



NECHAKO WHITE STURGEON RECOVERY INITIATIVE

2018-2019 Annual Report





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MESSAGE FROM THE NWSRI CHAIRS

Technical Working Group Chair Steve McAdam

2018-2019 was another year of progress towards recovery. Throughout the year the NWSRI's TWG team carried out several research and monitoring activities on the Nechako including adult spawn monitoring, juvenile indexing, and physical habitat investigations. These projects continue to provide information that will support future recovery work. This year also marked the fifth full year of operation of the Nechako White Sturgeon Conservation Centre (NWSCC). Making the most of the successful broodstock and wild egg collection in spring of 2018, staff remained focused on rearing juvenile sturgeon for release in 2019 and 2020. The NWSCC staff, project partners, and volunteers continued to serve the NWSRI through their combined efforts. Movements and habitat use by hatchery reared sturgeon were studied through radio telemetry monitoring in the Nechako watershed. Increased sampling in areas beyond the core sampling reach, also provided important information about juvenile sturgeon movement. The need for additional monitoring will build on these results was highlighted as an important outcome of the juvenile monitoring workshop that was held in February 2019. A new research project also led to an increased understanding of the extent of otter predation on White Sturgeon within the Nechako River. Valuable work is ongoing on multiple projects and I expect this will continue to support recovery efforts through both habitat and hatchery-based conservation work. Thank you to all of the NWSRI partners for the collaborative effort in support of the recovery this wonderful species.



Community Working Group Chair Wayne Salewski

The Nechako White Sturgeon Conservation Centre had a continuing and active role within the region on a number of fronts including the delivery of awareness signage around the region and communities that highlights sturgeon activity within their portions of the Nechako Watershed. The signage is designed to not only inform users of the presence of the Nechako White Sturgeon in their portion of the watershed but to educate them in facilitating the recovery of the species.

Our annual release of juveniles at the Riverside Park in Vanderhoof continues to provide not only excellent educational outreach opportunities while engaging schools and classes throughout the watershed and continues to be very popular within the community with several hundred people attending the annual event. We have a very committed group of stakeholders and volunteers that set up outreach stations, which provide awareness and education on the recovery program. We want to thank them and our coordinator for their continued support.

The Emergency Release Boat Kit program that has worked with First Nations fisher families continues to operate although with salmon numbers being low, we are seeing fewer opportunities for First Nations to fish. This past year saw 7 successfully released which brings our long-term success numbers up to 78 sturgeon having been successfully released since the beginning of the program.

Our school district educational programs continue to grow and advance with the move forward to now present these educational programs through smart board technology and the planned production of video short clips that walk students through the many steps within the program that take place. At this point we have confirmation of funding that will create production next year.

The continued uptake of the facility as an educational centre is growing and has become a central focus of the School District as it develops complementary programs to bring educational opportunities to its students comprising of its surrounding within the watershed. This growth is forecasted to grow as the School District is committed to the growth of regional educational opportunities that move students into the outdoors.

The growth and demand for tourism continues to thrive with the facility having three tour guides funded generously by Rio Tinto. This program saw regular tours daily through out the summer months and around 3500 tourists from around the world now having the Conservation centre as a designated spot on their travels though BC. This opportunity would not be successful without the total support of the Fresh Water Fisheries Society and our manager Mike Manky. This program continues to grow and benefit the region with its uptake and needs some ownership by the District of Vanderhoof to take it to the next steps.

I would like to thank the membership of the CWG along with our many stakeholders for their support and look forward to the following years as we continue our work to save this incredible fish. Without your help we would not succeed.



ABOUT THE NWSRI

Nechako White Sturgeon have been in the Nechako watershed for centuries and maybe as long as 10,000 years, yet within the last 100 years - the normal life span of a sturgeon - the number of Nechako White Sturgeon has dropped significantly, and the group has become endangered. The Nechako White Sturgeon Recovery Initiative (NWSRI) was established in 2000 by a group of stakeholders interested and invested in working together to find out why the Nechako White Sturgeon numbers have dropped dramatically in the last half century and what actions can be taken to restore a self-sustaining population within the Nechako watershed. The reduction in the total population of Nechako White Sturgeon may be due to many possible factors, including changes to habitat and flow regulation from the creation of the Nechako Reservoir, predation, and over-fishing.

This report highlights projects on Nechako White Sturgeon from April 2018 to March 2019. The report is broken down into three main sections that provide the updates on the 2018-2019 activities of the: 1) Technical Working Group (science-based arm of the NWSRI), 2) Community Working Group (outreach and awareness arm), and 3) the Nechako White Sturgeon Conservation Centre.

For further information on the NWSRI, and for detailed reports on projects outlined in this report, please visit our website at:

WWW.NECHAKOWHITESTURGEON.ORG



Photo 1. White Sturgeon on set line (photo from FFSBC).



STRUCTURE AND FUNCTION OF THE NWSRI

The Nechako White Sturgeon Recovery Initiative (NWSRI) was established in 2000 in response to learning that Nechako juvenile White Sturgeon were no longer as abundant as before, the sturgeon population as a whole was smaller, and the average age of fish was much older than expected. The NWSRI consists of individuals from the private sector, federal and provincial specialists, First Nations members and technical staff, industry experts, and members from non-profit wildlife and wilderness groups. The work of the NWSRI is based on the Recovery Strategy for Nechako White Sturgeon. The Recovery Strategy is based on the best-available science, local knowledge, and traditional knowledge. The NWSRI members work together in different capacities to address the Recovery Strategy. The NWSRI participates in the following activities to ensure that sturgeon, from eggs to adults, continue to live in the Nechako watershed for many generations to come:

- Conservation Fish Culture
- Habitat Research and Recruitment Failure mitigation
- Stewardship and Education

The NWSRI is comprised of two working groups - the Technical Working Group (TWG) and the Community Working Group (CWG). Together the TWG and CWG work towards the common vision of sturgeon population recovery:

- The TWG works to develop and oversee implementation of the Nechako White Sturgeon Recovery Strategy. This includes designing and carrying out the projects that are described in this Annual Report.
- The CWG is the communication and outreach arm of the NWSRI, and assists the TWG by garnering public and financial support for sturgeon recovery within the Nechako watershed, and sharing information with stakeholders.

