2023-2024

Annual Report

Nechako White Sturgeon Recovery Initiative

The sturgeon pictured here - Ighunute *(i-ghu-nu-te)* - was released on the 7 of June 2024, at 2 years old, 75.4 cm long, and 3.09 kg.

This special sturgeon was named and released by members from Saik'uz First Nation within their traditional territory. Ighunute means spirit brother or sister in the Dakelh language, as well as 'dreamer', considered very special and powerful to the Dakelh People.

Ighunute has leucism - having a partial loss of all types of pigmentation. It occurs in sturgeon roughly 1 in 15,000.

NECHAKO WHITE STURGEON

RECOVERY INITIATIVE

ABOUT THE NWSRI

The Nechako White Sturgeon Recovery Initiative (NWSRI) was established in 2000 in response to learning that recruitment failure (the lack of young fish entering the population) of Nechako White Sturgeon juveniles would lead to a collapse of the population within a few decades. Historically, the population likely had over 2,000 adults and many more juvenile sturgeon. The Nechako White Sturgeon has been listed as Endangered under the Federal Species at Risk Act since 2006.

The work of the NWSRI is based on the *Recovery Strategy for White Sturgeon (Acipenser transmontanus)* that **was developed from the best-available science, local, and traditional knowledge.** The NWSRI members work together in different capacities to address the Recovery Strategy and use new research and understanding of the species biology, ecology and stressors to make recovery recommendations.

NWSRI Structure

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

> The TWG works to develop and oversee implementation of the *Recovery Strategy for White Sturgeon*. 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 partners.

The work of the TWG and CWG is supported by a part-time **Recovery Coordinator.** 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.

The Recovery Coordinator position is funded by the Ministry of Water, Land and Resource Stewardship ($24,600).

This report highlights some of the new and ongoing projects on Nechako White Sturgeon from April 2023 to March 2024. For further information on the NWSRI, and for detailed reports on projects outlined in this report, please visit our website at:

www.nechakowhitesturgeon.org

NWSRI Partnerships

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. Those involved during the 2023-2024 fiscal year included:

> Artemis Gold
> Avison Management Ltd.
> BC Ministry of Environment
> BC Ministry of Forests, Land, and Resource Stewardship
> BC Wildfire Service
> Carrier Sekani Tribal Council
> District of Vanderhoof
> FireSmart BC
> Habitat Stewardship Program
> Fisheries and Oceans Canada
> Fraser Basin Council
> Fraser River Sturgeon Conservation Society
> Freshwater Fisheries Society of BC
> Integris Credit Union
> Lheidli T'enneh First Nation
> Nadleh Whut'en First Nation
> Nak'azdli Whut'en
> Rio Tinto
> Saik'uz First Nation
> School District 91
> Spruce City Wildlife Association
> Takla First Nation
> The Exploration Place
> Tl'azt'en First Nation

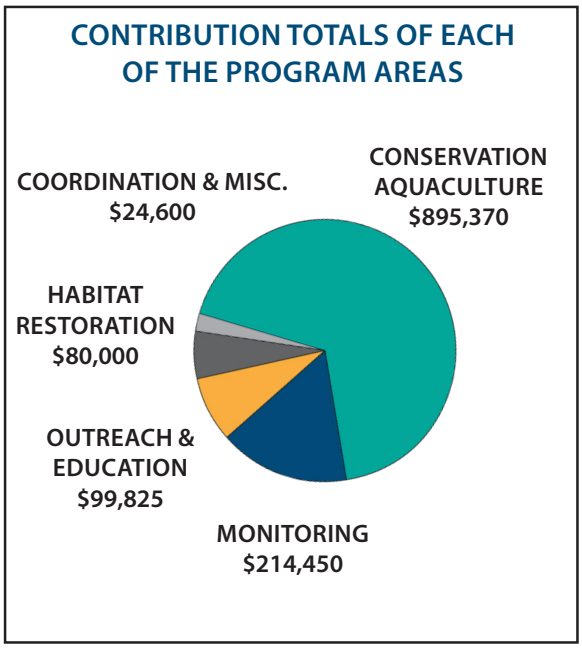
Learn more about the areas of the NWSRI:

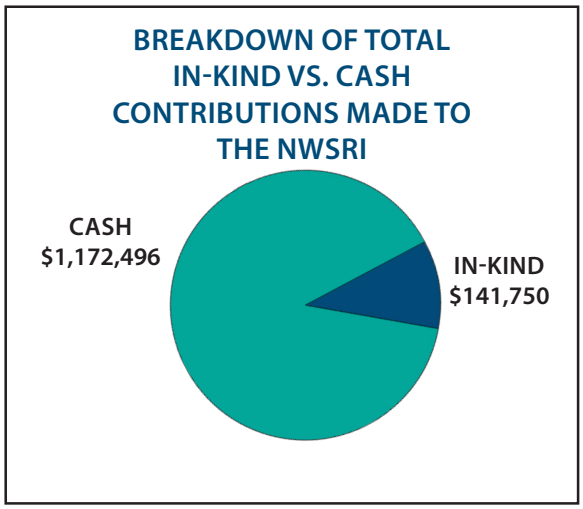
BC Wildfire staff provided strength, support, and big smiles again this year at the 2023 Juvenile Sturgeon Release event. Photo by Michelle Roberge.

FINANCIAL SUMMARY FOR 2023-2024

The work of the NWSRI can be broken down into five categories - Monitoring; Habitat Restoration; Conservation Aquaculture; Outreach & Education; and Coordination. The total program funding was roughly $??. Project dollars came from a number of sources including industry, government, environmental funding sources, and in-kind contributions.

