



NECHAKO WHITE STURGEON RECOVERY INITIATIVE

2019-2020 Annual Report



Figure 1. In this photo, a two-year old juvenile Nechako White Sturgeon is anesthetized and removed from the tank for a brief period of time in order to be fitted with a radio tag. In 2020, fifty out of the two hundred two-year old Nechako White Sturgeon will each be fitted with a radio tag that will allow the fish to be tracked throughout its journey in the Nechako River. Photo by the Freshwater Fisheries Society of BC.



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MESSAGE FROM THE NWSRI CHAIRS

Technical Working Group Chair Steve McAdam

In 2019/2020 the Nechako White Sturgeon Recovery Initiative's (NWSRI) Technical Working Group (TWG) team carried out several research and monitoring activities on the Nechako Watershed including adult spawn monitoring, juvenile indexing, an otter predation study, and a sediment transport investigation. Improvements in our understanding of the factors that affect spawning habitat and the habitat choices of spawning adults continue to support progress toward habitat-based restoration in the Nechako Watershed. I am hopeful that we can make further steps toward habitat restoration in the coming years. This year also marked the sixth 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 2019, staff remained focused on rearing juvenile sturgeon for release in 2020 and 2021. The NWSCC staff, project partners, and volunteers continued to serve the NWSRI through their combined efforts. Movements and habitat use by hatchery reared sturgeon were studied through radio telemetry and 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. Valuable work is ongoing on multiple projects and I expect this will continue to support recovery efforts through both habitat and hatchery-based conservation work. Thank you to all of the NWSRI partners for the collaborative effort that supports the ongoing recovery of this wonderful species.



Community Working Group Chair Wayne Salewski

The Nechako White Sturgeon Conservation Centre in Vanderhoof has had a very active year with the request for tours growing, both regionally and internationally with tour companies now booking well ahead as a destination stop. The growth and demand for tourism continues to thrive with the facility having three tour guides funded generously by Rio Tinto.

We continue to grow our signage program as we bring awareness to the adjacent communities of the presence of this animal though out the watershed. The signage growth and support is helping us bring the awareness issue to the forefront, which in turn brings awareness of the importance of a healthy watershed.

Our annual release of juveniles at the Riverside Park in Vanderhoof continues to provide excellent educational outreach opportunities while engaging schools and classes throughout the watershed. It continues to be very popular with several hundred people attending the annual event. We have a very committed group of stakeholders and volunteers that set up outreach stations, which provide awareness and education on the recovery program. We want to thank them and our coordinator for their continued support.

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 and fewer by-catch of sturgeon happening. We feel there is a need for the continuing 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. We need this program to respond to this possibility.

Our School District 91 educational programs continue to grow and modernize with the move forward to now present smart-board compatible educational videos. We are excited and very pleased with our first productions. We owe a big thank you to our coordinator – Andrea Sterling who has stick handled us through this program nicely and made this a program we can all be proud of.

The continued uptake of the facility as an educational centre is growing and has become a central focus of School District 91 as it develops complementary programs to bring watershed education opportunities to its students. The School District has funded the installation of three cameras this past year that will allow live streaming of videos of three different age classes from eggs hatching to large adults in the facility. This will greatly help teachers with new and current material on a daily basis. We again thank School District 91 for their support in the development and growth of the program.

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

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, and 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 stakeholders interested and invested in working together to find out why the Nechako White Sturgeon numbers have dropped dramatically in the last half century and what actions can be taken to restore a self-sustaining population within the Nechako watershed. The reduction in the total population of Nechako White Sturgeon may be due to many possible factors, including changes to habitat and flow regulation from the creation of the Nechako Reservoir and predation.

This report highlights projects on Nechako White Sturgeon from April 2019 to March 2020. The report is broken down into three main sections that provide updates on the 2019-2020 activities of the: 1) Technical Working Group (science-based arm of the NWSRI), 2) Community Working Group (outreach and awareness arm), and 3) the Nechako White Sturgeon Conservation Centre.

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

NECHAKOWHITESTURGEON.ORG



Photo 1. Juvenile White Sturgeon (photo by Dr. Nikolaus Gantner).



STRUCTURE AND FUNCTION OF THE NWSRI

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

- conservation fish culture;
- habitat research and recruitment failure mitigation; 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 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 three times in 2019-2020 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 is in decline; and,
- implementing the strategies to help restore the fish to a self-sustaining population.



