Columbia River Project Water Use Plan

Columbia River White Sturgeon Management Plan

CLBWORKS-25: Mid-Columbia River White Sturgeon Conservation Aquaculture

Implementation Year 6

CLBWORKS-34: Lower Columbia River White Sturgeon Conservation Aquaculture

Implementation Year 10

Study Period: May 2017 – May 2018

Freshwater Fisheries Society of British Columbia
Kootenay Trout Hatchery
Fort Steele, British Columbia, V0B 1N0

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Freshwater Fisheries Society of BC

COLUMBIA WHITE STURGEON CONSERVATION FISH CULTURE PROGRAM

KOOTENAY STURGEON HATCHERY

2017 Annual Report

July, 2018

Executive Summary

Juvenile White Sturgeon age classes are lacking in the Upper Columbia River population due to recruitment failure, where insufficient survival in the wild from embryos through the first year of life has threatened persistence of the population. Accordingly, conservation aquaculture has become a critical component of the Upper Columbia White Sturgeon Recovery Initiative (UCWSRI), with hatchery-origin juveniles being released over the last decade into both the lower (since 2001) and Mid-Columbia (since 2007) Rivers in Canada.

From 2001-2014, progeny were produced through direct spawning of mature adults (bloodstock) collected in the Upper Columbia River. At the April 2013 UCWSRI Technical Working Group (TWG) meeting, members identified and ranked the primary goals for a sturgeon conservation aquaculture program focused on rearing wild caught embryos and larvae in a streamside white sturgeon conservation aquaculture facility (the Facility). The primary goal of the Facility is to augment the genetic diversity of supplemental progeny given results that have shown reduced diversity of progeny produced using traditional broodstock methods. The Facility was first piloted in the summer of 2014 and is located on the Canadian section of the transboundary reach of the Columbia River near the Waneta spawning area and supports the incubation of wild caught eggs and short-term rearing of larvae. Embryos and larvae are collected from the Columbia River near the three known spawning locations in Canada. In April of 2015, the UCWSRI TWG identified the continued rearing of wild caught embryos and larvae as higher importance than the rearing and release of juveniles from hatchery brood stock programs, and the decision was reached to suspend the brood stock program and rely solely on wild origin progeny. As part of this decision, it was agreed that a portion of 2014 year class juveniles produced from broodstock would be held back and released into the Mid-Columbia as two and three year olds in 2016 and 2017, respectively. Further, in March 2015, there was a surplus of juveniles collected as wild larvae being reared at the Wells facility in Washington, USA (known as “Wells fish”). It was decided that these surplus juveniles could be used to satisfy releases into the Mid-Columbia River and Arrow Lakes Reservoir given that the broodstock program was suspended. Through the work of individuals associated with the UCWSRI group, necessary steps were taken to transfer 2,500 Well fish to the Kootenay Sturgeon Facility. These fish were reared to meet release criteria for age and size (300 grams) for the Mid-Columbia.
In 2015, 2016 and again in 2017, Juvenile sturgeon produced from wild source embryos and larvae collected in Canada (primarily at the Waneta spawning area) were hatched in the Facility and then transferred and reared at Kootenay Trout Hatchery (KTH) and released into the lower Columbia River. Since the first season of larvae capture, there have been 2,394 wild origin fish released into the Columbia.

The ploidy of wild white sturgeon has previously been determined to be octaploid (8N) in Columbia and Kootenay River populations. Concern was raised when a large number of 12N white sturgeon were discovered in juvenile family groups which were

offspring of wild adult Kootenay River White Sturgeon spawned at the Kootenay Tribe of Idaho (KTOI) Sturgeon Hatchery in 2013. The mechanism of this ploidy shift is unknown but it is thought to occur at the fertilization stage. Given that there are potential implications to the UCWSRI program, the Freshwater Fisheries Society, under the direction of the TWG, assess the ploidy of all wild progeny white sturgeon being reared at KTH. In 2017, 2 fish tested positive for 12N but did not survive to release.

Juvenile releases occurred in the spring of 2018 on May 8th in the mid-Columbia River and on May 10th and May 12th in the lower Columbia River. In total, 977 juvenile sturgeon were released into the Mid-Columbia River at Shelter Bay Provincial Park near Revelstoke BC. The remaining 2014 BY juveniles from the Wells group were released as three year olds into the Mid-Columbia River on May 8th, with a total of 551 fish released. Average weight of the fish was 450.5 grams and average fork length was 40.2 cm. Along with the Wells component, we also released into the Mid-Columbia the remainder of the 2015 BY fish that did not reach the required 200 gram weight target by the time of release in spring 2017. These fish, totaling 426, had an average weight of 411.5 grams and reached an average 38.9 cm in length.

