



# NECHAKO WHITE STURGEON RECOVERY INITIATIVE

## 2021-2022 Annual Report



Figure 1. New interpretive sign along the Nadleh River. Image Credit: Michelle Roberge.



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# MESSAGE FROM THE NWSRI CHAIRS

## Technical Working Group Chair, Trevor Rhodes

The Nechako White Sturgeon Recovery Initiative's (NWSRI) Technical Working Group (TWG) had another successful year conducting research and monitoring activities in the Nechako Watershed including adult spawn monitoring, juvenile indexing, an otter predation study, and a spawning substrate cleaning experiment. The TWG subgroups formed last year are closer to having plans that will further investigate predation on juvenile sturgeon and options for habitat restoration. The TWG is working on two other subgroups to focus on a broader river-wide habitat plan and long-term hatchery release strategy.

This was the eighth year of operation for the Nechako White Sturgeon Conservation Centre (NWSCC). NWSCC staff were out in the river in the spring collecting broodstock and wild eggs then busy incubating and rearing the offspring for future release back into the rivers and lakes within the Nechako Watershed.

Movements and habitat use by hatchery reared sturgeon were studied remotely through radio telemetry and directly through PIT-tagged juvenile recapture in the Nechako Watershed and adjacent portions of the mainstem Fraser River. These ongoing evaluations of fish movement support the TWG's goal of restoring the Nechako White Sturgeon population while limiting potential interactions with adjacent populations in the Fraser River. In 2021-2022, the NWSRI continued to support recovery efforts through both habitat and hatchery-based conservation work. Thank you to all the NWSRI partners for the collaborative effort that supports the ongoing recovery of this endangered population of White Sturgeon.



## Community Working Group Chair, Wayne Salewski

The Nechako White Sturgeon Recovery Initiative found creative ways to engage the community and run our programs in 2021 even though COVID-19 again meant that we were not able to offer in-person tours at the Nechako White Sturgeon Conservation Center and we were not able to host in-person events including the popular annual juvenile sturgeon release event.

We continue to grow our signage program as we bring awareness of the presence of White Sturgeon to adjacent communities throughout the Nechako watershed. Signs were added to Northern Lights Winery along the Nechako River in Prince George, and at the walking bridge in Nadleh Whut'en First Nation.

Sadly, we had to cancel the in-person juvenile sturgeon release event for a second year in a row. In 2021, we filmed the release so the students could still participate by watching the fish being released. We are hopeful that the release event will happen in-person in 2022. The annual release of juveniles at the Riverside Park in Vanderhoof is an excellent educational outreach opportunity that engages students from throughout the watershed.

With continuing declines in the salmon populations, we are seeing fewer First Nation fisher families that can set their nets and this is resulting in fewer by-catch of sturgeon. We feel there is a need to continue the by-catch monitoring program, should we see a rebound of salmon, but also as First Nations change over to more char and burbot fisheries we may see some incidental catches happening.

The NWSRI and School District 91 educational programs continue to grow and modernize with the move forward to now present smart-board compatible educational videos. The mini-documentary-style videos have been popular within the classrooms and beyond, and we were happy to release our first animated video to students.

In 2021, we were excited to expand our outreach potential by partnering with the Exploration Place in Prince George. We worked with their curation team to develop interactive sturgeon outreach materials for their display. We are looking forward to Exploration Place opening again in 2022 and what the impact of our partnership has for sturgeon outreach, education and recovery.

I would like to thank the membership of the CWG along with our many partners 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.

I would like to thank our many sponsors for their continued support and look forward to the continuing growth and help as we work towards the recovery of the Nechako White Sturgeon.



## ABOUT THE NWSRI

Nechako White Sturgeon have been in the Nechako watershed for centuries (maybe as long as 10,000 years); however, within the last 100 years (the normal life span of a sturgeon) the number of Nechako White Sturgeon has dropped significantly. The population was listed as Endangered under the federal Species at Risk Act in 2006. The Nechako White Sturgeon Recovery Initiative (NWSRI) was established in 2000 by a group of agencies 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, and predation.

**This report highlights the community and science-based projects completed on Nechako White Sturgeon from April 2021 to March 2022.** The report is broken down into three main sections that provide updates on the 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 (NWSCC).

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

[nechakowhitesturgeon.org](https://nechakowhitesturgeon.org)



*Photo 1. Sorting 2-year old sturgeon in preparation to of releasing them into the Nechako River. Photo credit Berg Media.*



# STRUCTURE AND FUNCTION OF THE NWSRI

The Nechako White Sturgeon Recovery Initiative (NWSRI) was established in 2000 in response to learning that juvenile Nechako 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* that was developed from 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; and
- 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 and Lower 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 four times in 2021-2022 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 Nechako White Sturgeon are 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 discuss the findings of the TWG to use that information to help plan community-based projects 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 2021-2022 fiscal year included:

- Avison Management Ltd.
- BC Ministry of Environment
- BC Ministry of Forests, Lands, Natural Resource Operations and Rural Development
- Canfor Pulp and Paper
- Carrier Sekani Tribal Council
- District of Fraser Fort George
- District of Vanderhoof
- The Exploration Place
- Fisheries and Oceans Canada
- Fraser River Sturgeon Conservation Society
- Freshwater Fisheries Society of BC
- Habitat Stewardship Program
- Integris Credit Union
- Artemis Gold
- Rio Tinto
- School District 91
- Spruce City Wildlife Association
- University of British Columbia

## NWSRI Recovery Coordinator

**Project:** NWSRI Coordinator  
**Project Lead:** NWSRI  
**Funders:** FLNRORD via Land Base Investment Strategy- Species at Risk (LBIS-SAR) \$17,500  
**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 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. Andrea Sterling was the Recovery Coordinator during the 2021-2022 year. Andrea is a biologist based out of Prince George.



# SPAWN MONITORING

**Project:** Egg monitoring  
**Project Lead:** CSTC  
**Funders:** HSP \$50,600  
**Start Year:** 2014

## Objectives

- To determine the timing of spawning;
- to collect wild-fertilized eggs for hatchery rearing and later release;
- to track the physical parameters of the river that occur during spawning, such as river discharge, temperature and substrate condition;
- to ascertain the exact location(s) where spawning occurs to inform habitat restoration decisions; and
- to collect larval sturgeon and provide measure of spawning success and recruitment to young of year.

## River Conditions During the Spawning Period

- River discharge during the spawning period ranged from 374 - 413 m<sup>3</sup>/s.
- The spawning period in 2021 (May 23 - June 2) occurred during a period of increasing river discharge.
- Mean daily water temperature during the spawning period ranged from 11.8°C to 12.3°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 Watershed. This information is used 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. Larval sampling can provide data related to annual spawning success and recruitment to young-of-year life-stage. Egg and larval detections can help TWG members assess spawning habitat remediation activities. There are three projects that make up the adult spawn monitoring program:

- egg mats,
- larval sampling, and
- radio-telemetry (fixed station, boat-based and aerial telemetry).



*Photo 2. Freshwater Fisheries of BC staff checking egg mats. Photo credit: NWSRI.*





# EGG MATS

## Objectives

- To confirm wild spawning activity in the river;
- to monitor river conditions, spawning behaviours and habitat preference; and
- 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.

Sturgeon spawn mid-water column. Females broadcast eggs at the same time and location males broadcast milt. Sturgeon eggs become adhesive and negatively buoyant once fertilized, at which point they drift downstream until they adhere to the river substrate. This program sets egg mats on the river bottom within and downstream of known spawning sites.

## Results

Egg mats were deployed to maximize the potential to collect as many wild fertilized eggs for hatchery rearing. Egg mats were checked every 48 hours by both Carrier Sekani Tribal Council (CSTC) and staff from the Nechako White Sturgeon Conservation Centre (NWSCC) at sites upstream, within, and downstream of the island complex in Vanderhoof. This is a summary of the 2021 result:

- 28 egg mat sites monitored by CSTC, and up to 40 variable sites monitored by NWSCC within the spawning reach (RKM 135.6 to RKM 139);
- CSTC and NWSCC mats detected a total of 1430 eggs between May 23<sup>rd</sup> to June 2<sup>nd</sup>.
- Viable eggs were brought to the NWSCC, where they are reared separately from the hatchery program sturgeon.
- Approximately 39% of the eggs collected from the mats hatched at the NWSCC.



Figure 1. Map of 2021 Nechako River spawn monitoring egg mat sites. Map provided by NWSCC.



# LARVAL SAMPLING

## Objectives

- To confirm and assess wild spawning success to young-of-year life stage;
- to identify important or critical habitat for sturgeon larvae in Nechako River; and
- to collect wild larvae specimens for use in genetic identification and otolith studies.

Once hatched, sturgeon larvae have two major life-stages associated with different behaviours. 0-12 days post-hatch (dph) sturgeon larvae hide near their hatching location using substrate interstitial spaces and feed off their egg yolk-sac. 12-40 dph sturgeon larvae become free-feeding and must actively forage in-river. Free-feeding larvae disperse by downstream migrations at night and can travel many kilometres.

## Results

Seven sites downstream of the spawning reach were sampled for larvae 23 times between June 7<sup>th</sup> and June 11<sup>th</sup>. Two larvae were detected; one was detected near the downstream end of the spawning reach on June 7<sup>th</sup>, and the second was detected approximately 5km downstream of the spawning reach on June 9<sup>th</sup>.



## RADIO TELEMETRY TRACKING

**Project:** Radio Telemetry

**Project Lead:** FLNRORD, FFSBC and NWSRI Partners

**Funders:** \$42,500 LBIS- SAR, \$20,000 FLNRORD and FFSBC monitoring in-kind

**Start Year:** 2015

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 and habitat use of adult sturgeon;
- to determine dispersal patterns and migration behaviours of adult sturgeon within the Nechako Watershed; and
- to monitor post-release movement of hatchery released juvenile sturgeon.



