

Nechako White Sturgeon Recovery Initiative 2011-2012 Annual Report



NECHAKO **WHITE STURGEON**



RECOVERY INITIATIVE



This female sturgeon captured during the broodstock program on April 30, 2011, weighed 129 kg (284 lbs) and is the third largest sturgeon caught by the NWSRI in the Nechako River to date. She was only 0.1 kg less than the second largest fish caught.

From left to right: Wayne Salewski, BC Wildlife Federation, Lana Ciarniello, NWSRI Coordinator, Lori Borth, MFLNRO, Cory Williamson, TWG Chair & MFLNRO, and Zsolt Sary, MFLNRO.

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

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Messages from the Chairs

Technical Working Group

This year brought some major success and challenges for the Nechako White sturgeon Recovery Initiative. Much progress was made on designing a conservation centre starting late in 2011 and by March 2012 with Freshwater Fisheries Society of BC playing a lead role in establishing a preliminary design. The objective next year is to finish engineering of the detailed design for of a state of the art recirculation aquaculture system (RAS) and begin construction once both sufficient capital and operations funding is in place. A source of operations funding remains elusive though it is hoped that the Nechako Environmental Enhancement Fund will play a key role.

Our teams and partners continue to work tirelessly on habitat related projects and gains continue to be made in our understanding of the cause of recruitment failure and the eventual restoration of natural recruitment so that this population can be restored.



Cory Williamson, TWG Chair

One major project started this year focused on steps leading to the eventual restoration of spawning and incubation habitat the Nechako White Sturgeon. We were able to place 2600 cubic meters of spawning gravels and cobble in an experiment to test our understanding of the early developmental biology of sturgeon. The goal of this project was assess the suitability of in-gravel incubation and rearing space for eggs and yolk-sac larval sturgeon outside of the laboratory. Results of this experiment are expected within 1 to 3 years as we learn more about how sturgeon use spawning areas in large rivers.

Cory Williamson, Chair
Technical Working Group
BC Ministry of Environment
March 31, 2012

Community Working Group

Another year has past and our team of Community Working Group (CWG) members is still fighting hard to save the Nechako White sturgeon. While at times we feel alone in our endeavors, we recognize the fact that if we do nothing the Nechako White Sturgeon will become extinct.

Our corporate sponsors such as the Integris Credit Union and the District of Vanderhoof should be commended for their willingness to go above and beyond the call of duty to help the CWG and TWG with their endeavors.

One of the major accomplishments this past year was the placing of two gravel beds in the Nechako River to try and provide the Nechako White Sturgeon adequate spawning beds. While the results of this project will take a couple of years to determine its success, it is the resolve of the team members that make projects like this worth the effort.

The CWG would like to thank our funding sources, media partners, as well as all the volunteers and staff who continue to work tirelessly to promote this very important endeavor. The chance of helping the Nechako White Sturgeon flourish and to have it removed from the endangered species list is within our grasp. The battle to succeed is constant but with the team that has been assembled, I am confident we will achieve our goals.

Brian Frenkel, Chair
Community Working Group
Avison Management Services Ltd
March 31, 2012



Brian Frenkel, 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 2011-2012

The members of both the Technical Working Group and Community Working Group represent a wide range of organizations. Those involved during the 2011-2012 fiscal year included:

BC Ministry of Environment
BC Ministry of Forests, Lands and Natural Resource Operations
BC Nature (Federation of BC Naturalists)
Carrier Sekani Tribal Council
District of Vanderhoof
Fisheries and Oceans Canada
Fraser Basin Council
Fraser River Sturgeon Conservation Society

Freshwater Fisheries Society of BC
Lheidli T'enneh First Nation
Rio Tinto Alcan Inc.
Sports Fisher representative
Spruce City Wildlife Association
Nechako River Alliance
Nechako Watershed Council
Tl'azt'en Fisheries Program



Nechako White Sturgeon banners line the streets of Vanderhoof, BC, in 2011. The NWSRI requested from Vanderhoof's Council to use the Nechako white sturgeon as the street banner theme for 2011. This outreach & harm reduction initiative was undertaken by Annerose Georgeson of the College of New Caledonia. The program is funded by Council and run by Arts Unlimited.

Project Updates for 2011-2012

Broodstock Capture

Project Lead: Ministry of Forests, Lands and Natural Resource Management, Freshwater Fisheries Society of BC

Funders: Interdepartmental Recovery Fund for Species at Risk \$40,000; Ministry of Forests, Lands and Natural Resource Management \$19,000; Freshwater Fisheries Society of BC \$3,000 In-Kind

Year: 6 and ongoing

The primary purpose for the broodstock capture conducted this year was to obtain eggs and milt for placement onto the gravel pads. Specifically, there were three 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.

