



# 2017-2018 ANNUAL REPORT NECHAKO WHITE STURGEON RECOVERY INITIATIVE





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# MESSAGE FROM THE NWSRI CHAIRS

## Technical Working Group Chair Ian Spendlow

*2017-2018 marks the fourth 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 2017, staff remained focused on rearing vigorous juvenile sturgeon for release in 2018. The NWSCC staff, project partners, and volunteers continued to serve the NWSRI through their combined efforts. 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. Survival and dispersal of hatchery reared sturgeon was studied through increased acoustic and radio telemetry monitoring efforts in the Nechako watershed and pilot index sampling in satellite areas beyond core sampling reaches. Additional resources were applied to improve the efficacy of wild egg collection and rearing, through acquisition of field equipment and protocols within the facilities. With this new information the team is better equipped for adaptive management in revisiting the monitoring strategies, breeding plans and practices, and securing resources for future generations of sturgeon. I would like to thank the entire team and community who contributes to this recovery efforts.*

## Community Working Group Chair Wayne Salewski

*The Community Working Group had a very active year on all fronts with a continuing growth and requests for information and tours of the Nechako White Sturgeon Conservation Center. I think Vanderhoof can be very proud of the facility, its role and the opportunity it has for us to share with our families and the over 3,500 visitors hosted by the facility this past season. The steady increase of tourism was notable but of particular note was the increase of European tours that switched to our facility in September and October were very exciting and well noted by the community. It is important to recognize that Rio Tinto funded our tour guides again this past season and they delivered an excellent product that is well received and appreciated.*

*Our annual release of last years juveniles continues to be a school highlight and this past release went very well with our team of volunteers and staff delivering the program without any obvious issues and our information tents were perhaps the best ever and met and exceeded the teachers' expectations. A very big thank you to our coordinator, Michelle Roberge for her skills and effort along with the District of Vanderhoof for their organizational skills in getting us set up and working in a timely fashion. The District of Vanderhoof is an invaluable partner and a great host of the BBQ that has become part of the tradition.*

*The Emergency Release Boat Kit Program, one of our longest running CWG programs, continued again this year. First Nations in the region have curtailed their salmon fishing because of low returning levels. Despite the low returns and reduced fishing, 13 sturgeon were successfully released from gill nets in 2017. A huge success to the program.*

*Our educational outreach with School District 91 continues to grow in leaps and bounds and under the leadership of NVSS's Casey Litton the program deliverables now include multiple schools throughout the School District delivering the Streamkeepers program to classrooms of schools that have adopted sections of streams in the vicinity of their schools. This linkage is nicely transferred back to healthy streams, healthy watersheds and all work nicely to recovering the Nechako White Sturgeon.*

*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.*



## INTRODUCTION

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 restore a self-sustaining population within the Nechako River. 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 2017 to March 2018. The report is broken down into three main sections that highlight key aspects of the NWSRI, and the projects and findings from 2017-2018 for the Technical Working Group (science-based arm of the NWSRI), and the Community Working Group (outreach and awareness arm).

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

[WWW.NECHAKOWHITESTURGEON.ORG](http://WWW.NECHAKOWHITESTURGEON.ORG)

Please note: If you are reading this report on your computer, you can open the reports and links in the yellow boxes by clicking the text.



Students learning about aquatic invertebrates and how they relate to river health in one of many educational booths during the Sturgeon Release Event on May 11, 2017 hosted in partnership with School District 91. Photo by Michelle Roberge.

# ABOUT THE NWSRI

## 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, while the sturgeon population as a whole was smaller, and the average age of fish 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, 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 juveniles 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 extension 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 was formed in September 2000, and is made up of fisheries, habitat and river geomorphology scientists and researchers. The TWG met over five times in 2017-2018 to discuss latest research project findings, plan future projects, the progress of the group and to develop 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.

This 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 affected public. The CWG met twice in 2017-2018 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
- > public awareness for Nechako White Sturgeon in the watershed.

Increasing the knowledge about 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 partners, and local governments.

*At the spring 2018 meeting, June Wood a long-time resident on the Nechako River and member of the Community Working Group, announced her retirement from the group. June was gifted an engraved Chief Louie paddle as thanks from the members of both the Technical and Community Working Groups for her years of dedication, passion and insight with this group.*



JUNE WOOD ACCEPTING HER PADDLE FROM CWG CHAIR WAYNE SALEWSKI. PHOTO FROM WAYNE SALEWSKI.

## NWSRI Partnerships

The members of both the Technical Working Group and Community Working Group represent a wide range of organizations. Those involved during the 2017-2018 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  
 Lheidli T'enneh First Nation  
 Rio Tinto  
 Tl'azt'en Fisheries Program

## NWSRI Recovery Coordinator

The NWSRI has a paid 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, and where necessary, assisting team members with their assigned tasks.

Michelle Roberge is the current Recovery Coordinator. Michelle is a Fisheries Biologist who lives in Vanderhoof and worked with the NWSRI on several outreach projects before her role as Recovery Coordinator.

**Project:** NWSRI Recovery Coordinator

**Project Lead:** NWSRI

**Funders:** FLNRO via - Land Base Investment Strategy  
 - Species at Risk (LBIS-SAR) \$18,750

**Start Year:** 2001

# TWG RESEARCH PROJECTS

## ADULT SPAWN MONITORING

### OBJECTIVES

- > To determine the timing of spawning, incubation success, larval drift, and 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.