Community Working Group

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

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

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

NWSRI Partnerships

The members of both the Technical Working Group and Community Working Group represent a wide range of organizations. Those involved during the 2019-2020 fiscal year included:

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

NWSRI Recovery Coordinator

Project: NWSRI Coordinator

Project Lead: NWSRI

Funders: FLNRORD via Land Base Investment Strategy- Species at Risk (LBIS-SAR) \$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 largely to outreach and education projects. Other tasks involve

maintenance of the website and social media, assisting in the development of outreach materials, and the coordination of public events. Andrea Sterling was the Recovery Coordinator during the 2019-2020 year. Andrea is a Fisheries and Aquaculture Biologist who lives in Prince George.



SPAWN MONITORING

Objectives

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

- 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 flow, temperature and substrate.
- To ascertain the exact location(s) where spawning occurs to inform habitat restoration decisions.
- 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 137 - 160 m³/s.
- The spawning period in 2019 (May 21 - June 06) occurred during peak spring discharge and through the descending hydrograph.
- Water temperature ranged between nightly lows between 11.0 - 17.5°C to daytime highs between 14.2 – 20.7°C. The overall average temperature was 15.78 ± 2.1°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. We use this information to help inform habitat restoration projects with the goal to improve in-river survival of eggs to year-old sturgeon, as well as to understand the behaviour of sturgeon in relation to the river characteristics. 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
- Radio-telemetry (fixed station, boat-based and aerial telemetry)



Photo 2. Wild caught eggs in a sampling container for transport to the NWSCC (photo by Michelle Roberge) and larval White Sturgeon caught in a fyke net in 2019 (photo by Jeff Beardsall).



EGG MATS

Objectives

- To confirm wild spawning activity in the river. Observe river conditions and spawning behaviours and habitat preference.
- 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

This is the third that year egg mats have been deployed to maximize the number of viable eggs collected for hatchery rearing. Most eggs detected by Carrier Sekani Tribal Council (CSTC) were detected at sites within the island complex or just downstream of the island complex in Vanderhoof. Most eggs were detected between May 21 and May 27.

- 77 egg mat sites in total within and downstream of the spawning reach.
- CSTC mats detected 787 eggs & NWSCC mats detected 844 eggs = 1631 eggs detected.
- Egg detections suggested the primary spawning event occurred around May 24th, 2019.
- Telemetry detections indicate the most adult sturgeon were present around June 6th, 2019.
- Prime condition eggs were found both upstream and downstream of the island complex within the spawning reach.
- Viable eggs were brought to the NWSCC, where they are reared separately from the hatchery program sturgeon.

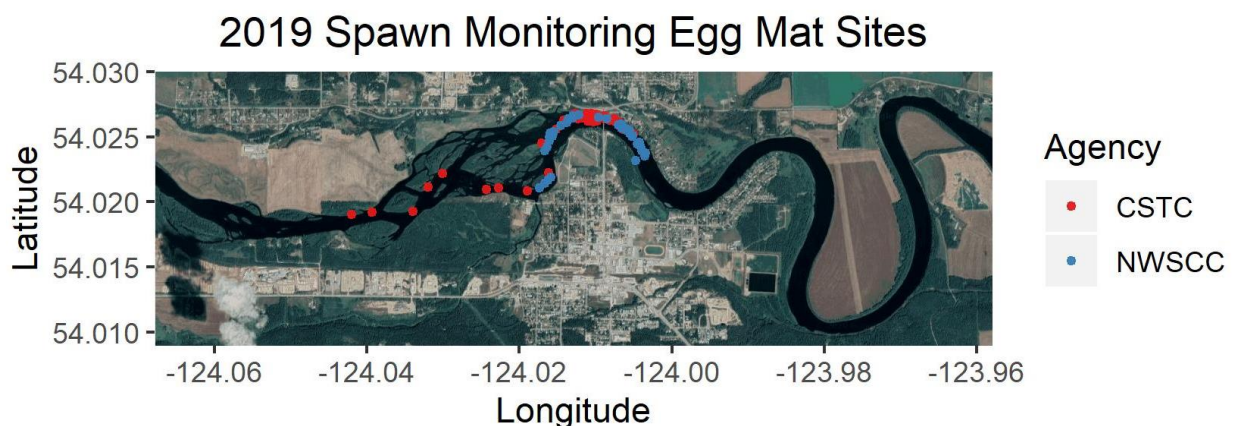


Figure 2. Map of 2019 Nechako River spawn monitoring egg mat sites (red for CSTC sites blue for NWSCC sites).



LARVAL SAMPLING

Objectives

- To confirm and assess wild spawning success to young-of-year life stages.
- 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 (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

Poor detection success in previous years resulted in novel larval sampling sites during 2019. Two yolk-sac larvae were detected in and downstream of the spawning reach on May 31st, 2019. A third free-feeding larva was detected approximately four kms downstream of the spawning reach on June 12th, 2019. Low numbers of detected larvae continue to affect the larval sampling program, however new sampling techniques and sites as being considered that might improve future captures.

