

Nechako White Sturgeon Recovery Initiative 2014-2015 Annual Report



NECHAKO **WHITE STURGEON**



RECOVERY INITIATIVE



Youngsters helping youngsters. Students from Nechako Lakes School District (SD 91) helped release hundreds of hatchery-raised juvenile Nechako White Sturgeon into the wild at the First Nechako White

From 1994 to 1999, the Province of British Columbia coordinated an intensive study of white sturgeon in the Nechako River. The study came to an unwelcome conclusion - the Nechako white sturgeon are in a critical state of decline. Unless immediate action is taken these great creatures, survivors from the age of dinosaurs, will become extinct in the Nechako watershed.

With so many stakeholders involved along the entire length of the Nechako River, it was imperative that all interested parties gather together to begin working as a team in recovery planning efforts. This was the beginning of the Nechako White Sturgeon Recovery Initiative (NWSRI). The NWSRI is composed of two committees: the Technical Working Group (TWG), which is responsible for identifying the reasons for the decline of white sturgeon in the Nechako watershed, and for the design and implementation of habitat protection, restoration and management options; and the Community Working Group (CWG), which focuses on increasing the public's awareness and knowledge about the recovery process, as well as the ecological problems facing the Nechako white sturgeon.

The Nechako White Sturgeon Recovery Initiative is committed to ensuring that sturgeon, from juveniles to adults, continue to live in the Nechako River for many generations to come.

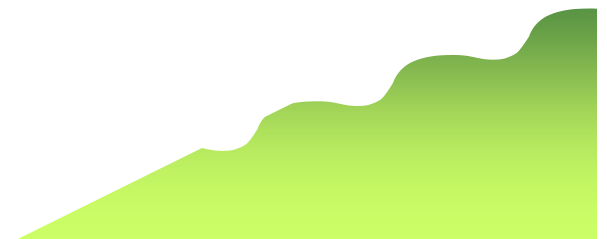
For more information on the NWSRI, and for detailed reports on projects outlined in this report, please visit our website:

www.nechakowhitesturgeon.org

Cover Photo: FFSBC staff, Mike Manky, holds a juvenile Nechako White Sturgeon produced by the new Conservation Centre. To increase their likelihood of survival, juvenile sturgeon are reared in the hatchery for approximately one year before they are released into the wild. Photo by FFSBC staff.

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Messages from the Chairs

Technical Working Group

The opening of the Nechako White Sturgeon Conservation Centre (NWSCC) in spring of 2014 has been a monumental step forward for the NWSRI as we work to prevent the loss of these majestic fish. The work of NWSCC will support the three priorities of the NWSRI: 1) Conservation fish culture; 2) Habitat Research and Recruitment Failure mitigation; and, 3) Stewardship and Education.

With the NWSCC in place, many recovery projects can now be based out of the centre allowing for more efficient project delivery and better integration with the local community - in short it is now easier to work together on-site to achieve our goals. In the first year of operation, the NSCC (operated by the Freshwater Fisheries Society of BC) had its ups and downs as staff learned the new system and worked out the bugs, however, despite low river flows, high temperatures, forest fires and many of the issues normally expected with the start-up of a new facility, the new staff with the support of partners and the help of numerous volunteers from the local community, managed to produce 1,260 juvenile sturgeon up to 1 kg in size! These fish are expected to be released in spring 2015 and are the first juvenile releases since pilot juvenile release program concluded in 2009. Thirty of these individual juvenile fish have been tagged with radio transmitters to monitor their movements and survival in the coming years. Significant progress was also made on habitat projects through partnerships with UBC, UNBC, and others including preliminary work to understand sediment transport and volume in the spawning reach. With this “big” year now behind us, the future of Nechako White Sturgeon seems a whole lot brighter!



Cory Williamson, TWG Chair, and his son showcase a healthy looking Nechako White Sturgeon!

Cory Williamson, Chair
NWS Technical Working Group
March 31, 2014

Community Working Group

As the completion of the construction of the hatchery was being wrapped up and contractors were being moved off site the opening of the Nechako White Sturgeon Conservation Center was blended into the hectic pace of the first official onsite spawning event.

Our first spawning program was incredibly long with all of the females induced and ready to spawn seemingly at the same moment we confirmed we were OPENED. The support for our first program from across the region was just great with people and groups traveling from Terrace to Quesnel to lend a helping hand in creating our first of what will be many new and diverse sturgeon families.

The Community Working Group has started the work required to understand what our outreach programs will be this season as we continue to partner with the many First Nation bands and their Fisher families to ensure live releases of sturgeon caught during their salmon, char and ling cod fishing seasons. We also work in partnership with our community and School District to understand opportunities in tourism and education.

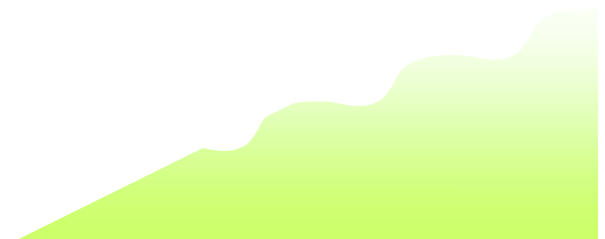
Although the hard work in having this facility built is behind us....we have a lot ahead of us to ensure we capitalize on the opportunities this facility has provided for the region, our universities, colleges and communities as we work to protect the Nechako White Sturgeon and enhance the opportunities for its survival for another 6 million years plus.

I want to thank the many individuals and groups that make up the Community Working Group, without you this would not be the success it has been to date.

Wayne Salewski, Chair
NWS Community Working Group
March 31, 2014



Wayne Salewski, CWG Chair



The Teams

Technical Working Group

The Technical Working Group (TWG) was formed in September 2000, and is made up of private sector, federal and provincial biologists as well as First Nations and industry experts. Each member has specific qualifications, including a working knowledge of white sturgeon biology, expertise in streamflow management/hydraulic engineering or experience in other animal recovery initiatives. Some members have a regulatory role with regard to the protection of fish and their habitats in the Nechako watershed.

This team of scientists is responsible for investigating *why* the Nechako white sturgeon population is in decline, and then developing an effective plan to help restore the fish to a self-sustaining population. These strategies are based on the best-available science, local, and traditional knowledge.