On May 10th a total of 179 wild progeny juvenile sturgeon were released into the lower Columbia River at Beaver Creek below Trail BC, and a total of 228 wild progeny juvenile sturgeon were released into the lower Columbia River at Millennium Park in Castlegar, BC. The average weight of the wild progeny released at Beaver Creek was 234.3 grams with an average of 31.5 cm length, and at Millennium Park the average weight was 265.4 grams, with an average fork length of 32.4 cm. Also, on May 12th, 50 wild progeny juvenile sturgeon were released into the lower Columbia River at Beaver Creek during the town of Trail's "Critters Day" celebration. These fish averaged 326.7 grams, and were an average fork length of 34.8 cm. There were school and public events associated with the sturgeon releases at Beaver Creek on May 12th, at Millennium Park on May 10th, and at Shelter Bay near Revelstoke on May 8th. Due to high water conditions and extreme flows, the school board cancelled the school event at Beaver Creek Park on May 10th.

Table of Contents

Acknowledgements

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We also acknowledge the Upper Columbia White Sturgeon Recovery Initiative Technical Working Group for their contribution to this program.

1.0 Background

The population of White Sturgeon in the Canadian portion of the Columbia River has been undergoing recruitment failure for several decades (UCWSRI 2012). This was recognized as a critical issue for this population in the early 1990's and resulted in the establishment of the Upper Columbia White Sturgeon Recovery Initiative (UCWSRI) in 2001 and the population being listed as endangered under the Species at Risk Act (SARA) in 2006. Original estimates, based on annual levels of natural recruitment being insufficient for maintaining a self-sustaining population, suggested that the population would become functionally extinct by 2044 (UCWSRI 2002; Hildebrand and Parsley 2014). Accordingly, intervention and monitoring were deemed essential to preclude extinction. An integral part of the original recovery plan was the initiation of a conservation aquaculture program designed to provide artificial recruitment to the population and provide fish for research purposes. The conservation aquaculture program was designed to support the population until such time as stock abundance/age structure and habitat conditions (including spawning, incubation and rearing flows and reservoir levels) can support a self-sustaining population. This program was initiated in 2001 and has stocked sub-yearling juvenile sturgeon annually into the lower Columbia River.

Although construction and operation of dams have been implicated in the decline of white sturgeon in the Columbia River, the mechanisms responsible for recruitment failure have been difficult to ascertain with certainty (Gregory and Long 2008). During development of the Columbia River Water Use Plan (WUP), this uncertainty made it difficult for the WUP Consultative Committee (CC) to develop response measures to address sturgeon declines. The conservation aquaculture program, as delivered under the Columbia River WUP, is divided between two areas of the Columbia River, the lower Columbia River and the Mid-Columbia River. The program goals differ between the two areas. Under operational parameters of the Columbia River Treaty, adequate flow treatments before and during spawning, incubation and drift phases of the life cycle were not seen as feasible in the lower Columbia River downstream of HLK. The CC therefore agreed to a plan which included monitoring to assess trends in population dynamics, research into juvenile habitat use and survival, and an assessment of the feasibility of different management responses. However, it was deemed impossible to deliver this plan without releases of hatchery reared juvenile sturgeon as wild juvenile age classes were lacking and a project (CLBWORKS#34 - Lower Columbia River White Sturgeon conservation aquaculture program) was initiated to provide for dependable financial resources for the maintenance of the aquaculture program for the duration of the Columbia WUP.

In the Mid-Columbia River there were more uncertainties (e.g. biological, operational etc.) during the development of the WUP and the CC report (BC Hydro Columbia White Sturgeon 2012 Annual Report) recognized several possible long term directions for the Mid-Columbia program including:

- Initiate a conservation aquaculture program for development of an Arrow Lakes Reservoir failsafe population.
- Develop a self-sustaining (in the long term) population in a Kinbasket Reservoir/upper Columbia River recovery area.
- Initiate a conservation aquaculture program for development of a Kinbasket Reservoir failsafe (non-reproducing) population.