Technical Working Group

The Technical Working Group represents the Nechako and Upper Fraser Rivers, but also has representation from the Middle Fraser River. It was formed in September 2000, and is made up of fisheries, habitat and river geomorphology scientists and researchers as well as First Nations fisheries managers and government representatives. The TWG met several times in 2018-2019 to discuss the latest research project findings, future project planning, the progress of the group, and the development of recovery recommendations for Provincial managers. Each member brings specific qualifications related to the technical problems being researched that might include: a working knowledge of White Sturgeon biology; expertise in stream flow management/hydraulic engineering; or experience in other animal recovery initiatives. The TWG is responsible for addressing the Recovery Strategy by:

- investigating why the Nechako White Sturgeon population is in decline; and,
- implementing the strategies to help restore the fish to a self-sustaining population.



Community Working Group

The Community Working Group is comprised of First Nations, non-government environmental organizations, industry, local and regional governments, and engaged members of the public. The CWG met twice in 2018-2019 to discuss the findings of the TWG and to use that information to help plan community-based project that provide:

- outreach and educational opportunities that relate to the latest research of the TWG; and,
- public awareness for Nechako White Sturgeon in the watershed.

Increasing the knowledge about White Sturgeon recovery in the watershed is a key focus of the group, and programs target key interest groups and stakeholders, including school children, riverside residents, industrial companies in the watershed, First Nations, and local governments

NWSRI Partnerships

The members of both the Technical Working Group and Community Working Group represent a wide range of organizations. Those involved during the 2018-2019 fiscal year included:

- Avison Management Ltd.
- BC Ministry of Environment
- BC Ministry of Forests, Lands, Natural
- Resource Operations and Rural Development
- BC Nature (Federation of BC Naturalists)
- Carrier Sekani Tribal Council
- District of Vanderhoof
- Habitat Stewardship Program
- Fisheries and Oceans Canada
- Fraser Basin Council
- Fraser River Sturgeon Conservation Society
- Freshwater Fisheries Society of BC
- Rio Tinto Alcan
- School District 91

NWSRI Recovery Coordinator

Project: NWSRI Coordinator

Project Lead: NWSRI

Funders: FLNRORD via Land Base Investment Strategy- Species at Risk (LBIS-SAR) \$18,500

Start Year: 2001

The NWSRI has a paid part-time Recovery Coordinator that supports the work of the TWG and CWG. The role involves coordination and administrative support of meetings, project proposals, budgets, and project progress related largely to outreach and education projects. Other tasks involve

maintenance of the website and social media, assisting in the development of outreach materials, and the coordination of public events. Michelle Roberge was the Recovery Coordinator during the 2018-2019 year. Michelle is a Fisheries Biologist who lives in Vanderhoof and worked with the NWSRI on several outreach projects before her role as Recovery Coordinator.



ADULT SPAWN MONITORING

Objectives

- To determine the timing of spawning.
- To track the physical parameters of the river that occur during spawning, such as river flow, temperature and substrate.
- To ascertain the exact location(s) spawning occurs to inform habitat restoration decisions.

River Conditions During the Spawning Period

- River discharge during the spawning period ranged from 300-470 m³/s.
- Discharge during the spawning period in 2018 (May 17-June 11) took place during the decreasing hydrograph.
- Water temperature ranged between the nightly lows of 10.2-13.3°C to daytime highs between 11.8-15.0°C. The overall average temperature was 12.0°C

The information gathered from this NWSRI project helps the TWG members to better understand the spawning behaviours and locations adult Nechako White Sturgeon use within the Nechako River. We use this information to help inform habitat restoration projects with the goal to improve in-river survival of eggs to year-old sturgeon, as well as to understand the behaviour of sturgeon in relation to the river characteristics. There are three projects that make up the adult spawn monitoring program:

- Radio-telemetry (fixed station, boat-based and aerial telemetry)
- Egg Mats



Photo 2. Wild caught eggs in a sampling container for transport to the NWSCC. Photo by Michelle Roberge



RADIO TELEMETRY TRACKING

Project: Radio Telemetry
Project Lead: FLNRORD, FFSBC
Funders: \$35,000 total: \$15,750
 LBIS- SAR, with FLNRO and
 FFSBC monitoring in-kind, DFO
 Species at Risk \$20,000
Start Year: 2015



Photo 3. Aerial telemetry receiver with Nechako White Sturgeon Conservation Centre below.

Telemetry data informs our understanding of broad scale dispersal patterns, periodicity of habitat use, and migration behaviours of both wild and hatchery origin White Sturgeon within the Nechako watershed and beyond.

Objectives

- To determine the timing of spawning habitat use of adult sturgeon.
- To determine dispersal patterns and migration behaviours of adult sturgeon within the Nechako River.
- To monitor post-release movement of hatchery released juvenile sturgeon.

Adult Telemetry Monitoring

Each year during the brood capture program adult sturgeon are radio tagged and monitored by boat-based crews. In 2018, there were 25 new radio tags placed during the brood capture program, ten were used to replace old radio-tags in recaptured adult sturgeon, and 15 were inserted in newly captured fish. In addition, five fixed telemetry stations are maintained in the Nechako watershed, three year-round sites (Vanderhoof, Ft. St. James, and Nechako confluence), and two operated seasonally (Nautley River, and Lower Stuart). An additional station was set-up at the Stone Creek area along the Fraser River by project partners in August of 2018. In addition to fixed stations, boat and aerial telemetry surveys are completed periodically to search for radio-tagged sturgeon.

Results

- Spawning activity is inferred from multiple daily detections at the spawning reach from May 15th to approximately June 8th, 2018. A total of 34 individual radio tagged adult sturgeon were detected at the spawning reach during this period.
- The peak of adult radio tag activity occurred on June 7th, when 15 individuals were detected at the Vanderhoof telemetry station (spawning reach) site.



Juvenile Telemetry Monitoring

On July 20th, 2018, a group of 32 radio-tagged juvenile sturgeon with an average fork length of 55 cm were released at Vanderhoof. This release trial focused on the post-release movement and survival of larger-than-average hatchery-reared juvenile sturgeon, grown larger than the spring (May) releases. Detection histories of fish from telemetry monitoring efforts are used to derive movement patterns, and areas where radio tags show little movement can reveal areas of mortality.

Results

- During the 2018 survey year, 31 of the 32 juvenile radio tags were detected ranging from river kilometer (RKM) 196 (Nautley R) to RKM 92 (Stuart R). The majority of detections were from RKM 136 to RKM 105, with nine tags showing movement upstream and two tags detected downstream.
- By early October 2018, five juvenile radio tags were recovered by monitoring crews and three more were detected multiple times in the same location (no longer moving), suggesting a mortality of 16-25% in the initial three months post-release. Tag recovery and locations were in close proximity to predator habitat (both terrestrial and aquatic predators).