Photo 3. Typical low-level aerial telemetry search over the Nechako River (photo by Ian Spendlow).

### Adult Telemetry Monitoring

Each year during the brood capture program adult White Sturgeon are radio tagged and monitored by boat-based crews. In the spring of 2021, 21 new radio tags were implanted during the brood capture program, seven of these were used to replace old tags. As of June 2021, approximately 283 adult White Sturgeon carry active radio tags in the Upper Fraser watershed (Nechako, Middle Fraser and Upper Fraser). In addition to radio tags applied during this spring brood capture, 5 new radio tags were implanted during the fall brood collection program, 2 of these replaced an old tag. To monitor sturgeon movements, five fixed telemetry stations are maintained in the Nechako watershed. Three of these stations operate year-round (Vanderhoof, Ft. St. James, and Nechako confluence) and two of these stations operate seasonally (Nautley River, Lower Stuart). Efforts to modernize the equipment to allow for remote download capability were initiated in the 2021 survey year, using new Ministry capital assets. Two additional seasonal stations are set-up in the Fraser River at Stone Creek and the Bowron River that are operated by partner First Nations. Mobile tracking efforts by boat and helicopter are also completed periodically to search for sturgeon radio-tagged by NWSRI partners.



## Results

- Spawning activity is inferred from multiple daily detections at the main spawning reach telemetry station from May 12th to approximately June 15th, 2020. A total of 41 individual radio tagged adult sturgeon were detected at the spawning reach during this period.
- Several clusters of adult radio tag activity occurred on May 12-19<sup>th</sup>, May 21<sup>st</sup>-26<sup>th</sup>, and June 1<sup>st</sup>-2<sup>nd</sup>. On May 25<sup>th</sup> up to fourteen individuals, the maximum per day, were detected at the main Vanderhoof telemetry station (spawning reach).
- In 2021, an enhanced telemetry array (pilot project) consisting of 3 temporary stationary receivers placed in the spawning reach during the spawning window provides finer-scale adult spawn monitoring detection data to NWSRI partners. Numbers generated from this pilot study are not available at the time of this report.

## Juvenile Telemetry Monitoring

Radio telemetry studies on hatchery-released juveniles are used to better understand movement patterns of juvenile sturgeon post-release and generate estimates of post-release survival of hatchery-origin juvenile sturgeon. One hundred and twenty-two “large-sized” (target 70 cm fork length) juvenile sturgeon have been released with radio tags since 2018 at Nechako River release sites (Table 1).

Table 1: Size range of ‘Large-sized’ river-release cohorts bearing radio tags by release year.

| River Release Group (year) | Radio tagged (number) | Mean Fork Length (cm) | Min  | Max  |
|----------------------------|-----------------------|-----------------------|------|------|
| 2018                       | 32                    | 55.00                 | 50.3 | 61.8 |
| 2019                       | 30                    | 68.98                 | 57.7 | 81.0 |
| 2020                       | 30                    | 67.41                 | 62.6 | 79.3 |
| 2021                       | 30                    | 76.85                 | 66.4 | 86.4 |

\*Does not include 40 lake released radio tags from 2020 (n=20) & 2021 (n=20) lake release groups.

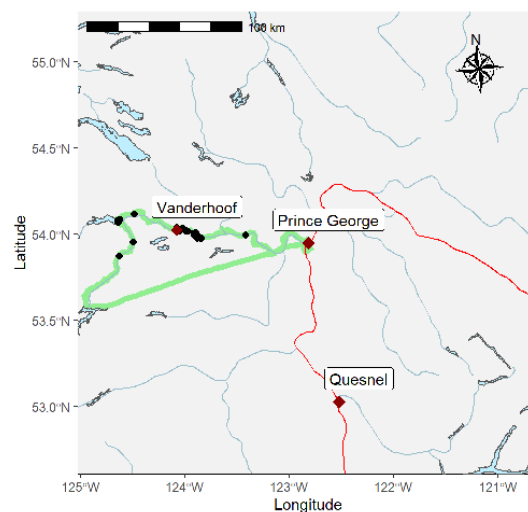


Figure 2: Locations of the 2021 juvenile river release cohort bearing radio tags as detected on the November 1, 2021 full-river telemetry flight (helicopter path seen in the green tracklog).



For the second consecutive year, in 2021 radio-tagged juveniles were released at three sites in the Nechako River mainstem (N=30) and at two sites in Fraser Lake (N=20). This marks the second year of sturgeon released into Fraser Lake to understand survival, growth, and occupancy of lake vs river habitats. The Fraser Lake Fisheries study, initiated in 2021, saw an acoustic array of 37 VR2W (VEMCO now InovaSea) receivers maintained in Fraser Lake capable of detecting acoustically tagged sturgeon, as part of this study lake-released fish (N=20) were double tagged with acoustic tags (equipped with pressure and temperature sensors) to better understand in-lake movement and habitat use. Results

- During the 2021 survey year, all 30 juvenile radio tags released into the Nechako River were detected, ranging from river kilometer (RKM) 247 (downstream of Greer Creek confluence) to RKM 74 (upstream of Isle Pierre).
- Only Two tags from the 2021 Nechako River release group (N=30) were suspected to lack observable movement (LOM) by November 2021 indicating a survival rate between 93-100% five months post release. No tags were recovered in-hand or determined to be onshore this season to further validate this mortality rate estimate.
- There were no significant observations of radio-tagged lake-released fish occupying river reaches during the 2021 telemetry survey efforts, suggesting they mostly stayed within the Fraser Lake system.