The CC recommended that the conservation aquaculture strategy for this program be robust enough to allow for the determination of whether or not wild production is possible and where recovery efforts would be best directed in either the Mid-Columbia or Kinbasket. CLBWORKS#24, Mid-Columbia White Sturgeon Experimental Aquaculture, was implemented during the first four years of the program (2008-2011). During this period, the focus was on providing for larval and sub-yearling juvenile releases designed to assist with monitoring habitat selection and use, and early survival. The second phase of the work under project CLBWORKS#25, Mid-Columbia White Sturgeon Conservation Aquaculture, was initiated in 2012 following a technical review of the entire Mid-Columbia White Sturgeon management plan. The results of a review in 2012 were to continue with conservation aquaculture program (2012-2018) in the Mid-Columbia and assess optimal size at release (survival / temperature / growth relationships) by releasing larger sized juveniles compared to those released from 2008-2012. Though the programs for the lower and mid-Columbia Rivers differ in implementation and design, they share several overarching objectives.

The overall objectives of the Columbia River White Sturgeon conservation aquaculture program include:

- The capture, transportation between the Columbia River and KTH, care and breeding of mature adult sturgeon at targeted numbers of 10 females and 10 males to provide for an annual objective of eight genetically distinct families or secondarily subfamilies. Adults are to be returned to the Columbia River upon completion of spawning.
- The successful incubation and rearing of approximately equal numbers of healthy juveniles from each family or subfamily bred in a given year targeting an annual release in the fall of the brood year or subsequent spring of a total of up to 12,000 sub-yearling sturgeon to facilitate stock rebuilding and research needs. Stocking targets are established through the TWG.
- The annual marking and tagging of all fish according to protocols, including scute removal, Passive Integrated Transponder (PIT) tagging, sonic tagging and other tagging as may be required of both broodstock adult and juvenile sturgeon.
- Annual participation in public awareness and educational activities including but not necessarily limited to release events, school events, public events, open houses workshops etc.

- Provision of research, testing and pilot programs exploring techniques for improved efficiencies and an ability to provide for broader genetic diversity of released stock.

In discussions at the UCWSRI TWG meetings in 2015, the alternative to focus all conservation aquaculture efforts on the rearing of wild caught embryos and larvae, with the use of a streamside white sturgeon rearing facility (the Facility) was agreed upon. Such programs have been found to result in improved genetic diversity, have more natural rearing conditions, and have allowed for the development of collection and rearing methods that incorporate more aspects of the species reproductive ecology compared to more traditional rearing practices for both white sturgeon and other sturgeon species. In addition, it was decided to hold back approximately half of the 2014 year class white sturgeon from the regular production brood stock program, to be released at a larger size into the mid-Columbia River near Revelstoke BC in the spring of 2015.

The specifics of this new alternative for the conservation aquaculture program were:

- Wild progeny (embryos and larvae) to be imprinted to the Columbia River within streamside rearing containers and the surviving progeny transferred to and reared at KTH until a minimum of 200 grams before release.
- Size at release for all sturgeon destined for the mid-Columbia River would be >300 grams.
- Suspend all hatchery broodstock programs.

This report specifically describes the conservation fish culture activities undertaken from May 2017 through to May 2018 by the Freshwater Fisheries Society of BC at their Kootenay white sturgeon conservation facility to meet the objectives defined by CLBWORKS#25 and CLBWORKS#34.

2.0 Incubation, larval development, and juvenile rearing

2.1 Wild Progeny

In the spring of 2014 a streamside rearing facility was piloted on the banks of the Columbia River near Waneta. The facility was constructed within a 14 by 8 foot cargo trailer for ease of transport. The trailer was parked at a streamside location just upstream of Waneta eddy, supplied with power and plumbed to allow river water to be pumped through a series of MacDonald Jar upwellors set up over small rearing troughs. Each year, wild source eggs are collected in river and taken directly to the container to be placed into flowing MacDonald Jars. There they were incubated to hatch and the larvae retained in a compartmentalized collection trough (equipped with artificial substrate (Bio balls) for cover and hiding) for a maximum of 7 days post-hatch. Larvae need to be in the main hatchery for rearing before 10 days post hatch to ensure they are successfully weaned onto feed, so FFSBC staff made