- 19 sample sites; six in the spawning reach and 13 downstream of the spawning reach.
- Three larvae detected; two yolk-sac larva and one free-feeding larva.
- Yolk-sac larvae were detected seven days after primary spawning event.
- The free-feeding larva was collected and stored in EtOH for future analyses.

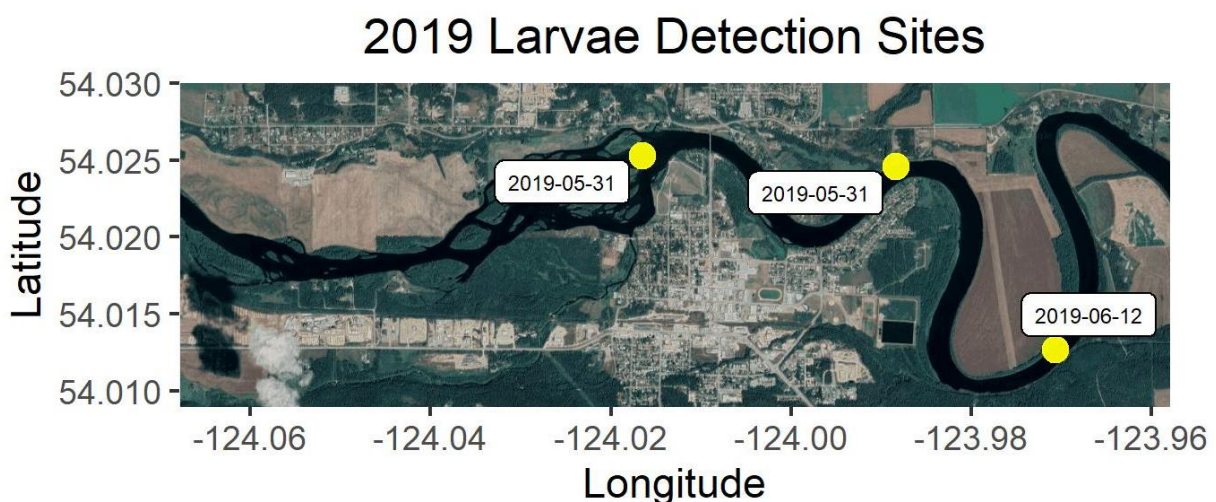


Figure 3. Map of 2019 Nechako River spawn monitoring larval detection sites. Detection sites are labelled with detection date of sturgeon larva.



RADIO TELEMETRY TRACKING

Project: Radio Telemetry
Project Lead: FLNRORD, FFSBC
Funders: \$22,000 total: \$5,000
LBIS- SAR, \$17,000 FLNRORD
with FLNRORD and FFSBC
monitoring in-kind
Start Year: 2015



Photo 3. Aerial telemetry receiver with Nechako White Sturgeon Conservation Centre below (photo by Dr. Nikolaus Gantner).

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

Objectives

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

Adult Telemetry Monitoring

Each year during the brood capture program adult sturgeon are radio tagged and monitored by boat-based crews. In 2019, 21 radio tags were implanted during the brood capture program, 12 of these were placed in recaptured adult sturgeon of which six were used to replace old tags. As a result, 15 sturgeon that had not been previously tagged were fitted with a radio tag. As of June 2019, approximately 269 adult sturgeon carry active radio tags in the Upper Fraser watershed (Nechako, Middle Fraser and Upper Fraser). To monitor sturgeon movements, five fixed telemetry stations are maintained in the Nechako watershed, three year-round sites (Vanderhoof, Ft. St. James, and Nechako confluence), and two operated seasonally (Nautley River, Lower Stuart). Two additional seasonal stations are set-up in the Fraser River at Stone Creek and the Bowron River by project partners since 2018. In addition to fixed stations, boat and aerial telemetry surveys are completed periodically to search for radio-tagged sturgeon.



Results

- Spawning activity is inferred from multiple daily detections at the spawning reach from May 10th to approximately June 4th, 2019. A total of 29 individual radio tagged adult sturgeon were detected at the spawning reach during this period.
- Several peaks of adult radio tag activity occurred on May 12-14th, May 20-25th and May 30th-June 4th when up to eleven individuals per day were detected at the Vanderhoof telemetry station (spawning reach) site.