Acoustic Telemetry Monitoring

For a second year, a series of thirteen stationary acoustic receivers were placed from approximately Vanderhoof at RKM 139 to RKM 96 near the Stuart River confluence. This project focused on the dispersal patterns of 30 hatchery-reared juveniles in the first five months following release on May 20th, 2018. In addition to the acoustic gates, boat drift acoustic surveys were completed periodically to search for acoustic tagged sturgeon between gated sections.

Results

- From May through October 2018, 60% of acoustic tags from the 2018 release and 20% from the 2017 release group were detected within the study area.
- Sixteen of the 2018 acoustic tagged fish were believed to be mortalities during the period, based on few detections on the gates and none during boat drifts.
- Two of the 2018 acoustic tagged fish exhibited migratory behaviour out of the study area based on last detections occurring at the downstream gate.

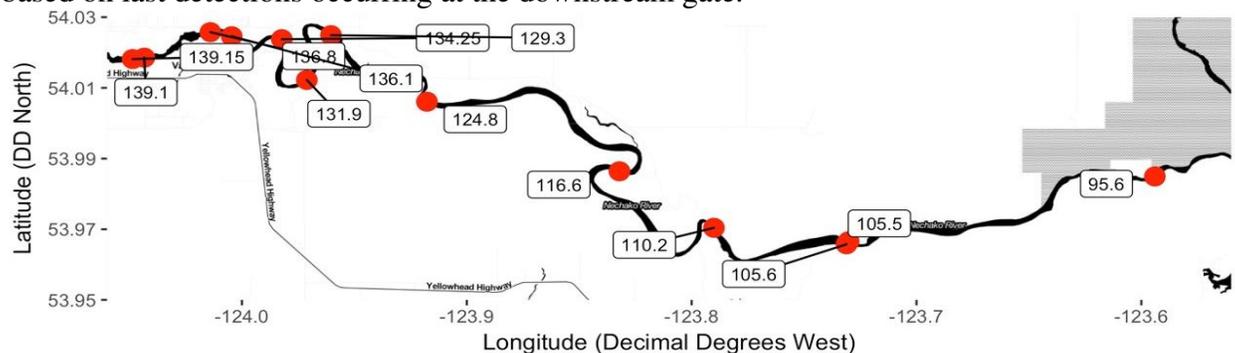


Figure 1. 2018 Acoustic Gate System



EGG MATS

Project: Egg monitoring
Project Lead: CSTC
Funders: DFO SAR
 \$29,960, AFSAR \$45,400
Start Year: 2014

Objectives

- To confirm wild spawning activity in the river, and relate back to river conditions and spawning behaviours/ habitat preference prior to egg detection.
- To collect wild eggs for rearing within the NWSCC, to bring these eggs past the critical stage of recruitment failure and ensure genetic diversity is maintained in the population.

Because sturgeon spawn in the water column, eggs are broadcast and are adhesive, and the eggs drift some distance downstream after spawning until they adhere to the substrate. Sturgeon eggs are therefore found downstream of where adults are detected during spawning. This program sets egg mats on the river bottom within and downstream of known spawning area.

Results

This is the second year that there have been enough egg mats to cover the known spawning site. The majority of the eggs were collected downstream of the Burrard Bridge. The eggs collected were likely from one spawn event:

- 84 egg mats in total within and downstream of the spawning reach
- Total eggs collected: 337
- Egg mat detections suggested the primary spawning event may have occurred around May 24th, but telemetry detections indicate the most adult sturgeon were present around June 6th
- Prime condition eggs were found both upstream and downstream of the island complex within the spawning reach indicating that eggs are spawned at sites upstream and downstream of the islands.
- Larval drift netting was not done in 2018.
- The eggs were brought to the NWSCC, where they were reared separately from the hatchery program sturgeon.

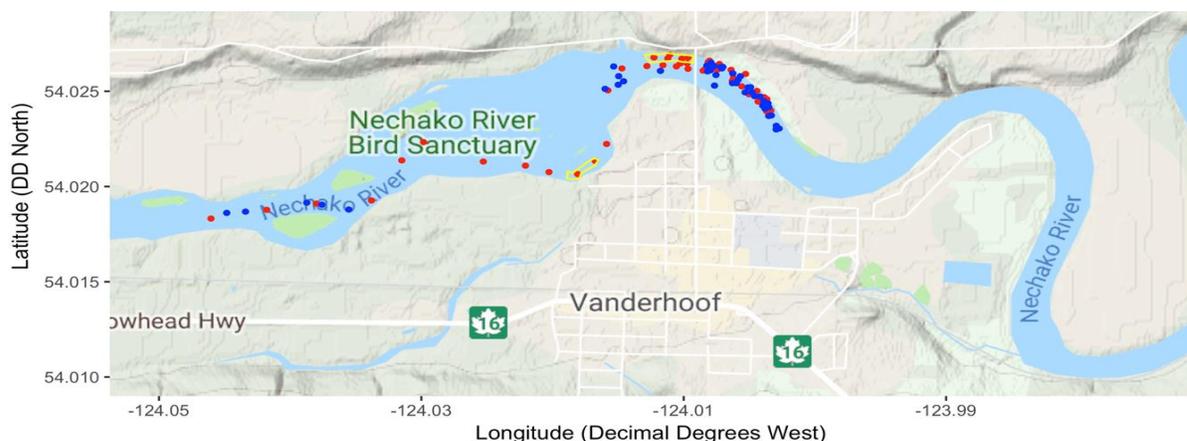


Figure 2. Map of 2018 Nechako River spawn monitoring area including egg mat sites (red for CSTC sites and blue for NWSCC sites) and remediated substrate areas known as “gravel pads” (yellow polygons).



SEDIMENT TRANSPORT RESEARCH

Project: Geomorphology and Sediment Transport Study
Project Lead: FLNRORD
Funders: DFO Species at Risk
Start Year: 2014

Infilling of spawning gravels has been identified as a contributing factor to recruitment failure of Nechako White Sturgeon. Understanding the placement and movement of sediment transported through and deposited within the spawning reach has implications on further research and mitigation measures to improve the potential effectiveness of the spawning reach.

2018 Update

Freshet occurred earlier than usual in the spring of 2018. The research team was not able to mobilize the research instruments in time. For this reason, no additional work on the geomorphology and sediment transport study was done in 2018. Additional research is planned to commence in the spring of 2019.

OTTER PREDATION STUDY

Preliminary searches in 2016 and 2017 resulted in 26 hatchery-released juvenile sturgeon PIT tags being retrieved from two River Otter (*Lontra canadensis*) latrine sites. The NWSRI decided to follow up by supporting a graduate student project beginning in 2018 that aims to identify River Otter latrine sites and to determine the extent of the predation on juvenile sturgeon.