regular trips to the facility to retrieve larvae and transport them back to KTH. Larvae are placed into rearing containers once they arrive at the hatchery. Separated by spawning events (usually by weeks), larvae are kept in their own groups (until they are large enough to PIT tag and take DNA from). Food (a mixture of krill, Cyclopeze *(biologically engineered organism of the Copepod family which has a much higher concentrations of essential omega-3 fatty acids, biological pigments and other nutrients than Brine Shrimp or Artemia nauplii)* and fish meal is introduced slowly to each group, with care taken to ensure suffocation does not occur in the excess food accumulation on tank bottoms (See Table 1 *for feeding rates based on fish size and water temperatures*). In the first few weeks, ponds are drawn down four to six times daily, and food is smeared onto the sides of the tank wall. As the pond level slowly rises, access increases to the food on the tank walls. This process continues until the fish reach the 'first grade' size. At KTH wild larvae were reared in quarantine using the same juvenile rearing techniques described in section 2.2 and the same marking and tagging protocols with the exception of the lateral scute removal, which is now done on the right side of the body to identify wild progeny fish. All mortalities were preserved in ethyl alcohol for DNA samples. All DNA sampling on the released fish was only done when the fish were large enough to have tissue samples taken (dorsal fin clip) without any negative effects. A total of 30 wild origin fish were selected for Fish Health Samples. Results of the testing proved negative, removing the requirement for quarantine.

2.2 Juvenile Rearing and Marking

During the juvenile rearing process, fish are graded based on size to improve growth and survival. At grading, fish were hand-picked into either large or small categories and placed into separate tanks. This was the first time during the rearing process when a complete inventory of fish was established. Numbers for all prior milestones of development were then back-calculated from this point. The splitting of fish between tanks decreases densities and reduces tank effects on growth. Secondly, non-competitive access to feed is important to the smaller, downgraded fish. These fish will recover from any feeding competition and quickly establish a higher growth rate. As post-release survival has been shown to be positively influenced by size at release[1], target size for juveniles at release has increased over the life of this program. For the lower Columbia River, mean size at release has increased from 50 grams during the early years of the program (2002-2007) to 75 grams (2008-2014) and now to a minimum of 200 grams (2015-present) for fish of wild origin. Given the genetic diversity of wild origin fish is higher than that of those produced by traditional broodstock methods; the 200 gram target was established to further improve survival following release based. In the mid-Columbia River the target size at release has increased from 75 grams (2008-2012) to 150 grams (2013-2015) and now to 300 grams (2016-present). The increase in size at release in the mid-Columbia is an

[1] BC Hydro. 2016 Lower Columbia River Juvenile Detection Program (CLBMON-29). Year 8 Data Report. Report by BC Hydro, Castlegar, BC, 88 pp.

attempt to evaluate survival through the first winter following release as recaptures of hatchery-origin juvenile white sturgeon has been low to date.

As a standard fish culture practice, specific feeding rate is calculated based on fish size (weight) and water temperatures and follows information provided in Table 1. As biomass increases so does the size and amount of feed provided to ensure consistent growth. During grading, smaller fish remain in smaller circular tanks until they are caught up on growth. Further grading may occur, and care is taken to ensure that smaller fish will contribute to the final release numbers.

Table 1. Fish Feeding Guidelines for fish rearing. Amounts of feed are based on water temperatures and fish size.

Sturgeon Feeding Rates Guide

$SFR=a*W^{-0.3548}$

Specific Feeding Rate (SFR) = % / Day

W = Body Mass (g)

a = Constant for Temperature

Constant "a" = (multiplier) 7.4440 7.9580 8.2968 8.6252 8.9145

	Temp range in *C				
	8 - 10	10 - 12	12 - 14	14 - 16	16 - 18
Mass (g)	%	%	%	%	%
0.05	21.55	23.04	24.02	24.97	25.80
0.10	16.85	18.01	18.78	19.52	20.18
0.15	14.59	15.60	16.26	16.91	17.48
0.16	14.26	15.25	15.90	16.53	17.08
0.20	13.18	14.09	14.69	15.27	15.78
0.25	12.17	13.01	13.57	14.11	14.58
0.50	9.52	10.18	10.61	11.03	11.40
0.75	8.24	8.81	9.19	9.55	9.87
1.00	7.44	7.96	8.30	8.63	8.91
2.50	5.38	5.75	5.99	6.23	6.44
5.00	4.21	4.50	4.69	4.87	6.04
7.50	3.64	3.89	4.06	4.22	4.36
10.00	3.29	3.52	3.67	3.81	3.94
25.00	2.38	2.54	2.65	2.75	2.85
50.00	1.86	1.99	2.07	2.15	2.22
75.00	1.61	1.72	1.79	1.86	1.93
100.00	1.45	1.55	1.62	1.68	1.74
250.00	1.05	1.12	1.17	1.22	1.26
500.00	0.82	0.88	0.91	0.95	0.98