Juvenile Telemetry Monitoring

Adding to past releases (75 radio tagged 1-year old juveniles since 2015 (refer to 2018 annual report), a further 62 large juvenile white sturgeon were released in 2018 and 2019. In 2018, 32 radio tagged large juveniles were released in Vanderhoof and 7,924 were released with just PIT tags. In 2019, a group of 30 radio-tagged large juvenile sturgeon were released on June 5, 2019th and 576 were released with just PIT tags. Radio-tagged sturgeon released in 2019 had an average fork length of 69 cm and were released at three sites, the Farm (rkm 116), Vanderhoof (rkm 136) and Fort Fraser (rkm 196). The 2018 and 2019 release trials focused on the post-release movement and survival of wild-egg origin, hatchery-reared juvenile sturgeon. This cohort was grown from wild-captured eggs that spawned naturally in the river in 2016 and 2017. Detection histories of fish from telemetry monitoring efforts are used to derive movement patterns, and areas where radio tags show little movement can reveal areas of mortality. The results of this study in part inform the Otter Predation study led by Cale Babey (UNBC).

Results

- During the 2019 survey year, all 30 juvenile radio tags were detected, ranging from river kilometer (RKM) 235 (upstream of Fort Fraser) to RKM 0 (Prince George). Three were observed in the Fraser River down to RKM 755 (Stone Creek). The majority of detections were from RKM 142 to RKM 105, with thirteen tags showing movement upstream of this section and four were detected downstream.
- By fall 2019, four juvenile radio tags released in 2019 were confirmed mortalities, two were recovered by monitoring crews and six more were no longer showing movement (detected multiple times in the same location), suggesting a mortality between 13-30% in the initial three months post-release. Tag recovery locations were near predator habitat (e.g. mammals, birds and fish).
- By August of 2019, after more than a full year at large, 18 (of 32) juvenile hatchery reared sturgeon released in 2018 were confirmed mortalities, seven were suspected mortalities and seven were thought to be alive, suggesting mortality of 56-78%.



SEDIMENT TRANSPORT RESEARCH

Project: Geomorphology and Sediment Transport Study

Project Lead: FLNRORD

Funders: DFO MOU \$40,000

Start Year: 2019

Objective: Characterize the physical condition of the spawning substrate on the river bed during the sturgeon spawning period as well as short term changes during high flows ($>300 \text{ m}^3/\text{s}$). This was done using a video camera installation downstream of the spawning bed throughout the spawning period as well as collecting still images in the vicinity of the known spawning locations.

Results

- Flows greater than $300 \text{ m}^3/\text{s}$ were not observed during the 2019 open water season.
- The study demonstrated the feasibility to use a fixed underwater camera system to monitor the condition of the substrate within the spawning reach in real-time.
- Turbidity in 2019 (which will vary from year to year) did not prevent the camera from recording relatively clear images of the substrate during the spawning period.
- Debris accumulation on the camera mount prevented continuous monitoring over the entire summer, which could be resolved prior to future use by altering the mount design.
- Underwater imagery collected upstream of the bridge during the spawning period showed that it was generally composed of highly infilled gravel and cobble (except where gravel substrate was added in 2011). This area is exposed to high sediment transport, with a large amount of sand observed to be moving over the surface of the river bed.
- Downstream of the bridge, the quality of the spawning substrate was also generally poor during the spawning period, except for a few small localized areas with good quality substrate along the north bank. The substrate along the center of the channel typically consisted of coarse gravel with sheets of sands observed moving overtop of it.
- The condition of the substrate within the spawning reach remained generally consistent from May to August as shown by images, except for some areas along the north bank and southeastern extent which showed more fines in August compared to May.

Recommendations

- Several fixed underwater cameras could be deployed within the spawning reach to monitor the substrate in real-time during the spawning period.
- Utilize high-precision GPS monitoring techniques to detect local changes in substrate composition over time to increase certainty in observed changes and to determine whether infilled substrate is annually “flushed” and restored by certain flows.
- The real-time underwater camera system could be used for other research purposes, including monitoring of controlled egg releases or spawning bed restoration activities.