Community Working Group

In April 2001, the Community Working Group (CWG) was assembled. Composed of some 20 individuals that represent First Nations, non-government environmental organizations, industry, local and regional governments, and affected public, the group was created to provide input from river stakeholders, and to act first and foremost as a public advocate for Nechako white sturgeon and the Recovery Initiative.

The CWG provides an opportunity for key groups essential to the success of the Nechako white sturgeon recovery plan to become involved in the process. The group focuses on increasing the public's awareness and knowledge about the recovery process, as well as the ecological problems facing the Nechako white sturgeon. It is also concerned with building and maintaining community support for the recovery plan and communicating progress back to their respective organizations.

Together the TWG and CWG work towards a common vision of sturgeon recovery. The TWG works to develop and oversee implementation of the Nechako White Sturgeon Recovery Plan. 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 Initiative, and assists the TWG by garnering public and financial support for sturgeon recovery within the Nechako watershed. By sharing a common coordinator, the two groups maintain a continual flow of information and are able to support each other on projects as needed.



NWSRI TWG & CWG Partnerships

Partners Involved During 2014-2015

The members of both the Technical Working Group and Community Working Group represent a wide range of organizations. Those involved during the 2014-2015 fiscal year included:

Avison Management Ltd.	Fraser River Sturgeon Conservation Society
BC Ministry of Environment	Freshwater Fisheries Society of BC
BC Ministry of Forests, Lands & Natural Resource Operations	Lheidli T'enneh First Nation
BC Nature (Federation of BC Naturalists)	Parks Canada
Carrier Sekani Tribal Council	Rio Tinto Alcan Inc.
District of Vanderhoof	Spruce City Wildlife Association
Fisheries and Oceans Canada	Tl'azt'en Fisheries Program
Fraser Basin Council	



Juvenile Nechako White Sturgeon in one of the rearing tanks at the Nechako White Sturgeon Conservation Center. These sturgeon are spending the winter 2014-15 at the hatchery to allow them to grow large enough to be past the majority of the early predation stages (egg and larvae). On May 4, 2015, ~600 of these juvenile sturgeon will be released in a large, public event held at Riverside Park in Vanderhoof. Riverside Park is adjacent to the only known Nechako white sturgeon spawning grounds. For now, however, their job is to grow!

Project Updates for 2014-2015

Broodstock Capture

Project Lead: Freshwater Fisheries Society of BC

Funders: Freshwater Fisheries Society of BC as part of operations of the conservation centre. Please refer to the budget for the NWSCC.

Year: 9 and ongoing

Capturing fish that can be used for broodstock is fundamental to the success of the Nechako White Sturgeon Conservation Facility (NWSCF). The Broodstock capture program has three main objectives:

- 1) To capture of brood fish for hatchery purposes;
- 2) To place more tags and replacement of tags; and,
- 3) To continue the monitoring and collection of biological data.

The goal of the NWSCF is to produce sturgeon using eggs from 12 adult females and milt from 12 adult males in a factorial mating design. The end goal is to release 12,000 juveniles per year into the Nechako River at various predetermined locations.

Broodcapture ran from April 24th to 20th May, and crews spent a total of 25 days on the river. A total of 54 sturgeon were captured representing: 10 immature males, 25 mature males; 11 females, 6 of which were mature; three unknown gender adults and one juvenile (i.e., <1m). Two of the 6 mature females were taken to the hatchery to assess their future maturity. They will be held over the winter for future spawning within the next one to two years. Almost 60% of sturgeon captured were mature.

Forty-one of the 54 sturgeon captured received a radio-tag and a PIT (Passive Integrated Transponder), 12 received PIT tags only, and one female taken to the hatchery will receive a radio-tag and PIT tag upon her future release.



Coming aboard the boat for processing. This sturgeon captured during the broodstock program will be assessed as to its applicability as broodstock or if it will be radio-tagged and released on site.



This adult Nechako white sturgeon is having its transmitter replaced so it can continue to contribute valuable biological data on movement and habitat use.

Project Updates for 2014-2015

Juvenile Indexing Program

Project Lead: Carrier Sekani Tribal Council

Funders: Aboriginal Funds for Species at Risk \$29,500 via Carrier Sekani Tribal Council

Year: 11 and ongoing

The juvenile index program started in the early-2000's using multi-panel gill nets. In 2009, we switched to gill nets. Later, the set line method was used because we are not targeting adult fish. Our current sampling utilized setlines with small, light-gauge circle hooks (Sizes 4, 2, 1 and 1/0), so we can focus on the capture of juvenile white sturgeon. The goal of the juvenile index program is to catch sturgeon <1 m in length (100 cm), and to monitor trends on an ongoing bases. The data will also help us determine if there is an effect with our habitat restoration work.

The 2014 Nechako White Sturgeon Juvenile Indexing program ran from the 15th September to the 17th October. Sampling began at Vanderhoof river kilometer (rkm) 110.2 and covered to 135 rkm, over 20km downstream of the Burrard Street Bridge. Sixteen fish <1 m were caught, but one fish was captured twice, resulting in 15 individual fish sampled; this was less than anticipated. All 15 juvenile fish captured were wild origin fish, and 13 of those were wild origin not previously captured. Fork length ranged from 42.1 to 87.5 cm with a mean of 59.4 (median 59.3 cm) for the 13 wild origin fish. The two recaptures had fork lengths of 51 and 51.9 cm, respectively.

The large proportion of new juvenile fish was not consistent with past results. Sampling distribution was the same as past years' sampling and we continued to focus on the 5 key locations to catch juveniles because that is where the prime habitat for juvenile sturgeon was previously identified. The flow and discharge of the river was noted to be lower than normal, but water temperature during the sampling period was similar to past years.



This juvenile sturgeon waits to be released back into the Nechako River after having its biological information recorded. This information will help inform habitat restoration projects.



Neil Heron, Stellaten member and CSTC staff, gets set to release this juvenile sturgeon that was sampled during the 2014 juvenile index project.