Results

- Five additional latrine sites were identified and a total of 93 PIT tags retrieved from the now seven known latrine sites in 2018.
- Five of 32 radio tagged sturgeon released in July of 2018 were determined to be mortalities as their radio tags found on shore. These are suspected to be the result of predation events, with the largest mortality being from a sturgeon released at 59.8cm.



Photo 4. Handheld PIT tag readers are used to detect and retrieve juvenile sturgeon PIT tags from river otter latrine sites



JUVENILE INDEXING PROGRAM

Project: Juvenile White Sturgeon Monitoring

Project Lead: CSTC

Funders: \$60,000 AFSAR via Carrier Sekani Tribal Council

Start Year: 2004

Objectives

- To gain insight into hatchery-origin juvenile sturgeon survival and growth rates.
- To monitor the presence of wild-origin juvenile sturgeon.
- To refine knowledge of juvenile sturgeon habitat and distribution in the Nechako Watershed.

The juvenile indexing program uses a standardized set-line sampling technique and methodology to catch river-origin and hatchery-origin juvenile sturgeon. The gear used targets juvenile sturgeon less than 1 m in length. Biological data, location, and river condition information is recorded for each juvenile sturgeon caught.

Results

Location	Effort (hookhours)	Hatchery-origin	Wild or unknown	Recaptures
Index Zone in Nechako River (RKM 105-135)	112,109	120	5	89
Peripheral area in Nechako River, Stuart River and Stuart Lake	71,339	18	2	8
Fraser River (RKM 674-835) and Lower Nechako (RKM 0-30)	38,168	5	17	1
Fraser River (RKM 420-674)	12,669	6	39	0
Fraser River (RKM 957-955)	9,062	0	76	0

Recommendations:

- Sampling within Fraser mainstem habitats should be expanded in future years.
- DNA should be collected from a suitable sample of wild individuals. A finray sample should be collected from all hatchery individuals captured (in the Fraser).
- Fraser mainstem sampling/monitoring should be coordinated with the Nechako TWG to ensure standardization and comparability of sampling and data.
- A risk assessment framework related to the hatchery augmentation recovery action should be created and updated annually.



2018 JUVENILE WORKSHOP

Project: Juvenile Workshop
Project Lead: CSTC
Funders: \$5,070 DFO; in-kind
 FLNRORD and DFO
Start Year: 2018

Objective

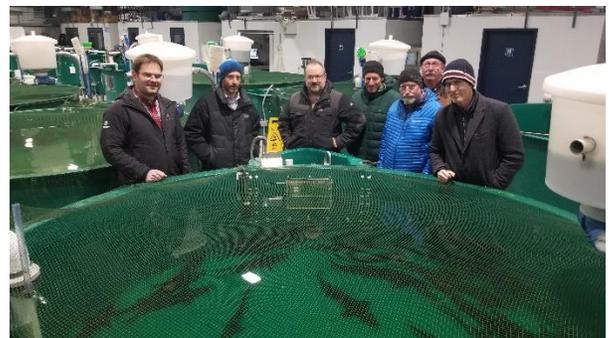
To bring together the best available data and ‘lessons learned’ from all White Sturgeon recovery programs in BC to help guide future juvenile-focused monitoring activities for the Nechako River and Upper/Mid Fraser River watershed.

The NWSRI White Sturgeon Juvenile Workshop took place on February 20-22, 2019 in Prince George, BC. The 21 participants came together to achieve the three objectives listed below.

1. Review the current knowledge on historic and present status of White Sturgeon in the Nechako River system.
2. Brainstorm Nechako/Upper Fraser specific challenges and solutions as they relate to recruitment failure and conservation hatchery releases and juvenile monitoring.
3. Provide considerations on future hatchery release strategy and juvenile monitoring program to the NWSRI TWG.

The following key challenges and data gaps were identified by the group:

- NWSRI monitoring data collected to date has identified key questions; extent of dispersal and residency of all juveniles and survival of larger juveniles (data gaps that make it difficult to have a complete understanding of survival, mortality, movement, and historic range).
- Data on wild mid-Fraser juvenile sturgeon is limited to exploratory set-lining in 2018.
- The current and historical extent of Nechako River-origin juvenile movement out of Nechako River and associated risks to Mid- or Upper-Fraser stocks.
- Lack (or lag) of analyses and interpretation of existing data, including a lack of vetting through peer review.
- Nomenclature and associated designations that are subject to periodic review (e.g. Nechako White Sturgeon, upper Fraser White Sturgeon, mid-Fraser White Sturgeon, designatable unit, nationally significant population) can create information gaps and uncertainty (i.e. “natural/historic” stock ranges, genetic exchange).





GENETIC PARENTAGE AND INDIVIDUAL STOCK IDENTIFICATION

Project: Genetic Parentage and Individual Stock Identification

Project Lead: BC MOE and University of Victoria

Start Year: 2016

Objective

Evaluate the use of genetic tools to help inform and improve the implementation and monitoring of recovery measures.

Parentage

One component of the project will evaluate the parentage of wild caught juveniles, using previously established techniques. For example, this will allow us to determine wild juveniles born in 2011 that were from fertilized eggs that we released directly onto restored substrates in 2011. Successfully linking wild juveniles to the parental broodstock used for this egg release experiment could provide a clear indication of the potential of substrate restoration.

Additionally, identifying the number of unique parents that contribute to the wild juveniles will provide information about the number of parents that contributed to the observed juvenile production.

Stock Identification

A second genetics project addresses a more challenging problem, to identify the population of origin of individual fish. While genetic analysis has shown that the Nechako population is distinct from the upper and middle Fraser populations, it is much more difficult to assign an individual fish to a particular population. Sturgeon are octaploidy (i.e. they have 8 sets of chromosomes whereas many other organisms are diploid and have only two sets) which increases the difficulty to easily identify them. This study addresses the need to develop a method to easily distinguish individual fish to help determine the potential exchange of fish between the Nechako and the mainstem Fraser River. In particular a successful development of genetic screening tool would allow us to exclude non-Nechako fish from the hatchery program. These sorts of genetic tools are just being developed for other species, but have not yet been developed for White Sturgeon.

Progress in 2018-2019

- NWSRI continues to work with researchers from UVIC and Seastar on the genetic parentage project, and results are expected by 2019-2020.
- Researchers at UBC are developing and testing a method to use fin ray samples to determine from which watershed sturgeon originate from.
- Tissue samples from juvenile Nechako White Sturgeon continue to be collected for these studies.