Organization	Abbrev.	Contribution
Aboriginal Fund for Species at Risk	AFSAR	$125,450
Avison Management Services	AMS	$500
BC Conservation Office	BCCO	$500
BC Wildfire	BCWF	$1,000
Carrier Sekani Tribal Council	CSTC	$5,850
Department of Fisheries and Oceans (Local)	DFO	$500
District of Vanderhoof	DoV	$4,700
Exploration Place	ExPlace	$500
Freshwater Fisheries Society of BC	FFSBC	$10,000
Habitat Stewardship Program	HSP	$50,366
Integris Credit Union	ICU	$800
Ministry of Water, Land and Resource Stewardship	WLRS	$110,000
Nechako Environmental Enhancement Fund	NEEF	$448,185
Nechako White Sturgeon Recovery Initiative	NWSRI	$5,209
Province of British Columbia	Prov BC	$378,185
Rio Tinto BC Works	RT	$140,250
School District 91 - Nechako Lakes	SD91	$15,500
Spruce City Wildlife Assoc.	SCWA	$1,750
University of Northern British Columbia	UNBC	$15,000
TOTAL		$ 1,234,246





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 to one or a number of the programs outlined in this report. This support is essential to the success of the NWSRI and the recovery of white sturgeon in the Nechako watershed.

TECHNICAL WORKING GROUP

The Technical Working Group (TWG) was formed in September 2000 and is made up of fisheries, habitat and river scientists and researchers, First Nations fisheries managers, industry partners, and government representatives. The TWG meets to discuss the latest research project findings, plan recovery initiatives and projects, provide updates on the state of the Nechako White Sturgeon population, and develop recovery recommendations to provide provincial managers. Each member brings specific qualifications related to the technical problems being explored.

The TWG is responsible for addressing the Recovery Strategy by:

> Investigating why the Nechako white sturgeon population is in decline.

> Implementing the strategies to help restore to a self-sustaining population.

TWG Research Projects

Listed here are the main areas of work conducted by the TWG members in 2023-2024. Many of these projects and programs have been happening for many years and have detailed project reports that can be found on the NWSRI website. The next section of this report provides an overview of the project goals, objectives and findings from 2023-2024.

Sturgeon newly implanted with a radio-tag during the spring broodstock capture program . Photo by FFSBC.

MESSAGE FROM THE TECHNICAL WORKING GROUP CHAIR STEVE McADAM

2023-2024 was another year of progress towards recovery. Throughout the year the NWSRI's TWG team carried out several research and monitoring activities within the Nechako watershed. These projects continue to provide information that will support future recovery work. This year also marked the nineth 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 2023, staff remained focused on rearing juvenile sturgeon for release in 2024 and 2025. The NWSCC staff, project partners, TWG members and researchers, and volunteers continued to serve the NWSRI through their combined efforts.

SPAWN MONITORING

The information gathered from the suite of spawn monitoring programs helps the TWG members 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 and larvae, and to understand the behaviour of sturgeon in relation to the river characteristics.

OVERALL OBJECTIVES

> Determine the timing of spawning;
> Collect wild-fertilized eggs for hatchery rearing and later release;
> Track the physical parameters of the river that occur during spawning, such as river discharge, temperature and substrate condition;
> Estimate specific location(s) where spawning occurs given annual river conditions, to inform habitat restoration decisions; and
> Collect larval sturgeon and provide measure of spawning success and recruitment to young of year.

PROGRAM DETAILS

Lead: ***CSTC***

Funding: ***$63,950***

Funders: ***AFSAR and NEEF***

Start Year: ***2004***

ACTIVITIES

1) Adult Spawning Telemetry
2) Egg Mat Sampling
3) Larval Sampling

RIVER CONDITIONS DURING THE 2023 SPAWNING PERIOD

> Discharge was between 129 -143 m^3/s at the Burrard Bridge.
> Mean daily water temperature ranged between 13.0 - 16.6°C.

Adult Spawning Telemetry

OBJECTIVES

> Monitor adult movements during spawning.
> Monitor adult movements year-round to determine overwintering habitat and habitat use.

See Juvenile Radio Telemetry section for more information about the overall NWSRI telemetry program.

In total, there were 195 adult sturgeon tags available for detection during the 2023 spawning telemetry program. One spawning radio station was installed on Apr 25, and another two were installed on May 8. Spawn telemetry stations were removed on June 30.

RESULTS

> 29 new adult Nechako White Sturgeon were implanted with radio-tags in 2023.
> Male and female adult sturgeon were first detected in the spawning reach on April 25.
> A significant increase in the number of tags was recorded on May 15 (approximately 17 unique tags at the Murray Creek station).
> More than 10 unique tags were detected daily to May 28.

In the background located on an island within the spawning reach in Vanderhoof is one of the seasonal spawn monitoring telemetry stations . In the foreground is a red buoy that marks the location of an egg mat. Photo by Michelle Roberge.

Egg Mat Sampling

OBJECTIVES

> Confirm wild spawning activity in the river.

> Monitor river conditions, spawning behaviours and habitat preference.

> 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.

This program sets egg mats - 1m by 1m coarse mats - on the river bottom within and downstream of known spawning sites. Egg mats are deployed to maximize the potential to collect as many wild fertilized eggs for hatchery rearing, and to help determine wild spawning locations and habitat. This program is led by CSTC however Nechako White Sturgeon Conservation Centre (NWSCC) staff also set egg mats (see Conservation Aquaculture).

RESULTS

Egg mats were placed by CSTC and Freshwater Fisheries Society of BC (FFSBC) Staff within the spawning reach from the upper end of the islands to below the bridge. Mats are checked every 48 hours.

> Between May 5 and 29, CSTC collected 175 eggs off the mats of which 82 eggs were in good enough condition to be brought to the NWSCC to attempt to hatch.

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.