*Photo 4: One of the telemetry station system upgrades that occurred in spring of 2021 (Photo by Ian Spendlow).*



# SPAWNING SUBSTRATE RESTORATION PLANNING AND ACTIONS

**Project:** Spawning Habitat Restoration  
**Project Lead:** LWRS  
**Funders:** NEEF/CESI/LWRS \$89,388  
**Start Year:** 2019

**Objective:** Develop a spawning habitat restoration plan to guide investigations over the next five years. Specific work in this year tested a method to remove fine substrates that accumulate in critical spawning areas for White Sturgeon and then monitor riverbed condition and subsequent infilling. These tests were done during the 2021 summer and were a collaborative effort including LWRS, FLNRORD, Northwest Hydraulic Consultants.

## Results

### Habitat Restoration Planning

A workshop on March 21, 2021 brought together an interdisciplinary group to plan future habitat restoration work. The key question addressed was “what information is needed in order to implement large scale restoration after five years?”. The interdisciplinary group at the virtual workshop included members of the NWSRI, academics (UBC and Concordia University), consultants (NHC) and technical specialists from other white sturgeon recovery programs (Columbia, Kootenay). Two documents were produced as part of the workshop. The first is a detailed summary of biological and geomorphological studies that provided background information to workshop participants. The second report documents the outcomes of the workshop and identifies key information gaps that need to be addressed in order to implement long term habitat restoration.

### Substrate Cleaning

Studies during the summer of 2021 (i.e. prior the March workshop) tested several different cleaning methods including use of a hydraulic jet, a suction dredge with multiple sizes of dredge heads and screen sizes, and mechanical raking. For a method to be effective, it needed to remove sand and silt from the gravel. Exposed gravel, including interstitial spaces, is required for sturgeon eggs to adhere and for larval sturgeon to find refuge from predators. These methods were all deployed using divers.



- Of the methods tested, the hydraulic jet was the most effective at removing sand and silt from the gravel.
- Approximately 20-25 m<sup>2</sup> of the lower patch and 30-35 m<sup>2</sup> of the upper patch were restored on May 7<sup>th</sup> and 8<sup>th</sup> respectively.
- The hydraulic jet method allowed for substrate cleaning at a rate of 8-14 m<sup>2</sup>/hr.
- Substrates appeared to remain relatively free of sand and silt in June, but limitations in video monitoring made the images difficult to interpret. Locations near the bank appear to have infilled with sediment at a faster rate.
- This method has limitations as only small areas can be cleaned and the divers were not able to clean substrate in high velocity areas, but the method is for certain small-scale applications.



*Photo 4. Substrate cleaning experiment 2020. Photo credit: Northwest Hydraulic Consultants.*

## OTTER PREDATION STUDY

**Project:** Otter Predation Study  
**Project Lead:** TWG Predation Subcommittee and UNBC  
**Funders:** CESI / NEEF \$15,000 Risk Review and Predation Plan; FLNRORD in-kind \$3000;  
**Start Year:** 2016

The focussed research into predation of hatchery-origin by River Otters by UNBC graduate student Cale Babey resulted in a total 1,211 PIT tags recovered from 61 different latrine sites, 12 feeding sites identified along the Core Area and peripheral areas of the Nechako River. Through this study, hot spots of predation have now been confirmed in the Core Area, while this predation itself has been confirmed to occur in peripheral areas of the Nechako River. The work utilized a combination of PIT tag searches and radio telemetry tag retrievals. This Otter Predation Study has resulted in one publication (Babey et al 2021) and a publicly UNBC MSc thesis to date, with additional manuscripts in preparation.

In 2021, the CSTC team was trained in the PIT tag search methodology and has taken on monitoring of several sentinel latrine sites.



To address the broader implication of predation, a TWG Predation Subcommittee was established, and a *Nechako White Sturgeon Predation Risk Review 2022* commissioned (Breault, Babey, and Gantner, 2022). Based on this review, a *Nechako White Sturgeon Survival and Predation Plan 2022* was completed (Gantner, Breault, and Babey 2022). In early 2022, a new study comparing juvenile sturgeon survival in lake and river environments was initiated in collaboration with a graduate student at UNBC. This study will assess survival of hatchery-origin juvenile sturgeon in Fraser Lake and the Nechako River, based on a combination of radio and acoustic telemetry.

## 2021 Results

- 1,211 PIT tags recovered from 61 otter latrine sites. There have been over 3,000 juvenile sturgeon PIT tags collected to date for this project.
- CSTC Summary of findings.

