3	3.2	0.6	0.3	0.0	2.2	1.0	1.1	0.0	1.0	0.0	3.1	0.9	1.1	
2015	5,558	1.6	2.7	0.5	0.5	0.0	2.8	0.7	0.4	0.1	2.5	0.4	2.1	1.4	1.2	
2016	3,155	1.5	4.0	0.7	0.6	0.1	4.0	1.1	0.5	0.0	1.6	0.4	1.3	1.2	1.3	
2017	3,121	2.2	4.7	0.5	0.4	0.1	6.2	1.1	3.7	0.0	0.7	0.3	1.2	2.2	1.8	
2018	4,612	1.3	2.9	0.4	0.5	0.1	3.6	1.3	1.0	0.0	1.7	1.3	1.9	1.3	1.3	
2019	3,368	1.6	2.3	1.1	1.0	0.0	2.1	1.0	0.8	0.0	0.6	0.3	1.0	1.2	1.0	
2020	6,021	1.0	2.7	0.7	0.5	0.0	5.2	0.6	0.2	0.0	0.3	0.1	0.6	0.9	1.0	
2021	3,186	2.7	3.0	0.5	0.5	0.0	2.4	0.5	0.1	0.0	0.3	0.5	1.0	3.5	1.2	
2022	4,587	1.6	4.0	0.6	0.2	0.1	2.7	1.0	0.1	0.0	0.5	0.6	1.8	1.5	1.1	

*HD includes eye injuries

[†]HM includes fin hem, eye hm, and pink fin

**BD includes fin injuries, and deformity

⁺⁺Pred OT includes fish and juv. lamprey

Yearling Spring Chinook were the most commonly sampled smolt at JDA in 2022. Their overall Condition Index estimate was 1.1% which is slightly better than their historical average of 1.5%. Body injuries, 2.7% in 2022, was a bit lower than the historical average of 3.0%. In addition, partial descaling and descaling associated with predation caused by birds and fish were slightly higher at 1.8% versus 1.6% historical and 1.5% compared to 1.1% for the historical estimate. Most other ailments were similar or lower in 2022 than the historical averages.

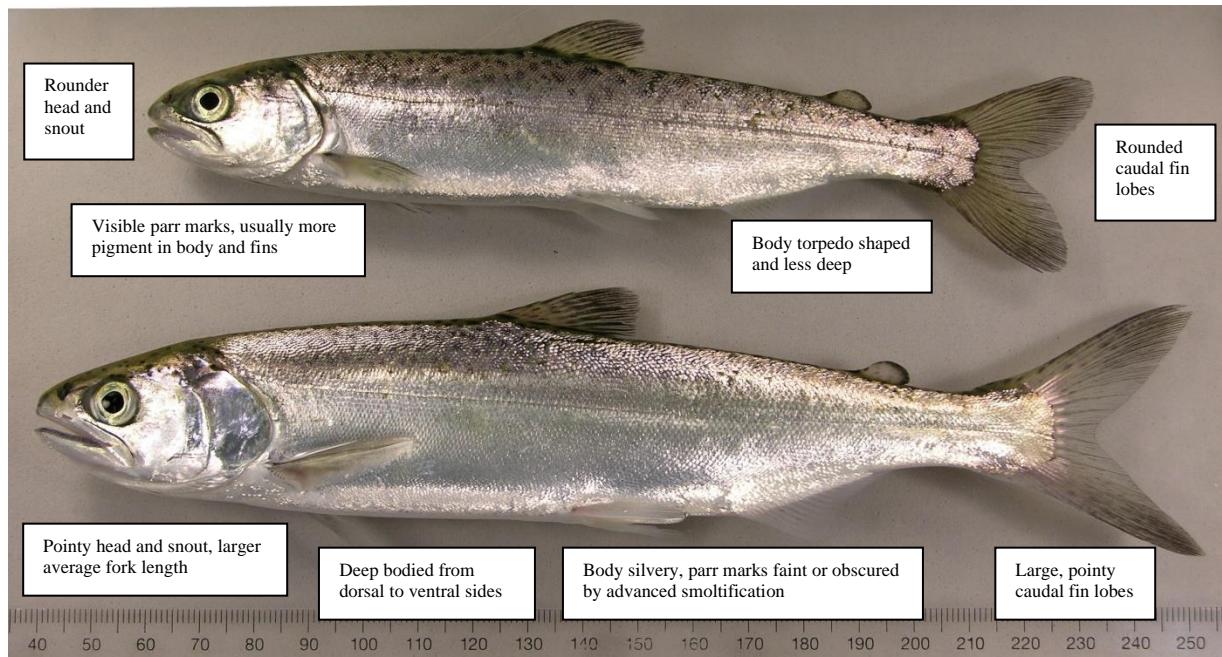


Figure 3. Yearling Spring Chinook on top compared to a yearling Fall Chinook on bottom.

Table 6. Yearling Fall Chinook Holdover (clipped and unclipped) Condition Exam Summary, 2009-2022.

Yearling Chinook Holdover- (percent of sample)

NO. SMPLD	Length (mm)			PRED DESC	3-19% DESC	20% DESC	INJURY					DISEASE				PREDATION		
	Avg	Min	Max				HD	OP	PE	BD	HM	PAR	COL	FUN	BKD	BIRD	OT	
2009	171	196	150	242	2.9	14.6	1.2	0.6	0.0	0.0	4.1	1.2	1.8	0.0	0.0	0.0	2.3	2.9
2010	114	218	172	304	1.8	3.5	12.3	0.0	0.0	0.0	1.8	0.9	5.3	0.0	0.0	0.0	4.4	0.9
2011	258	199	144	265	1.9	29.8	3.9	3.9	1.9	0.4	23.3	2.3	17.4	0.0	0.4	0.7	5.0	8.1
2012	269	192	153	247	3.0	24.2	3.7	0.0	1.1	0.0	7.8	1.1	5.2	0.0	0.4	0.0	2.3	4.5
2013	371	214	160	300	3.2	12.3	2.1	1.0	1.6	0.0	3.6	3.0	2.1	0.0	0.0	0.0	9.1	1.8
2014	837	204	155	359	1.8	10.9	1.7	1.7	1.4	0.0	3.4	2.5	1.3	0.2	1.2	0.0	5.7	2.3
2015	434	208	150	310	2.1	7.4	1.2	0.7	0.0	0.0	1.1	0.9	2.1	0.0	0.0	0.0	6.0	5.3
2016	115	203	151	242	5.2	8.7	1.7	1.7	2.6	0.0	3.5	5.2	2.6	0.0	0.0	0.0	4.3	5.2
2017	19	207	183	278	5.3	15.8	10.5	0.0	0.0	0.0	26.4	5.3	10.5	5.3	0.0	0.1	0.0	5.3
2018	83	192	157	230	1.2	7.3	0.0	0.0	1.2	0.0	3.7	0.0	2.4	0.0	1.2	0.0	0.0	6.1
2019	157	200	166	257	3.2	7.0	1.9	0.6	0.6	0.0	3.8	0.0	2.5	0.0	0.6	0.0	3.2	6.4
2020	83	204	172	286	2.4	4.8	0.0	0.0	1.2	0.0	2.4	2.4	4.8	0.0	0.0	0.0	1.2	3.6
2021	68	202	161	286	4.4	4.4	0.0	0.0	0.0	0.0	5.8	0.0	2.9	0.0	0.0	0.0	0.0	5.9
2022	83	198	156	282	1.2	13.3	0.0	1.2	0.0	0.0	0.0	4.8	1.2	0.0	0.0	0.0	2.4	1.2
Hist. Avg	233	203	159	278	2.8	11.7	2.9	0.8	0.8	0.0	6.5	2.1	4.4	0.4	0.3	0.1	3.3	4.3

* HD includes eye injuries

*HM includes fin hem, eye hm., and pink fin

** BD includes fin injuries and deformity

** Pred OT includes fish and juv. Lamprey

Yearling fall Chinook Holdovers tend to be larger than their spring out-migrant counterparts, Yearling spring Chinook. Partial descaling in 2022 was 13.3% which is slightly higher than the historical average of 11.7%. This category continues to be one of the more commonly observed ailments during condition exams for Holdovers. Although body injuries have a historical average of 6.5%, no body injuries were observed in 2022. Hemorrhaging in the fin or eyes were observed on 4.8% of those examined in 2022 which is more than double the historical average of 2.1%. As in past years, partial descaling and descaling associated with predation marks by birds and fish were one of the more common ailments recorded in 2022, although both were still lower than historical averages. Please note that sample sizes of Holdover Chinook have been smaller than for the other smolt, which is normal.

Table 7. Subyearling Fall Chinook (clipped and unclipped) Condition Exam Summary, 1998-2022.