> 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 sturgeon larvae hide near their hatching location using substrate interstitial spaces and feed off their egg yolk-sac. Age 12-40 days post-hatch sturgeon larvae become free-feeding and must actively forage within the river water column. Free-feeding larvae disperse by downstream migrations at night and can travel many kilometres.

RESULTS

> 6 nets deployed in early June near the spawning reach to collect yolk-sac larvae. Resulted in no larvae caught.

> Moved nets to roughly 3km downstream of spawning reach to capture free-swimming larvae. Again no larvae caught.

Aerial photo of the spawning reach of Nechako White Sturgeon in Vanderhoof. Photo by Aaron Zwiebel.

JUVENILE RADIO TELEMETRY

Radio Telemetry is an established method to detect large-scale movements by juvenile and adult sturgeon. There are 5 fixed base stations located at ecologically important spots: in Vanderhoof near the spawning reach, near the Nechako-Fraser confluence, the Upper Stuart River, the Nautley-Nechako confluence, and the Stuart-Nechako confluence. During spawning season, additional temporary stations are set up within the spawning reach. The stations function like gates and record when a sturgeon pass. Active telemetry surveys are also performed monthly from June through November by helicopter, covering the Nechako mainstem, Nautley River, and Fraser River from Red Rock to the Nechako confluence.

OBJECTIVES

> Determine juvenile sturgeon migration and distribution following release.

> Understand habitat use and survival outcomes of hatchery fish.

> To ultimately determine juvenile sturgeon recruitment success into the Nechako River population during the first eight years in the wild.

PROGRAM DETAILS

Project Lead: ***WLRS and FFSBC***

Funding: ***$49,000***

Funders: ***WLRS***

Start Year: ***2015***

As of 2023, there are 150 - 70cm+ long juvenile hatchery-origin sturgeon fitted with radio-tags within the Nechako Watershed. In 2023, 50 radio-tagged juveniles were released into the Nechako River (30), and Fraser Lake (20).

RESULTS

> The range of detections reached from RKM 235 in the Nechako River to RKM 782 in the Fraser River.

> For the lake released juveniles, all detections were made within the lake except for one observation at RKM 116 in the fall.

> During active tracking, 603 location detections were made, representing 128 juvenile individuals.

> At base stations, 997 detections were made, representing 63 juvenile and 77 adult individuals. In total, radio-tagged sturgeon were in contact with base stations for over 9150 hours.

> To improve data processing speed and consistency, a script was developed to automatically filter telemetry station data. This will facilitate expansion of the telemetry network.

Using cumulative data including 2023 information, some additional observations were made:

> In the spring, sturgeon are relatively widespread in their distribution, especially for juveniles just released. This is likely due to forage and taking advantage of productivity in the river.

> In the winter, distribution is much more narrow, likely concentrated in deeper areas of the rivers.

> As juveniles age, their habitat preferences change, with an overall shift towards lower reaches of the Nechako. Newly released juveniles are relatively more likely to be found in upstream locations such as the Nautley Confluence, while older juveniles and adults spend more time downstream of the Stuart confluence.

LEFT: The fixed radio telemetry station at the confluence of the Nautley River and Nechako River. RIGHT: Image showing the telemetry antennae fixed to the helicopter during a flight over the Nechako River. Photos by Aaron Zwiebel.

JUVENILE INDEXING

The juvenile index program has used the same standardized set-line sampling technique and methodology since 2009 to be able to compare results from year to year. The fishing gear targets juvenile white sturgeon less than 1 m (3.28 ft) in length. Biological data and location of capture are collected, as well as river condition, such as flow and temperature.

Detailed reports produced by Carrier Sekani Tribal Council on this Juvenile Monitoring program are available on the NWSRI website > Publications > Technical Reports.

OBJECTIVES

> Gain insight into hatchery-origin juvenile sturgeon survival, health, and growth.
> Monitor the presence of wild-origin juvenile sturgeon.
> Refine knowledge of juvenile sturgeon habitat in the Nechako River.

PROGRAM DETAILS

Lead: ***CSTC***

Funding: ***$81,500***

Funders: ***AFSAR***

Start Year: ***2004***

In 2023, the program ran from April 26 to September 21 (spring and fall monitoring). A total of 181 setlines were deployed (for both brood and juvenile effort) between RKM 106 and RKM 134 and in Fraser Lake, for a total of 72,404 hook-hours. The river water level was at historically low levels, limiting access to some of the sampling sites.

NUMBER OF JUVENILES

In total, 94 unique juvenile and sub-adult sturgeon were caught. Five of those were caught twice, and two were first time captures. In total there were 101 juvenile and sub-adult capture events.

Of the 94 juveniles captured:

> 72 were hatchery broodstock eggs; 10 were hatchery reared wild-eggs; 18 were wild captures.
> Hatchery reared fish came from brood years 2006, 2008-2009, and 2015-2023.
> Length ranged between 80-100 cm.
> 15 juveniles were captured in Fraser Lake.

CAPTURE LOCATIONS

> The majority of sturgeon were captured between RKM 107 to RKM 117, a known overwintering area for juvenile and adult sturgeon.
> Of the fish caught in Fraser Lake, the majority were caught near the outlet to the Nautley River.

BELOW: CSTC Crew member about to release a juvenile sturgeon back into the Nechako River after collecting biological data on the fish. Photo by Jeff Beardsall.

SUB-ADULTS

Four of the fish caught in 2023 were from brood year 2006 and have grown to sub-adult size. These fish were caught within the mainstem Nechako River.

FRASER RIVER SITES

Juvenile sampling also occurs in Fraser River and in 2023 two hatchery reared juveniles were captured at locations - between Stone Creek and Redrock, and near the Bowron River confluence.

WINTER MONITORING

Data loggers are stationed at two sites in the Nechako River. These data loggers record temperature, dissolved oxygen, depth and light levels. The data loggers unfortunately have been unrecoverable as of March 2024.