JUVENILE STURGEON RELEASE

Project: CWG Outreach Programs

Project Lead: NWSRI CWG

Funders: \$28,190: Habitat Stewardship Program \$3,900, NWSRI \$1,890; In-kind: FFSBC \$7,000, School District 91 \$5,000, District of Vanderhoof \$7,200, Rio Tinto \$800, Avison Management Services \$3,300, Integris \$1,000, UNBC \$100, EnviroVikes \$400, NWSRI \$2,600

Start Year: Juvenile Release: 2006-2009, 2014- ongoing; NWSRI Website 2012; Storm Drain 2017; Stakeholder Signs 2017

Objectives

- To provide an opportunity for students to participate hands-on in the recovery of Nechako White Sturgeon.
- To have a public awareness opportunity.

The Juvenile Sturgeon Release Event was held on May 4, 2018 at Riverside Park in Vanderhoof. The NWSRI, along with Freshwater Fisheries Society of BC, School District 91 and the District of Vanderhoof, hosted the event. Students came from schools around School District 91, including public, private, First Nations, and home-school. Each student named and released a PIT (passive integrated transponder) tagged one-year old juvenile sturgeon into the Nechako River. Additionally, students circulated through the educational and interactive booths, including some hosted by Carrier Sekani Tribal Council and the Department of Fisheries and Oceans, that covered topics on sturgeon biology, research programs of the NWSRI, river health and ecology, salmon biology, the Sturgeon School Curriculum, watersheds, and the spinning Wheel of Life. Participants got a free hot dog lunch and a tour at the Nechako White Sturgeon Conservation Centre as well. The data collected from the event is added to the “Where is My Fish” database of the NWSRI website where students can search their names to track the movements of the fish they released.

Results

526 sturgeon were released at the May 4th event, by over 500 students from Vanderhoof, Fraser Lake, Fort St. James, Takla, Francois Lake, Prince George, and Burns Lake.

Outcomes

Feedback from the students and teachers was very positive as it has been in previous years.



Photo 5. Staff and volunteers working together at the release event.



NWSRI WEBSITE

Objectives

To promote further interest in Nechako White Sturgeon recovery.

- To allow citizens an opportunity to actively participate in sturgeon recovery, by naming a tagged sturgeon, and following it online.
- Have a user-friendly website that provides information about Nechako White Sturgeon and their recovery.

The NWSRI website is the information interface of the NWSRI to the general public. The website includes pages related to project and reports, information about the Nechako White Sturgeon Conservation Centre, link to school resources, and much more.

The NWSRI Facebook page @NWSRI has been used to increase awareness to and engagement by local citizens towards sturgeon recovery. The Facebook page following continues to increase with time.

Where is My Fish Page

The “Where is My Fish” page of the NWSRI website is updated each year with the new Juvenile Sturgeon Release Event data (photo of student and the data related to their fish), and then any information on recaptured juvenile during the juvenile monitoring program in the fall of 2018. There are several sturgeon on the website now that have data from multiple recaptures, and shows the viewer how much they have grown and moved.

Outcomes

- You can now search by recaptured fish and number of recaptures.
- The Where is My Fish page continues to be a popular page on the website.

Web Link

www.nechakowhitesturgeon.org/whereismyfish

Baby Blue
152222770A

Nickname: Baby Blue
Student: Jerry Charliebroy
Grade: 5

Release Info	Capture 1	Capture 2
Date: May 4, 2015	Date: Sep 25, 2015	Date: Sep 7, 2017
Fork Length: 46	Fork Length: 50.6	Fork Length: 55.6
Weight: 0.671	Weight: 0.598	Weight: 0.854

Fork Length: 46cm (Release), 55.6cm (Recapture 2)

Map Satellite

Figure 3. An example from the website of a recaptured sturgeon. Since being release in 2015, “Baby Blue” has been recaptured twice.



COMMUNITY OUTREACH SIGNAGE

In 2018/2019, the NWSRI designed and printed two interpretive signs to support public education and awareness within the Nechako watershed. The signs were paid for and erected by BC Parks in the following locations:

- Paarens Beach Provincial Park on Stuart Lake
- Beaumont Provincial Park on Fraser Lake

NECHAKO WHITE STURGEON IN FRASER LAKE

Pre-historic Fish

Dwelling in the waters of Nechako Watershed is a survivor from the age of the dinosaurs – White Sturgeon (*Acipenser transmontanus*). This magnificent animal is the largest freshwater fish in Canada, and has existed relatively unchanged for millions of years. It is likely that White Sturgeon arrived to the Nechako Watershed from the Upper Columbia River system when the two were connected over 10,000 years ago after the last ice-age. Since that time, the White Sturgeon in the Nechako Watershed appear to have remained almost exclusively within its waters,

using the deep waters of the river and lakes, such as Fraser Lake, for winter refuge. We know today that the adults congregate to spawn in the Nechako River at Vanderhoof.

Research to date indicates the Upper Fraser Designation Unit (DU) of White Sturgeon (Upper Fraser, Middle Fraser and Nechako River populations) is genetically distinct from other populations and within that DU, the Nechako River White Sturgeon is a unique group.

nechakowhitesturgeon.org

Sturgeon Recovery

The Federal Species at Risk Act lists Nechako White Sturgeon as an endangered species. The Nechako White Sturgeon Recovery Initiative (NWSRI) works toward sturgeon recovery.

Ways to support recovery!

- keep the water and shores of Fraser Lake clean.
- learn more about Nechako White Sturgeon by visiting the NWSRI website.
- donate to the NWSRI!
- visit the Nechako White Sturgeon Conservation Centre in Vanderhoof.

Sturgeon Habitat in Fraser Lake

Looking out over Fraser Lake from Beaumont Park, you can't see them, but Nechako White Sturgeon are living under the surface of the water. Fraser Lake empties into the Nechako River via the Nautley River, north of Beaumont Park. Fraser Lake has areas as deep as 27m that could act as overwintering areas for sturgeon. Sturgeon have been recorded at depths of 9m during the summer in Fraser Lake, and on rare occasions have been accidentally caught in seine nets of the Stel'ten First Nation on the western side of the lake during their salmon harvest. Sturgeon eat adult salmon, which migrate through Fraser Lake in the late summer and fall.

If you accidentally catch a sturgeon!

It is illegal to fish for, keep any part of, or kill a Nechako White Sturgeon. If you catch a sturgeon, take these steps to safely release it:

1. use gloves
2. do not take sturgeon out of the water
3. remove hook if possible, cut line if necessary
4. if safe for the fish, take a photo and estimate the length
5. email the NWSRI

Sturgeon FACTS!