Subyearling Chinook- (percent of sample)															
YEAR	NO. SMPLD	PRED DESC	3-19% DESC	INJURY					DISEASE				PREDATION		CI
				HD*	OP	PE	BD**	HM ⁺	PAR	COL	FUN	BKD	BIRD	OT ⁺⁺	
Avg	8,399	0.9	4.9	0.1	0.4	0.0	2.5	2.5	3.5	0.1	0.1	0.2	0.4	1.1	1.3
Min	3,053	0.2	2.0	0.0	0.1	0.0	0.9	0.3	0.0	0.0	0.0	0.0	0.1	0.4	0.4
Max	16,073	2.3	11.6	0.4	1.6	0.1	8.9	8.0	12.2	0.6	0.4	1.0	1.0	2.8	2.5
1998	5,169		7.7	0.2	0.3	0.0	1.5	4.0	0.2	0.1	0.2	0.1	0.2	0.5	1.2
1999	8,767		4.8	0.1	0.4	0.0	1.4	0.8	0.1	0.1	0.1	0.0	0.3	0.8	0.8
2000	9,823		2.8	0.1	0.1	0.0	1.1	0.3	0.1	0.0	0.1	0.0	0.1	0.5	0.4
2001	9,588		8.1	0.1	0.2	0.0	1.1	2.0	0.0	0.0	0.0	0.2	0.1	0.6	1.0
2002	14,382		4.7	0.1	0.3	0.0	1.1	1.5	0.1	0.0	0.0	0.1	0.2	1.3	0.8
2003	16,073		4.4	0.0	0.4	0.0	1.4	2.1	0.0	0.0	0.1	0.0	0.2	0.8	0.8
2004	13,332		3.2	0.0	0.2	0.0	0.9	1.0	0.0	0.1	0.0	0.0	0.3	0.4	0.5
2005	15,433		11.6	0.2	0.5	0.0	2.1	6.7	0.1	0.1	0.1	0.1	0.4	0.9	1.9
2006	10,882		11.4	0.3	1.6	0.1	2.4	8.0	0.2	0.0	0.0	0.1	0.2	1.1	2.1
2007	6,795		6.4	0.1	0.5	0.0	1.4	3.1	0.1	0.0	0.0	0.1	0.4	0.5	1.0
2008	13,695		4.0	0.1	0.3	0.0	1.7	1.5	0.2	0.0	0.1	0.1	0.3	0.8	0.7
2009	5,093	0.2	7.0	0.4	0.5	0.0	2.3	3.2	0.2	0.1	0.0	0.3	0.5	0.7	1.2
2010	7,490	0.7	5.9	0.3	0.4	0.0	5.4	1.1	1.8	0.1	0.0	0.1	0.5	0.7	1.3
2011	14,995	0.4	4.2	0.1	0.3	0.0	4.7	3.2	1.2	0.1	0.4	0.1	0.4	0.7	1.2
2012	8,928	0.4	3.2	0.2	0.4	0.0	1.9	2.6	3.1	0.1	0.2	0.2	0.1	1.1	1.0
2013	6,093	0.6	4.4	0.1	0.5	0.0	1.8	2.3	2.9	0.1	0.1	0.1	0.4	1.1	1.1
2014	8,460	0.8	2.4	0.1	0.2	0.0	1.5	2.0	10.7	0.1	0.1	0.0	0.3	1.0	1.5
2015	4,879	0.5	2.8	0.0	0.1	0.0	2.1	2.7	8.5	0.2	0.1	0.1	0.5	1.1	1.4
2016	3,627	2.3	4.4	0.0	0.2	0.0	5.0	1.6	7.1	0.6	0.2	1.0	0.7	2.8	2.0
2017	3,760	1.0	4.0	0.1	0.3	0.0	4.0	1.7	5.6	0.2	0.1	0.0	0.5	1.3	1.4
2018	3,791	0.9	2.0	0.1	0.3	0.0	2.3	1.9	5.1	0.1	0.1	0.2	0.2	1.2	1.1
2019	3,053	1.1	3.9	0.1	0.3	0.0	2.2	2.5	10.7	0.0	0.2	0.0	0.3	1.5	1.8
2020	8,173	2.0	4.2	0.3	0.3	0.0	8.9	2.6	10.7	0.0	0.2	0.2	0.3	2.6	2.5
2021	3,535	1.5	2.4	0.0	0.3	0.0	1.9	1.0	12.2	0.1	0.2	0.4	0.4	2.3	1.7
2022	4,160	0.8	2.9	0.1	0.2	0.1	3.4	3.1	6.9	0.0	0.1	0.2	1.0	1.7	1.6

*HD includes eye injuries

⁺HM includes fin hem, eye hm, and pink fin

**BD includes fin injuries, and deformity

⁺⁺Pred OT includes fish and juv. lamprey

Subyearling fall Chinook smolt had slightly more body injuries at 3.4% compared to their historical average of 2.5%. Parasite infections, primarily black spot caused by trematodes, at 6.9% was also higher than their historical average of 3.5%. Although this is higher than average it is substantially lower than the three previous season's average of approximately 11%. Their overall Condition Index estimate was only slightly higher than average at 1.6% compared to 1.3% historically.

Table 8. Unclipped Steelhead Condition Exam Summary, 1998 - 2022.

YEAR	NO. SMPLD	PRED DESC	3-19% DESC	Unclipped Steelhead- (percent of sample)								CI	
				INJURY					DISEASE				
				HD*	OP	PE	BD**	HM [†]	PAR	COL	FUN	BKD	
Avg	1,670	2.4	6.7	0.6	0.7	0.1	2.5	0.5	6.2	0.1	0.9	0.0	4.4
Min	238	1.0	2.4	0.0	0.0	0.0	0.4	0.0	2.4	0.0	0.2	0.0	1.8
Max	2,921	4.6	17.9	1.2	1.7	0.5	4.2	1.9	12.6	0.8	2.0	0.2	9.4
1998	1,707		3.6	0.2	0.1	0.1	0.4	0.3	2.4	0.1	0.2	0.0	1.8
1999	2,334		9.3	0.3	0.7	0.1	2.6	1.7	5.0	0.0	1.0	0.1	4.9
2000	2,304		10.1	0.0	0.0	0.1	1.6	0.0	2.5	0.0	0.4	0.1	2.7
2001	1,715		5.1	0.2	0.1	0.0	1.2	0.1	8.2	0.0	0.5	0.0	2.0
2002	2,921		6.4	0.8	1.0	0.0	1.2	0.4	5.3	0.0	1.3	0.0	5.1
2003	2,092		8.7	0.6	1.1	0.5	1.9	0.4	8.4	0.1	2.0	0.0	5.4
2004	2,315		6.3	0.6	0.3	0.3	1.6	0.2	3.3	0.0	0.9	0.0	3.5
2005	2,057		13.9	1.2	0.8	0.0	4.0	1.0	5.6	0.1	1.7	0.0	6.2
2006	2,795		17.9	0.6	1.7	0.3	4.2	1.9	7.1	0.1	1.0	0.0	5.3
2007	1,210		11.9	0.3	0.9	0.1	4.2	0.7	4.6	0.2	0.9	0.0	5.8
2008	1,939		5.9	0.2	0.5	0.1	1.8	0.4	3.8	0.1	1.0	0.0	3.0
2009	1,312	1.7	8.8	0.8	0.7	0.0	3.0	0.1	4.6	0.0	0.8	0.1	5.3
2010	1,654	2.1	7.9	0.5	1.1	0.0	3.5	0.1	4.8	0.0	0.6	0.0	5.1
2011	2,787	1.4	6.8	0.8	1.1	0.0	4.2	0.4	5.1	0.0	0.8	0.0	3.3
2012	2,892	1.7	5.4	0.7	0.8	0.0	2.7	0.8	6.2	0.1	0.6	0.1	4.1
2013	1,300	1.4	4.6	0.4	1.2	0.1	2.5	0.5	11.1	0.1	0.5	0.0	4.5
2014	1,959	1.0	2.4	0.8	0.6	0.0	1.9	0.4	8.6	0.0	1.1	0.0	4.3
2015	965	4.6	5.2	0.4	0.1	0.0	2.5	0.5	10.5	0.1	0.8	0.0	9.4
2016	967	4.0	5.2	1.0	0.6	0.0	3.6	0.6	9.5	0.0	0.8	0.0	6.0
2017	1,685	2.9	3.1	0.6	0.5	0.0	3.4	0.5	6.6	0.0	0.7	0.0	3.0
2018	916	3.4	3.2	0.7	0.4	0.0	3.5	0.8	5.9	0.0	0.5	0.0	4.5
2019	922	1.5	3.5	0.6	0.9	0.0	2.8	0.2	7.9	0.0	0.7	0.0	3.1
2020	470	2.1	4.5	0.4	0.2	0.0	2.2	0.6	2.6	0.2	0.6	0.2	2.1
2021	238	3.8	5.5	0.8	0.4	0.4	0.4	0.4	12.6	0.8	0.4	0.0	5.9
2022	304	2.0	3.0	0.3	0.7	0.0	2.6	0.0	2.6	0.0	2.0	0.0	3.6

*HD includes eye injuries

[†]HM includes fin hem, eye hm, and pink fin

**BD includes fin injuries, and deformity

^{††}Pred OT includes fish and juv. lamprey

Unclipped steelhead smolt had a slightly lower Condition Index estimate in 2022 at 1.4% than for the historical estimate of 2.0%. Partial descaling, estimated at 3% in 2022, was less than half the historical average of 6.7%. Observations of parasites (copepods and trematodes), were less in 2022 at 2.6% versus a historical average of 6.2%. Body injuries were only a bit higher in 2022 at 2.6% versus 2.5% historically. One ailment that was almost double historical estimates was the occurrence of fungus at 2% in 2022 versus 0.9% historically.

Table 9. Clipped Steelhead Condition Exam Summary, 1998 – 2022.