FRASER LAKE STUDIES

Starting in 2021, this three year project has been using radio and acoustic telemetry to explore interactions between juvenile white sturgeon and burbot within Fraser Lake. Fraser Lake is a deep, cold lake with a dramatic oxy-thermal range.

This project has involved graduate students from the University of Northern British Columbia, while being supported by Ministry of Water, Land, and Resource Stewardship fisheries experts.

- Understand the movement of juvenile white sturgeon and burbot in Fraser Lake.
- Understand the interactions between these species in relation to water temperature and oxygen conditions.
- Ascertain an estimate of juvenile sturgeon survival in the lake environment.

PROGRAM DETAILS

Lead: ***WLRS, CSTC, and UNBC***

Funding: ***$20,000***

Funders: ***WLRS and UNBC***

Start Year: ***2020***

The summer of 2023 was the 3rd field season for this 4-year project (array ends in May 2025). In total since 2021, 80 juvenile sturgeon have been released into Fraser Lake with radio and/or acoustic tags to support this study. To be able to detect movement and location of juvenile sturgeon and burbot as accurately as possible within the whole of Fraser Lake, 36 receivers were placed within and around the lake in 2023. These receivers were in place for the summer and winter to track seasonal movement patterns of both sturgeon and burbot.

STURGEON AND BURBOT RESULTS

By March of 2024, there have been no formally released results as the data is being reviewed and will be presented in formal papers and research dissertations later in 2024. Preliminary results have been shared with the NWSRI and local First Nations. A workshop is also being planned for 2025 to share and discuss the results of this work. Preliminary results show:

- From 2020-2023, 8 of the 80 juvenile sturgeon were recorded as mortalities.
- 7 of 8 of those mortalities were confirmed to be from either otters or birds of prey.

A piece of sturgeon body found near a radio-tag detected on land. Photo by Graeme Lyon.

HABITAT RESEARCH AND RESTORATION

Infilling of spawning gravels with fine sediment has been identified as a contributing factor to recruitment failure of Nechako White Sturgeon. Through previous studies, there is a good understanding of where sediment deposition occurs within the islands and spawning reach of the Nechako River at Vanderhoof. Moving forward, researchers are planning methods for habitat restoration to improve spawning success in sturgeon.

OVERALL HABITAT RESTORATION OBJECTIVES

> Understand habitat requirements for eggs and larvae.

> Develop a spawning habitat restoration plan to guide investigations.

> Conduct and monitor habitat restoration work within the Nechako River as identified by habitat research.

PROGRAM DETAILS FOR 2023-2024

Lead: ***WLRS and SFU Graduate Program***

Funding: ***$80,000***

Funders: ***WLRS, NEEF, DFO***

Start Year: ***2011***

EGG DISPERSAL STUDY

Starting in 2022, researchers from Simon Fraser University and the Ministry of Water, Land and Resource Stewardship conducted a study to evaluate egg mats as a way of identifying white sturgeon spawning habitat characteristics. One component of this study compared egg dispersal over ambient substrate in river (gravel infilled with fine sediment) and over substrate that had been restored by the removal of fine sediment.

Key findings include:

> Fewer eggs were captured on egg mats in the cleaned channel due to higher retention in the crevices between gravel particles.

> Eggs dispersed longer distances in the uncleaned substrate (up to 50 m from the release site) than the restored substrate (up to 20 m from the release site).

LARVAL SETTLEMENT STUDY

In 2023, researchers from the Ministry of Water, Land and Resource Stewardship conducted experiments on larval settlement at various velocities and substrate compositions. The goals were to estimate larval settlement success at varying velocities, as well as determine if substrate composition impacts settlement success. This work was conducted on land in large flumes. This allowed for close observation of larvae at velocities near to what they would experience in the wild. Analysis is ongoing, however preliminary findings include:

> Water velocity influenced the number of larvae able to settle. Fewer larvae were able to hide in the substrate at 0.72 m/s than at 0.48 m/s.

> Older larvae (1 day post-hatch, dph) had higher settlement rates than younger larvae (0 days post-hatch). At low velocity, 72% of 1 dph larvae and 41% of 0 dph larvae hid in the gravel. At high velocity, 20% of 1 dph larvae and 8% of 0 dph larvae hid in the gravel.

> Substrate composition did not statistically influence the proportion of larvae that settled. Larvae settled equally well in gravel compared to gravel covered with a layer of cobble.

HABITAT RESTORATION PROJECT PLAN

Through 2023, members of the NWSRI TWG developed a 5-year Project Package for the Nechako River and Nechako White Sturgeon. The package's purpose is to identify priority recovery actions and scientific knowledge gaps to address over the next 5 years. The projects are grouped into those that are (1) closely tied to ongoing recovery work, and (2) broader species management and address longer-term concerns. The package prioritizes these areas of research and projects to best support Nechako White Sturgeon recovery in the short and long-term. Additionally, the package lists projects that are planned or occurring outside the NWSRI umbrella but that link to and/or support recovery work.

As a result of this planning process, a Substrate Cleaning Project is slated for 2024-2025.

LEFT and ABOVE: Overview and side view of the flume that was constructed to test larval sturgeon settlement at differing flow velocities.

BELOW: Screenshot from video showing larval sturgeon dispering down the flume in moving water. Photo provided by Angie Coulter.

CONSERVATION AQUACULTURE

The Freshwater Fisheries Society of BC (FFSBC) operates the Nechako White Sturgeon Conservation Centre (NWSCC) with the goal to replenish the population of sturgeon in the Nechako River to a self-sustaining level within the next 10-15 years. The NWSRI continues to recognize that the facility is a stop-gap for sturgeon recovery that will give more time for the TWG to continue to research, implement, and monitor the more permanent solutions required to achieve a self-sustaining sturgeon population, such as habitat rehabilitation and resolutions to the recruitment failure.