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 a three projects that make up the adult spawn monitoring program:

- > Radio-telemetry (fixed station and boat telemetry)
- > Acoustic telemetry (VPS)
- > Egg Mats

### Project: Adult Spawn Monitoring

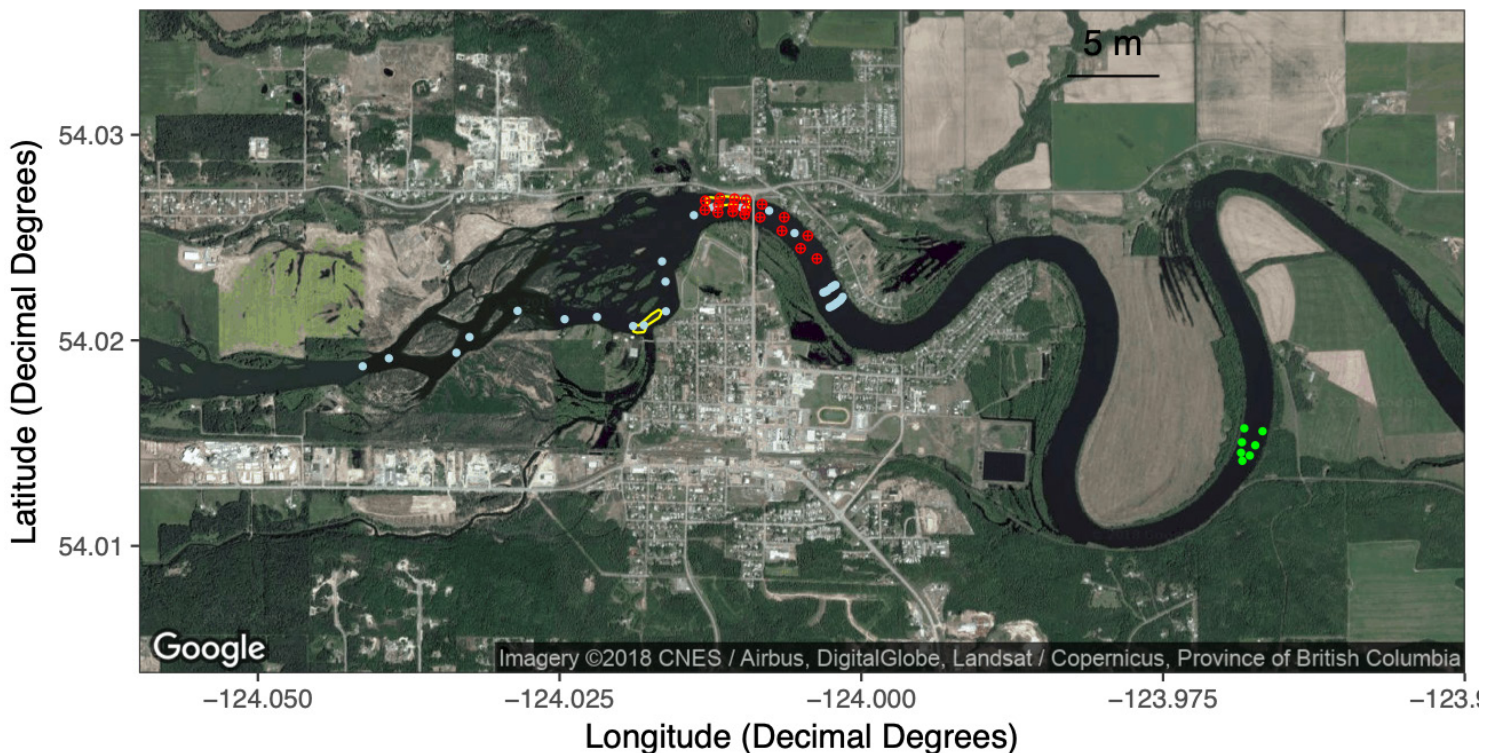
**Project Lead:** CSTC

**Funders:** \$91,650 total. \$76,650 via Environment Canada, and \$15,000 DFO MOU.

**Start Year:** 2004

### RIVER CONDITION DURING THE SPAWNING PERIOD

- > River discharge during the spawning period ranged from 300-360 m<sup>3</sup>/s.
- > Differing from 2015 and 2016, discharge during the spawning period in 2017 started on the last days of increasing hydrograph and ended during a period of constant, relatively high discharge.
- > Water temperature ranged between the nightly lows of 10.0-12.5°C to daytime highs between 11.0-15.0°C. The overall average temperature was 11.6°C.



Map of 2017 Nechako River spawn monitoring area including egg mat sites (light blue), VPS acoustic receiver array (red), free-feeding larvae sampling sites (light green), and substrate re-mediated areas known as "gravel pads" (yellow polygons).



## Fixed Station and Boat Telemetry

Telemetry data informs our understanding of broad scale dispersal patterns, periodicity of habitat use, and overall migration behaviours within the Nechako and Stuart rivers and beyond.

### OBJECTIVES

- > To determine the timing of spawning.
- > To determine dispersal patterns and migration behaviours of adults within the Nechako River, before, during and after spawning.
- > To determine habitat use of adult sturgeon, especially during spawning.