YEAR	NO. SMPLD	PRED DESC	3-19% DESC	Clipped Steelhead- (percent of sample)								CI			
				INJURY					DISEASE						
				HD*	OP	PE	BD**	HM [†]	PAR	COL	FUN	BKD			
Avg	2,158	5.1	12.9	0.9	1.9	0.1	4.3	0.6	0.8	0.1	2.2	0.0	9.4	0.8	3.0
Min	1,028	2.9	4.1	0.2	0.4	0.0	1.9	0.1	0.0	0.0	0.8	0.0	6.4	0.2	2.0
Max	3,564	8.3	29.1	2.1	3.7	0.5	11.6	2.3	5.5	0.6	4.6	0.2	15.2	3.5	5.0
1998	1,510		12.8	0.7	2.3	0.5	3.7	1.1	0.4	0.1	1.2	0.1	7.6	0.3	2.6
1999	2,716		19.3	0.6	2.4	0.2	4.3	1.8	0.1	0.0	1.3	0.0	8.4	1.3	3.3
2000	1,990		18.3	0.4	0.7	0.1	3.1	0.1	0.7	0.1	0.9	0.0	6.9	0.2	2.6
2001	1,043		13.0	0.6	0.4	0.0	2.2	0.2	2.8	0.0	2.4	0.0	7.3	0.3	2.4
2002	2,765		11.1	1.3	1.6	0.1	2.4	0.3	5.5	0.0	4.6	0.0	10.6	0.3	3.1
2003	1,874		16.7	1.2	2.1	0.5	2.6	0.5	1.5	0.1	4.3	0.1	9.2	1.0	3.3
2004	1,864		12.9	0.4	0.8	0.2	2.3	0.1	0.4	0.0	1.6	0.1	8.6	0.2	2.3
2005	1,970		24.3	1.3	2.4	0.3	5.9	1.5	0.3	0.2	3.8	0.1	12.3	0.7	4.4
2006	3,137		29.1	1.5	3.7	0.4	6.4	2.3	0.3	0.1	2.1	0.0	11.2	0.7	4.8
2007	1,679		22.2	1.5	2.8	0.3	11.0	0.8	0.8	0.4	4.1	0.0	15.2	0.7	5.0
2008	2,331		15.2	0.2	2.6	0.1	2.7	0.5	0.2	0.1	2.4	0.0	8.1	0.2	2.7
2009	1,850	4.3	19.2	1.9	2.9	0.1	6.3	0.1	0.6	0.1	1.6	0.1	8.8	0.4	3.6
2010	2,144	4.7	15.1	0.6	2.1	0.0	6.6	0.2	0.5	0.0	1.9	0.0	9.0	0.4	3.2
2011	3,564	2.9	14.6	1.6	2.9	0.0	11.6	0.7	0.1	0.3	2.2	0.0	6.4	0.5	3.4
2012	2,786	3.8	10.1	1.3	3.1	0.0	3.2	0.9	0.3	0.0	1.2	0.2	7.6	0.5	2.5
2013	1,634	3.1	11.3	0.3	2.6	0.0	3.8	0.7	0.5	0.3	1.7	0.0	7.8	0.2	2.5
2014	2,274	3.7	5.5	0.6	1.7	0.0	2.1	0.1	0.4	0.0	2.1	0.0	13.0	0.4	2.3
2015	2,503	6.1	7.2	0.3	1.1	0.0	2.0	0.2	0.1	0.0	2.8	0.0	15.1	1.0	2.8
2016	1,835	6.8	8.5	1.3	2.0	0.1	7.0	0.4	0.2	0.2	2.6	0.1	10.5	1.0	3.1
2017	3,486	5.1	6.5	1.4	2.1	0.0	5.1	0.5	0.6	0.0	1.3	0.0	7.6	0.8	2.4
2018	2,444	5.4	4.1	0.5	1.1	0.0	2.2	0.6	0.6	0.1	0.8	0.0	8.8	1.9	2.0
2019	2,235	6.0	4.2	2.1	1.6	0.0	1.9	0.2	0.3	0.0	1.2	0.0	8.3	1.4	2.1
2020	2,140	4.5	7.2	0.8	1.6	0.0	2.0	0.8	0.0	0.0	1.1	0.1	6.7	1.5	2.0
2021	1,028	8.3	6.3	0.6	1.3	0.0	3.2	0.1	1.6	0.6	3.9	0.0	10.0	3.5	3.0
2022	1,150	6.2	7.5	0.4	0.8	0.0	3.9	0.9	0.1	0.2	1.4	0.0	9.7	1.8	2.5

*HD includes eye injuries

†HM includes fin hem., eye hm., and pink fin

**BD includes fin injuries, and deformity

††Pred OT includes fish and juv. lamprey

Clipped steelhead smolts have historically had a slightly higher Condition Index estimates than their unclipped cohorts. Of note in 2022, partial descaling and descaling associated with predation marks (birds and fish) was higher in 2022 at 6.2%, with the historical average estimated to be 5.1%. Hemorrhaging in the fins or eyes on clipped steelhead smolt was 0.9% in 2022, versus approximately 0.6% for the historical average. Most other categories were observed at similar or lower rates than their historical averages.

Table 10. Coho (clipped and unclipped) Condition Exam Summary, 1998 – 2022.

YEAR	NO. SMPLD	PRED DESC	3-19% DESC	Coho- (percent of sample)								CI			
				INJURY					DISEASE						
				HD*	OP	PE	BD**	HM [†]	PAR	COL	FUN	BKD			
Avg	1,338	2.0	7.5	0.3	0.5	0.1	2.2	0.5	0.5	0.0	0.5	0.1	2.3	1.4	1.4
Min	483	1.2	2.5	0.0	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.6
Max	2,767	4.0	23.5	0.6	1.0	0.4	5.3	2.9	1.4	0.3	1.0	0.8	3.7	5.3	3.1
1998	1,374		5.9	0.1	0.5	0.4	1.5	0.7	0.0	0.1	0.3	0.1	1.8	0.8	1.0
1999	2,767		11.7	0.2	0.5	0.1	1.3	1.0	0.4	0.0	0.4	0.2	1.5	1.2	1.5
2000	2,399		5.0	0.2	0.2	0.0	1.2	0.1	0.4	0.0	0.3	0.0	1.1	0.1	0.7
2001	591		3.9	0.2	0.2	0.0	0.8	0.0	0.2	0.3	0.0	0.2	1.0	0.5	0.6
2002	2,191		6.7	0.6	0.4	0.0	0.7	0.1	0.6	0.0	0.8	0.2	2.3	0.3	1.1
2003	1,113		7.4	0.1	0.1	0.0	0.7	0.4	0.7	0.0	0.3	0.0	1.7	1.2	1.0
2004	1,608		7.2	0.1	0.2	0.1	1.3	0.0	0.1	0.0	0.4	0.0	2.2	0.7	1.0
2005	1,822		18.3	0.3	0.5	0.2	3.1	1.2	0.3	0.0	1.0	0.1	3.7	1.9	2.5
2006	1,534		23.5	0.6	0.7	0.3	3.5	2.9	0.9	0.0	1.0	0.0	2.4	1.4	3.1
2007	1,271		15.7	0.2	0.8	0.2	2.4	0.9	0.3	0.0	0.7	0.0	3.1	1.2	2.1
2008	1,611		7.1	0.2	0.4	0.2	1.6	0.2	0.2	0.0	0.4	0.8	2.4	0.5	1.2
2009	1,753	1.8	10.7	0.6	1.0	0.0	3.1	0.1	0.2	0.0	0.5	0.1	3.7	1.0	1.8
2010	894	1.3	8.4	0.4	0.4	0.1	3.1	0.1	0.2	0.1	0.3	0.0	3.0	0.5	1.4
2011	1,742	1.2	6.5	0.3	0.7	0.1	2.1	0.6	0.6	0.1	0.5	0.2	2.0	0.6	1.2
2012	1,560	1.2	4.9	0.6	0.7	0.0	0.9	0.3	0.3	0.0	1.0	0.0	1.3	1.0	0.9
2013	867	1.5	6.3	0.4	0.8	0.0	1.8	0.0	0.6	0.0	0.6	0.1	2.9	1.2	1.2
2014	1,192	1.3	3.8	0.3	0.3	0.1	0.3	0.2	1.1	0.0	0.6	0.0	3.5	0.8	0.9
2015	1,375	1.8	3.8	0.1	0.5	0.0	3.2	0.3	0.4	0.0	0.7	0.1	2.4	2.5	1.2
2016	637	3.0	5.2	0.5	0.8	0.3	2.3	0.3	1.4	0.2	0.0	0.0	3.3	2.0	1.5
2017	706	3.4	5.4	0.5	0.7	0.0	4.4	0.9	0.3	0.0	0.3	0.3	1.7	2.8	1.6
2018	922	1.8	2.5	0.5	0.2	0.1	4.7	0.1	0.8	0.1	0.9	0.0	2.3	2.6	1.3
2019	929	4.0	4.2	0.4	0.4	0.1	2.5	0.1	1.2	0.0	0.8	0.0	2.3	2.6	1.6
2020	1,221	1.2	4.3	0.3	0.4	0.0	1.1	0.6	0.2	0.1	0.3	0.0	1.5	1.1	0.9
2021	881	2.8	3.5	0.1	0.5	0.0	1.4	0.2	0.0	0.0	0.5	0.1	0.5	5.3	1.1
2022	483	1.7	5.4	0.0	0.2	0.0	5.3	0.8	0.4	0.0	0.2	0.0	2.9	1.2	1.4

*HD includes eye injuries

[†]HM includes fin hem, eye hm, and pink fin

**BD includes fin injuries, and deformity

^{††}Pred OT includes fish and juv. lamprey

Coho smolt examined in 2022 had a Condition Index estimate that equaled their historical average of 1.4%. They had a lower incidence of descaling associated with predator marks in 2022 at 1.7% versus a 2.0% average historically. Of note, occurrences of body injuries (which include fin injuries and deformities) in 2022 was 5.3% which is more than twice the historical average of 2.2%. Fin and eye hemorrhaging was also slightly higher in 2022 at 0.8% compared to 0.5% for the historical average.