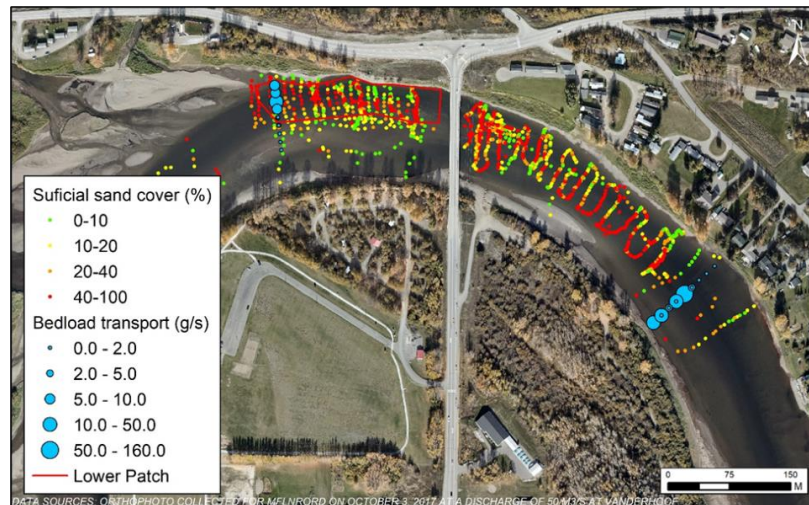


Figure 4. Pattern of sand dominated bedload transport through the spawning reach, as indicated by white arrow, overlaid onto substrate classification data from 2017-2019 and bedload sampling data from 2017-2019

OTTER PREDATION STUDY

Project: Otter Predation Study

Project Lead: UNBC

Funders: FLNRORD \$30,000

Start Year: 2016

Preliminary searches from 2016 to 2018 resulted in 93 hatchery-released juvenile sturgeon PIT tags being retrieved from seven River Otter (*Lontra canadensis*) latrine sites. In 2019, a UNBC graduate student studying this predation, with the help of FFSBC and FLNRORD staff, put increased effort into the identification of otter latrine sites and collection of PIT tags to gain a greater understanding of this predator-prey interaction.

Results

- 20 additional latrine sites and 4 feeding sites were identified and a total of 405 PIT tags retrieved from the now 27 known latrine sites and seven feeding sites in 2019. There have been 523 PIT tags collected to date.
- 21 of 32 radio tagged sturgeon released in July of 2018, and four of 30 released in 2019 were determined to be mortalities as their radio tags found on shore.
- Many of these were suspected to be the result of predation events, with the largest mortality being from a sturgeon released at 70.8 cm.



Photo 4. Partial carcass of radio tagged juvenile sturgeon released at 69.8 cm, found near otter den and otter latrine site (photo by Kyle Krahn) and three juvenile sturgeon PIT tags found in a single otter scat (photo by Cale Babey).



JUVENILE INDEXING PROGRAM

Project: Juvenile White Sturgeon Monitoring
Project Lead: CSTC
Funders: \$60,000 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.
- To refine knowledge of juvenile sturgeon habitat and distribution in the Upper Fraser watershed including Nechako watershed.

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, 30cm to approximately 130 cm fork length. Biological data, capture location, as well as river conditions are collected and recorded for each juvenile sturgeon caught.

Results

Location	Effort (hook hours)	Hatchery Captures (Recaptures)	Wild Captures (Recaptures)
Core reach Index Zone in Nechako River (RKM 105-135)	88,482	106 (49)	6 (2)
Peripheral areas in Nechako Watershed (Nechako River, Stuart River, Fraser Lake, Stuart Lake)	93,061	17 (2)	7 (4)
Fraser River Region 7 (RKM 755-835) & Lower Nechako (RKM 20-32)	24,917	10 (1)	25 (5)
Fraser River Region 5 (RKM 531-695)	34,199	35 (3)	54 (7)
Longworth Canyon Fraser River (RKM 957-955)	4,986	0 (0)	48 (14)

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 2019 Upper-Mid Fraser/Nechako Watershed Juvenile White Sturgeon Monitoring report.

JUVENILE STURGEON RELEASE

Project: Juvenile Sturgeon Release and Website

Project Lead: NWSRI CWG

Funders: Total \$32,540: Habitat Stewardship Program (HSP) \$3,150, NWSRI \$1,890; In-kind: FFSBC \$7,000; School District 91 \$5,000; District of Vanderhoof \$7,200; Rio Tinto \$800; Avison Management Services \$3,300; Integris \$1,000; UNBC \$1000, EnviroVikes \$400; NWSRI TWG \$2,600

Start Year: Release: 2006-2009, 2014-2019; NWSRI Website 2012

Objectives

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

The Juvenile Sturgeon Release Event was held on May 3rd, 2019 at Riverside Park in Vanderhoof. The NWSRI, along with Freshwater Fisheries Society of BC, School District 91 and the District of Vanderhoof, hosted the event. Students came from schools around School District 91, including public, private, First Nations, and home-school. Each student named and released a PIT (passive integrated transponder) tagged one-year old juvenile sturgeon into the Nechako River. Students also circulated through the interactive booths (hosted by Carrier Sekani Tribal Council, Department of Fisheries and Oceans, UNBC, Avison Management, and NWSRI), which covered topics on sturgeon biology, research programs of the NWSRI, river health and ecology, salmon biology, the Sturgeon School Curriculum, watersheds, and the spinning Wheel of Life. Participants got a free hot dog lunch and a tour at the Nechako White Sturgeon Conservation Centre as well. The data collected from the event is added to the “Where is My Fish” database of the NWSRI website where students can search their names to track the movements of the fish they released. Follow us on Facebook @NWSRI to attend future releases!