OBJECTIVES

> Produce the next generation of sturgeon that will spawn naturally in the Nechako River.

> Conserve genetic diversity within the Nechako white sturgeon population.

> Grow sturgeon past the critical recruitment failure stage.

PROGRAM DETAILS

Lead: ***FFSBC and NWSRI***

Funding: ***$895,371***

Funders: ***RT, Prov of BC, and NEEF***

Start Year: ***2014***

ACTIVITIES

1) Broodstock Capture
2) Wild Egg Capture
3) Sturgeon Rearing and Release
4) Hatchery Tours and Outreach
5) Juvenile Indexing

The NWSCC operations team was comprised of Mike Manky, Hatchery Manager; Fraser Linza, Senior Fish Culturist; Jake Zimich, Senior Fish Culturist; Christy Hunter, Seasonal Aquaculture Technician, and Kara Geary, Senior Research Technician and Outreach Coordinator (a new position established in 2023). They were joined over the summer months by two student technicians and two student outreach assistants, all funded through Rio Tinto. Jordan Hendricks, a student from Vancouver Island University served a two-week internship in November, 2023.

A large adult sturgeon captured in the Nechako River for broodstock. Photo by FFSBC.

Broodstock Capture

OBJECTIVES

> Capture up to 8 female and 12 male mature sturgeon to supply eggs and milt for the conservation aquaculture program.

> Collect wild eggs to rear in the hatchery to augment conservation aquaculture program.

> Assist NWSRI research programs such as the application of radio tags or tracking of tagged adults to inform programs such as spawn monitoring.

> Monitor and assess the health of the adult sturgeon population.

The broodstock capture program is the key component of the Nechako White Sturgeon Breeding Plan. The crew, using angling or set-lining, seek to capture breeding condition wild adult sturgeon for egg and milt collection. The NWSCC crew also will implant radio-tags during the brood capture period to support the spawn monitoring program (see Radio Telemetry).

BROOD YEAR 2023

> Fishing for adult sturgeon started on April 19, 2023 and ran until May 15, 2023 using first angling then set-lining.

> 68 adult sturgeon (33 males, 20 females, 15 un-sexed adults), plus 11 un-sexed juveniles were caught (total 79).

> 11 juveniles were caught during brood capture.

> 6 females and 7 males were brought back to the hatchery for the brood program. An additional female already at the hatchery from the previous year's capture for use in 2023, and one other female was retained for 2024 brood year.

> Total of 49 crosses were made on two dates: May 17 (28 crosses by 4 females and 7 males), and May 24 (21 crosses by 3 females and the 7 males).

> No fall broodstock capture was conducted due to low river level.

> Ploidy Analysis in Nov. resulted in 99.5% of the 377 sampled as 8n, the target ploidy.

Wild Egg Capture

The NWSCC supports the spawn monitoring and egg capture programs conducted by CSTC (see also Spawn Monitoring). The NWSCC egg mats were deployed on May 15 and removed June 14, 2023. No eggs were collected after June 1. All eggs were brought to the NWSCC to hatch. Of the total 314 eggs, 97 made it to the juvenile stage as of the fall of 2023.

NWSCC	CSTC	TOTAL
232 eggs	82 eggs	314 eggs

Sturgeon Rearing and Release

OBJECTIVES

> Produce the next generation of sturgeon that will spawn naturally in the Nechako River.

> Conserve genetic diversity within the Nechako White Sturgeon population.

> Grow sturgeon to 2 years of age - past the critical recruitment failure stage.

Juvenile sturgeon are raised to a size of roughly 70cm in length and 2.5 kg in weight, which is equivalent in size to a 5-year old river-reared sturgeon. This length was identified by the TWG as a size of fish this is less vulnerable to predation and ultimately has the greatest chance of survival to breeding age. To reach the release size within 2 years, the rearing tank water is maintained at optimal growing temperatures and juveniles are fed year round.

JUVENILE RELEASES

The 2023 juveniles were the 8th cohort to be released from the NWSCC. Reared from 2021 eggs, 300 juvenile sturgeon were released into the Nechako watershed in June 2023. **Of the 300 juveniles released:**

> 158 from broodstock capture eggs; 142 from wild egg captures.

> 220 were released at three release locations in the Nechako River at Fort Fraser (RKM 196), Riverside Park in Vanderhoof (RKM 136 - see also Juvenile Release Event), and south of Vanderhoof (RKM 116).

> 80 were released into Fraser Lake at two sites: Beaumont Provincial Park, and White Swan Park.

> 50 (10 per site) were implanted with radio-tags to support juvenile research and monitoring programs (see Fraser Lake Studies and Juvenile Monitoring).

Hatchery Tours and Outreach

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.

NWSCC Staff provide tours for the entire year, adjusting from scheduled times (summer and fall) to appointment only tours. In total in 2023, **2138 people toured the NWSCC**.

A group of medical students from Vancouver take a tour of the NWSCC. Photo by Michelle Roberge.

The NWSCC Summer Staff attended the Vanderhoof Farmers' Market throughout the months of June to August, and hosted a number of outreach sessions at libraries and Exploration Place in Prince George.

The media was also very interested in the NWSCC in 2023, over 5 different media interviews and articles were done on the program.

Merchandise was sold out of the NWSCC and visitors were generous in making donations to the NWSRI.

Juvenile Indexing

Again supporting the other juvenile indexing work done by CSTC (see Juvenile Indexing Program), the NWSCC staff conducted setline indexing in both the Nechako River and Fraser Lake from July 17 to August 24. Indexing started later than previous years due to lower water levels and high water temperatures. **In total 42 juveniles were captured:**

> 29 between RKM 106 and RKM 118.

> 13 in Fraser Lake.