Table 11. Sockeye (clipped and unclipped) Condition Exam Summary, 1998 – 2022.

YEAR	NO. SMPLD	PRED DESC	3-19% DESC	Sockeye- (percent of sample)								CI			
				INJURY					DISEASE						
				HD*	OP	PE	BD**	HM [†]	PAR	COL	FUN	BKD			
Avg	1,367	0.9	11.8	0.6	1.9	0.2	1.7	1.1	0.1	0.0	0.5	0.0	0.6	0.5	1.6
Min	323	0.3	2.5	0.0	0.6	0.0	0.5	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.7
Max	2,366	2.1	29.1	2.6	3.4	0.6	5.2	3.3	0.2	0.3	1.8	0.2	1.7	1.4	3.3
1998	1,268		15.5	0.1	1.4	0.2	0.5	0.9	0.0	0.0	0.2	0.1	0.1	0.2	1.6
1999	1,864		19.0	0.2	1.9	0.2	1.6	1.2	0.0	0.0	0.8	0.1	0.8	0.2	2.2
2000	1,463		6.9	0.8	0.8	0.1	0.9	0.0	0.1	0.0	0.2	0.1	0.1	0.1	0.8
2001	828		15.7	0.0	0.6	0.1	1.3	0.8	0.0	0.1	0.4	0.1	0.5	0.1	1.7
2002	2,328		12.0	0.9	2.6	0.1	1.0	0.9	0.0	0.0	1.8	0.1	0.1	0.0	1.6
2003	1,558		9.3	0.5	1.9	0.4	0.6	0.8	0.0	0.0	0.2	0.0	0.1	0.0	1.2
2004	1,527		11.3	0.6	0.8	0.4	0.7	0.8	0.0	0.1	0.5	0.1	0.3	0.1	1.3
2005	1,145		23.8	0.3	0.7	0.3	2.4	2.5	0.2	0.3	0.7	0.0	1.2	0.4	2.7
2006	1,462		29.1	0.3	2.5	0.5	2.1	3.3	0.1	0.0	1.0	0.0	0.7	0.5	3.3
2007	1,803		22.4	0.2	1.2	0.1	2.0	1.4	0.2	0.1	0.5	0.1	0.3	0.3	2.4
2008	1,236		12.9	0.4	1.6	0.4	1.1	1.5	0.0	0.0	0.8	0.0	0.6	0.2	1.6
2009	823	1.1	14.7	2.6	2.6	0.0	1.8	0.9	0.0	0.0	0.2	0.0	0.4	1.3	2.0
2010	2,366	0.4	13.6	0.6	1.7	0.0	1.6	0.3	0.0	0.0	0.4	0.0	0.6	0.4	1.5
2011	1,341	0.4	13.7	0.6	2.8	0.2	2.8	1.6	0.0	0.0	1.0	0.0	0.5	0.5	1.9
2012	1,899	0.5	9.7	0.5	2.8	0.0	0.8	1.4	0.0	0.1	0.8	0.0	0.4	0.4	1.3
2013	1,208	0.3	10.5	0.6	2.8	0.0	2.2	1.7	0.2	0.0	0.5	0.1	0.5	0.3	1.5
2014	2,016	0.8	7.0	1.0	2.3	0.0	0.9	1.0	0.1	0.0	0.5	0.0	0.9	0.3	1.1
2015	1,021	0.8	5.7	0.1	1.4	0.1	1.6	0.1	0.0	0.1	0.5	0.1	1.2	0.5	0.9
2016	1,844	2.1	7.9	0.3	1.7	0.2	1.4	0.7	0.1	0.2	0.2	0.1	0.8	1.0	1.3
2017	674	0.4	8.0	0.1	2.5	0.0	3.0	0.9	0.0	0.0	0.1	0.0	0.3	0.4	1.2
2018	1,552	0.4	4.8	1.1	2.1	0.3	2.7	1.3	0.1	0.0	0.6	0.0	0.5	0.9	1.1
2019	1,013	1.6	4.6	0.8	2.0	0.0	2.0	1.0	0.1	0.0	0.4	0.1	0.4	1.4	1.1
2020	323	0.9	8.7	2.2	3.4	0.6	5.2	1.5	0.0	0.0	0.6	0.0	0.3	0.9	1.9
2021	477	1.5	2.5	0.0	0.8	0.0	1.3	0.6	0.2	0.0	0.4	0.0	0.6	1.3	0.7
2022	1,140	1.2	4.6	0.3	1.6	0.1	1.6	1.0	0.1	0.0	0.3	0.2	1.7	1.1	1.1

*HD includes eye injuries

[†]HM includes fin hem, eye hm, and pink fin

**BD includes fin injuries, and deformity

^{††}Pred OT includes fish and juv. lamprey

Sockeye smolt had a Condition Index estimate of 1.1% versus a historical average of 1.6%. Partial descaling was only 4.6% in 2022 versus approximately 11.8% for the historical average. Predator marks caused by birds were higher in 2022 at 1.7% where the historical average is only 0.6%. In addition, predation marks caused by fishes was 1.1% in 2022 which is slightly more than double the historical average of 0.5%. Most other categories were similar to their historical averages in 2022.

JUVENILE PACIFIC LAMPREY –CONDITION DATA

Table 12. Juvenile Pacific Lamprey Detailed Condition Exam Summary, 2011 – 2022.

YEAR	NO. SMPLD	Pacific Lamprey - Macrophthalmia							PREDATION Bird	PREDATION Fish
		Head/Eye	Pop Eye	Body/Fin/Deform	Hem Fin/Eye	Parasite/Oth	Columnaris	Fungus		
2011	4245	0.7	0	11.9 *	1.2	0	0.02	0.2	0.05	
2012	7136	0.6	0.03	2.4	1.2	0	0	1.2	8.3 *	
2013	4226	0.5	0	1.8	0.9	0	0	0.4	17.0	
2014	3526	0.7	0	1	0.3	0.1	0	0.5	13.3	
2015	1046	0.8	0	1.3	0.8	0	0	0.6	10.5	
2016	997	0.8	0	4	0.7	0.1	0	0.1	10.6	
2017	1060	0.7	0	1.7	2	0.1	0	0	9.9	
2018	2737	0.6	0	0.8	0.8	0.3	0	0.1	9.2	
2019	2112	0.5	0	1.7	0.2	0	0	0.5	9.6	
2020	191	2.1	0.5	4.2	1.6	0.5	0	13.6	7.9	
2021	94	0	0	4.3	3.2	0	0	2.1	17	
2022	319	0.3	0	1.8	0.9	0	0	2.8	15.0	
Avg.	2307	0.7	0.04	2.3	1.2	1.5	0.0	1.8	10.9	

YEAR	NO. SMPLD	Pacific Lamprey - Ammocoetes							PREDATION Bird	PREDATION Fish
		Head/Eye	Pop Eye	Body/Fin/Deform	Hem Fin/Eye	Parasite/Oth	Columnaris	Fungus		
2011	851	0.7		6.2	1.4			0	0	0
2012	165	0		8.5	0.6			0	0	0
2013	21	0		0	0			0	0	0
2014	86	0		2.3	0			0	0	0
2015	3	0		0	0			0	0	0
2016	15	0		6.7	13.3			0	0	0
2017	64	1.6		7.8	6.3			0	0	0
2018	59	0		0	0			0	0	0
2019	403	0		4.5	0.5			0	0.2	0
2020	49	2		4.1	0			2.0	0	0
2021	0	0		0	0			0.0	0	0
2022	47	2.1		4.3	2.1			0.0	2.1	2.1
Avg.	147	0.5		3.7	2.0			0.2	0.2	0.2

* = In 2012, the "tick mark" body injuries were reclassified as bird predation marks

Condition exam categories for juvenile Pacific lamprey (both macrourhalmia and ammocoetes) differ slightly than for salmonid smolts primarily due to the lack of the partial descaling, descaling, and opercular injury categories. Macrourhalmia had more observations of fungus in 2022 at 2.8% versus a historical average of 1.8%. Predation marks attributed to birds were recorded on 15.0% in 2022 which is higher than the historical average of 10.9%.

Ammocoetes exhibited higher than average injury rates than historically in 2022. Of note, 2.1% of those examined had head or eye injuries in 2022 at 2.1% which is about 4 times the historical average of 0.5%. Body and fin injuries were 4.3% in 2022 versus 3.7% historically. Finally, 2.1% of the ammocoetes had evidence of bird and fish predation in 2022 which is approximately 10 times the historical average of 0.2%.

LENGTH AVERAGES

Many out-migrating smolts are of hatchery origin so fork length data are primarily a function of smolt size at the time of release. However, graphing the average length shows relative size differences between years and species (Figure 4).