In 2017, there were five fixed telemetry stations in the Nechako watershed, two year-round sites (Vanderhoof, and Nechako confluence), and three operated seasonally (Nautley River, Upper Stuart, and Lower Stuart). The Nautley River receiver was stolen, resulting in a data gap Apr-Jun 2017. Boat telemetry surveys were also completed.

Additionally, gated acoustic receivers were placed at rkm 140 and rkm 105 with an additional downstream gate placed near Stuart River confluence.

### RESULTS

- > Spawning activity began on May 17 and continued to May 25-26.
- > Some detections in upper Stuart River and lower Stuart River sites.
- > The gated acoustic receivers provided detections of fish moving between the Stuart and Nechako River systems.

### RECOMMENDATIONS

- > Improve design of the gated acoustic receivers to decrease equipment loss and plan for more in 2018.

## Acoustic Telemetry (VPS)

### OBJECTIVES

- > To determine the timing of spawning.
- > To determine specific locations/habitats sturgeon are associated with within the spawning reach during spawning.
- > To determine interaction between male and female adults during spawning.

The acoustic Vemco Positioning System (VPS) is able to locate a tagged fish's position when the fish is within the array. A tagged fish emits a signal; three receivers must hear that signal, and a location is generated based on the time difference of when the signal arrives at each of the three receivers. Very accurate positions ( $\pm 1$ m) can be calculated when the signal is heard by several groups of three receivers.

This is the third full year of data collection using the VPS system. As many as 30 sturgeon have acoustic tags implanted and are able to be detected within the VPS array. Based on a recommendation from 2016, an acoustic array was added downstream of the Burrard Avenue bridge to determine if some spawning activity occurs there. In 2017, 18 acoustic receivers were deployed in total, with 11 upstream of the bridge within the spawning reach, and 7 downstream of the bridge. The array coverage also differed from 2016 as it only monitored upstream as far as Murray Creek, it did not extend as far upstream to Stoney Creek confluence.

The VPS array was operational from May 5 to June 26, 2017 (52 day operational period).

### RESULTS

- > Eleven tagged adult sturgeon entered the array (3-4 m spatial resolution).
- > Concentration of activity detected over the spawning beds within 200m upstream of the Burrard bridge, as well as activity within 600m downstream of the bridge.

### RECOMMENDATIONS

The acoustic array information provides useful information for detecting sturgeon activity, however the potential for detecting fine-scale interactions of sturgeon has not been realized.

- > Reassess this program before the 2018 field season.



# TWG RESEARCH PROJECTS

## Egg Mats & Larval Drift Netting

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.

### 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.

### RESULTS

This is the first 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:

- > 53 egg mats in total within and downstream of the spawning reach
- > May 24-26 - 652 eggs collected
- > Total eggs collected: 900
- > Eggs not collected during the single 'hit' were covered in sand.

Larval drift netting was carried out downstream of the spawning reach.

- > June 16 - 1 larval sturgeon was captured at rkm 132, well downstream of the spawning reach.

The eggs and larval sturgeon were brought to the NWSCC, where they were reared separately from the hatchery program sturgeon.

### RECOMMENDATION

- > Make improvements to the collection methods to increase the chance of egg survival.
- > Sample for larvae 4-7km downstream of the spawning reach to find 'gathering' zones.



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



CSTC crew sampling egg mats in the Nechako River just upstream of the Burrard Bridge. Note the buoy in the river that indicates the location of an egg mat. Photo by Michelle Roberge.



# SEDIMENT TRANSPORT INVESTIGATION

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.

This is the fourth year of investigation into sediment transport within the spawning reach of the Nechako River.

**Project: Geomorphology and Sediment Transport Study**

**Project Lead:** Ministry of Forests, Lands and Natural Resource Operations

**Funders:** DFO Species at Risk \$29,000.

**Start Year:** 2014

## 2017 OBJECTIVES

- > Monitor the condition of the Lower Patch substrate that was restored in 2016;
- > Investigate the features controlling back-watering effect development downstream of the spawning reach; and
- > Expand the substrate related dataset downstream of the bridge to include additional areas of sturgeon spawning habitat.

A multitude of measurement methods were used to collect the various data needed to understand flow and sediment movement within and downstream of the spawning area.

## RESULTS

- > The dominant back-watering effect which originates downstream of the bridge appears to be caused by a gradient break downstream of the spawning area.
- > The bed is “relatively steep” through the spawning area compared to downstream. It’s important to note that “relatively steep” is still very low gradient in absolute values; it’s only steep compared to the very low gradient that extends another 8 km downstream.
- > Downstream of the bridge, transport rates are moderate and bedload appears to be transported along the inside bend of the channel.
- > Upstream of the spawning area rates are generally consistent with previously established relations with discharge, and the location of highest transport across the channel remains consistent.
- > Underwater imagery shows that downstream of the bridge, the substrate is generally coarse gravel/cobble along the outside bend of the channel.
- > A lot of mussels were observed both upstream and downstream of the bridge. They were observed both within cobble substrate free of fines and within sand deposits.

## FURTHER RESEARCH

Plans for 2018-19 is to analyze the dataset in its entirety and produce a comprehensive report. There are also plans to extend the 2D flow model downstream to cover the entire surveyed extent.

# TWG RESEARCH PROJECTS

## JUVENILE INDEXING PROGRAM

### 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 in the Nechako River system.

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 white sturgeon less than 1 m (100 cm) in length. Biological data and location data is collected on all caught sturgeon, as well as river condition, such as flow and temperature.