- they live to 100 years old and can grow over 3 m in length
- the 'heterocercal' shaped tail (larger top than bottom) tells us they are strong swimmers
- their flat head and 4 barbels mean they are primarily bottom feeders
- they have a cartilaginous skeleton
- they do not have scales, but rows of scutes (armour) that are used for protection

CONTACT NWSRI:
nechakowhitesturgeon.org
info@nechakowhitesturgeon.org
 @NWSRI on Facebook - [nechakowhitesturgeon](https://www.facebook.com/nechakowhitesturgeon)
NECHAKO WHITE STURGEON CONSERVATION CENTRE:
 Tours year-round. Call: 250-567-6673.

BC Parks

Information provided by the Nechako White Sturgeon Recovery Initiative with funding from BC Parks Park Enhancement Fund.

THE NECHAKO WHITE STURGEON RECOVERY INITIATIVE



EVERY FISH COUNTS - BOAT KIT PROGRAM

Project: Boat Kit Program
Project Lead: NWSRI and CSTC
Funders: Total: \$29,875 Habitat Stewardship Program \$13,800; Canfor Pulp \$5000, Mt. Milligan \$2,000; CSTC \$6,500 In-kind; NWSRI \$2,575
Start Year: 2011

Objectives

To reduce accidental harm to sturgeon and the sturgeon population as a result of sturgeon by-catch associated with the First Nation salmon, char and burbot fisheries.

The Emergency Sturgeon Live Release Boat Kit program has been operating since 2011. It is an initiative developed by the NWSRI and Carrier Sekani Tribal Council (CSTC) to reduce the potential for by-catch mortalities associated with the First Nation Food, Social and Ceremonial (FSC) fisheries. Every sturgeon saved because of this program remains in the population to breed in the future and contribute to the genetic variability of the population to prevent extirpation of the White Sturgeon population. Since 2011, 86 sturgeon have been reported by the program, and 78 sturgeon have been released live. Considering the adult population to be roughly 600, the number of live released sturgeon since 2011 is likely 10% of the available adults in the population.

In 2018, seven First Nation communities, including Stellat'en, Saik'uz, Nak'azdli Whuten, Tl'azt'en, Takla, Lheidli T'enneh, and Yekooche, were approached to participate in this program. By-catch Monitors were hired in each community to distribute kits to the fisher families, and assist with sturgeon removal and data collection.

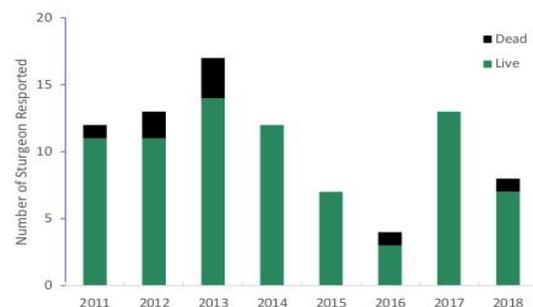
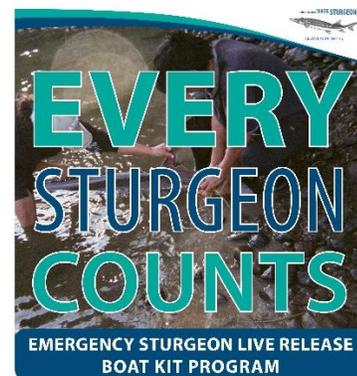
Kit Components

- A small kit intended to remain in the boat at all times and contain all of the tools necessary for a successful live release.
- A video, "Every Sturgeon Counts," which is used as an education and training tool for Fisher Families.
- An on-site community By-catch Monitor that can explain the program and help release sturgeon caught in a net.

Results

All seven First Nation communities participated in the program.

- Tl'azt'en, Nak'azdli, and Lheidli T'enneh reported releasing a total of 7 sturgeon live in 2018.
- One mortality was reported.
- A total of 10 additional kits were distributed in 2018 to the seven communities.





SCHOOL CURRICULUM

Project: Nechako White Sturgeon Curriculum
Project Lead: NWSRI
Funders: \$12,670 total: Habitat Stewardship Program \$3,520. In-kind NWSRI, School District 91: \$5,550
Start Year: 2014

The Healthy Watersheds for Sturgeon School Curriculum Program was first introduced in schools within School District 91 in 2014

Objectives

- Tool to increase awareness of the connection between maintaining healthy rivers, riparian areas and watersheds to benefit sturgeon and all organisms.
- To provide educational tools to teachers and students within the Nechako watershed (School District 91), to learn about the biology, history, environment and value of the Nechako White Sturgeon.

The goal for 2018-2019 was to convert existing curriculum materials that were initially developed for grades 4-7 to be Smart Board compatible. This was based on teacher feedback in 2017. Materials were also updated to stay up to date with information emerging from the Technical Working Group. Specific activities completed in 2018/2019 included:

- Updated the map to include ancestral names and other key features.
- Converted existing PDF activities to be Smartboard compatible.
- Reviewed and updated existing PowerPoint presentations.
- Added click availability to 2018-2019 calendar.
- Added new lessons on internal anatomy, Nechako vs other sturgeon populations.

2018-2019 STURGEON CALENDAR
CLICK THE LINKS to get more information. Also, add your own sturgeon-related events and projects on this calendar!

September 2018

Mon	Tue	Wed	Thu	Fri	Sat	Sun
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

October 2018

Mon	Tue	Wed	Thu	Fri	Sat	Sun
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

November 2018

Mon	Tue	Wed	Thu	Fri	Sat	Sun
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

December 2018

Mon	Tue	Wed	Thu	Fri	Sat	Sun
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

January 2019

Mon	Tue	Wed	Thu	Fri	Sat	Sun
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

February 2019

Mon	Tue	Wed	Thu	Fri	Sat	Sun
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

March 2019

Mon	Tue	Wed	Thu	Fri	Sat	Sun
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

April 2019

Mon	Tue	Wed	Thu	Fri	Sat	Sun
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9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

May 2019

Mon	Tue	Wed	Thu	Fri	Sat	Sun
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

June 2019

Mon	Tue	Wed	Thu	Fri	Sat	Sun
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9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

July 2019

Mon	Tue	Wed	Thu	Fri	Sat	Sun
1	2	3	4	5	6	7
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15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

August 2019

Mon	Tue	Wed	Thu	Fri	Sat	Sun
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

Important Dates!