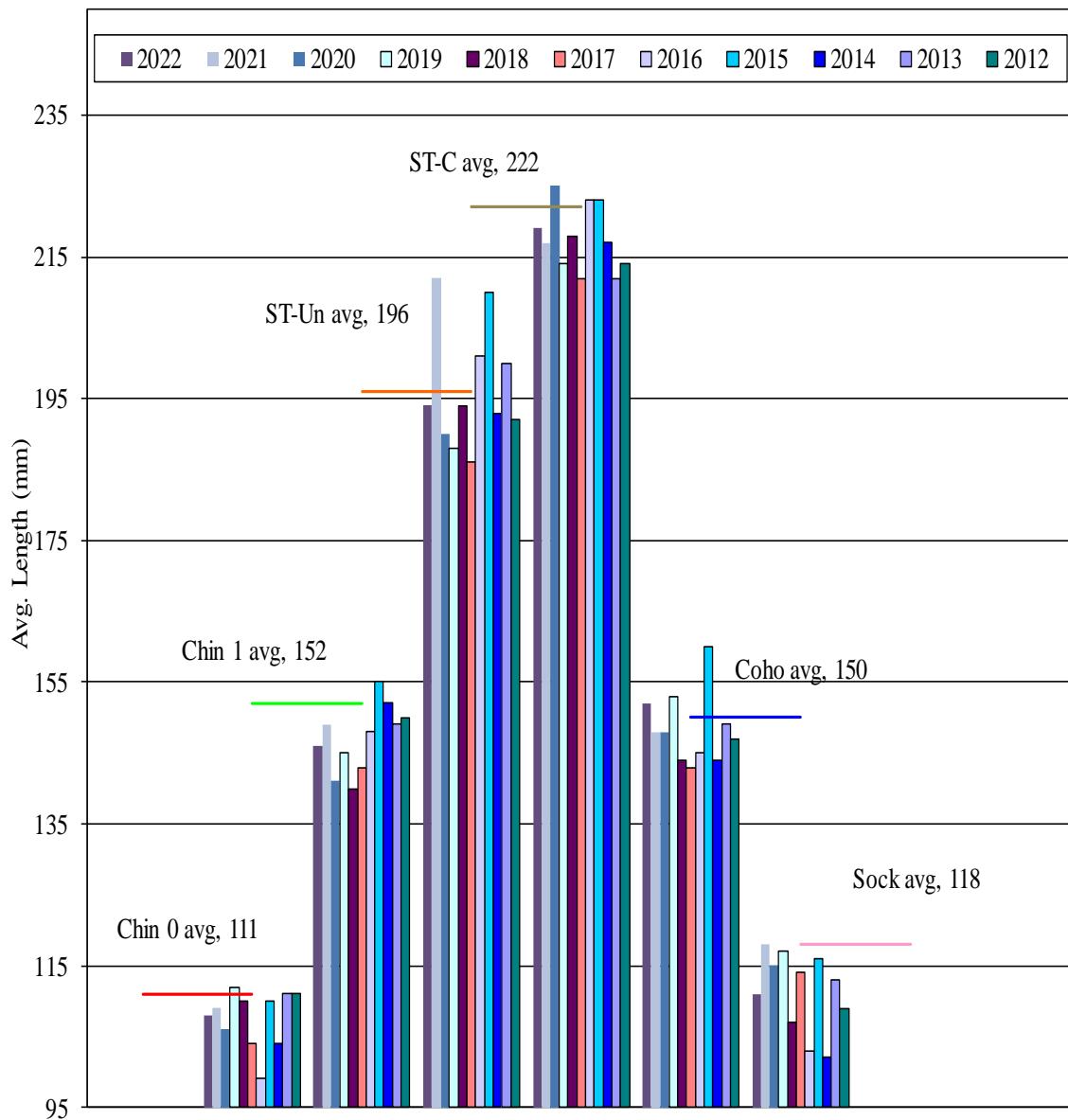


Fig. 4. John Day Dam Smolt and Condition Monitoring Seasonal average fork lengths by species, 2012 - 2022 and historical average 1998 - 2022.

INCIDENTAL CATCH

Table 13a. John Day Dam Incidental species collection estimate summary, 1998- 2009.

Species	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
American shad (Adult)	276	939	174	628	657	957	1,608	1,878	1,038	775	965	589
American Shad (Juvenile)	1,281,697	5,235,479	8,274,057	648,522	5,451,889	3,163,054	2,082,532	2,378,433	2,447,033	1,326,198	3,064,471	97,746
Banded killifish												
Bluegill/ Pumpkinseed	4,359	2,320	320	525	590	648	2,328	7,635	3,100	2,147	357	1,073
Bull trout						14						
Bullhead	975	213	231	260	429	261	819	1,015	773	148	310	15
Carp	1,743	319	40	8	139	8	79	146	12	10	21	10
Channel catfish	2,045	3,550	349	261	166	372	156	2,597	7,469	762	512	516
Chinook Jack (12" to 22")						10				7		
Chinook Minijack		149	7			10	8			146		
Chiselmouth	196	2,050	1,452			60			5	5		
Chum Salmon (fry)									19	123		
Crappie	1,802	281	266	59	438	580	329	546	398	154	265	134
Dace, Longnose	60	62	65	253	11	92	46	134			108	
Kokanee	166	517	19			23	3			74		
Largemouth bass	168	297	66	450	28	72	97			350		
Northern pikeminnow	187	236	5		121	67	47	310	12			57
Pacific lamprey (Adult)	1,012	493	467	586	928	4,030	2,283	1,475	934	513	1,230	101
Pacific lamprey (Ammocoete)	30,256	33,500	3,363	435	8,164	2,507	7,465	2,859	19,773	60	27,032	11,184
Pacific lamprey (Macrophthalmia)	119,227	134,356	138,298	85,281	271,138	191,876	66,456	166,760	312,702	74,736	730,244	251,786
Peamouth	310	117	5	12	83	403	379	165	102	28	93	
Pink Salmon (fry)							307					
Rainbow trout	326	32					24	10	2			
Redside shiner		7		4				3	4			
River Lamprey (<i>L. ayresii</i>)												
Sandroller	298	138	263	149	8			3	25			64
Sculpin	2,682	1,050	6,710	200,362	7,003	1,736	6,012	7,471	1,412	3,387	2,992	1,259
Smallmouth bass	7,554	1,586	1,821	3,422	4,441	4,183	10,591	8,819	10,916	4,387	15,746	6,837
O. mykiss (fry)							12					
Sucker, spp.	34,583	6,761	1,122	2,744	5,964	2,581	1,457	2,551	1,986	2,270	1,499	428
Threespine stickleback	4	30	3	4	150	8	83	134	228	344	184	154
Walleye	628	1,347	2,412	4,197	1,406	1,621	1,056	1,369	625	411	1,159	397
White sturgeon	209											
Whitefish, Mountain	17,808	8,294	4,820	14,541	8,367	8,396	6,908	4,122	10,272	1,206	4,328	5,757
Yellow perch	201	799	362	978	3,763	3,497	3,558	5,176	7,556	3,062	17,187	1,863
Siberian Prawn (<i>E. modestus</i>)										14	29	
TOTAL	1,508,315	5,436,922	8,438,697	965,684	5,767,977	3,387,005	2,194,651	2,593,754	2,826,918	1,420,706	3,868,595	380,000

n = number of sample days

Table 13b. John Day Incidental species collection estimate summary, 2010 – 2022.

Species	n= 147	n= 156	n= 159	n= 131	n= 138	n= 119	n= 75	n= 73	n= 96	n= 81	n= 74	n= 89	n= 91
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
American shad (Adult)	499	2,415	5,873	887	165	122	168	1,004	1,108	355	192	94	105
American Shad (Juvenile)	1,760,738	238,748	934,451	82,001	769,235	700,583	614,259	345,117	2,178,301	348,985	155,907	1,003,342	588,597
Banded killifish							50	321	1,208	1,059	4	37	70
Bluegill/ Pumpkinseed	2,428	2,472	1,506	2,121	2,423	564	2,504	2,366	6,161	2,569	54	18	73
Bull trout													
Bullhead	100	176	270	11	36	12	43		134	110	0	7	10
Carp	163	87	185	86	116	25	131	10	110	125	2	6	22
Channel catfish	1,622	343	381	320	375	254	45	98	1,346	213	35	6	20
Chinook Jack (12" to 22")		64	51	4				6			11	5	14
Chinook Minijack		5											
Chiselmouth		100											
Chum Salmon (fry)													
Crappie	95	152	20	45	235	15	345	228	578	205	40	6	68
Dace, Longnose	40	76	704	40	119	53	110		100	50	6		
Kokanee		169	34	16		83		103	75	50			
Largemouth bass		20		21	69		10			163		1	10
Northern pikeminnow	103	1,801	551	4	661		20	658		100	7		25
Pacific lamprey (Adult)	50	572	522	882	1,718	417	153	1,129	1,042	80	3	12	10
Pacific lamprey (Ammocoete)	52,757	28,145	12,283	345	1,131	21	311	5,137	1,950	12,350	366	0	533
Pacific lamprey (Macrophthalmia)	667,026	466,333	490,668	274,056	97,772	19,935	25,882	57,347	224,778	166,042	936	133	4,161
Peamouth	81	102			457	34							
Pink Salmon (fry)			1,989										
Rainbow trout													
Redside shiner													
River Lamprey (<i>L. ayresii</i>)				50									
Sandroller													
Sculpin	6,584	808	1,319	2,777	1,467	5,906	1,516	182	850	7,955	25	319	76
Smallmouth bass	1,430	6,668	2,583	2,549	5,315	1,336	2,085	1,024	3,163	3,865	123	109	462
O. mykiss (fry)		400											
Sucker, spp.	840	598	1,832	1,056	550	268	70	471	928	1,115	25		10
Threespine stickleback	401	3,252	2,498	1,046	567	354	139	584	205	25	15	37	27
Walleye	1,290	157	307	1,242	1,377	1,759	2,297	499	291	630	138	125	517
White sturgeon													
Whitefish, Mountain	5,295	3,332	6,070	3,828	2,629	581	35	1,983	2,350	635	81	15	100
Yellow perch	6,661	3,574	2,616	4,277	5,841	1,542	15,336	1,942	876	1,128	283	39	3,348
Siberian Prawn (<i>E. modestus</i>)	197	2,877	6,428	16,982	55,208	78,404	49,426	13,262	86,283	49,463	404	2,583	1,575
TOTAL	2,508,905	762,942	1,473,141	394,646	947,466	812,268	715,341	433,471	2,511,837	597,272	158,657	1,006,894	599,833

n = number of sample days

SIBERIAN PRAWN

Non-native Siberian prawns (*Exopalaemon modestus*) have been sampled at the JDA SMF since 2008. See figures below for prawn sample numbers and collection estimates and note that the number of sample days and sample rates varied by sample season.