In 2017, the indexing program was expanded to cover a larger geographical area to get a wider understanding of where hatchery juveniles move to after release. The areas sampled were: the index zone (rkm 110-135); and the peripheral zones (rkm 020-035 Nechako River, rkm 090-100 Stuart river confluence; and, rkm 159-163 Nautley River confluence). There was additional sampling done in the Fraser River (rkm 745-798). Sampling ran from August 15 to October 5 in the index zone, and September 5 to October 20 in the peripheral zones. A total of 217 setlines were deployed in the index zone, and 119 setlines in the peripheral zones for a total of 336 setlines. Hook sizes ranged from 4 to 8/0, with the majority of juveniles caught on sizes 4,2,1,1/0, 4/0 and 5/0. The 5/0 was successful at capturing juveniles >70 cm fork length.

### NUMBER OF JUVENILES

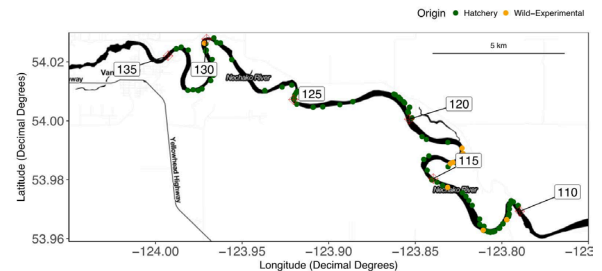
- > 257 unique juvenile sturgeon were caught in 2017.
- > There were 245 captures in the index zone (220 unique fish of which 25 were caught twice); and, 14 in the peripheral zones.
- > No juvenile sturgeon were caught during the Fraser River sampling.
- > The majority of juveniles caught were from the 2016 cohort, with fish also caught from the 2017, 2015 and 2008 cohorts.

### Project: Juvenile White Sturgeon Monitoring

**Project Lead:** CSTC, MFLNRORD, FFSBC

**Funders:** \$84,600 total. \$25,900 Aboriginal Funds for Species at Risk via Carrier Sekani Tribal Council; \$15,000 DFO Species at Risk; \$21,000 FHRI; \$22,700 FLNRORD via LBIS-SAR Fraser River sampling portion.

**Start Year:** 2004



Map of the Nechako River showing the location of juvenile captures.

### MOVEMENT

- > The majority of sturgeon were captured at rkms 111, 112, and 117 within known areas for juvenile and adult sturgeon presence. Juvenile captures were recorded in this area in 2015-16 as well, suggesting this area (to rkm 114) of the river is Critical habitat for Nechako White juvenile sturgeon.
- > One juvenile was caught at rkm 25, which was the largest downstream migration confirmed by juvenile sampling.
- > Catch-per-unit-effort (CPUE) was lower in the peripheral zones than the index zone, however juveniles were found occupying habitats outside the index zone.

**REPORT:** 2017 Nechako Juvenile White Sturgeon Sampling; 2016AFSAR-2861 (Year 2) Juvenile Recruitment Indexing. 2016. Prepared by Carrier Sekani Tribal Council.



# JUVENILE TELEMETRY

## OBJECTIVES

- > To determine juvenile sturgeon distribution, migration patterns, and habitat use.
- > To determine overwintering movements and seasonal habitat use.
- > To ultimately determine juvenile sturgeon recruitment success into the Nechako River population.

This program follows hatchery-origin juvenile sturgeon within the Nechako River using radio-telemetry. The use of radio-telemetry allows researchers to follow sturgeon through their first two years of life in the river, and to determine their success and what, if any, are the limiting factors to their survival. This data will lead to a better understanding of the behaviour of hatchery-origin juvenile sturgeon in the Nechako River.

## Acoustic Tagging

In 2017, three groups (15 fish in each) of juveniles were used to test if the external visual cues of a radio antenna may influence juvenile migration success and susceptibility to predation, as 80% of the radio-tags from 2016 were detected on-shore near wildlife middens by the spring of 2017. In the test, one group had only an acoustic tag implanted (pure acoustic), one group had an acoustic tag implanted with a fake radio antenna trailing external to the fish (dummy radio/acoustic), and the third control group had a radio tag implanted (with external antenna) for comparison with the acoustic groups.

Crews used a combination of aerial, boat and ground surveys, as well as 13 acoustic receivers deployed in the river between rkm 97-138 to detect the location of juvenile sturgeon from May to October 2017.

## RESULTS

All 45 fish were detected near rkm 137 at the onset of the study, and thirteen of the 45 (almost equal numbers from the three test groups) were detected at rkm 116 later on.

- > After July 26, no acoustic tags were detected, meaning either they were taken out of the system, or they migrated out of the monitoring area.
- > Similar distributions of juveniles from three tagging groups within the index zone and similar overall detection rates within the index zone.

### Project: Juvenile Telemetry

**Project Lead:** FLNRO and 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

## Radio-tagging

Over the past three seasons, a total of 75 juvenile sturgeon have been radio-tagged. In 2017:

- > 30 total detections and of those:
  - 4 detections from 2015 tags; 11 detections from 2016 tags; 15 detections from 2017 tags

## RECOMMENDATION

This research is becoming increasingly important for managers to better understand survival of juvenile hatchery sturgeon. A more comprehensive 5-year monitoring plan, encompassing the indexing and telemetry work, is being developed to start in 2018.