In February the juvenile fish were individually handled to insert a PIT tag into the dorsal musculature at the midpoint between the dorsal and lateral scute line inferior to the anterior margin of the dorsal fin (see Figure 1). DNA samples were taken from all wild progeny fish, either by preserving mortalities or collecting tissue samples (dorsal fin clip) of live fish. PIT tag, length and weight data was recorded for each individual fish starting in late April to be as close to release time as possible. This was done to ensure no additional growth occurred in-hatchery that may be attributed to post-release growth. Each individual fish can subsequently be identified to its release location and date of release in addition to family record. Juveniles are transported in FFSBC fish transport vehicles according to UCWSRI TWG transport protocols.

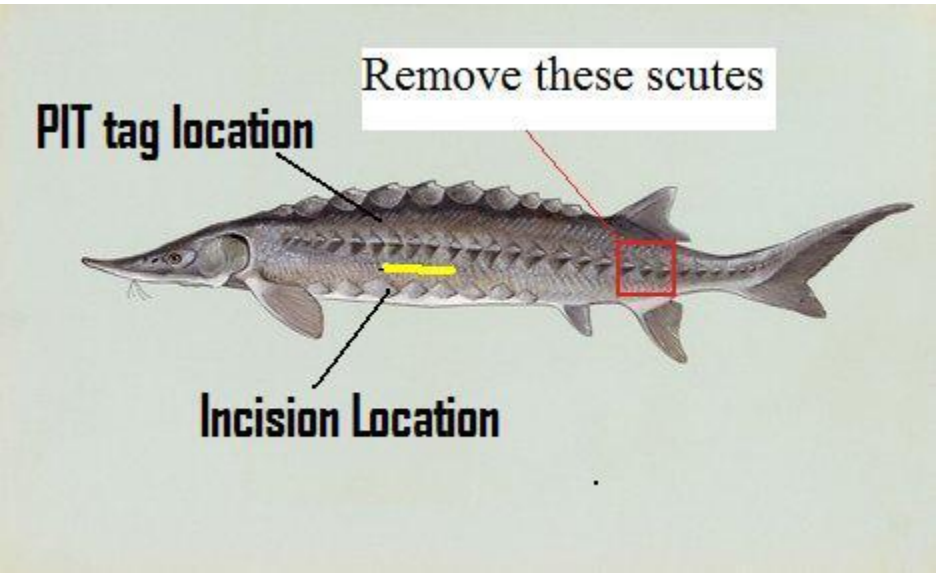

Figure 1: Scute removal and PIT tag locations. Note the incision location for application of telemetry tags if required.

In 2018, the stocking number for the Lower Columbia section was composed solely of wild progeny sturgeon collected in 2017. A total of 941 larvae were transported to the KTH, from several separate spawning “events” that were estimated to occur at the Waneta spawning site. Survival was 57% from larvae to release age (see Table 2). Further, embryos were collected from the ALH spawning area and transported back to KTH. Due to the lateness of the season and the remote location of the stream-side rearing trailer, it was deemed more practical to transport the embryos directly to KTH rather than try to rear them in the streamside trailer. A total of 506 eggs were transported back to the hatchery. Survival of these embryos was 11% through to the time of release for this group. Survival was significantly less in these embryos than from those reared in the streamside facility near Waneta. Embryos collected at ALH were in the early stages of development and because of their delicate stage of development, it was deemed safer to leave the eggs undisturbed and to carefully monitor them in a small circular rather than trying to ‘tease apart’ clumps of eggs for incubation in a McDonald Jar as they were not de-adhesed upon arrival to the . In future, if embryos are to be transported back to KTH to be reared,

they will be properly de-adhesed at time of collection so as to not become encased and stuck to each other and then reared in a McDonald jar.

Table 2. Numbers of wild origin White Sturgeon embryos and larvae transferred from the lower Columbia River to KTH for rearing during June and July 2018.