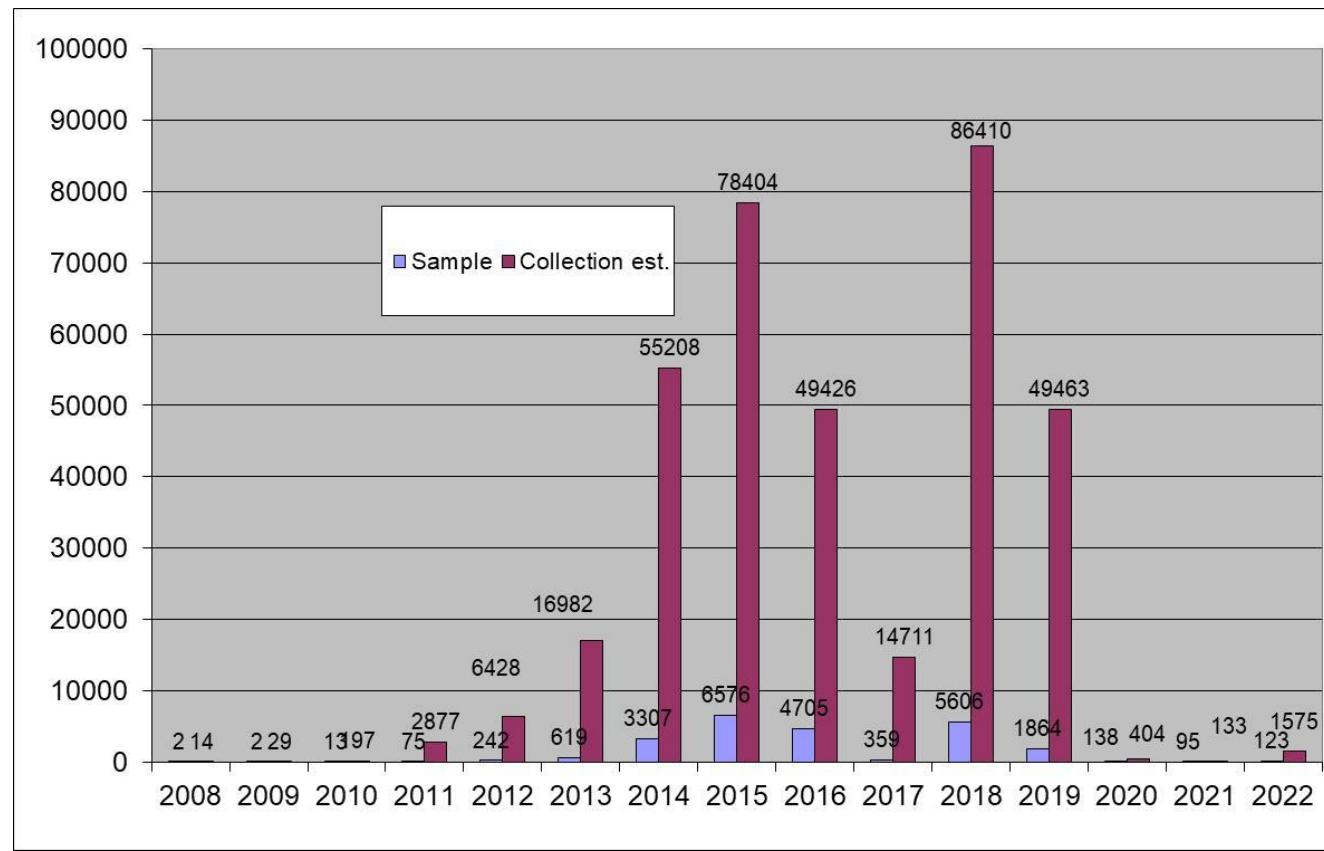


Figure 5. Siberian prawn sample and collection estimates, John Day Dam, 2008 to 2022. Note that the decline observed from 2020 to 2022 is due at least partly to reduction in sampling effort and time period and not necessarily a decline in abundance.

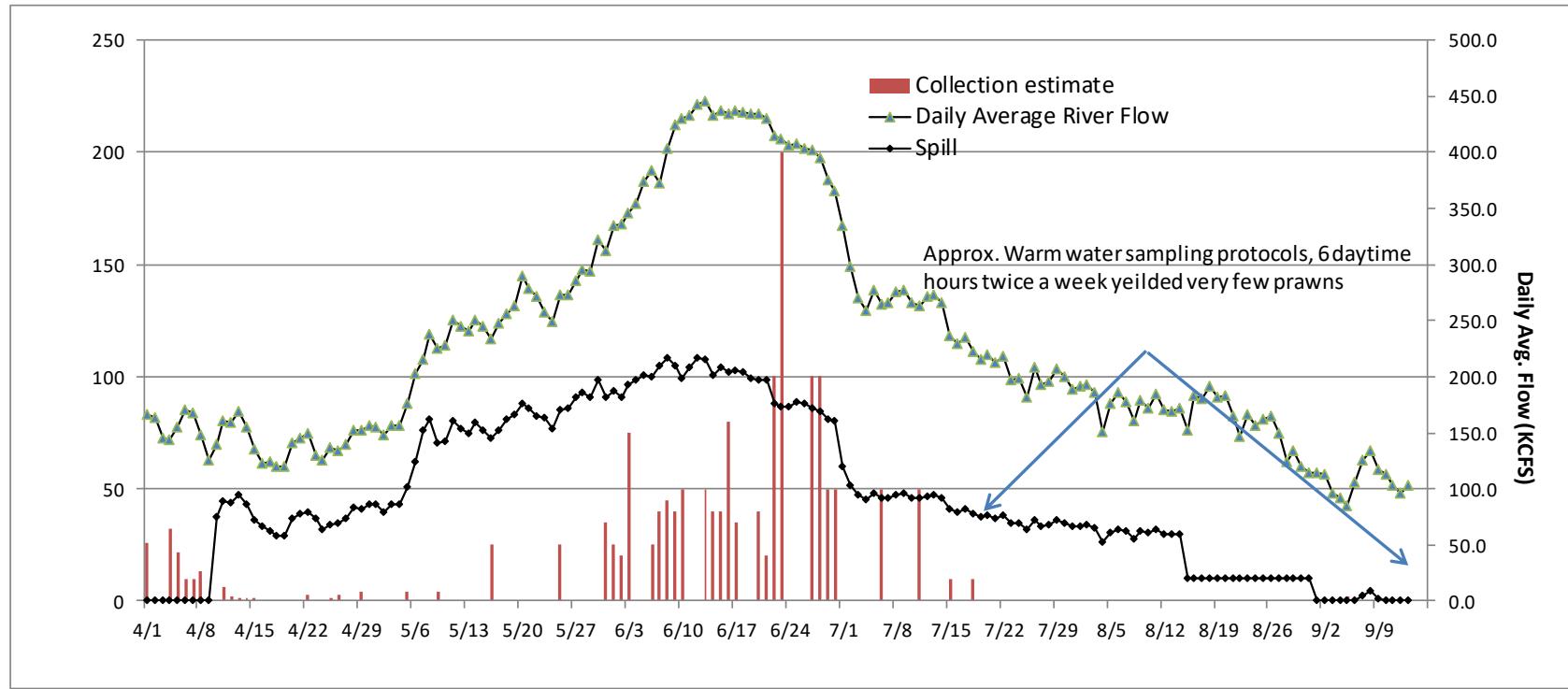
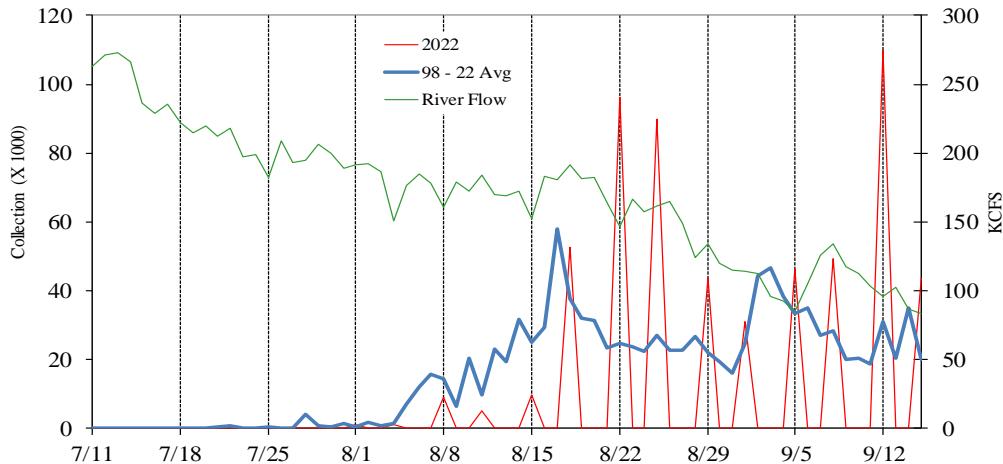


Figure 6. Siberian prawn daily collection, total river flow, and spill at John Day Dam, 2022.