Freshwater Fisheries Society of BC crew out setling for juvenile sturgeon. Photo by FFSBC.

# TWG RESEARCH PROJECTS

## GENETIC PARENTAGE AND INDIVIDUAL STOCK IDENTIFICATION

### OBJECTIVES

- > 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 ID

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 2017-2018

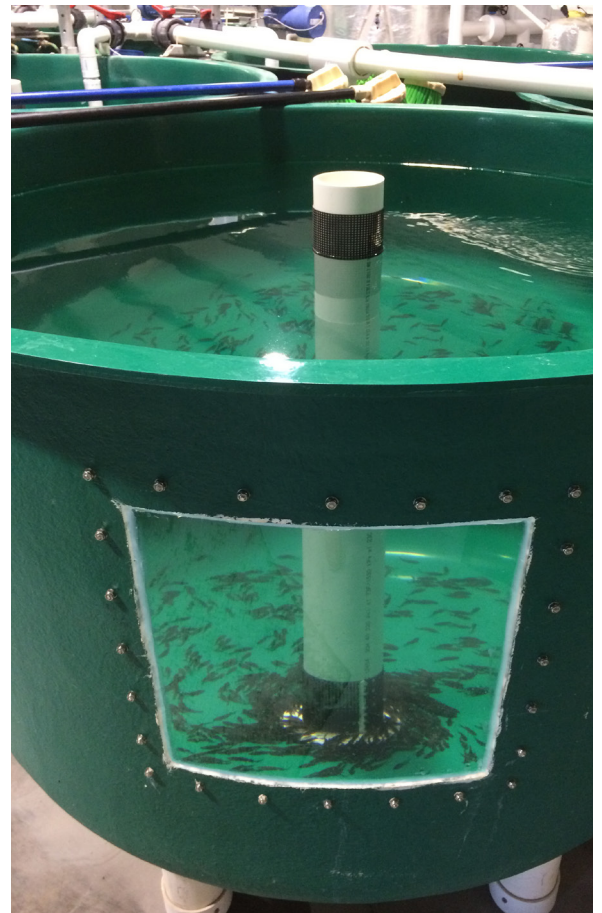
- > NWSRI is working with researchers from UVIC and Seastar on the genetic parentage project, and results are expected by 2018-2019.
- > Researchers at UBC are developing and testing a method to use fin ray samples to determine from which watershed sturgeon originate from.

**Project: Genetic Parentage and Individual Stock Identification**

**Project Lead:** BC MOE and University of Victoria

**Funder:** \$37,500 DFO Species at Risk

**Start Year:** 2016



A tank of juvenile sturgeon from the 2017 brood year at 2 months of age. Photo by NWSRI.



## AWARENESS AND OUTREACH EVENTS

The NWSRI Community Working Group conducted six outreach and awareness related projects in 2017-2018.

### Juvenile Sturgeon Release

#### 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 11, 2017 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. With it being also Canada's 150 birthday, special t-shirts were made to give as gifts to all the students who attended 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.

#### RESULTS

- > 601 sturgeon were released at the May 11 event, by 600 plus 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, and everyone liked their t-shirts and were appreciative of the opportunity to attend and participate in the event.
- > The CWG will continue to explore additional ways to increase the learning potential for students at the event.

#### PROJECT: CWG Outreach Programs

**Project Lead:** NWSRI Community Working Group

**Funders:** \$48,146: Habitat Stewardship Program \$9,340; FFSBC \$7,000 In-kind; School District 91 \$3,500 & \$5,000 In-kind; District of Vanderhoof \$2,200 & \$11,200 In-kind; Rio Tinto \$6,000; Avison Management Services \$3,300 In-kind; LBIS \$2,800; Integris \$1,000; UNBC \$100

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



Students enjoying different aspects of the Sturgeon Release Event on May 11, 2017.

# CWG PROJECTS

## 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 2017. 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.

### RESULTS - APRIL 2017-MARCH 2018

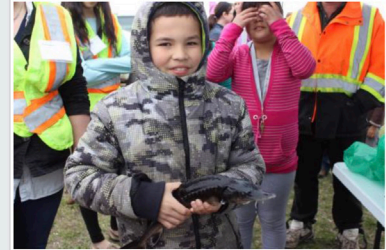
- > You can now search by recaptured fish and number of recaptures.
- > 9% of the visits to the NWSRI were on the Where is My Fish page of the website.

### OUTCOMES

- > Further improvements to the search and display function of the database is planned for 2018.

Baby Blue

152222770A



Nickname: Baby Blue

Student: Jerry Charlieboy

Grade: 5

Release Info

Date: May 4, 2015

Fork Length: 46

Weight: 0.671

Capture 1

Date: Sep 25, 2015

Fork Length: 50.6

Weight: 0.598

Capture 2

Date: Sep 7, 2017

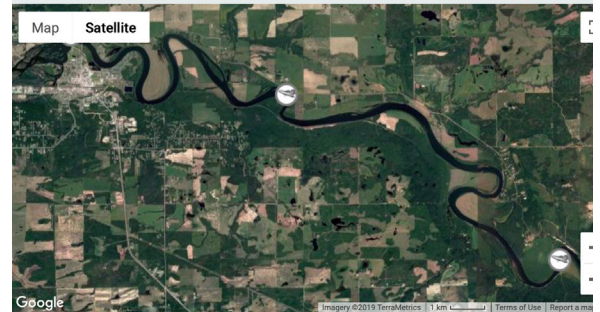
Fork Length: 55.6

Weight: 0.854

Fork Length

46cm

50.6cm/55.6cm



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

#### Web Link:

[www.nechakowhitesturgeon.org/where-is-my-fish](http://www.nechakowhitesturgeon.org/where-is-my-fish)



## UNBC Green Day

In February 2017 the NWSRI participated in UNBC's Green Day event. This event is a campus lead event that spreads awareness about green living initiatives, environmental groups, and research. The NWSRI booth had many visitors and questions about the recovery initiative and Nechako white sturgeon.