Results

500 sturgeon were released at the May 3rd event, by over 400 students from Vanderhoof, Fraser Lake, Fort St. James, Takla, Francois Lake, Prince George, and Burns Lake.

Outcomes

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

Find Your Fish

Nechakowhitesturgeon.org/whereismyfish



Photo 5. FFSBC staff prepping students to release their sturgeon and kids searching for PIT tags in the gravel (photo by Dr. Nikolaus Gantner).



EVERY FISH COUNTS - BOAT KIT PROGRAM

Project: Boat Kit Program

Project Lead: NWSRI and CSTC

Funders: Total: \$35,437 HSP \$16,643; Anonymous \$5,000; Mt. Milligan \$2,000; Rio Tinto Alcan \$5000; NWSRI \$1,575; In-kind: CSTC \$3,700; NWSRI \$1,719

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.

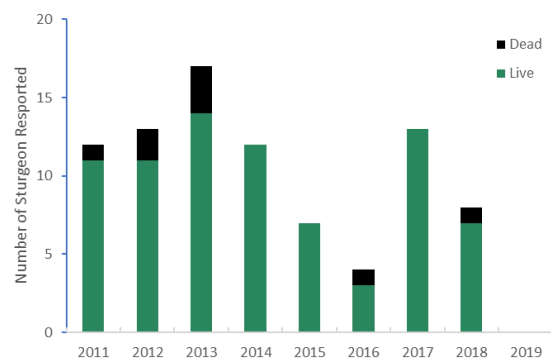
The Emergency Sturgeon Live Release Boat Kit program has been operating since 2011. It is an initiative developed by the NWSRI and Carrier Sekani Tribal Council (CSTC) to reduce the potential for by-catch mortalities associated with the First Nation Food, Social and Ceremonial (FSC) fisheries. Every 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.

2019 was a year all of our First Nation partners will remember. The Big Bar landslide largely blocked passage for returning salmon runs, with particularly dire impacts to the early runs such as the early Stuart Sockeye. This was a year of everyone coming together to protect and preserve the few salmon that did manage to get through or get lifted over the landslide. For this reason, our member First Nations did not fish for salmon this year and were forced to seek alternate protein sources or protein sources outside of the Nechako Watershed. Due to reduced fishing effort (e.g. other small fisheries such as char and burbot were active), there were no sturgeon encounters reported in 2019. Instead, some communities used 2019/2020 to further promote the Emergency Sturgeon Live Release Boat Kit program in their communities. This included school presentations, net mending workshops, posters, and working with fisher families to ensure the kits were working for them.

In 2019/2020 the First Nation communities that participated in the revised activities of this program were Saik'uz, Nak'azdli Whuten, Tl'azt'en, and Yekooche. A coordinator was also hired in 2019/2020 to help all communities with this program. Funds from communities that did not participate were used to purchase supplies for the program including three PIT tag readers.

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.
- An on-site community By-catch Monitor that can explain the program and help release sturgeon caught in a net.





SCHOOL CURRICULUM

Project: Nechako White Sturgeon Curriculum

Project Lead: NWSRI

Funders: Total \$43,085: HSP \$23,975; NWSRI \$2,835; In-kind: School District 91 \$10,510; FFSBC \$1,715; CSTC \$700; UNBC \$1000; NWSRI \$2,350

Start Year: 2014

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

Objectives

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

In 2019-2020 we started to migrating the curriculum content to mini-documentary format and developed three live streams from the NWSRI. We also created an interactive curriculum calendar and reorganize the curriculum materials on the website to be easier to navigate. The 2020-2021 calendar was tailored to specific age groups and includes links to videos and other resources.

Four 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

These videos are great for all age groups and audiences!

K-GRADE 3 2020-2021 STURGEON + CALENDAR

LEARN ABOUT LIFE CYCLES AND HOW DIFFERENT ANIMALS LIVE IN THE WATERSHED. SMARTBOARD - Click on the LINKS for more! ON YOUR CLASSROOM WALL - Add your own events and projects on this calendar!

Highlighted Calendar Dates/Activities/Links

October 11-12: Sturgeon Day! Sturgeon are an ancient species that have survived for over 350 million years. They are the only fish that can live in both salt and fresh water. Sturgeon are also the only fish that can live in both the ocean and the river. Sturgeon are also the only fish that can live in both the ocean and the river. Sturgeon are also the only fish that can live in both the ocean and the river.