JUVENILE SHAD AND LAMPREY-COLLECTION ESTIMATES AND PASSAGE TIMING

Juvenile American shad



Juvenile Pacific lamprey (Macrophthalmia and Ammocoetes)

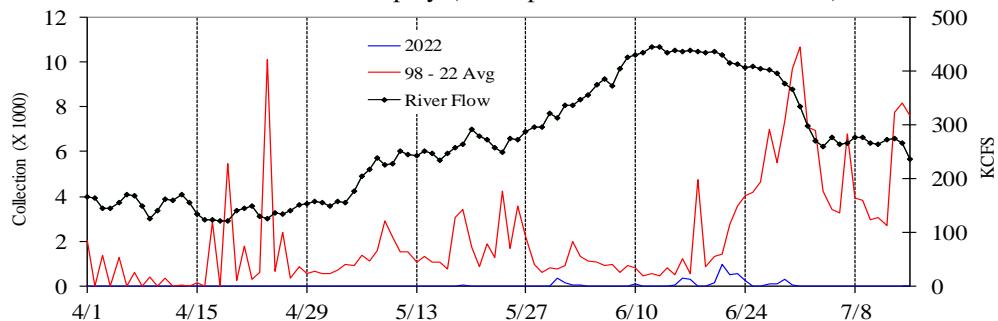


Figure 7. John Day Dam daily juvenile American shad and Pacific lamprey passage, 2022.

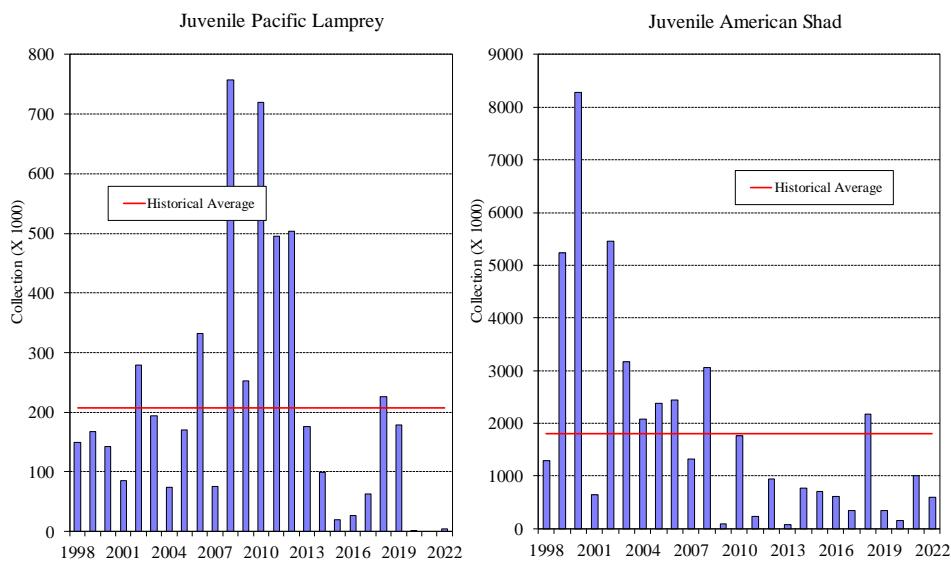


Figure 8. Juvenile Pacific lamprey and juvenile American shad passage, historical collection estimate- 1998-2022.

PERFORMANCE MONITORING

The quality control program at John Day utilized peer consensus, quality control tests, and digital photography. When both crew members were present, questions regarding species or stock identification, marks, or conditions were discussed with the fish in hand. When both workers were not present, texts or emails with pictures attached made real time and later review possible.

Another aspect of personnel performance monitoring is the number of sampling mortalities recorded each year. For performance monitoring purposes, sample mortality is defined as any mortality incurred as a direct result of SMP handling and/or sample processing activities (mistakes). These numbers have been very low in recent years and no direct mortalities were recorded in 2022.

FISH AND DEBRIS SEPARATOR FALLBACKS

Sample Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Unknown Fallbacks	4,685	25,195	35,242	39,930	49,999	36,003	19,912	18,279	12,378	12,490	17,517
Sample Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Unknown Fallbacks	21,050	10,919	10,572	4,078	3,516	8,821	8,809	4,383	1,078	914	1,486

RESEARCH

John Day Smolt and Juvenile Lamprey Condition Monitoring personnel provided support for juvenile Pacific lamprey genetic collections again in 2022. Support included activities such as logistics coordination, fish collection, and tissue sample acquisition.

1. Columbia River Intertribal Fish Commission- Laurie Porter, Greg Silver. During Condition Exam processing, the crew sampled and collected approximately 320 genetic fin clips from juvenile Pacific lamprey macrophtalmia and 47 ammocoetes in 2022. Samples will be analyzed and compared to adult DNA samples to help understand population dynamics and potential natal stream origin.

ACKNOWLEDGMENTS

The success of the John Day Dam Smolt and Juvenile Lamprey Condition Monitoring program continues to involve cooperative interaction with the Bonneville Power Administration, the Pacific States Marine Fisheries Commission, the Fish Passage Center, the Portland District of the United States Army Corps of Engineers, and the Oregon Department of Fish and Wildlife and Nation Oceanic and Atmospheric Association ESA handling permitting personnel. Special thanks to the John Day Dam/Willow Creek project and fisheries personnel including Eric Grosvenor, Michael Lotspeich, Laura Ricketts, and Keith Morris. I would also like to thank the Portland staff of the Pacific States Marine Fisheries Commission for their continued assistance, support, and guidance.

In addition, I would like to thank Aaron Young for his hard work, reliability, and dedication to safe fish handling and quality data collection throughout the 2022 out-migration.

JOHN DAY AND BONNEVILLE FACILITY MAPS



PIT Tag Information Systems
Columbia Basin | ptagis.org

John Day Smolt Bypass and Lab (JDJ)

PIT Tag Interrogation Coil Map: Version 2.2, Cnfg. #150; Revised March, 2005

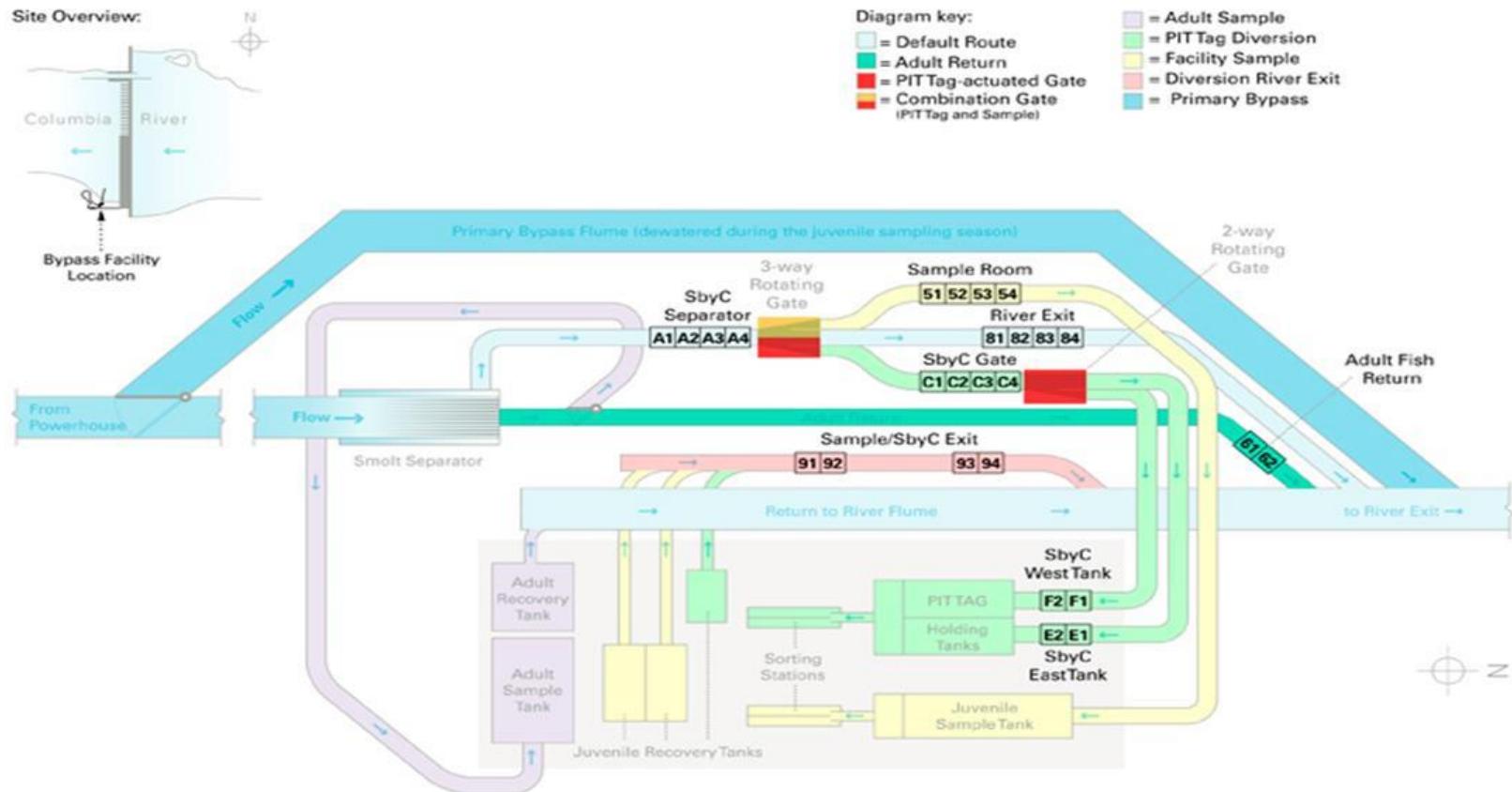


Figure 9. John Day Dam PIT tag detection system and laboratory layout. Graphic courtesy of the Columbia Basin PIT Tag Information System.