## Related Reports

- *Otter Predation Study – Thesis by Cale Babey, 2021*
- *Nechako White Sturgeon Predation Risk Review, 2022*
- *Nechako White Sturgeon Survival and Predation Plan, 2022*





# JUVENILE INDEXING PROGRAM

**Project:** Juvenile White Sturgeon Monitoring  
**Project Lead:** CSTC  
**Funders:** \$82,000 AFSAR  
**Start Year:** 2004

## Objectives

- To gain insight into hatchery and wild juvenile sturgeon survival and growth rates;
- to collect biological samples for movement, growth, and genetic analyses; and
- to refine knowledge of juvenile sturgeon habitat and distribution in the Upper Fraser watershed including Nechako watershed.

## Nechako River and Upper Fraser

The juvenile indexing program uses a standardized set-line sampling technique, gear, and methodology to catch wild-origin and hatchery-origin juvenile sturgeon. The gear targets juvenile and sub-adult sturgeon (approximately 30 to 130 cm fork length). Biological data, capture location, and river conditions were collected for each juvenile sturgeon caught.

| Location  | Effort (hook hours) | Hatchery Captures (recaptures) | Wild Captures (recaptures) |
|---|---------------------|--------------------------------|----------------------------|
| Core reach Index Zone in Nechako River (RKM 105-135)  | 51, 136             | 57 (19)                        | 6 (2)                      |
| Peripheral areas in Nechako Watershed (Nechako River, Stuart River, Fraser Lake, Stuart Lake) | 51, 524             | 2 (2)                          | 1 (0)                      |
| Fraser River Region 7 (RKM 740-956)   | 14, 837             | 14 (3)                         | 19 (2)                     |
| Fraser River Region 5 (RKM 524-695)   | 10, 752             | 19 (6)                         | 58 (13)                    |
| Longworth Canyon Fraser River (RKM 957-955)   | 8, 603              | 0 (0)                          | 57 (20)                    |

## Middle Fraser River

Region 5 FLNRORD staff conducted juvenile sampling in the Middle Fraser between RKM 524 and 695. In 2021, they caught a total of 77 juvenile white sturgeon (10, 752 hook hours). Of these 77 fish, 19 were hatchery origin and 58 were wild origin. Staff are able to distinguish hatchery origin fish from their wild counterparts through their unique PIT tag ID.

## Recommendations:

- Monitoring Upper-Mid Fraser watershed and Nechako watershed continue with similar effort to address knowledge gaps related to (1) juvenile survival in Nechako River and effectiveness of current population recovery strategy, and (2) threats to wild Fraser River sturgeon populations.
- Detailed recommendations are made in the 2021 Upper-Mid Fraser/Nechako Watershed Juvenile White Sturgeon Monitoring report.

## JUVENILE STURGEON RELEASE

**Project:** Juvenile Sturgeon Release and Website

**Project Lead:** NWSRI CWG

**Funders:** HSP \$3,820, NWSRI \$1,890; In-kind: FFSBC \$6,000; School District 91 \$2,000; SCWA \$1,000; District of Vanderhoof \$1000; New Gold \$2,000; CSTC \$800; NWSRI TWG \$1000; DFO-SEP \$400

**Start Year:** Release: 2006; Website 2012

### Objectives

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

For the second consecutive year, the 2021 in-person release event was cancelled due to COVID-19. However, the NWSRI CWG still wanted to engage the 500+ kids that would have bussed to this exciting in-person event at Riverside Park in Vanderhoof. While following COVID-19 protocols, NWSRI staff filmed the release of both White Sturgeon and Chinook into the Nechako River. This footage was turned into a shareable video that you can find on our website or via the link below:

<https://www.youtube.com/watch?v=UY1Rk2uOK4g>

We also provide kits to all interested Grade 4 and 5 classes before the fish were released. This provided classes an opportunity to name the juvenile sturgeon and complete some fun educational activities. The classes then met for an online meeting to share the names they selected for their fish and to show off their sturgeon artwork!

Students that released juvenile sturgeon in the past can track their movements via the NWSRI Where is My Fish page on the website:

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



Photo 5. Virtual release kits and FFSBC staff releasing 2-year old juvenile White Sturgeon in June of 2020. Photo credit: FFSBC



# EVERY FISH COUNTS - BOAT KIT PROGRAM

**Project:** Boat Kit Program  
**Project Lead:** NWSRI and CSTC  
**Funders:** n/a  
**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 Nechako White Sturgeon. 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 2021, for the third consecutive year our First Nation partners were not able to fish for the salmon they have relied on for centuries due to declining salmon stocks exacerbated by the Big Bar landslide. For this reason, fishing activities by our member First Nations were minimal this year and they were forced to seek alternate protein sources or protein sources outside of the Nechako Watershed. Due to reduced fishing effort (other small fisheries such as char and burbot were active), there were no sturgeon encounters reported in 2021. Instead, the NWSRI used this funding to expand their outreach and education programs

## Kit Components

- a small boat kit that contains all of the tools necessary for a successful live release;
- a video, “Every Sturgeon Counts,” which is used as a training tool for Fisher Families; and
- an on-site community By-catch Monitor that can explain the program and help release sturgeon caught in a net.