	Total Transferred		
Arrival at KTH	**Embryos**	**Larvae**	**Spawning Site**
27-Jun-17		13	Waneta
30-Jun-17		43	Waneta
07-Jul-17		217	Waneta
11-Jul-17		572	Waneta
14-Jul-17		91	Waneta
19-Jul-17	462		ALH
21-Jul-17	45		ALH
28-Jul-17		4	Waneta

3.0 Juvenile Releases

Juvenile releases took place in the spring of 2018 over a period of three days, May 8th, 10th, and 12th. On May 8th 2018, 551 juveniles from the 2014 year class wild progeny fish were released into the Mid-Columbia at Shelter Bay, ~55 km downstream from Revelstoke BC. These individuals were greater than 400 grams in weight at the time of release (Table 3). An additional 426 wild-origin fish collected in Canada were also released into the Mid-Columbia, also averaging >400 grams in weight at the time of release (Table 3). A total of 457 juveniles from the 2017 wild progeny collection were released into the lower Columbia River on May 10th and 12th at both Beaver Creek near Trail BC and at Millennium Park in Castlegar BC (Table 3).

Table 3. Summary of juvenile White Sturgeon released into the Mid-Columbia (Shelter Bay) and lower Columbia Rivers in spring 2018. Weight (g) and length (cm) represent averages across all individuals released. Origin refers to the spawning location the progeny were collected from.

Release Location	Origin	Release Date	River km	Number Released	Weight (g)	Fork Length (cm)	Total weight (kg)
Shelter Bay	Wells (USA)	08-May-18	178.0	551	450.0	40.0	248
	Waneta	08-May-18		426	411.0	39.0	175.1
Millennium Park	ALH	10-May-18	10.5	55	234.3	31.5	12.9
	Waneta	10-May-18	49.0	173	234.3	31.5	40.5
Beaver Creek	Waneta	10-May-18	49.0	179	248.0	31.5	44.4
		12-May-18		50	326.7	34.8	16.4

Table 4. Summary of all Columbia White Sturgeon released into Lower and Mid-Columbia by release year, corresponding year class, and origin (broodstock produced or wild), 2001 – 2018

Release Year	Year Class	Lower Columbia Brood Origin	Lower Columbia Wild Origin	Mid-Columbia Brood Origin	Mid-Columbia Wild Origin	Total
2002	2001	8,671				8,671
2003	2002	11,803				11,803
2004	2003	9,695				9,695
2005	2004	12,748				12,748
2005	2005	5,039				5,039
2006	2005	10,828				10,828
2006	2006	4,042				4,042
2007	2006	8,123		4,288		12,411
2007	2007	4,029				4,029
2008	2007	6,448		6,534		12,982
2009	2008	4,141		8,118		12,259
2010	2009	3,947		9,625		13,572
2011	2010	4,010		8,078		12,088
2012	2011	4,192		6,567		10,759
2013	2012	4,037		5,944		9,981
2014	2013	1,800		6,013		7,813
2015	2014	2,800	1,095	3,283		7,178
2016	2015		76		1,324	1,400
2017	2015				1,589	1,589
	2016		800			800
2018	2015				551	551
	2016				424	424
2018	2017		457			457
	Totals	106,353	2,428	58,450	3,888	171,119

3.1 Release Events

Each year school and public release events are planned and organized the Fish & Wildlife Compensation Program (FWCP) and FFSBC staff, along with the assistance of volunteers from other agencies. The FWCP works on behalf of its partners, BC Hydro, the B.C. Ministry of Environment and Fisheries and Oceans Canada, to conserve and enhance fish and wildlife populations impacted by the construction of BC Hydro dams in the Columbia Basin. The FWCP and BC Hydro are the primary

funders for the Columbia River white sturgeon aquaculture program and FWCP is an active partner in the Upper Columbia White Sturgeon Recovery Initiative (UCWSRI). It also recognises that the sturgeon recovery work will take many years and will only be successful if the community and the younger generations become more connected with the fish. With that goal in mind FWCP organized juvenile sturgeon release events for the public on behalf of the UCWSRI for school children and public in Trail and in Revelstoke.

This year's release event in Shelter Bay saw approximately 200 students attending, while the release event at Millennium Park had close to 300 students, while the Public event at 'Critters Days' attracted close to 600 people, so was very well attended and received.