Project Updates for 2014-2015

Adult Spawn Monitoring (Telemetry, Egg Mats and Drift Net Sampling)

Project Lead: Carrier Sekani Tribal Council

Funders: Aboriginal Fisheries Strategy \$7,025 (training & wages); Canadian Forest Products Pulp Division \$10,000 (fixed station telemetry); Fisheries and Oceans Canada via Species at Risk Committee (SARCEP) \$37,752 (VEMCO array); Habitat Stewardship Program to CSTC \$70,830 (spawn monitoring).

Year: 11 and ongoing

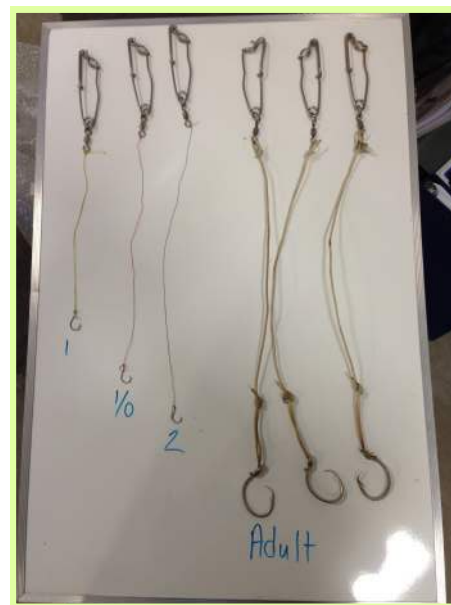
In the past the spawn monitoring program was conducted to examine if sturgeon are spawning, when, and where, but now we are using the information to inform habitat restoration. The current objectives of the adult spawn monitoring program are to determine the timing of spawning and the physical parameters of the river that occurred during that time frame, such as river flow and temperature. We also want to ascertain the exact location(s) that spawning occurs to inform habitat restoration decisions.

Telemetry (Adult Monitoring)

Fish were radio-tracked during spawning through to the end of October, 2014. There were a total of 147 fish detections representing 53 unique fish. The fish encountered the most times ($n = 18$) was a 32 year old male fish that was first captured in 2006 at Rkm 132.4. This fish was recaptured in 2011 and 2012.

Fixed Station Telemetry

In 2014, there were 5 fixed telemetry monitoring stations located at: Spruce City mouth; Vanderhoof; upstream Nadleh; Lower Stuart; and, Upper Stuart. Each fixed station site was visited 5-6 times throughout the season (~once per month). We use the fixed station data to examine fish movement throughout the River system. Each fixed station as receiver that is programmed to pick up the code of a tagged fish when swims by the receiver. We then know what date, time, and direction the fish was travelling. On August 15, 2014, there was a loss of power the Nadleh station which was not discovered until September. Unfortunately, the dates the Nadleh station was not working coincided with the sockeye run. The Upper Stuart lost power from 5-10 May, 2014, but was otherwise operational. On August 10th, 2014, a receiver that could detect the older 1994 code set radio-tags was installed at Spruce City. Therefore, there were two receivers at Spruce City: one for the 2000 and one for the 1994 code sets. The last check of that receiver was on the 15 October. Overall there were 1,010 detections of fish recorded, representing 61 individual fish being between Vanderhoof and the Stuart River. By fixed telemetry station: 11 individual fish were detected at Spruce City mouth, 30 at Vanderhoof, 2 at Nadleh, 40 at Lower Stuart, and 3 at the Upper Stuart. In some cases the same fish was detected at multiple stations.



A look at the different size of hooks used to capture sturgeon of different age classes. Fish must be captured to be implanted with radio-transmitters to track their movements throughout the watershed.

Project Updates for 2014-2015

Adult Spawn Monitoring Continued

Acoustic Telemetry

Unfortunately, the funding source that supports the acoustic array project was announced late and although tags were purchased, and they system was put in place, the funding was not available to deploy the tags in time to monitor spawning. Last year's testing went well and we plan to have a functioning, 18 receiver (or more), 3-dimensional array, in place for the 2015 spawning event. Once funding was announced the project was approved for 2-years so work will begin immediately in spring/spawning 2015.

The acoustic array information is very important to help inform habitat restoration decisions because a sturgeon can be mapped to a 3D location, to an accuracy of +/- 1m. The array works by having three receivers communicate with each other at all times, and then those three communicate with another three, and so on, to achieve very precise locations of spawning fish. This information will allow us to determine if fish are focusing on a particular spot to spawn. From a restoration perspective we can then focus gravel placement rather than placing gravel through the entire reach.

Egg Mat Program

Mats used to collect sturgeon eggs (i.e., egg mats) were first set May 17, 2014, and remained in place until the 10 June, 2014, for a total of 24 days monitored. In total, 51 egg mats were deployed. Twenty-four of the large egg mats were placed on the lower gravel pad near the Burrard Street bridge, while the remaining 27 were distributed throughout the upper spawning grounds. No smaller mats were deployed this year because they were used for anchors for the acoustic array.

The first check for eggs on the mats was on May 23rd and 554 eggs were collected. Eggs were found on the lower gravel pads and in the upper 3 main stem. Six mats collected eggs twice. Water depth ranged from 2.5 m-0.8 m. Water temperature ranged from 12.2°C to a high of 15.6°C on 2 June, 2014. The temperature of the mats that eggs were collected ranged from 11.8°C to 14.8°C. The depth of the location of mats with eggs collected ranged from 1.2 m to 2.6 meters.

On 28th May, 2014, NWSRI TWG members observed wild sturgeon spawning behaviour occurring from Murray Creek to the bridge around the bird sanctuary. This observation coincided with the egg mat program and eggs were collected on that date (see figure next page).



Buoys (and red arrows) mark the locations of egg mats in the Nechako River.

Project Updates for 2014-2015

Adult Spawn Monitoring Continued

Drift Net Program

Based on the information we obtained from the egg mat program 6 drift nets were deployed below the Burrard Bridge but no larvae were caught. The expected first hatch is 12 to 15 days after spawn. Sampling ran from June 4 to 21 for a total of 9 sampling days, 4 during the day and 5 overnight sampling periods. Sets that fished during the day were deployed June 4- 7th, and sets that were deployed overnight ran 17-21st June. The NWSRI and CSTC considered whether or not we missed the sampling window or if the eggs did not survive. We concluded that is possible that the lack of larvae may have been due to poor rearing conditions.