- September 4:** First day of school. Use this calendar to plan your year of sturgeon learning and research!
- September 30:** World Rivers Day!
- October 1:** Visit a creek to look for aquatic insects, make paper boats, and discuss our watershed and ecosystem.
- October 15-20:** Hatchery sturgeon are spawning. If you can't see them, they are spawning. If you can't see them, they are spawning. If you can't see them, they are spawning.
- November 1:** The Great Migration is being updated. Check in on any fish you or your school have released to see if they have been recaptured!
- November 19-20:** The water temperature in the hatchery starts to lower as winter temperatures and finding of juvenile sturgeon slow or stop your trip!
- December 4:** Sturgeon are overwintering. Worry about what you think it would be like to be an overwintering sturgeon.
- January 8:** Welcome back to school! Book a tour at the hatchery and do some SmartBoard activities to get started.
- February 15:** Sturgeon researchers are planning their work for the summer. Can you think of a research project?
- March 1:** Water is slowly coming on and, across the map, of the watershed and talk about sturgeon migration and land uses within the watershed.
- April 1:** This month the water temperature will start to warm up. Sturgeon become active and start to feed. Review the sturgeon life cycle.
- April 22-28:** Chicks are growing to 11. Release the year old sturgeon into the Nechako. (If you have adult sturgeon for the next year's breed program, finishing ages and they have enough mature adults, or natural spawning starts.)
- May 1:** Watch the boys and boys on the river. They are checking for white-spotted sturgeon eggs. Many necessary programs for the adult sturgeon are spawning. Follow us on Facebook for regular updates.
- May 3:** Invertebrate Sturgeon Release Event
- May 20-June 2:** Spawning at the hatchery and that's about it with hatchery staff to see if your class can watch them collect sturgeon eggs for spawning.
- June 4:** There is a release day, so bring your class in your community.
- June 17-22:** Sturgeon have hatched into a million babies and grow up for wintering larvae. Review anatomy.
- June 27:** Forward your parents to take out your friends and any visiting family to the hatchery for a tour with the Hatchery Staff this weekend!
- July 1-7:** Most of the eggs that have hatched. They will now be fully formed juvenile sturgeon at roughly 30mm long (3.0 to 3.5 inches).
- August 1 onward:** Check the website for exact dates and times of tours at the hatchery, as well as other sturgeon-related events over the summer.

We want to help YOU LEARN about sturgeon.
 Book a tour at the hatchery, borrow a sturgeon fish and/or stream dike kit, download resources from our website (Education) and share your experience and ideas on our Facebook page (638395), or by emailing edu@nechakowhitesturgeon.org

nechakowhitesturgeon.org @NWSRI



NECHAKO WHITE STURGEON CONSERVATION CENTRE

Conservation Fish Culture

Project: Conservation Fish Culture
Project Lead: FFSBC
Funders: Total: \$481,070. Nechako Environmental Enhancement Fund \$431,070, Rio Tinto \$50,000.
Start Year: 2014

Objectives

- To produce the next generation of sturgeon that will spawn naturally in the Nechako River.
- To conserve genetic diversity within the Nechako White Sturgeon population.
- To grow sturgeon to 1 year of age to get them through the critical recruitment failure stage.

This marks the fourth year of operation for the Nechako White Sturgeon Conservation Centre. Mike Manky is the Hatchery Manager, Fraser Linza is the Senior Fish Culturist, and Kris Mohoruk, Peter Merth and Alyssa Purse were the seasonal Fish Culture Technicians.

Seven females were spawned with eleven males in two events in 2018 in May. Numerous volunteers came to the Centre to help mix the eggs with the milt; this was definitely a community effort! There was good representation for each of the seven females used in the brood program. Of the 16 females caught during brood sampling, three were kept over the winter to be used in a future brood program, as so they could mature further.

Eggs hatched by mid-June, and first feeding was a week later. As of February 2019, there were about 830 juvenile sturgeon in the hatchery, this included: 500 for the community release in May 2019, 70 juveniles from 2017 and 36 carried over from 2016 that were brought in from the wild as eggs. Some were kept from the 2018 brood year to be released in the Spring of 2020 as the NWSCC shifts to rearing 2-year-old sturgeon. to mimic natural conditions in the river just before release. A small group of 35 fish were reared in 16°C water for the winter to be released at a much larger size as part of an experimental release size.

Prior to release in May 2019, our hope is that the fish will be past the stage of recruitment failure identified by our TWG and therefore a greater number will survive to breeding age. These young fish will be released in May at various locations on the Nechako River, including the Juvenile Release Event that will involve approximately 500 students from across the Nechako watershed .The NWSRI continues to recognize that the facility is a stop-gap for sturgeon recovery that will aid in providing more time for the TWG to continue to research, implement, and monitor the more permanent solutions required to achieve a self-sustaining sturgeon population.



Photo 6. Larval sturgeon taking cover in artificial substrate (photo by FFSBC).



Broodstock Captures

The broodstock capture program underpins the success of the breeding plan for the endangered Nechako White Sturgeon. This program captures wild adult sturgeon in breeding condition to use to seed the hatchery program for the coming year. The Breeding Plan currently calls for the production of up to 12 adult females and from 12 adult males in a factorial mating design (up to 144 crosses).

Objectives

- To capture 12 female and 12 male mature sturgeon, which supply eggs and milt for the conservation fish culture program.
- To assist NWSRI research programs such as the application of radio and acoustic tags, or tracking of tagged adults to inform programs such as spawn monitoring.
- To monitor and assess the health of the adult sturgeon population

Results

- 57 adult sturgeon (38 males and 16 females, and one un-sexed) were caught (two were caught twice) in a four-week period in April and May 2018, using set-lines and angling.
- 11 males and seven females were used for the brood program to make seven maternal families and 77 half-sibling crosses.
- 13 radio-tags were implanted in adults that were not used in the brood program, but returned to the river.
- Of 337 wild eggs collected between May 17th and June 11th, 16 survived to the juvenile stage.



Photo 7. FFSBC staff releasing adult sturgeon following health and reproductive assessment (photo by FFSBC).

Juvenile Release

Through April and May 2018, 4,334 juvenile sturgeon spawned from the 2017 brood were released into the Nechako River. Approximately 540 fish were released at nine locations from as far upstream as Fort Fraser to RKM 116. In July, 32 radio tagged juvenile sturgeon from the 2017 brood year with an average length of 55cm were released. In late November/early December 3,560 juvenile sturgeon from the 2018 brood year were released.



Hatchery Tours

Project: Merchandise and Donations

Project Lead: FFSBC & NWSRI

Raised: \$3,457

Objectives

- To increase public awareness in sturgeon conservation and recovery initiatives through public interaction.
- To facilitate a better understanding of the hatchery's role in sturgeon conservation.