Christina Ciesielski of CSTC and NWSRI at Green Day.

## Storm Drain Painting Program

In October 2017, 10 students from Evelyn Dickson School in Vanderhoof piloted a new NWSRI outreach program, that has students painting sturgeon and salmon images at storm drains in the community. The intent is to remind residents that anything that is poured into a storm drain will reach fish habitat. The goal is to reduce chemical pollution within the Nechako watershed from communities.

The students spent one day working in two teams to paint over 30 storm drains within a few blocks from their school.

### OUTCOMES

- > Direct student engagement and stewardship within community.
- > The program has supplies to continue for the next two school years.



Students painting sturgeon and salmon signs at storm drains in Vanderhoof.

## Stakeholder Signs

Through funding from Habitat Stewardship Program and collaboration with the communities of Fort St. James, Fraser Lake, and Vanderhoof, and Recreation Sites BC, the NWSRI was able to build four interpretive signs to support public education and awareness within the Nechako watershed.

The signs are placed at boat launches or popular areas at the water's edge to increase the exposure of the signs.

### OUTCOMES

- > Increase in the potential for public engagement and awareness within three communities.



Stakeholder interpretive sign at Stuart Lake in the community of Fort St. James.



# CWG PROJECTS

## EVERY FISH COUNTS - BOAT KIT PROGRAM

### OBJECTIVE

- > To reduce accidental harm to sturgeon and the sturgeon population as a result of sturgeon by-catch associated with the First Nation gill net fisheries.

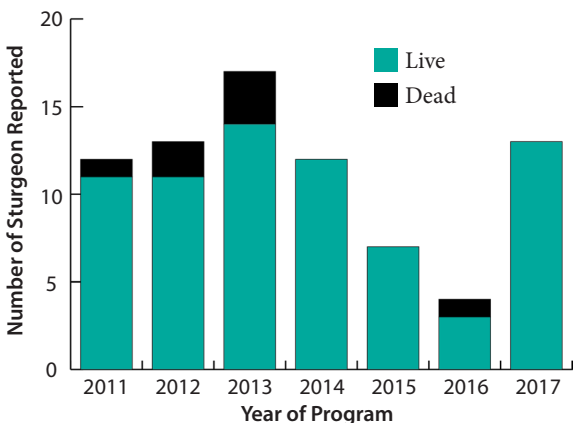
The Emergency Sturgeon Live Release Boat Kit program has been operating since 2011. It is an initiative developed by the NWSRI and Carrier Sekani Tribal Council (CSTC) to reduce the potential for by-catch mortalities associated with the First Nation Food, Social and Ceremonial (FSC) fisheries. Every 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, 78 sturgeon have been reported by the program, and 71 sturgeon have been released live. Considering the adult population to be roughly 550, the number of live released sturgeon since 2011 is likely 10% of the available adults in the population.

### METHODS AND KIT COMPONENTS

In 2017, seven First Nation communities including Stella't'en, Saik'uz, Nak'azdli Whuten, Tl'azt'en, Takla, Lheidli T'enneh, and newly added Yekooche on Stuart Lake, 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. The kit consists of

- > A kit small enough 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" 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.



Tl'azt'en members releasing a tangled sturgeon from their salmon gill net.

### PROJECT: Boat Kit Program

**Lead:** NWSRI and CSTC

**Funders:** Total: \$24,875

Habitat Stewardship Program \$13,800; Mt. Milligan \$2,000; CSTC \$6,500 In-kind; NWSRI \$2,575

**Start Year:** 2011

### LIST OF RESOURCES

**Youtube Video:** Search for 'Every Sturgeon Counts'

**Report:** 2011-2016 Summary Report

**Data Form:** Sturgeon Release Form

### RESULTS

- > All seven First Nation communities participated in the program.
- > Tl'azt'en and Nak'azdli, both on Stuart Lake, reported releasing a total of 13 sturgeon live.
- > Size measurements were only recorded on five of the released sturgeon. The sizes were: 0.46m, 0.76m, 1.67m, 1.0m, and 2.2m. Sturgeon <1.0m are juveniles.
- > No mortality were reported.
- > A total of 16 kits were distributed in the seven communities: Nak'azdli, 6; Yekooche, 3; Takla, 3; Saik'uz, 1; Lheidli T'enneh, 3; Tl'azt'en, 1; and, Stella't'en, 0 (kits were kept on hand by the Catch Monitor).

### RECOMMENDATIONS

- > To conduct a review and evaluation of the Boat Kit Program for 2018 to see where improvements can be made in areas such as kit distribution, participation, and reporting.
- > Approach the Nak'azdli Cultural Centre and Nakalbun school to participate in the Boat Kit Program as they have fishing days.
- > Ensure the new data sheets get used in 2018.