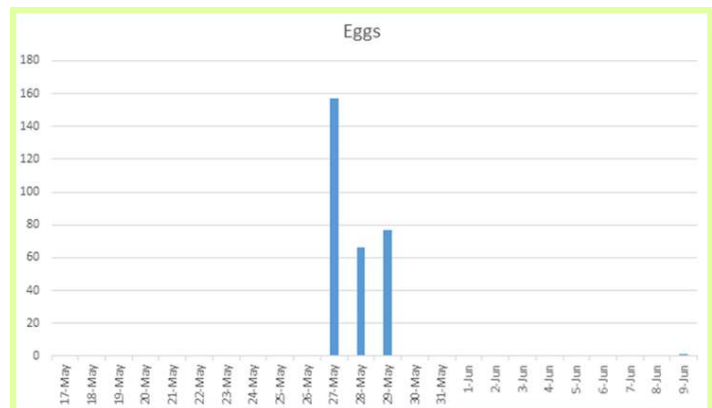
Egg mats waiting to be deployed throughout the Nechako white sturgeon spawning reach, 2014.



Aaron Raphael of Saik'uz checks an egg mat, 2014.



A Nechako white sturgeon egg recovered from a egg mat, 2014. Photos by CSTC.



Histogram showing the number of eggs caught by date. The data indicate a spawning event on 27-29 May, 2014. Last year there were two spawning events and the graph had two peaks.

Project Updates for 2014-2015

Sediment Dynamics and Spawning Habitat Research

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

Funders: Fisheries and Oceans Canada via Species at Risk Committee \$48,500

Year: 5 and ongoing

In 2011, two pads of cleaned and sorted gravel substrate were placed in two sections on the bed of the Nechako River near Vanderhoof and each year since placement we conduct biological (wild spawn monitoring egg production, incubation and early larval rearing success) and physical monitoring programs (e.g., sediment infilling). The results of the biological monitoring are discussed under the Adult Spawn Monitoring section. The objectives of the 2014-15 physical monitoring was to study the sediment dynamics in the reach within a range of hydraulic conditions to better understand sediment supply and transport rates, and timing and patterns of sediment deposition, in order to better understand the range options available for future habitat restoration.

We again hired Northwest Hydraulics Consulting Ltd. to help determine the suspended sediment load and bedload transport rates of the Nechako River at the spawning grounds. In 2014, we focused sampling on the Upper Site and Lower Patch gravel pads, sampling at 5 minute intervals with 10 m spacing. This year we increased our bedload sampling by monitoring at different flows and different times of the year for both the Upper Site and Lower Patch (see map). Bedload sampling started in April and continued through August, for a total of 12 sample days. The August sampling was during the Skins Lake Spillway cold water release and therefore had a higher flow than other sampling periods. We used a Helley-Smith sampler to assess bedload transport within the reach. Suspended sediment samples were gathered during April and May 2014 around the Burrard Avenue Bridge during the spring freshet using a D-74 depth integrated sampler and crane at 10 m spacing across the channel.



Bedload is assessed using a Helley-Smith sampler, attached to a crane and launched from an anchored boat. Photo by NHC and can be found in their 2014 report.

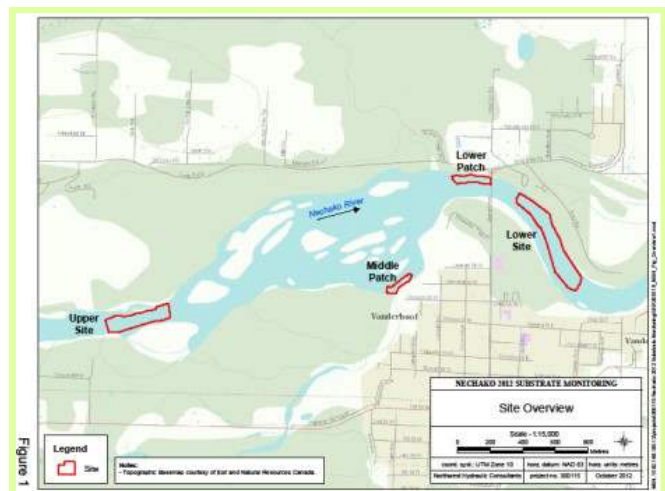


Figure 1

Location of the substrate monitoring pads in the Nechako River at the white sturgeon spawning grounds. Photo by NHC and can be found in their 2012 report.

Project Updates for 2014-2015

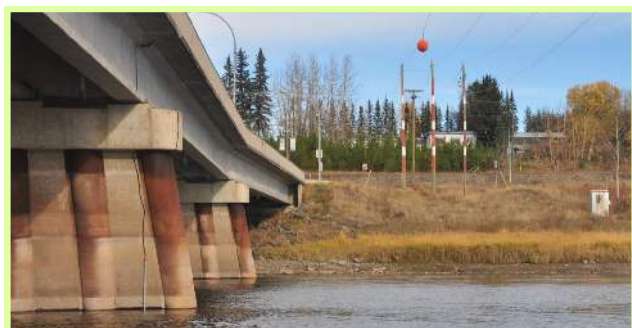
Spawning Habitat Manipulation Gravel Placement Project Continued

The 2014 work concluded that the Lower Patch had more sediment moving through than the Upper Site. Overall, the amount of sediment movement was more than 2013. The majority of the suspended sediment arrived during the spring freshet rather than the cold water release period. Therefore, NHC concluded that the tributaries may be an important source of fine sediment in the Nechako River. NHC found that 2,000 m³ per year more sediment moved past the Lower Patch than the Upper Site in 2014. The 2014 bedload-to-total load ratio was 5% for the Upper Site and 14% for the Lower Patch. NHC considers the revised data more reliable but notes that it still needs refinement based on measurements at higher flows. The volume, timing, and source of sediment material and transport are not well known and we will continue the physical monitoring of the gravel pads in 2015.

For more information on the physical monitoring component of this project please download the 2014 Sediment Transport Investigation on the Vanderhoof Reach of the Nechako River produced by Northwest Hydraulic Consultants by clicking on this link: <http://nechakowhitesturgeon.org/research/reports>



Crew prepare to deploy the equipment required to monitor the physical aspects of the Nechako River as part the physical monitoring program. Photo by Z. Sary, FLNRO.