4.0 Fish Health Testing Summary

4.1 Virus Screening

20 fish were submitted this year on Dec. 13th for fish health screening. 3 fish from group one, 14 fish from group two and 3 fish from group three were tested for viruses and bacteria. Results were negative for all three tests and are described in the following text.

2017 fish health testing – Kootenay Trout Hatchery: Case 2017-1131
Submission Date December 13, 2017

Fish were submitted for screening purposes to determine if water could be released into the stream. The submission was planned, the group is not experiencing any mortalities. A total of 20 small juvenile fish were submitted to the Lab for virus and bacterial screening. Submitted fish were tested for the presence of the sturgeon viruses; White Sturgeon Iridiovirus (WSIV), White Sturgeon Herpesvirus 1 (WSHV1) and White Sturgeon Herpesvirus 2 (WSHV2) using a pool of selected tissues; gill, kidney, spleen, pyloric ceaca, liver, operculum, barbel/snout and pectoral fins, in this case where the fish are too small, pooled whole body homogenates with tails removed. The homogenates will be inoculated onto the white sturgeon skin (WSSK) and white sturgeon gonads (WSGo) cell lines. The selected tissues were inoculated onto the salmonid cell lines EPC and CHSE-214 to test for the salmonid viruses; Infection Hematopoietic Necrosis (IHNV), Infection Pancreatic Necrosis (IPNV) and Viral Hemorrhagic Septicemia (VHSV). Kidney tissue will be inoculated onto Tryptic Soy Agar (TSA) and Sheih's (HS) media to isolate known pathogenic bacteria.

RESULTS: All 20 fish tested negative for the following Sturgeon viruses: White Sturgeon Iridio Virus (WSIV), White Sturgeon Herpesvirus 1 (WSHV1) and White Sturgeon Herpes Virus 2 (WSHV2) homogenizing and inoculating gill, kidney, spleen, pyloric ceaca, liver, operculum, barbel/snout and pectoral fin tissues onto WSSK and WSGo cell lines. They also tested negative for the following salmonid viruses: Infectious Hematopoietic Necrosis virus (IHNV), Infectious Pancreatic

Necrosis virus (IPNV) and Viral Hemorrhagic Septicemia virus by homogenizing and inoculating gill, kidney, spleen, pyloric ceaca, liver, operculum, barbel/snout and pectoral fin tissues onto EPC and CHSE-214 cell lines. Kidney tissue onto TSA media: 20/20 negative, no pathogenic bacteria detected Kidney tissue onto HS media: 20/20 negative, no pathogenic bacteria detected TREATMENT: No treatment require as this was a schedule health check.

5.0 Permits

In March of 2018 a five year SARA permit was obtained for the Columbia White sturgeon's educational component. All of the activities related to adult transport, holding, spawning, rearing, research and releases has been deemed clear for KTH to handle and rear White Sturgeon. This permit is valid to June 2023. All necessary Introductions and Transfer Committee (ITC) permits for adult and juvenile transfers were obtained in February 2018.

6.0 Autopolyploidy Assessment

The ploidy of wild white sturgeon has previously been determined to be 8N in Columbia and Kootenay River populations. Concern was raised when a large number of 12N white sturgeon were discovered in progeny family groups which were derived from wild Kootenay River white sturgeon brood and were being cultured in the artificial rearing environment at the Kootenay Tribe of Idaho's (KTOI) Sturgeon Hatchery. The mechanism of this ploidy shift is unknown but it is thought to occur at the fertilization stage. In partnership with a commercial sturgeon farm and with the assistance of University of California at Davis, blood samples were collected from family groups at KTOI and sent to UC Davis for Flow/Cytometry analysis. Through this process it was determined that some of the family groups at KTOI were composed of up to 50% 12N sturgeon. Given that there are potential implications to the Upper Columbia River recovery program, the Freshwater Fisheries Society, under the direction of the TWG, assessed the ploidy of all wild progeny white sturgeon families being reared at KTH.

Sometimes slides are imaged out of focus or are of poor quality which can give a false result. Therefore all suspect 12N slides were re-imaged and re-analysed for confirmation. Two slides were confirmed as 12N ploidy. These two fish were re-tested and confirmed 12N. While the established protocol is to not release known 12N fish, both these fish died in the hatchery prior to release. Going forward in 2018, a coulter counter will be used as it is a more reliable method for measuring cell size.