# STURGEON CURRICULUM

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 2017-2018 was to promote, review and add to the existing curriculum that was initially developed for grades 4-7.

## FEEDBACK

Twenty-seven teachers participated in an online survey and others provided direct feedback on which curriculum resources they use/would like to use the most and which resources are still needed. As well, Principals provided feedback during a presentation held in March. The main feedback included:

- > Create field trip lessons related to sturgeon in each of the communities in SD91.
- > Provide easy resources/hand-outs available at the NWSRI for student visits.
- > Expand and improve the NWSRI website.
- > Generate a list of professional to offer in-class talks.
- > Print and distribute more Nature Guides to classrooms.
- > Expand the accessibility of the Watershed Demonstration Kit.
- > Develop more lessons, literature units etc. for grades K-3.
- > Create mini-lessons on topics outside of science (eg. history) for older grades.
- > Continue promoting the curriculum resources through multiple avenues including presenting at staff meetings, in addition to providing Pro-D workshops.



Classroom calendar dedicated to sturgeon life stages and facts for classes to follow along all year long.

## PROJECT: Nechako White Sturgeon Curriculum

**Project Lead:** NWSRI

**Funders:** \$12,670 total: Habitat Stewardship Program \$6,540. In-kind NWSRI, School District 91.

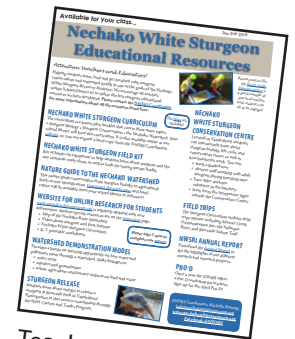
**Start Year:** 2014

[www.nechakowhitesturgeon.org/education](http://www.nechakowhitesturgeon.org/education)

Of these recommendations, the following actions were taken this year:

## OUTCOMES

- > Targeted News Blast as well as a Press Release with School District 91 to promote the resources to teachers.
- > Development of a Pre-Juvenile Sturgeon Release worksheet for grades 2-6 (sent to schools participating in the 2018 Juvenile Sturgeon Release, as well as available online).
- > Printing and distribution of additional Nature Guide booklets to schools, for addition to the resource field kit, and for classes that tour the Nechako White Sturgeon Conservation Centre.
- > Planning and preparation for Pro-D presentation in October 2018.
- > Developed 6 new K-3 resources available online.
- > Developed classroom calendar for 2018-2019 school year that will have accompanying monthly lessons (to be developed in 2018-2019).



Teacher News Blast.

## NECHAKO WHITE STURGEON CONSERVATION CENTRE

### Conservation Fish Culture

#### 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. Cory Williamson is the Hatchery Manager, Mike Manky is the Senior Fish Culturist, and Fraser Linza, Sebastian Van Leeuwen and Alyssa Purse were the seasonal Fish Culture Technicians.

Eight females were spawned with six males in four events in 2017 from May 23-30. 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 eight females used in the brood program. Of the 14 females caught during brood sampling, one was kept over the winter to be used in a future brood program, as this female when caught, was 1-2 years from having mature eggs.

Eggs hatched by mid-June, and first feeding was a week later. As of February 2018, there were about 4,900 juvenile sturgeon in the hatchery, this included 72 juveniles from 2017 and 36 carried over from 2016 that were brought in from the wild as eggs. The growth and development of juvenile sturgeon was on target, and the water temperature was reduced 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 2018, 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 approximately 500 of them during the Juvenile Release Event that will involve approximately 500 students from across the Nechako watershed.

#### PROJECT: Conservation Fish Culture

**Project Lead:** FFSBC

**Funders:** Total: \$500,160. Nechako Environmental Enhancement Fund \$400,000, Rio Tinto \$50,000, and the Province of BC \$50,160.

**Start Year:** 2014

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.



Spencer working with juvenile sturgeon at the NWSCC. Photo by FFSBC.

#### LIST OF RESOURCES

**Report:** Breeding Plan for Nechako White Sturgeon



## Broodstock Capture

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

- > 49 adult sturgeon (29 males and 14 females, and 6 un-sexed) were caught in a six week period in April and May 2017, using set-lines and angling.
- > 6 males and 8 females were used for the brood program to make 8 maternal families and 45 half-sibling crosses.
- > 10 radio-tags were implanted in adults that were not used in the brood program, but returned to the river.
- > Of the 902 wild eggs caught, 71 survived to the juvenile stage.

## Juvenile Release

Over April and May 2017, 11,518 juvenile sturgeon that were spawned from the 2016 brood were released into the Nechako. Roughly 667 fish were released at 10 locations along the Nechako River from as far upstream as Fort Fraser to rkm 116, with the remaining fish being released at the bridge in Fort Fraser.

## Predator Training Study

A new study in 2017 by hatchery staff in conjunction with Mark Shrimpton and Rachel Hornsby (UNBC) was spearheaded to explore predation responses in sturgeon.

### OBJECTIVE

- > To evaluate responses by juvenile sturgeon to potential predator odours as a prelude to future predator training studies.

The study examined a juvenile sturgeon's response to water (control), rainbow trout odour, and otter odour.