The turbidity sensor was installed using the Burrard Avenue bridge's middle pier as its anchor.



Andre Zimmerman from NHC samples turbidity and suspended sediments as part the physical monitoring program.

Project Updates for 2014-2015

Instream Structures Project

Project Lead: Ministry of Environment, University of British Columbia

Funders: Fisheries and Oceans Canada via SARCEP \$22,000

Year: 1 and ongoing

As part of our physical monitoring work, University of British Columbia Master's student, Simon Gauthier-Fauteux, began an instream structures project. Altering the natural flow and sediment regimes of a river may cause significant physical and ecological change within the ecosystem. One common effect of flow-regulation by dams is a reduced ability to mobilize and transport sediment. As sand and fine gravels increasingly deposit on the river bed, the naturally occurring gravel substrate may become covered and pore spaces between larger gravels and cobbles may infill. This process is currently occurring within the critical White Sturgeon spawning reach of the Nechako River at Vanderhoof. The reason substrate infilling and loss of pore space is a concern is because the quality of this habitat is believed to be a key feature for larval survival and ultimately recruitment. Larval White Sturgeon have been shown to preferentially hide within these pore spaces immediately after hatching, providing them with several survival advantages such as increased growth and reduced predation.

This project was initiated in May 2014 to examine methods to provide localized remediation by restoring the quality of interstitial physical habitat. The purpose was to design low relief structures that mimic natural bedforms in the river. Prototype fixed bedforms (< 15 cm in height) were developed and pilot field tests occurred just upstream of the Burrard Street Bridge. A total of six low relief bedforms were installed on the river bed and monitored with underwater video (lowering a camera from a boat). The structures were removed in September/October of 2014. The goal of this study is to test the effectiveness of these small scale habitat restoration measures with respect to localized substrate cleaning and the alteration of sand deposition patterns. Sampling occurred in July and August when the flows were high. In July the sediment was more confined to a narrow band, and the transport rate was lower than in August. In August, increased sand was found and the cobbles visible in July were not visible in August. If effective, such structures may provide a means to increase the complexity of the river bed and to maintain suitable substrate conditions in restored habitats.



The cylindrical half-circle shape was chosen to replicate flow dynamics typically observed over a sand dune.

Preparing to deploy the low-relief bedforms with help from Mike Manky, FFBBC. The bedform can be seen in the photo as a black, cylindrical half-circle shape.

Six bedforms were placed in clusters of three on the lower spawning pad, immediately upstream of the Burrard Bridge (as indicated by the buoys). The bedforms were placed in clusters in an attempt to preferentially route sediment through the area.



Community Education, Outreach & Harm Reduction Programs for 2014-15

EVERY FISH COUNTS – The Emergency Sturgeon Live Release Boat Kit Program

Project Lead: Nechako White Sturgeon Recovery Initiative and Carrier Sekani Tribal Council

Funders: Habitat Stewardship Program \$18,350; Integris Credit Union \$2,000; Carrier Sekani Tribal Council \$11,500 In-Kind; Nechako White Sturgeon Recovery Initiative \$5,500 In-Kind and cash.

Year: 4 and ongoing

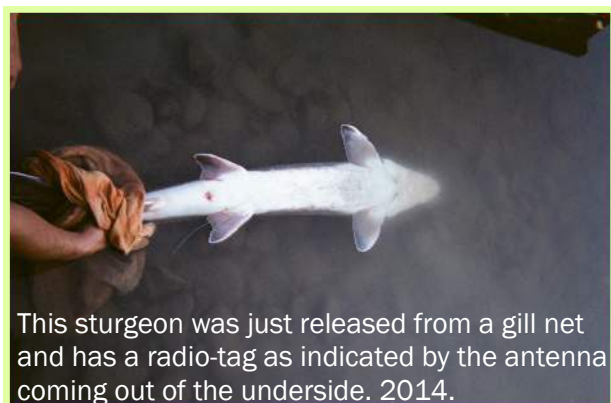
The White Sturgeon Recovery Plan states that the primary population objective is to “Prevent extirpation of white sturgeon in each of the four identified populations by preventing net loss of reproductive potential” (SARA 2014:51). The Emergency Sturgeon Live Release Boat Kit program was piloted in 2011 because the NWSRI and CSTC had become aware that an unknown number of sturgeon were by-caught in association with the First Nation Food, Social and Ceremonial fisheries. The Boat Kit program has three main components: (1) a kit small enough to remain in the boat at all times and contain all of the tools necessary for a successful live release; (2) a video, *Every Sturgeon Counts: Live Release of Gill Netted Sturgeon* (<http://www.youtube.com/watch?v=YhrEJUEi-ow&feature=colike>), and (3) an on-site community bycatch monitor that can explain the program and help release sturgeon caught in a net.

The goal of the boat kit program is to help reduce accidental harm to sturgeon and the sturgeon population as a result of sturgeon bycatch associated with the First Nation gill net fisheries.

Every fish counts! Program Results

12 live releases were reported during the Food, Social and Ceremonial (FSC) fisheries by four of the seven bands (Tlazt'en $n = 5$, Takla $n = 1$, Stellaten $n = 1$, Nakazdli $n = 3$, Lheidli $n = 3$). Two mortalities were reported: a mature sturgeon found washed up on an island within Stuart Lake and that died of unknown causes; and, a report of a sturgeon in a smoke house. There were no sturgeon encounters reported in the fall/winter setline fishery.

The ultimate long-term result of the boat kit program is maintenance of breeding stock for future breeding purposes as well as genetic variability thereby being directly applicable to the white sturgeon recovery strategy. Since its pilot year in 2011, 49 sturgeon have been live released (2011 $n = 12$, 2012 $n = 11$, 2013 $n = 14$, 2014 $n = 12$).



The Emergency Sturgeon Boat Kit provides all of the materials necessary to live release sturgeon bycatch and to fix nets that are damaged as a result of a live release.