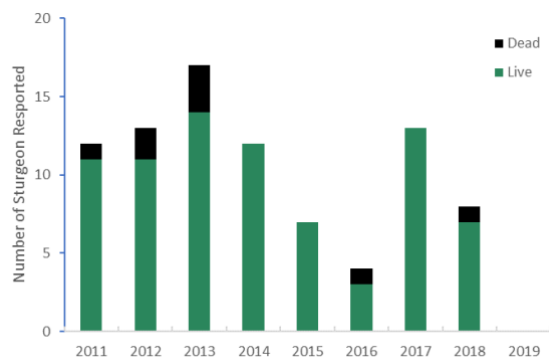


Figure 2. White Sturgeon bycatch reported in the Nechako Watershed to date.



# SCHOOL CURRICULUM

**Project:** Nechako White Sturgeon Curriculum  
**Project Lead:** NWSRI  
**Funders:** HSP \$21,393; NWSRI \$2,835; In-kind: School District 91 \$4,000; FFSBC \$2,000; CSTC \$1000; NWSRI CWG \$2,000  
**Start Year:** 2014

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

## Objectives

- The program provides tool to increase awareness of the connection between maintaining healthy rivers, riparian areas and watersheds to benefit sturgeon and all organisms; and
- 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.

In 2021-2022, we continued migrating the curriculum content to a mini-documentary format. We also held a Pro-D day with SD-91 teachers to get feedback on the videos released to date. The feedback was very helpful and in-line with the CWG’s thoughts. In 2021/2022, we created a lifecycle video specifically for younger audiences as the videos made to date are more appropriate for high school-aged children. We also received some helpful feedback to decolonize the interactive curriculum calendar. This calendar is widely used in SD91 and tailored to specific age groups. It includes links to videos and other resources. The decolonized version follows the seasons rather than calendar months, but still links to key resources. We look forward to receiving feedback from the teachers in May of 2022 during a follow up Pro-D day.

**Nine mini-documentaries are available for streaming on YouTube:**

Search Nechako White Sturgeon Recovery Initiative on YouTube or go to:  
[www.youtube.com/channel/UC\\_TQ1F2mc8HRzi5at0-K-gg](http://www.youtube.com/channel/UC_TQ1F2mc8HRzi5at0-K-gg)

**Videos #1-8 are best suited for high school students and adults. Video #9 is best suited for elementary students.**

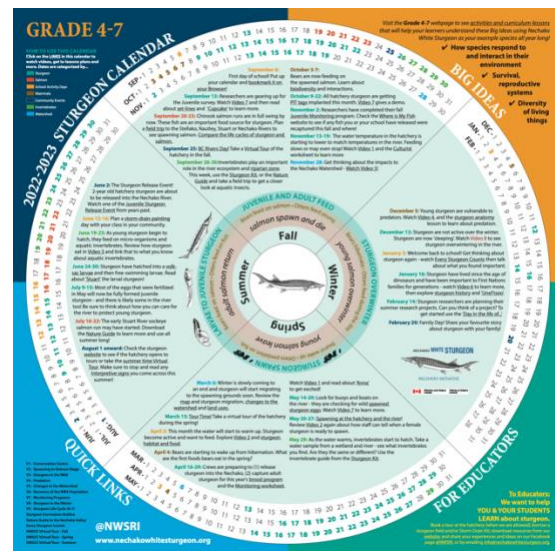


Figure 3. The Grade 4-7 2022/2023 curriculum calendar.



# COMMUNITY OUTREACH SIGNAGE

# OTHER NWSRI CWG ACTIVITIES

**Project Lead:** NWSRI CWG  
**Funders:** HSP \$2,904; NWSRI \$967; In-kind: NWSRI \$1000; Nadleh First Nation \$500; Norther Lights Winery \$200; MFLNRORD \$1,000; NWSRI CWG: \$500  
**Start Year:** 2017

**Project Lead:** NWSRI CWG  
**Funders:** HSP \$10,000; NWSRI \$1,575 In-kind: School District 91 \$1000; FFSBC \$1000; NWSRI CWG \$2500; Exploration Place \$3,000; University of British Columbia \$2,000; MFLNRORD \$1,000  
**Start Year:** 2017

In 2020/2021, the NWSRI designed and printed two interpretive signs to support public education and awareness within the Nechako watershed:

- Nadleh River walking bridge; and
- Northern Lights Winery on the Nechako River

In 2021/2022 the CWG also completed the following activities:

- developed an Annual Report and Brochure for 2020/2021;
- storm drain painting with School District 91 in Vanderhoof and Fort Saint James;
- worked with the Exploration Place in Prince George to develop content for their White Sturgeon display including video game development (in progress), educational signage and interactive displays; and
- website (nechakowhitesturgeon.org) and Facebook (@NWSRI) updates.