### RESULTS

- > Responses by juvenile sturgeon to water, and rainbow trout characterized by increased exploratory movement in tank.
- > Exposure to otter caused the fish to move toward the tank bottom.

Expansion of this study is planned for 2018-2019, as well as more exploration into the impact of predators on juvenile sturgeon survival.



Students from Nechako Valley Secondary School volunteering at the hatchery are learning some fish culture and sampling skills. Photo by FFSBC.

## Hatchery Tours

### 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 2,360 people attended either a tour or a special event lead by the Tour Guides. These people include public and private school students, tourists, industry managers, local governments, researchers, and the general public.
- > The use of a sign on the road indicating tour times each day increased the average number of visitors from 53 per week to 122 per week.
- > The use of the Farmers' Market booth had more visitors to the hatchery on those days.
- > \$1,070 was raised from merchandise sales, and \$903 from donations.

**PROJECT: Merchandise**

**Project Lead:** FFSBC & NWSRI

**Raised:** \$1,973

**For:** 2016



Home-school children at the hatchery for a tour. Photo by Wayne Salewski.



Mayor Thiessen of Vanderhoof giving Mayor Hall from Prince George a tour of the hatchery. Photo by Wayne Salewski.



# FINANCIAL SUMMARY FOR 2017-2018

## Project Funding

During the 2017-2018 fiscal year, project funding was roughly \$421,414 (\$379,003 cash and \$42,411 in-kind). 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 to the NWSRI for 2017-2018.

BC Ministry of Forests, Lands & Natural Resource Operations and Rural Development — \$60,000 Land Based Investment Strategy - Species at Risk.0

Carrier Sekani Tribal Council — \$108,050 in-kind & cash (\$25,900 via Fisheries and Oceans Canada's Aboriginal Funds for Species at Risk, and \$76,650 via Environment Canada's Habitat Stewardship Program, and \$6,500 in-kind for the Boat Kit Program)

Fisheries and Oceans Canada Species at Risk Program — \$122,500  
FHRI - \$42,000

Environment Canada's Habitat Stewardship Program (aquatic species) — \$29,680

Integrus Credit Union — \$1,500

Canfor Pulp Products Inc. — \$5,000

Mt. Milligan Community Fund — \$2,000

District of Vanderhoof — \$2,200 and \$11,200 in-kind

Village of Fraser Lake — \$335 in-kind

Fort St. James District \$300 in-kind

School District 91 — \$3,500 and \$10,000 in-kind

Avison Management Services Ltd. — \$3,300 in-kind

UNBC Fish & Wildlife Club — \$100

Recreation Site BC — \$276

NWSRI Working Groups — \$6,800 in-kind

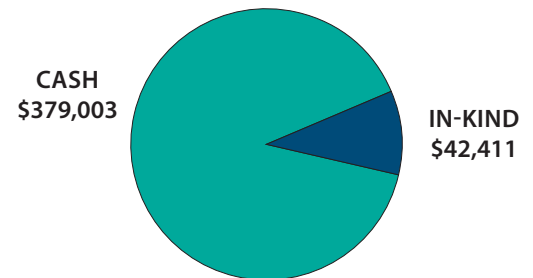
NWSRI Sales & Donations — \$1,973

Freshwater Fisheries Society of BC — \$7,000 in-kind

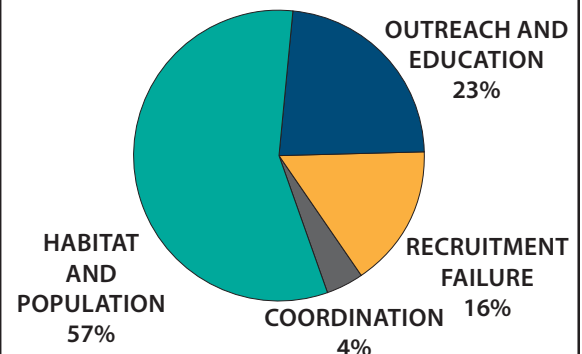
Rio Tinto — \$6,000

### TOTAL FUNDS TO SUPPORT RECOVERY PROJECTS OF THE NWSRI 2017-2018

\$421,414



### BREAKDOWN OF FUNDING BY RECOVERY CATEGORY FOR 2017-2018. PERCENTAGE OF FUNDS PER CATEGORY.



*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.*

## NWSCC

In 2017-2018 the total operating expenses of the Nechako White Sturgeon Conservation Centre was \$500,160. Contributions to the NWSRI came from the Nechako Environmental Enhancement Fund (\$400,000), Rio Tinto (\$50,000), and the Province of BC (\$50,160).

COVER PHOTO: Neil Heron of Carrier Sekani Tribal Council, and crew, checking egg mats during the summer of 2017 just upstream of the Burrard Avenue Bridge in Vanderhoof. Photo by Michelle Roberge.

## CONTACT THE NWSRI

**Nechako White Sturgeon Recovery Initiative**  
**c/o the Nechako White Sturgeon Conservation Centre**  
**PO Box 710**  
**3030 Burrard Avenue**  
**Vanderhoof, BC**  
**V0J 3A0**

**E-mail: [info@nechakowhitesturgeon.org](mailto:info@nechakowhitesturgeon.org)**

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

**[www.nechakowhitesturgeon.org](http://www.nechakowhitesturgeon.org)**

This project was undertaken with the financial support of the Government of Canada.

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**Canada** 