Grand Opening of the Nechako White Sturgeon Conservation Centre

Outreach and Harm Reduction Programs

Project Lead: FFSBC and NWSRI CWG

Funders: Freshwater Fisheries Society of BC \$15,000 in-kind; Habitat Stewardship Program \$4,620; District of Vanderhoof \$2,000 in-kind; NWSRI \$3,420 in-kind; CNC in-kind \$600

Year: 1 and complete

Decades of persistence, dedication, and determination came to fruition with the celebration of the Grand Opening of the Nechako White Sturgeon Conservation Centre on the 17th June, 2014. The event was hosted by the Freshwater Fisheries Society of BC, the District of Vanderhoof, and the Nechako White Sturgeon Recovery Initiative. Approximately 450 people came to help celebrate this monumental day. The event was opened

by the Saik'uz First Nation dancers.



Saik'uz First Nation dancers opened the event in front of a great turn out of participants!

Speeches were provided by the Honourable Steve Thomson, Minister of Forests, Lands and Natural Resource Operations; River Conservationist, Mark Angelo; DOV Mayor Gerry Thiessen; Cora MacIntosh of Saik'uz First Nations; and, MLA John Rustad.

The NWSRI CWG hosted display booths on sturgeon biology, how to track sturgeon, the emergency sturgeon live release boat kit program and the grades 4-7 school program. The NWSRI Tent contained information on TWG research projects and CWG outreach and harm reduction projects with our focus on sturgeon conservation. Participants could also test how they measure up to a Nechako White Sturgeon.



Displays were on hand to educate participants about Nechako white sturgeon ecology and research.



How do you measure up to a Nechako white sturgeon? At least to 2 meters because that is the top of our tent! The largest NW sturgeon caught to date was 3.7 m!

Outreach and Harm Reduction Programs, 2014-2015

NWSCF Grand Opening, Continued

The Kids' Activities Center was run by a long-time sturgeon volunteer, Annerose Georgeson of CNC, and the Vanderhoof Arts Council. They hosted a number of fun and innovated kid's activities including a large sturgeon for kids to paint and face painting.

The Sturgeon Biology, tagging and tracking tent displayed posters on sturgeon anatomy and NWSRI research programs. We also had a display of sturgeon foods gathered from the Murray Creek area.

Guided tours of the conservation facility were provided and participants could view the production of the first hatchery produced Nechako White Sturgeon larvae and incubation. There were also two large sturgeon that remained in the hatchery tanks.



Mike Manky, FFSBC, provided guided tours of the Conservation Centre to show participants the facility and demonstrate the hatchery process.



Two large sturgeon were in the hatchery and this allowed visitors an up close look at these prehistoric looking fish. Mature breeding age fish like these are essential to the success of the broodstock program.



Participants were also treated to lunch courtesy of the FFSBC and the DOV with dessert being a 6 foot sturgeon cake provided by Woody's Bakery!

The NWSRI extends our sincere appreciation to all of the volunteers that helped make Grand Opening a fun and educational experience! We would also like to thank all of the participants for celebrating this momentous day with us.

Outreach and Harm Reduction Programs, 2014-2015

Updates to the NWSRI Webpage: Where Is My Fish and Photo Gallery

Project Lead: NWSRI

Funders: Habitat Stewardship Program \$4,505; NW Sturgeon Recovery Initiative \$1,800 in-kind

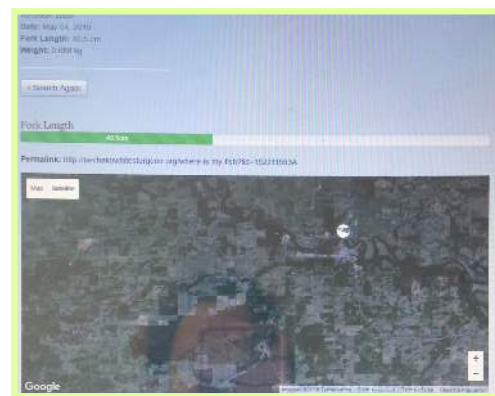
Year: 1 update complete and Where is My Fish ongoing

This year we undertook a major upgrade of the NWSRI website to prepare for the upcoming NWS Conservation Facility fish release events and promote further interest in recovery initiatives. On the “Where is My Fish” page of the NWSR web site participants that release a fish at a release event may now search for their fish using their first and last name and/or by entering the fish’s PIT tag number. Before only the PIT tag numbers were used in searches but we found that kids often misplaced their numbers. Further, at the release event we will offer people releasing fish to have their picture taken with their fish just prior to its release. That picture will come up when they enter their information in the “where is my fish” page. We also added a Google Earth aerial map image showing the release point/location as well as the location of any subsequent recaptures as indicated by a marker that is in the form of a sturgeon’s head. Information on fish weight and fork length was added to the site so participants can track their released fish’s growth and location. A horizontal bar is provided that extends from 0 to the maximum fish length we have captured to date (370 cm). At release and for each recapture a line will appear in the bar that indicates how the release fish is growing in relationship to the maximum fish length. This visual description of the relationship of the release fish to the maximum captured to date is also provided for fish weight. This page will be active by the May 2015 release event. If you would like to view the Where is My Fish page click here: <http://nechakowhitesturgeon.org/where-is-my-fish>

We have also set up a Photo Gallery page that includes some memorable photos (<http://nechakowhitesturgeon.org/about/photo-gallery>). The page uses prettyPhoto and supports images, videos, flash, YouTube, iframes and ajax. The script is also compatible in every major browser. The intention is to promote further interest in white sturgeon recovery and the page will be populated as projects are undertaken. The entire NWSRI website was also made to be I-device and tablet friendly.



These little sturgeon produced at the NWS Conservation Facility may be released in a public release event in 2015. The person that releases the fish can find information on their fish using the NWSRI’s webpage, *Where is My Fish*.



A map and fork length bar were added to the Where is My Fish page of the NWSRI website so release participants can track the growth and location of their fish at any future recaptures.

Outreach and Harm Reduction Programs, 2014-2015

River's Day Celebrations in Vanderhoof

Project Lead: NWSRI Community Working Group and Carrier Sekani Tribal Council

Funders: Habitat Stewardship Program \$750 (printing outreach material); Carrier Sekani Tribal Council \$600 In-Kind; NWSRI Community Working Group \$1,000 In-Kind; Fisheries and Oceans Canada In-Kind \$650 (outreach material donations).