BIG IDEAS!

- ✓ Life cycle
- ✓ Adaptations
- ✓ How living things interact with their environment

WHAT'S HAPPENING WHEN...

October 2020

Sun	Mon	Tue	Wed	Thu	Fri	Sat
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November 2020

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December 2020

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January 2021

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February 2021

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March 2021

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April 2021

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May 2021

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June 2021

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July 2021

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August 2021

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September 2021

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October 2021

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November 2021

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December 2021

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January 2022

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February 2022

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March 2022

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April 2022

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May 2022

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June 2022

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July 2022

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August 2022

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September 2022

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October 2022

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November 2022

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COMMUNITY OUTREACH SIGNAGE

Project: Juvenile Sturgeon Release and Website

Project Lead: NWSRI CWG

Funders: Total \$5,334: HSP \$4,460; In-kind: NWSRI \$394; UNBC \$480; City of Prince George \$400

Start Year: 2017

In 2019/2020, the NWSRI designed and printed nine interpretive signs to support public education and awareness within the Nechako watershed.

- Two complimentary signs for Nechako Riverside Park in Prince George.
- One sign with a focus on Stuart Lake at Sowchea Bay Provincial Park.
- One sign displaying research to date on North American River Otter Predation of White Sturgeon in the Nechako River to be displayed outside the NWSRI.
- A series of five signs that highlight four individual notable White Sturgeon.



Figure 5. One of two signs that were developed for Nechako Riverside Park in Prince George

OTHER NWSRI CWG ACTIVITIES

In 2019/2020 the CWG also completed the following activities.

- Website (nechakowhitesturgeon.org) and Facebook (@NWSRI) updates.
- Applied for funding via the Habitat Stewardship Program and other private sponsors because the previous agreement will end on March 31, 2019.
- Attended a Rivers Day event in Prince George.
- Participated in Nechako Water Engagement Initiative meetings.
- Developed an Annual Report and Brochure for 2018/2019 (printing costs covered by HSP \$750).



NECHAKO WHITE STURGEON CONSERVATION CENTRE

Conservation Fish Culture

Project: Conservation Fish Culture

Project Lead: FFSBC

Funders: Total: \$483,484. Nechako Environmental Enhancement Fund \$433,484, Rio Tinto \$50,000.

Start Year: 2014

Objectives

- To produce the next generation of sturgeon that will spawn naturally in the Nechako River.
- To conserve genetic diversity within the Nechako White Sturgeon population.
- To grow sturgeon to 2 years of age to get them through the critical recruitment failure stage.

This was the sixth year of operation for the Nechako White Sturgeon Conservation Centre. Mike Manky was the Hatchery Manager; Fraser Linza was the Senior Fish Culturist; and Peter Merth, Scotti Griffin and Emily Bailey were the seasonal Fish Culture Technicians.

Seven females were spawned with nine males in two events in 2019 in May and June. Numerous volunteers came to the Centre to help mix the eggs with the milt; this was definitely a community effort! There was good representation for each of the seven females used in the brood program. Of the 18 females caught during brood sampling, two were held over the winter to be used in future brood programs.

Eggs hatched by mid-June, and first feeding was a week later. As of February 2020, there were 400 juvenile sturgeon in the hatchery. This included: 200 from brood year 2018, 15 of which were from the 2018 wild egg collection. The additional 200 were from brood year 2019, 46 of which were from the 2019 wild egg collection. The 2018 brood year will be released in the Spring of 2020 and the 2019 brood year are expected to be released in the Spring of 2021.

Prior to release in the Spring of 2020, 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 6. Nechako White Sturgeon eggs in incubation containers (photo by Dr. Nikolaus Gantner).



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 or tracking of tagged adults to inform programs such as spawn monitoring.
- To monitor and assess the health of the adult sturgeon population.

Results

- 45 adult sturgeon (22 males and 18 females, and two un-sexed) were caught (three were caught twice) in a three-week period in April and May 2019, using set-lines and angling.
- Nine males and seven females were used for the brood program to make seven maternal families and 63 half-sibling crosses.
- Six radio-tags were implanted in adults that were not used in the brood program but returned to the river.
- Of 1341 wild eggs collected between May 17th and June 11th, 46 were held to the juvenile stage.



Photo 7. 2019 Broodstock captures by FFSBC staff with help from volunteers (photo by Dr. Nikolaus Gantner).