> The 42 fish comprised of 4 hatchery-reared wild-captured eggs; 3 wild-reared eggs; 35 hatchery-reared eggs.

> The hatchery-reared juveniles were from BY2014-2018, and BY2020-2021.

Top: Three of four of the FFSBC Student Summer Staff returning from a morning of juvenile indexing on Fraser Lake. Photo by Michelle Roberge. Above: Juvenile sturgeon being released back into Fraser Lake after indexing by FFSBC staff. Photo by Kara Geary. Right: Summer FFSBC staff pulling in a setline during the heat and smoky skies that plagued the region in 2023. Photo by FFSBC.

OTHER PROGRAM UPDATES

Data analysis and reporting out on projects can often take months or even years to complete. Below is a summary and update about a few projects that were focuses from previous years. These updates are of March 2024.

Project	Lead	Update
Adult Abundance Modeling	WLRS	Analysis is still in progress. Exploring Gravity vs. Markov methods for analysis. Update expected by the spring of 2024.
Juvenile Abundance Modeling	WLRS	Analysis is still in progress. This abundance estimate will support future recommendations for the Conservation Aquaculture program. Update expected by the spring of 2024.
Parentage Analysis	WLRS	Analysis is still in progress. Update expected by the spring of 2024.
Sturgeon Mortalities from 2022	WLRS	Laboratory analyses have established the concentrations of trace metals and organic pollutants in sturgeon muscle and organ tissues, as well the presence of pathogens on skin and gills. None of these provide a clear explanation for the string of adult sturgeon mortalities occurring in late summer of 2022.
Nechako - Fraser River Genetic Comparison	WLRS	1) Examined wild caught eggs for their relatedness, and discovered that relatedness was low. 2) Results showed that Nechako, Upper Fraser and Middle Fraser fish are genetically different, and that the fish from the 'mixing zone' are different than all three populations, but most similar to Nechako fish.
Otter Predation	WLRS	Fraser lake studies explored otter predation on juvenile sturgeon (see Fraser Lake Studies). Results from prior otter predation research are being applied to management and release strategies.

COMMUNITY WORKING GROUP

The CWG members include First Nations, non-government environmental organizations, industry, local and regional governments, and citizens. The CWG discusses the findings of the TWG to use that information to help plan community-based projects that provide:

> Outreach and educational programs that relate to the latest research of the TWG.

> Public awareness campaigns 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, including school children, residents, industrial companies in the watershed, First Nations partners, and local governments.

CWG Outreach Activities

Listed here are the main areas of work conducted by the CWG members in 2023-2024. Many of these projects and programs have been happening for many years and have dedicated pages on the NWSRI website that have additional information, links to resources and more. The next section of this report provides an overview of the work of the CWG from 2023-2024.

A sticker made to hand out to students and educators to promote the Nechako White Sturgeon Curriculum program. The website has a long list of activities, information and videos for teachers to use in their classrooms. Photo by Michelle Roberge.

Message from the Community Working Group Chair Wayne Salewski

The CWG is pleased with the support of the broader community with the continued uptake of tours, especially since COVID. We continue to see growth in area, region and international tourism and we continue receive rave reviews for our staff's presentation. It's fun to see students that named and released a sturgeon as a grade 3 student now working within our facility.

Our Conservation Centre contributes greatly to our community while working towards the recovery of this animal and I would like to thank everyone for their contribution and leadership.

EMERGENCY BOAT KIT PROGRAM

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 bycatch mortalities associated with the First Nation Food, Social and Ceremonial 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.

OBJECTIVE

> Reduce accidental harm to sturgeon and the sturgeon population as a result of sturgeon bycatch associated with the First Nation gill net fisheries.

METHODS AND KIT COMPONENTS

Seven First Nation Communities, including Nadleh Whut'en, Stellat'en, Saik'uz, Nak'azdli Whut'en, Tl'azt'en, Takla and Lheidli T'enneh, are approached each year to participate in this program. Boat Kit Monitors are 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 PIT tag reader is provided, when possible, to help identify individual sturgeon.

> A video, "Every Sturgeon Counts" as an education and training tool for Fisher Families.

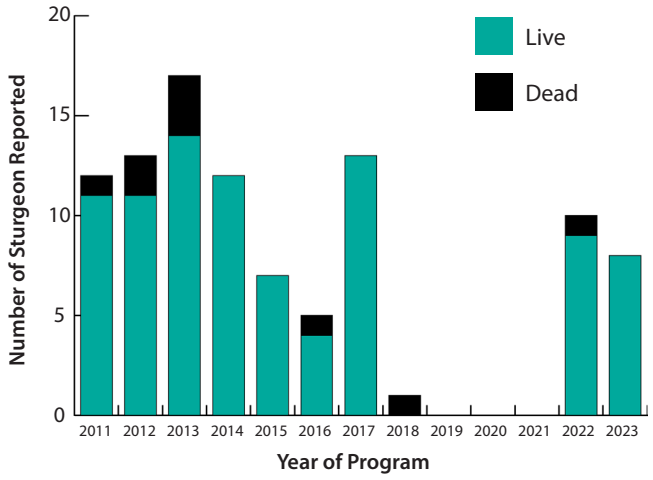
2023 RESULTS

Since 2011, **98** sturgeon have been reported to the program, of which **89** sturgeon (**90%**) have been released live.

> There was limited salmon fishing in 2023.

> Takla and Nak'azdli reported releasing 8 sturgeon live.

> Promotion of the Boat Kit Program ramped up in 2023 with more plans for 2024.



PROGRAM DETAILS

Lead: ***NWSRI and CSTC***

Funding: ***$23,830***

Funders: ***HSP, CSTC, NWSRI***

Start Year: ***2011***

The new smaller Boat Kit supply bag that is more streamlined with the items folks needs when they encounter a sturgeon from the boat or shore. Photo by Michelle Roberge.