Year: 6 and ongoing

Each year on the last Sunday of September, local community groups come together to celebrate our province's spectacular river heritage by hosting a public Rivers Day event. This year the NWSRI along with the DOV hosted a River's Day event at Riverside Park in Vanderhoof on the 28th of September 2014. There were approximately 200 people in attendance and the event was well received. The NWSRI hosted booths on sturgeon biology, how to track sturgeon, the boat kit program, and the grades 4-7 healthy watersheds for sturgeon school program. The goal of our community outreach is to raise public awareness and knowledge regarding the decline of the Nechako white sturgeon population, habitat loss, and recovery activities in order to promote the stewardship of sturgeon throughout the watershed. We cover topics ranging from the foods sturgeon eat, gathered fresh from Murray Creek, to sturgeon anatomy, their lifecycle, and conservation issues.

Nechako white sturgeon conservation facility manager, Cory Williamson, also provided tours of the hatchery. In addition to viewing the first juvenile sturgeon ever produced at the facility tour participants could view the two large sturgeon that were to remain at the facility over the 2014-15 winter.



The Nechako White Sturgeon Recovery Initiative's display tents at Rivers Day (2014).



Children engage in learning about fish and taking an up-close look at the Sturgeon foods gathered fresh from Murray Creek.

NWSRI Management & Conservation Goals

NWSRI Coordination and Data Management

Project Lead: Lana Ciarniello—NWSRI Coordinator

Funders: Fisheries and Oceans Canada *via* SARCEP and BC Ministry of Forests, Lands and Natural Resource Operations \$30,000

Year: 14 and ongoing

2014 was a year that was decades in the making for the NWSRI. The Nechako White Sturgeon Conservation Facility was built, staff were hired, and most importantly fish were made and are being held over winter to allow them to grow past the stages where our TWG thinks recruitment failure is happening (egg and larval stages). We carried out research while simultaneously managing aspects of the building of the Facility, most importantly its system to hold and rear the fish. This is a very exciting time for the NWSRI and we think we may have built the facility just in the nick of time!



Recovery Coordinator, Lana Ciarniello (centre), poses with a Nechako White sturgeon as well as FFSBC and FLNRO staff.

The CWG responded by co-hosting the Grand Opening of the Conservation Facility, which was a major public event. 2014 also was the first year where our grades 4-7 Healthy Watersheds for Sturgeon school curriculum program was in use by elementary aged children residing in the Nechako watershed. During the summer all elementary schools within SD91 received two copies of the program and at the beginning of the school year a reminder letter was sent out to principals to forward to their teachers. As coordinator I have applied for funding to follow-up on the program in 2015.

As Coordinator I strive to ensure that all aspects of NWSRI's technical and community outreach projects are carried out with effective communication between all sturgeon stakeholders. I work cooperatively and with the involvement of NWSRI members by providing coordination between and within working groups as well as administrative and technical support. The coordination and administrative support involves the following services: organizing meetings; tracking action items; completing technical tasks assigned by members of the Recovery Initiative; assisting in or leading project proposal development and Terms of Reference for projects and the development of funding proposals; assisting in the development of outreach materials and the coordination of public events; website maintenance and updating; and, where necessary, assisting team members with their assigned tasks. Technical support is provided to ensure scientific accuracy and technical expertise in planning and executing of recovery tasks.

I look forward to another year with the NWSRI Team.

Together in Conservation!

Lana Ciarniello



NWSRI Management & Conservation Goals

Conservation Fish Culture: Construct and Operate a Permanent Production Facility

Project Lead: Freshwater Fisheries Society of BC & NWSRI

Funders: \$1.2 million includes cost of brood capture work. The \$1.2 million was the remaining contribution from 2013-14 provided by the Province of BC, Rio Tinto Alcan, Nechako Environmental Enhancement Fund, District of Vanderhoof, and Fisheries and Oceans Canada.

Year: 1 of operations and Ongoing

This year was a flurry of facility construction, hiring staff, and carrying out research projects—often all at the same time! The Freshwater Fisheries Society of BC hired Cory Williamson, TWG Chair and former FLNRO fisheries biologist, as the Facility Manager, Mike Manky was the senior fish conservationist, and Kara Varley and BJ Bruder were the seasonal fish culture technicians. Kara began as a CWG member and is now a Fisheries student at CNC.

By June 2014, the facility was largely complete with the grand opening event scheduled to take place on the 17th June (please go to page 16 to read about the opening). During facility completion FFSCB staff were also conducting brood capture (April 24th to 20th May, see page 7 to read about the broodstock program).

Spawning of the broodstock occurred between the 26 to 30 May, 2014. A number of volunteers came to the facility to help with the spawn and mix the eggs with the milt; this was definitely a community effort! Neurulation rates were calculated in early June and estimated to be very high at 89%, which means the vast majority of the fertilized eggs will survive.

Eggs hatched between the 6 to 12th of June and first feeding was between 21 to 23 June, 2014. The first 10 days of feeding went very well, but unfortunately some serious issues arose after that point which resulted in a large die-off of baby sturgeon.



In the wild, sturgeon are broadcast spawners, releasing eggs and milt above their spawning beds to mix near the river bottom. This process is simulated by hand at the hatchery.



Sturgeon larvae hide in the blue bio-balls just like they would hide between rocks in the river to avoid predators.

NWSRI Conservation Goal: Nechako White Sturgeon Conservation Centre's Ongoing Operations

Conservation Fish Culture: Permanent Production Facility

Three main events caused the die-off of the hatchery sturgeon: (1) high river water temperatures; (2) issue with feeding; and, (3) system waste feed/ learning how to operate the new system. Next, the fish came down with *Flavobacterium psychrophilum*, a common pathogen found even in soils and which there is no treatment for fish that young. The majority of fish did not make it past this stage and 1,317 fish remained. How to deal with these issues has been rectified and we are confident that next year our survival rate will be a lot higher. At this point the largest fish was 100 grams and the average was 38.1 g.

As of January 2015 there were approximately 1,260 hatchery produced juvenile fish remaining and those fish were doing very well and had good growth rates. The sturgeon produced this year remained at the facility over the winter to allow them to grow larger prior to their release. Our hope is that these fish will be past the stage of recruitment failure identified by our TWG and therefore a greater number will survive to breeding age.