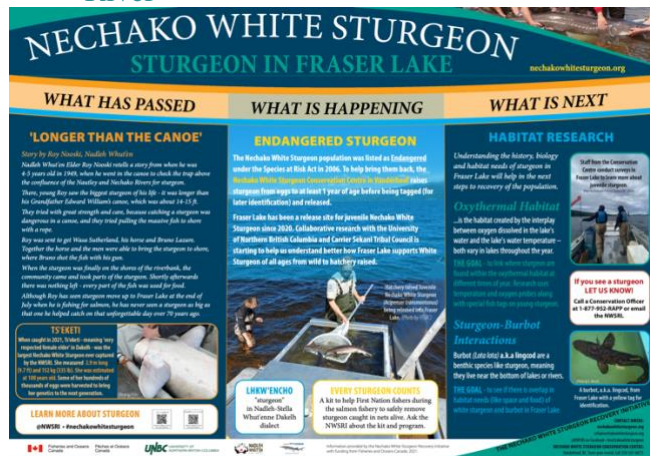


Figure 4. Sign developed for Fraser Lake, Nadleh Whut'en community.

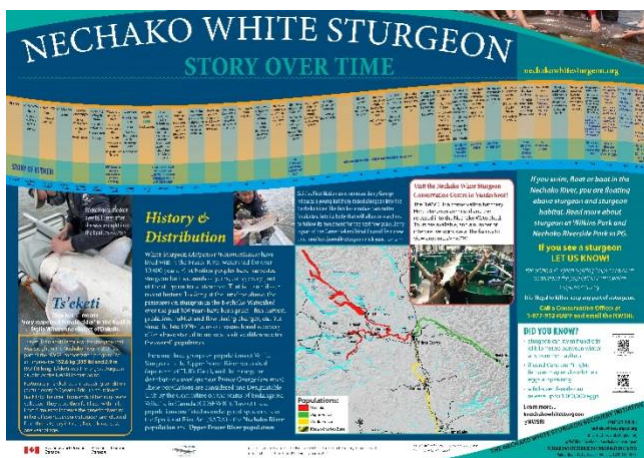


Figure 5. Sign developed for Northern Lights Winery



Photo 6. SD91 students painting storm drains. Photo courtesy of M. Roberge.



# NECHAKO WHITE STURGEON CONSERVATION CENTRE

## Conservation Fish Culture

**Project:** Conservation Fish Culture

**Project Lead:** FFSBC

**Funders:** Total: \$487,534. Nechako Environmental Enhancement Fund \$394,688, Rio Tinto \$50,000, Rio Tinto (Intern Program) \$92,846.

**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 2 years of age to get them through the critical recruitment failure stage.

This was the eighth year of operation for the Nechako White Sturgeon Conservation Centre. Mike Manky was the Hatchery Manager; Fraser Linza was the Senior Fish Culturist; Jake Zimich was the Fish Culturist and Megan Samson was the Seasonal Fish Culture Technician.

Seven females were spawned with five males in two events in May and June in 2021. Eggs were hatched by mid-June, and first feeding was a week later. As of February 2022, there were 600 juvenile sturgeon in the hatchery. This included: 300 from brood year 2020 and 300 from brood year 2021. The 2020 brood year will be released in the Spring of 2022 and the 2021 brood year are expected to be released in the Spring of 2023.

Prior to release in the Spring of 2022, 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 at various locations in 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 5. Juvenile sturgeon marked before release. Photo by NWSRI.



## 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 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

- 33 adult sturgeon (18 males and 13 females, and 2 un-sexed) were caught in a 5-week sampling period from April 15<sup>th</sup> to May 18<sup>th</sup>, using setlines and angling. 2 of the adult sturgeon were recaptured during the sampling period.
- 7 females and 5 males were used for the brood program to make seven families and 26 half-sibling crosses.
- 10 radio-tags were implanted in adult sturgeon that were not used in the brood program but returned to the river. All 12 adults used in the brood program were released with radio tags.
- Of 934 wild eggs collected between May 23<sup>rd</sup> and June 7<sup>th</sup>, 164 were held to the juvenile stage.
- 5 days of brood sampling took place from September 20<sup>th</sup> to 25<sup>th</sup>. 17 adult sturgeon were captured (8 males and 9 females). 3 females were brought back to the hatchery for use in future brood programs. Five additional radio tags were applied.



*Photo 6. 2021 Broodstock captures by FFSBC staff. Photo by NWSRI.*



## Juvenile Release

Two hundred juvenile sturgeon were released into the Nechako watershed in 2021. 120 juveniles were released at three different locations on the Nechako River. These three release locations included Fort Fraser (RKM 196.4), the boat launch in Vanderhoof (RKM 136.4) and RKM 116.9. 30 of the juvenile sturgeon released into the Nechako River (10 per site) were released with radio tags. 80 juvenile sturgeon were released at two locations (Beaumont Provincial Park and Whiteswan Park) on Fraser Lake in 2021. 20 of the juvenile sturgeon released into Fraser Lake (10 per site), were released with a radio tag and an acoustic tag. All tags were surgically implanted two weeks prior to release, allowing the fish time to heal in the hatchery before being released.