Juvenile Release

Five hundred juvenile sturgeon were released at Riverside Park in Vanderhoof, BC on May 3rd, 2019 by students from School District 91. Thirty-six juvenile sturgeon that were caught in 2016 as wild collected eggs and 70 in 2017 were released on June 5, 2019 at three different locations. The farthest upstream release group, consisted of 35 individuals that were released at Fort Fraser, RKM 196.4. The next group of 35 was released at the boat launch in Vanderhoof, RKM 136.4. The downstream group was released at RKM 116.9. Ten of the juvenile sturgeon released at each of the locations were released with radio tags. These 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: \$3,457

Objectives

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

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

Tour Statistics

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

- In total 2,287 people participated tours between May 2019 and April 2020. These people include public and private school students, tourists, industry managers, local governments, researchers, and the general public. In 2019, the facility was toured by Premier John Horgan.
- \$1,288 was raised from tour donations and \$250 was raised from merchandise sales between April 1st, 2019 and March 31st, 2020.



Photo 8. BC Premier John Horgan's 2019 visit to the Nechako White Sturgeon Conservation Center (Photos from John Horgan's Twitter).

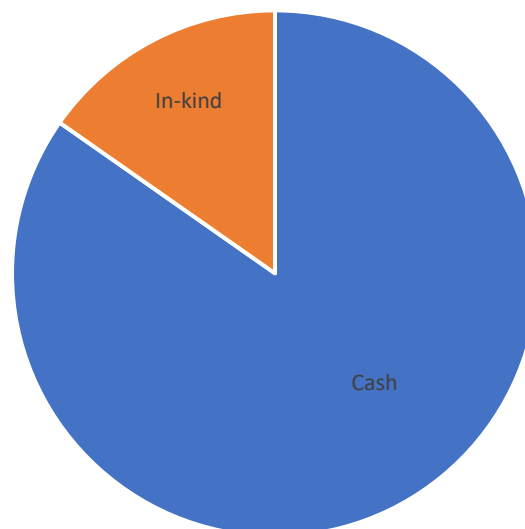
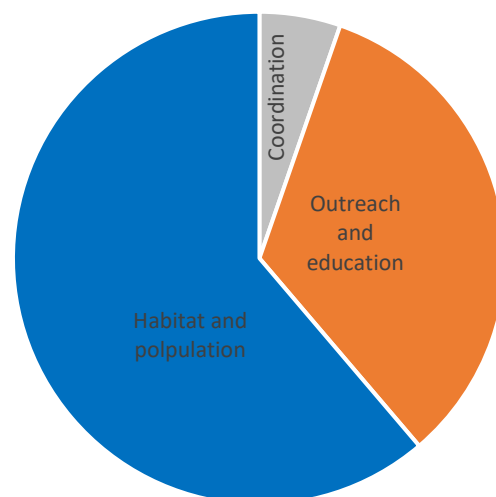


FINANCIAL SUMMARY FOR 2019-2020

Project Funding

Details on project funding for the 2019-2020 fiscal year are provided below. Project dollars came from a variety of sources including industry, government, environmental funding sources, and volunteer hours. The following provides a breakdown of financial and in-kind contributions. These numbers underestimate the number of in-kind hours that are generously donated to the NWSRI by researchers, hatchery staff and community members. These numbers do not include the funding to run the NWSCC.

Contributor	Cash	In-kind
AFSAR via CSTC	\$60,000	
HSP via CSTC	\$50,600	
FLNRORD	\$47,000	
Habitat Stewardship Program	\$46,248	
Fisheries and Oceans Canada MOU	\$38,820	
FLNRORD via Land Based Investment Strategy – Species at Risk	\$22,500	
Anonymous donor	\$5,000	
Mt. Milligan Community Fund	\$2,000	
NWSRI Sales & Donations	\$1,538	
Rio Tinto Alcan via CSTC	\$5,000	\$800
School District 91		\$15,510
Freshwater Fisheries Society of BC		\$8,715
District of Vanderhoof		\$7,200
NWSRI Working Groups		\$7,063
CSTC		\$4,400
Avison Management Services Ltd		\$3,300
UNBC		\$1,480
Integrus Credit Union		\$1,000
City of Prince George		\$400
EnviroVikes		\$400
Total Cash Contributions	\$278,706	
Total In-Kind Contributions		\$50,268
Grand Total	\$328,974	



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

Nechako White Sturgeon Recovery Initiative

c/o The Nechako White Sturgeon Conservation Centre

PO Box 710

3030 Burrard Avenue

Vanderhoof, BC V0J 3A0

E-mail: info@nechakowhitesturgeon.org

Facebook [@NWSRI](https://www.facebook.com/NWSRI)

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

www.nechakowhitesturgeon.org

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