YouTube Video: Search for 'Every Sturgeon Counts'

Report: 2011-2022 Summary Report

Data Form: Sturgeon Release Form

STORM DRAIN PAINTING

The Storm Drain Painting program allows students to participate directly in public awareness and stewardship. Students are led on an expedition to paint as many local storm drains as they can, to educate community members about keeping harmful chemicals and garbage out of storm drains. The students make the connection between storm drains and fish habitat. This program empowers children to take an active role in protecting water resources in their communities.

OBJECTIVE

> Engage students in hands-on watershed stewardship.

> Bring awareness to the public regarding water and sturgeon health.

PROGRAM DETAILS

Lead: ***NWSRI and SD91***

Funding: ***$3,966***

Funders: ***HSP, SD91, NWSRI***

Start Year: ***2020***

Small groups of students from schools in Vanderhoof (WL McLeod and Evelyn Dickson Elementary schools) painted 43 storm drains over two days within the town limits, and students from David Hoy Elementary in Fort St. James painted 12 storm drains.

Additionally in 2023, the NWSRI created Storm Drain Painting Kits for schools in Fort St. James and Fraser Lake. The goal of the kits is to allow educators and students to head out and touch-up or paint at new storm drains whenever the weather is good and the students are up for some stewardship action!

These four students from Evelyn Dickson Elementary School are painting a storm drain near their school. The goal is always to be safe first, and students take holding the sign quite seriously. Photo by Michelle Roberge.

Video: Storm Drain Painting Instructional Video

School Kits Available!

One of the full Storm Drain Painting kits that were delivered to schools in Fort St. James and Fraser Lake so classes have easier access to the tools to engage in this outreach work. Photo by Michelle Roberge.

STURGEON CURRICULUM

The Healthy Watersheds for Sturgeon School Curriculum Program was first introduced in schools within School District 91 in 2014. Since then, the program has diversified and is available online, to make it accessible from anywhere! The NWSRI works closely with the School District 91 Career and Trades Program to help build upon and promote the curriculum within the local school district.

OBJECTIVES

> Increase awareness of the connection between maintaining healthy rivers, riparian areas and watersheds to benefit sturgeon and all organisms.

> 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 2023-2024 was to update components of the curriculum (eg. videos and calendars, the website itself, and the School Kits), and speak with educators about their interests and understanding of the curriculum.

CURRICULUM RESOURCES

> Paper and digital curriculum (Grade 4-7) that includes activities, lesson plans, field trips, and links to further resources.

> Sturgeon Classroom Kit that comprises of hands-on sturgeon tools and resources, include a silicon sturgeon, PIT tags, bioballs, fishing hooks, picture sheets, etc..

> 11 videos with activity sheets for K-12, plus an instructional video for the Storm Drain Painting program. **NEW in 2023, Video #11 about watersheds.**

> Digital classroom calendar.

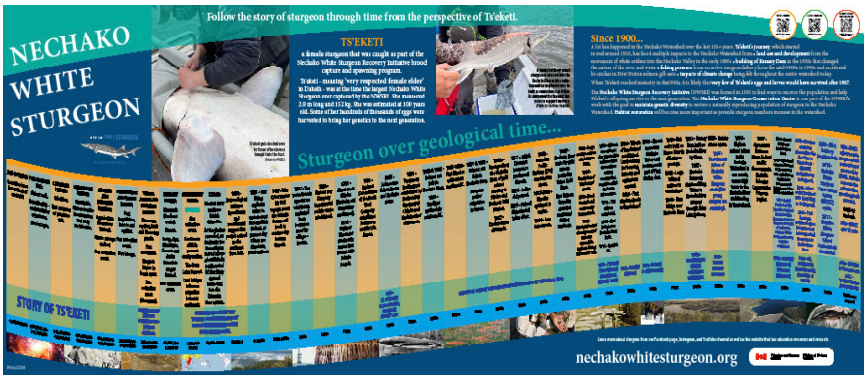
> Sturgeon size floor mat for students to measure up to a sturgeon in the classroom.

> Map of the Nechako watershed with sturgeon distribution.

> Tours of the Nechako White Sturgeon Conservation Centre, opportunities for guided tours, volunteerism in the hatchery.

> *The Nechako Watershed: Nature Guide and Educational Resource*.

> A **timeline handout** for classrooms (a great poster for your wall).



PROGRAM DETAILS

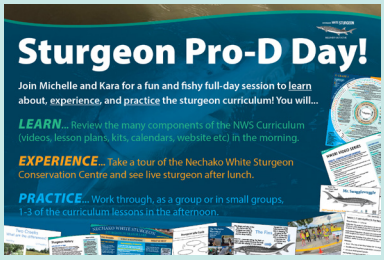
Lead: ***NWSRI and SD91***

Funding: ***$14,101***

Funders: ***HSP, SD91, NWSRI***

Start Year: ***2010***

2023 PRO-D DAY



In 2023, eight teachers participated in a professional development day about the curriculum. The educators came from schools in Vanderhoof, Burns Lake, Fort St. James and Prince George, and covered Grade 2 through 12. It was a great mix of teachers who had never used the curriculum to teachers who have used the curriculum extensively.

IDEAS & COMMENTS:

> Provide more information about the watershed including the history.

> Teachers need to understand why this curriculum and sturgeon are important so they can engage more with it.

> Make more videos.

> Create more worksheets, quizzes and group work activities.

> Include art activities.

> Include more First Nation content into the curriculum.

> Include more tours of the hatchery for teachers to help them learn more about sturgeon.

> Keep promoting the sturgeon curriculum across the School District.

JUVENILE STURGEON RELEASE EVENT

One of the biggest outreach events the NWSRI CWG hosts, the Juvenile Sturgeon Release Event is 'the best day of the year' for many. Students from across the Nechako Watershed (which has roughly the same geography as the School District 91 boundary) gather at Riverside Park in Vanderhoof to actively participate in sturgeon recovery.