The Nechako white sturgeon conservation facility was decades in the making and successfully securing a facility was in part due to the dedication of NWSRI CWG and TWG members. The NWSCF goal is to produce, raise and release up to 12,000 juvenile sturgeon each year into the Nechako River.

The NWSRI continues to recognize that the facility is not a permanent solution for sturgeon recovery, however, it 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.

The NWSRI CWG is proposing to release approximately 600 of these fish in a public event that will take place in May 2015. The event will be focused on elementary aged children residing in School District 91 and generally throughout the Nechako and Upper Fraser watersheds.



A visit to the hatchery results in a wealth of information on sturgeon biology and conservation! Here we are looking at some of the 2014 sturgeon larvae preserved in ethanol.



Hundreds of juvenile Nechako White Sturgeon were produced at the hatchery in 2014-15. These fish were reared in holding tanks before being released into the river in May 2015.

Financial Summary for 2014-2015

During the 2014-2015 fiscal year, project funding was \$1,529,473 (\$1,502,403 cash and \$27,070 in-kind) which is \$4,326,318 less than last year’s budget, and was the result of the funding required last year to build the majority of the Nechako White Sturgeon Conservation Facility. In-Kind contributions increased from 2006-07 to 2008 but have been steadily declining for the last four fiscal years (Figure 1). Project dollars came from a variety of sources including industry, government, environmental funding sources, and volunteer hours. The following provides a breakdown of financial and in-kind contributions to the NWSRI for 2014-2015:

BC Ministry of Forests, Lands & Natural Resource Operations & DFO SARCEP—\$30,000

Canfor Pulp Products Inc.—\$10,000

Carrier Sekani Tribal Council \$12,100
In-Kind & Cash from:

Aboriginal Fisheries Strategy — \$7,025

Aboriginal Fund for Species at Risk — \$29,500

College of New Caledonia - \$600 In-Kind

District of Vanderhoof—\$2,000 in-kind & part of \$1.2 million for facility

Fisheries and Oceans Canada’s SARCEP— \$108,252 & \$650 in-kind

Freshwater Fisheries Society of BC— \$1,200,000 cash & \$15,000 in-kind

Habitat Stewardship Program — \$28,710 to NWSRI
\$70,830 to CSTC

Integrus Credit Union — \$2,000

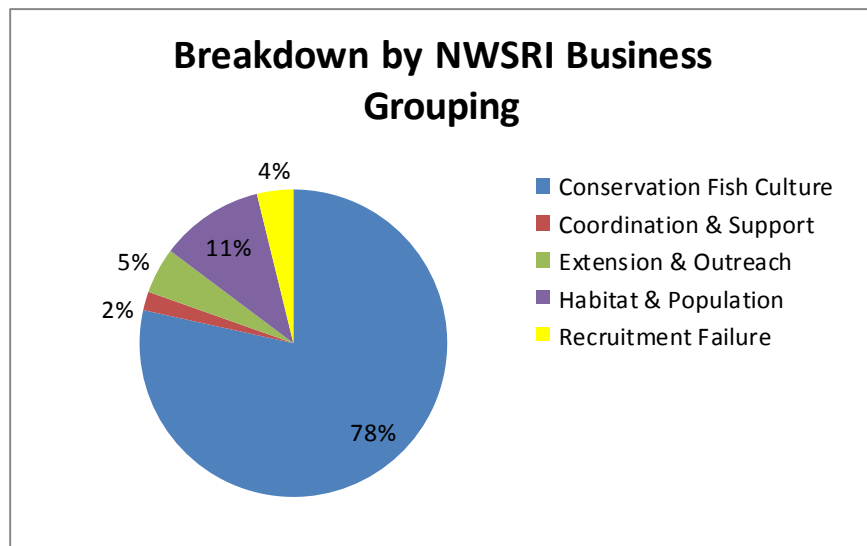
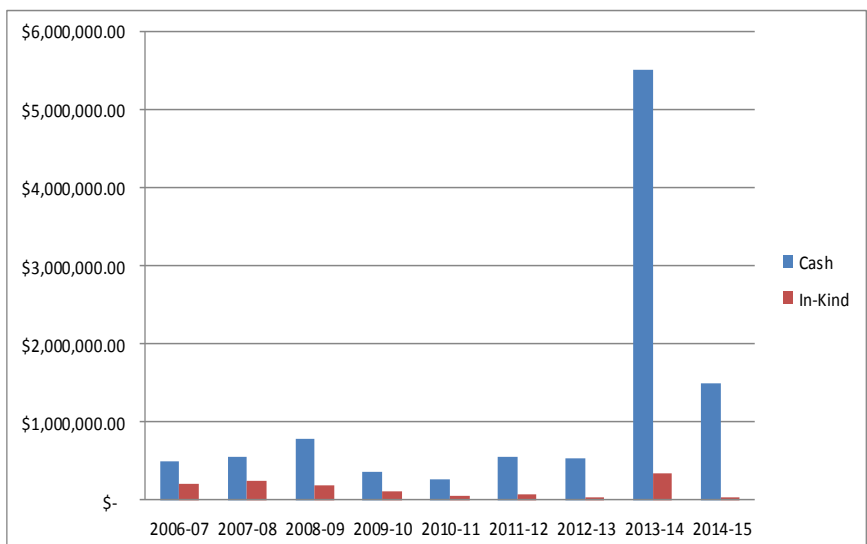
Nechako Environmental Enhancement Fund— part of \$1.2 million allocated to FFSCB for facility

NWSRI Community and Technical Working Groups - \$11,720 In-Kind

NWSRI Sales—\$1,086

Province of BC— part of remaining \$1.2 million allocated for recovery facility

Rio Tinto Alcan Inc. — part of remaining \$1.2 million allocated for facility



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 Initiative and the recovery of white sturgeon in the Nechako watershed.

Photo Credits:

We gratefully acknowledge the use of photos for this annual report from the following individuals and/or organizations:

- BC Ministry of Environment
- Carrier Sekani Tribal Council
- Freshwater Fisheries Society of BC
- Kevin Gedling, Parks Canada
- Nechako White Sturgeon Recovery Initiative
- Northwest Hydraulic Consultants (NHC)
- Zsolt Sary, MFLNRO
- Various release event participants & volunteers

NECHAKO **WHITE STURGEON**



RECOVERY INITIATIVE

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