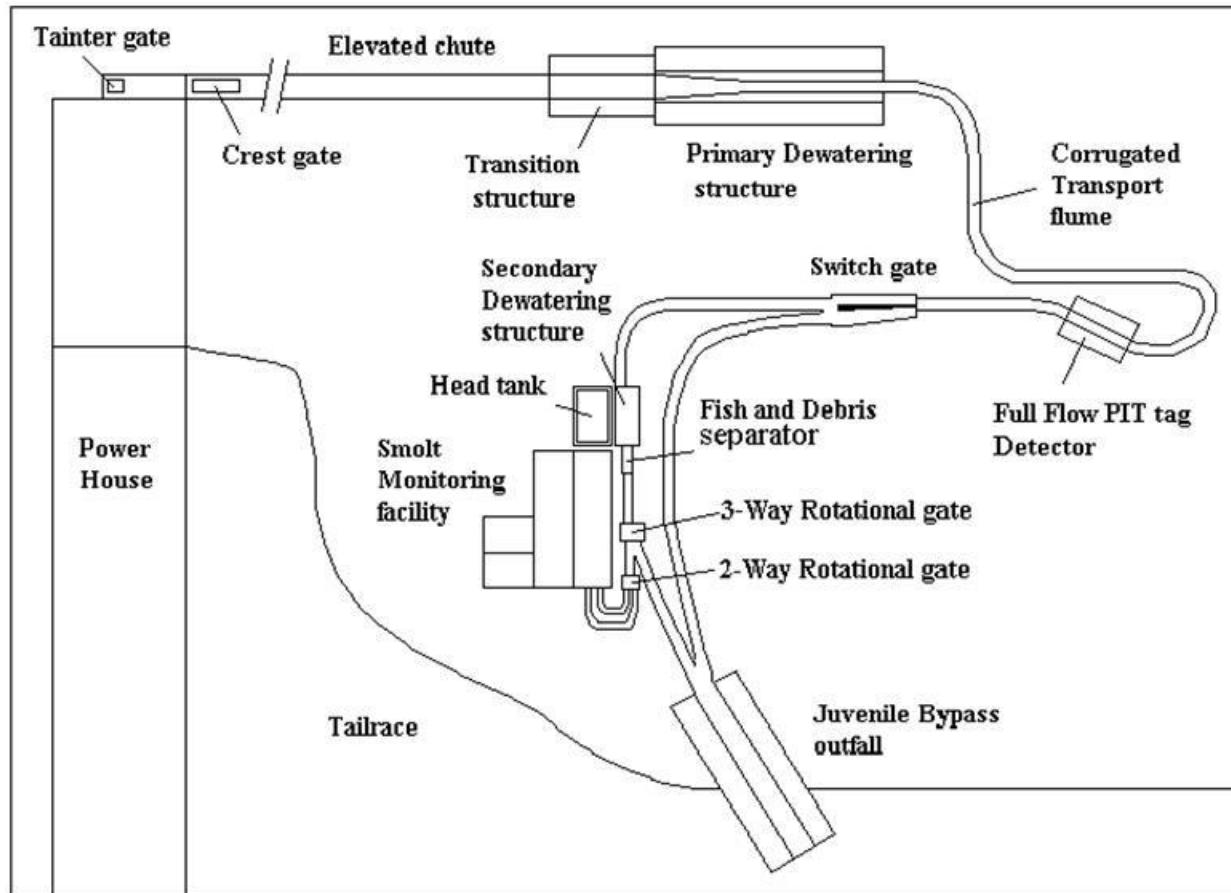


Figure 10. John Day Dam Smolt Juvenile Bypass Components and Monitoring Facility plan view (not to scale).

Appendix A. Detailed Condition Exam Examples

Descaling and Injury Category

There are five types of Descaling recorded during Condition Exams; Descaled (20% of one side or greater), Partial descaled (3-19% of one side), and Descaling with predator marks caused by birds, fish, or juvenile Pacific lamprey.



Descaled (20%) subyearling Chinook smolt.



Partial descaled (approx. 3-19%) coho smolt.



Avian predation on yearling Chinook.



Fish predation on coho smolt.



Lamprey predation on Chin 0.

Six types of injuries, based on their location on the fish, are recorded during Condition Exams; these include head injury, eye injury (including missing eyes), opercular injury, body injury, fin injury, and any type of deformity. In addition, popeye and eye and fin hemorrhaging are recorded.



Head injury on steelhead smolt.



Eye injury on Chin 1 smolt.



Opercular injury on Chin 0 smolt.



Body injury on yearling Chinook smolt.



Stunted growth deformity on subyearling Chinook smolt.



Fin injury on Chin 1 smolt.



Fin hemorrhaging on steelhead smolt.



Eye hemorrhage on steelhead smolt



Popeye or exophthalmia (also with eye hemorrhage) on yearling Chinook smolt.

Disease Category

Several pathogens and parasites are recorded during Condition Exams including Bacterial Kidney Disease, Columnaris-like symptoms, fungal infections, Gas Bubble Trauma symptoms, and any furuncles, blisters, cysts, or tumors. Parasites consist of copepods (*Argulus*, *Lernia*, and *Salmincola*), black-spot disease (*Trematoda*), leeches, and any ich-like symptoms (caused by the protozoan *Ichthyophthirius multifiliis*).



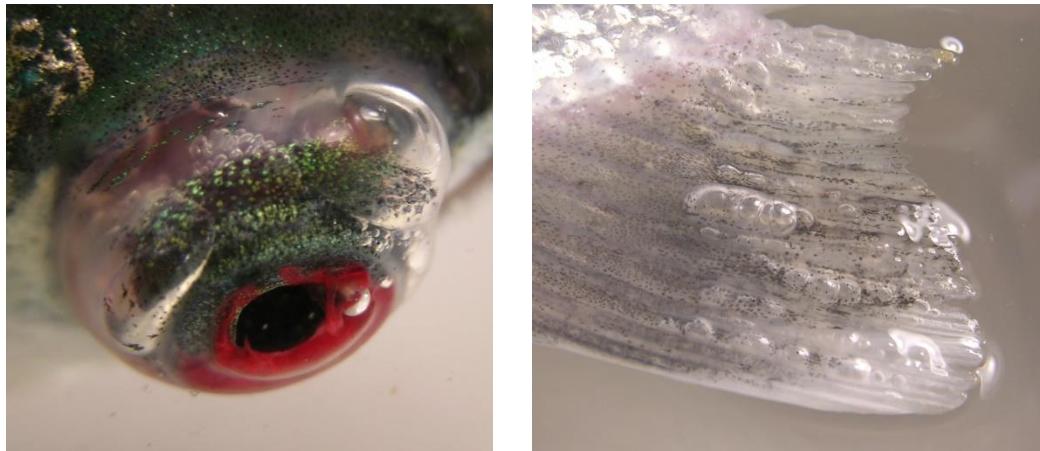
Subyearling Chinook smolt with several signs of BKD; bloated stomach, descaling, popeye, and fin hemorrhaging.



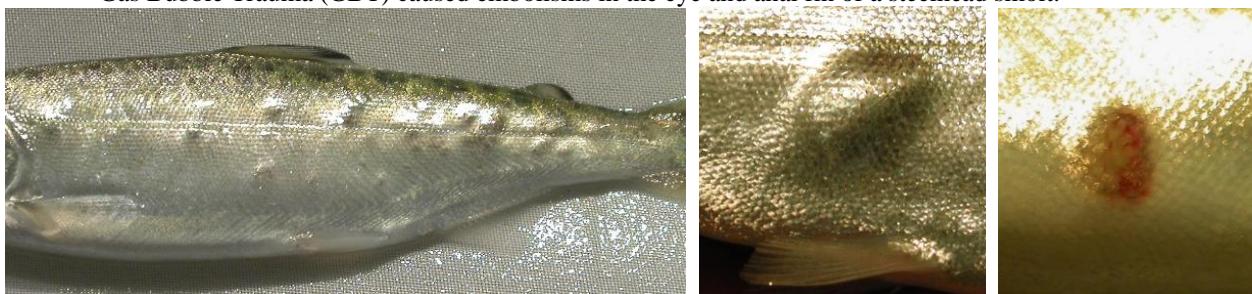
Columnaris-like bacterial infection on subyearling fall Chinook smolt. Both head and body examples appear to have infected previously injured or descaled areas on the fish.



Fungal infection on Chin 1, showing typical cottony growths on areas that were previously descaled or injured.



Gas Bubble Trauma (GBT) caused embolisms in the eye and anal fin of a steelhead smolt.



Unknown bumps or cysts on subyearling Chinook, possibly tumors or furuncles caused by Furunculosis bacteria.

Parasite Category



Three genera of freshwater Copepoda parasites have been observed and recorded during Condition Exams, *Argulus* on a subyearling Chinook to the left, *Salmincola* on a sockeye smolt in the middle, and *Lernia* on a subyearling Chinook smolt to the right.



Steelhead smolt showing bumps in body and fins, signs of a Trematode infection, also known as black spot disease.



Leech on pectoral fin of a subyearling Chinook smolt and small white spots under the slime layer which are signs of an *Ichthyophthirius multifiliis* infection, also known as white spot disease on a subyearling Chinook smolt.