OBJECTIVES

> Provide an opportunity for students from School District 91 (Nechako watershed) to participate hands-on in the recovery of Nechako white sturgeon.

> Host a public awareness opportunity.

PROGRAM DETAILS

Lead: ***NWSRI*** *Funding:* ***$38,078***

Funders: ***HSP, SD91, DoV, WLRS, DFO, FFSBC, SCWA, RT, ICU, CSTC, AMS***

Years: ***2006-2009, 2014-2019, 2022-2023***

The NWSRI along with its many partners hosted the Sturgeon Release Event on **June 2, 2023** at Riverside Park in Vanderhoof.

Again in 2023, 300 sturgeon, all approximately 70 cm long, were released as part of the recovery program. Of the 300, **63** were available for students to release in 2023. As a result, **800 students** from **14 schools plus home-school students** participated in the event and were part of releasing these 63 fish! Additionally, each student was able to **personally release a Chinook Salmon** into the Nechako River as part of the Spruce City Wildlife Association hatchery program.

After the fish releases, teachers led students around the kiosks and outreach stations that cover topics including sturgeon biology, salmon biology, the Boat Kit Program, watershed health and Koh learning. In 2023, students were particularly interested in the Conservation Officer booth, where they had their work trucks open for students to explore. Students also played the Wheel of Life to win a prize. Participants all received a free hot dog lunch.

The data collected from the event was added to the **"Where is My Fish"** database of the NWSRI website.




Photos from the 2023 Juvenile Release Event! Photos by NWSRI.

"Where is My Fish"

This online searchable database allows anyone who has released a juvenile sturgeon to find information about their fish, including fork length, weight, release location on Google Maps, and a photo of the student or class and their sturgeon at release (if applicable). Any subsequent recaptures of these fish are uploaded and added to the database so participants can follow the life of their sturgeon.

A class from Mouse Mountain School (Fraser Lake) with their sturgeon 'Eclipse Oooga Relic' before its release into the Nechako River. Photo by NWSRI.

AWARENESS AND OUTREACH EVENTS

The NWSRI CWG engages in a number of other activities to promote community education and general outreach about the Nechako White Sturgeon.

Public Education & Information

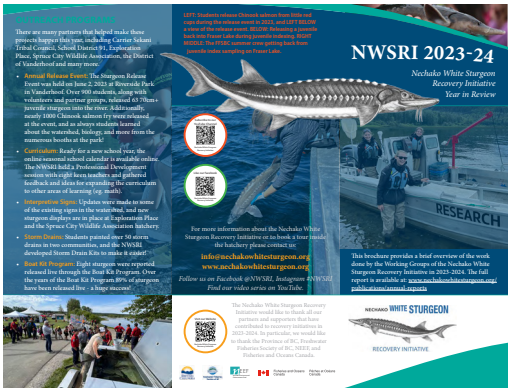
PROGRAM DETAILS

Lead: ***NWSRI*** *Funding:* ***$15,141***

Funders: ***HSP, SCWA, ExPlace, NWSRI, FFSBC***

Start Year: ***2012***

Over the years the NWSRI has built a wide network of interpretive signs across the Nechako River Watershed. The interpretive signs provide public awareness about sturgeon biology, conservation, history and watershed health. Part of that growth is partnering with other organizations to further promote sturgeon in new and exciting ways.



In 2023-2024:

- Two new interpretive signs at Spruce City Wildlife Association Salmon Hatchery in Prince George. Spruce City supports the NWSRI **radio telemetry** program and now there is information there about the program for everyone to read.
- Exploration Place is revamping their sturgeon display, and we partnered with them to create some new displays in the space that showcase the Nechako population and also general sturgeon biology.
- The NWSRI has begun producing newsletters twice a year. The first edition 'Spring 2024' is available online!
- Check out the Annual Brochure that gives a high level overview of the work of the NWSRI Technical and Community Working Groups.
- We made a new watershed map (see above)! We love our new map - it is showcased in the newsletter, but also on one of the new signs at the Spruce City Wildlife hatchery. We are updating many of the existing interpretive signs from across the watershed with this new map, so keep an eye out for it!.

Find all the above at the NWSRI website:
www.nechakowhitesturgeon.org

NWSRI Website & Social Media

OBJECTIVES

- Promote further interest in Nechako white sturgeon recovery.
- 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.

PROGRAM DETAILS

Lead: ***NWSRI*** *Funding:* ***$*** *Start Year:* ***2012***

Funders: ***Habitat Stewardship Program***

The NWSRI website is the one-stop location for information, research, reports, photos and educational resources on Nechako White Sturgeon. From April 2023 to March 2024 the website had **2974 visitors**.

NWSRI Facebook page **@NWSRI** has **1,012 Followers**, and the YouTube channel has **54 subscribes**. The NWSRI expanded into Instagram and has**187 Followers**.

Nechako White Sturgeon Recovery Initiative

c/o the Nechako White Sturgeon Conservation Centre
PO Box 710
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E-mail: info@nechakowhitesturgeon.org

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

www.nechakowhitesturgeon.org

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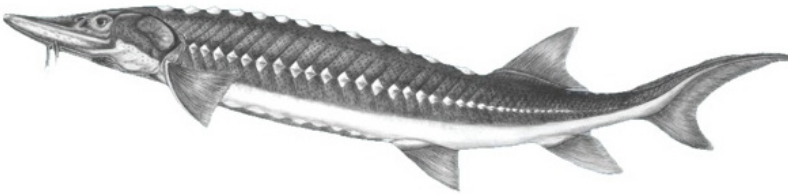
NECHAKO WHITE STURGEON



RECOVERY INITIATIVE

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