## Hatchery Tours

**Project:** Merchandise and Donations  
**Project Lead:** FFSBC & NWSRI  
**Raised:** \$220

### 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.

Due to the Covid-19 Pandemic the Freshwater Fisheries Society of BC was not able to provide in-person public tours of the Nechako White Sturgeon Conservation Centre in 2021. Outreach activities were however, conducted in an online format and included several short videos and hatchery updates posted to social media. Facebook contests were also used to engage with the public. The most successful contest was to help name the largest female sturgeon ever caught for the brood stock program. This post reached 22,236 people and led to the story being published over 30 times across Canada. The winning name was *Ts'eketi*, which translates to a "very respected female Elder" in Dakleh.

### Tour Statistics

Data was collected about the "online" visitors to the NWSCC.

- In 2021 there were 25,822 people reached by 38 posts to the NWSRI Facebook page
- \$220 was raised from merchandise sales between April 1<sup>st</sup>, 2021 and March 31<sup>st</sup>, 2022.





# FINANCIAL SUMMARY FOR 2021-2022

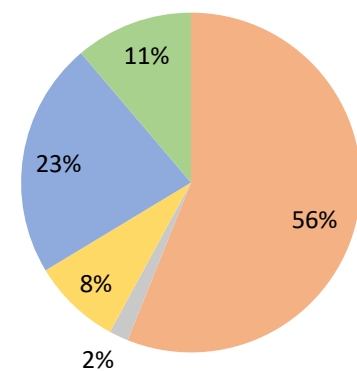
## Project Funding

Funding came from a variety of sources including industry, government, environmental funding sources, and volunteer hours. The following breakdown of financial and in-kind contributions underestimates the number of in-kind hours that are generously donated to the NWSRI by researchers, hatchery staff and community members. These numbers include the funding to run the NWSCC (see page 19).

In 2021, the NWSRI was able to partner with new funders to allow additional research and monitoring work to occur on Nechako White Sturgeon this year, and for the coming year. These new partners and sources of funding are the Nechako Environmental Enhancement Fund (NEEF), and from COVID Economic Stimulus Initiative (CESI). In total, these two partnerships have added roughly \$450,000 towards research.

| Contributor   | Cash             | In-kind         |
|---|------------------|-----------------|
| Aboriginal Fund for Species At Risk via Carrier Sekani Tribal Council (CSTC)          | \$82,000         |                 |
| Habitat Stewardship Program via CSTC  | \$50,600         |                 |
| Ministry of Forests Lands Natural Resource Operations and Rural Development (FLNRORD) | \$30,000         | \$25,000        |
| Ministry of Environment   | \$30,000         |                 |
| Habitat Stewardship Program via NWSRI   | \$35,717         |                 |
| Nechako Environmental Enhancement Fund  | \$394,688        |                 |
| COVID Economic Stimulus Initiative (CESI)   | \$15,000         |                 |
| Fisheries and Oceans Canada MOU to Ministry of Environment                            | \$89,388         |                 |
| FLNRORD via Land Based Investment Strategy – Species at Risk                          | \$60,000         |                 |
| Centerra Gold   | \$4,000          |                 |
| NWSRI Sales & Donations   | \$220            |                 |
| Rio Tinto   | \$142,846        |                 |
| Department of Fisheries and Oceans  |                  | \$400           |
| The Exploration Place   |                  | \$3,000         |
| School District 91  |                  | \$7,000         |
| Freshwater Fisheries Society of BC  |                  | \$29,000        |
| District of Vanderhoof  |                  | \$1,000         |
| Nechako White Sturgeon Recovery Initiative  | \$7,267          | \$7,800         |
| Nadleh Whut'en First Nation   |                  | \$500           |
| Carrier Sekani Tribal Council   |                  | \$1,800         |
| Spruce City Wildlife Association  |                  | \$1,000         |
| University of British Columbia  |                  | \$2,000         |
| Northern Lights Winery  |                  | \$200           |
| <b>Total Cash Contributions</b>   | <b>\$879,726</b> |                 |
| <b>Total In-Kind Contributions</b>  |                  | <b>\$78,700</b> |
| <b>Grand Total</b>  | <b>\$958,426</b> |                 |

### Breakdown by NWSRI Recovery Areas



- Conservation Fish Culture
- Coordination & Support
- Extension & Outreach
- Habitat & Population
- Recruitment Failure

|                           |           |
|---------------------------|-----------|
| Conservation Fish Culture | \$537,534 |
| Coordination & Support    | \$17,500  |
| Extension & Outreach      | \$80,904  |
| Habitat & Population      | \$215,100 |
| Recruitment Failure       | \$107,388 |



*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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**3030 Burrard Avenue**  
**Vanderhoof, BC V0J 3A0**

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

Facebook @NWSRI

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

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



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