Freshwater Fisheries Society of BC staff along with NWSRI volunteers provided tours of the Nechako White Sturgeon Conservation Centre (NWSCC). Tours were scheduled on Thursdays at 2:00pm through the winter months and additional tour times during the summer months when the Tour Guides were on staff. As well, private bookings for groups were conducted by hatchery staff and our volunteers

The NWSRI received funding to purchase additional souvenirs, to help raise funds for sturgeon recovery. The NWSRI purchased t-shirts and sturgeon stuffies.

The NWSCC Tour Guides, funded through Rio Tinto, also travelled to other communities to give presentations, gave guided walks along the Nechako River, and attended the Vanderhoof Farmers' Market three times.

Tour Statistics

Data was collected about the visitors to the NWSCC. The statistics presented here are an under-representation of the number of visitors to the hatchery, as many people visited the grounds without taking a guided tour. Visitors enjoyed the picnic area interpretive signs situated outside the facility.

Statistics from the tour season between May 1-August 31 showed:

- In total 2,392 people participated in 190 tours between May and August 2018. These people include public and private school students, tourists, industry managers, local governments, researchers, and the general public.
- \$3,457 was raised from merchandise sales and donations.

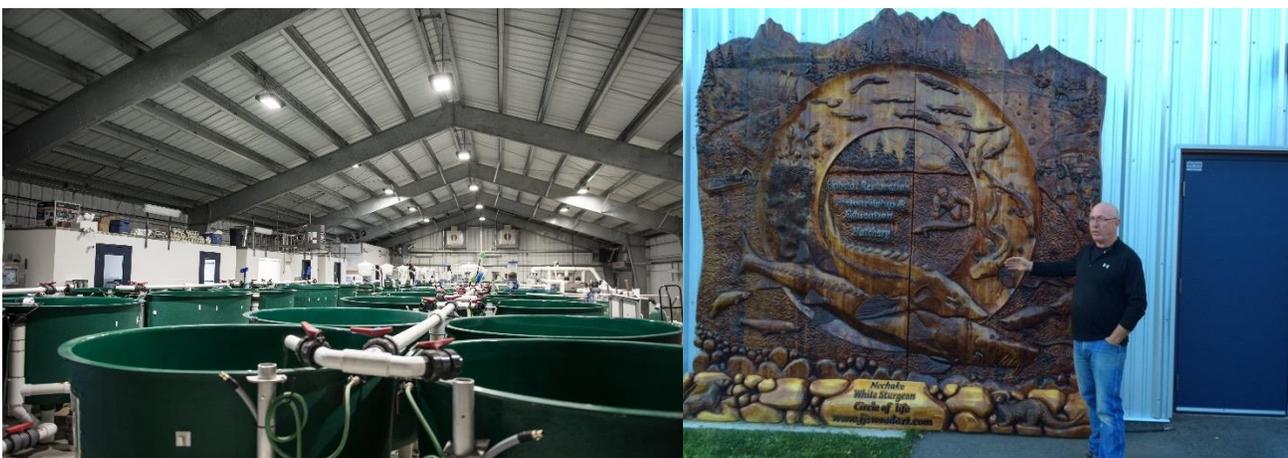


Photo 8. Inside and outside of the Nechako White Sturgeon Conservation Centre (Photo by FFSBC).

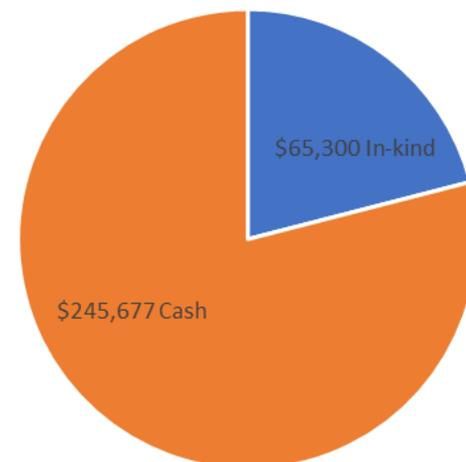
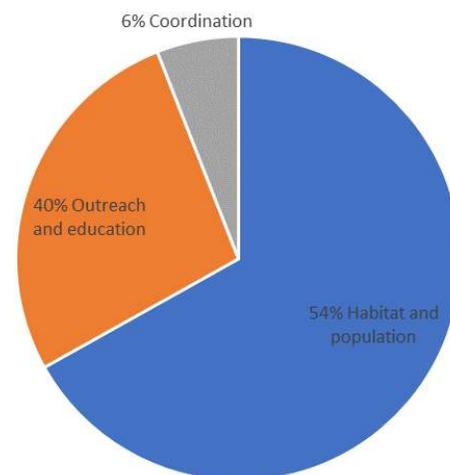


FINANCIAL SUMMARY FOR 2018-2019

Project Funding

Details on project funding for the 2018-2019 fiscal year are provided below. Project dollars came from a variety of sources including industry, government, environmental funding sources, and volunteer hours. The following provides a breakdown of financial and in-kind contributions. These numbers underestimate the number of in-kind hours that are generously donated to the NWSRI by researchers, hatchery staff and community members.

Contributor	Amount
FLNRORD via Land Based Investment Strategy – Species at Risk	\$34,250
FLNRORD via DFO MOU#10	\$25,000
Carrier Sekani Tribal Council: \$105,400 via DFO Aboriginal Funds for Species at Risk and \$29,960 via DFO Species at Risk, \$8,200 in-kind for the Boat Kit Program	\$143,560
Fisheries and Oceans Canada Habitat Stewardship Program	\$5,070
Integrus Credit Union	\$28,940
Canfor Pulp Products Inc	\$1,000
Mt. Milligan Community Fund	\$8,600
BC Parks	\$2,000
CSTC	\$3,000
Freshwater Fisheries Society of BC	\$82,00 in-kind
FLNRORD	\$17,000 in-kind
Rio Tinto	\$10,000 in-kind
District of Vanderhoof	\$800 in-kind
School District 91	\$7,200 in-kind
Avison Management Services Ltd	\$10,500 in-kind
EnviroViktes	\$3,300 in-kind
UNBC	\$400 in-kind
NWSRI Working Groups	\$100 in-kind
NWSRI Sales & Donations	\$6,800 in-kind
Total Cash Contributions	\$245,677
Total In-Kind Contributions	\$65,300
Grand Total	\$310,977



The NWSRI extends a sincere thank you to all of the groups and individuals who have contributed funds, time and/or other in-kind contributions. This support is essential to the success of the NWSRI and the recovery of White Sturgeon in the Nechako watershed



CONTACT THE NWSRI

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Visit our website for more information about the program, projects both past and present.

www.nechakowhitesturgeon.org

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Canada 

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