Brood capture started April 26, 2011 and fishing occurred for 14-15 days total, between April 26-May 5 and May 17-20, 2011. Forty-six sturgeon were caught, including 16 recaptures. This was the fewest fish caught since 2006. Twenty-six of the 46 sturgeon were males, 13 were females, 4 were unknown, and 3 were juveniles. Ten of the males and three of the females captured were considered mature. Overall crews noted that the fish captured and ready to spawn this year were relatively small in comparison to previous years. At the end of this program there were approximately 90 active tags on fish in the river.

Enhanced Pilot Conservation Fish Culture Program: Three ripe females and three of the larger males were brought to the transfer facility in Prince George for spawning. One of the females was returned to the river because she did not appear ready to spawn during the hatchery timeline. That female was tagged prior to her release. Spawning occurred May 26th and both remaining females were spawned the same day. The two female brood stocks' maturity was similar and there were approximately 300,000 eggs gathered. The two groups of eggs were placed in the river on the upper half of the gravel pads in two locations that same day. The eggs were fertilized in the river on the boat by placing the eggs in a bucket, adding milt and some water. Eggs were then placed into a tube that was suspended within a meter of the river bottom. Drift nets were set down stream to catch the eggs if they drifted rather than settled. No eggs were caught. Fertilization success appeared to be near 100% as determined by subsequent inspection of the eggs caught on egg mats.



Nechako white sturgeon eggs wait to be mixed with milt and then placed onto the gravel pads in the Nechako River, 2011.



Mixed eggs and milt for fertilization and then placement on the Stoney Creek experimental spawning and incubation pad.

Project Updates for 2011-2012

Juvenile Indexing Program

Project Lead: Carrier Sekani Tribal Council

Funders: Aboriginal Fund for Species at Risk \$22,200; Ministry of Forests, Lands and Natural Resource Operations \$350 In-kind

Year: 8 and ongoing

Juveniles are defined as fish under a total length of 1 meter and due to recruitment failure are rare in the Nechako River. The 2011 Nechako White Sturgeon Juvenile Indexing program consisted of 20 days of sampling that occurred from Aug 31- Oct 1, 2011. This year sampling was conducted earlier to focus on warmer river temperatures in an attempt to increase the catch. Six juvenile setlines were deployed with baited fine-wire circle hooks. Smaller hooks were used specifically to target smaller/juvenile sturgeon and limit the catch of adults.

Sets were deployed overnight but never remained fishing for >24 hours. A total of 27 white sturgeon were captured, including 25 individuals (2 fish were captured twice during the sampling session). Captures included 13 juvenile fish that had not been captured previously, and 12 juvenile fish that were recaptures (including 7 fish of hatchery origin). The total lengths of fish caught ranged from 47.6cm to 89.6cm. It was noted that there was a wider distribution of fish than previous years which was attributed to the higher water levels. The catch per unit effort appeared to decrease with cooler water temperatures.



David Clark, CSTC employee and Skin Tyee Band member, and Theo Barfoot, CSTC employee and Saik'uz Band member, get set to release this rare juvenile Nechako white sturgeon, 2011.

Project Updates for 2011-2012

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

Project Lead: Carrier Sekani Tribal Council

Funders: Interdepartmental Recovery Fund for Species at Risk \$37,390; Aboriginal Fund for Species at Risk \$36,350; Aboriginal Fisheries Strategy \$12,235.

Year: 8 and ongoing

Telemetry (Adult Monitoring)

Radio-tracking to determine fish movement patterns began on May 11 and concluded August 26, 2011. During this time fish were monitored for a total of 50 days. Telemetry was conducted once every two to three days before spawning fish were detected in the area and twice daily once spawning was detected. The primary purpose of using radio-telemetry to monitor fish was to determine the timing and duration of spawning activities.

Sturgeon were monitored from their over-wintering sites and followed to their spawning grounds located at the Vanderhoof reach area (River km 132-139). The information gathered was used to detect and track their migration routes. Identification of important migration routes for sturgeon may be used to protect these habitats in the future. Understanding the timing of spawning related movements provides important information regarding factors that may affect the timing of spawning activities, such as water temperature and flow rates. The information gained through tracking sturgeon also helps to determine the most efficient times to conduct other spawning related sampling activities, particularly sampling for sturgeon eggs on placed egg mats. A group of sturgeon were tracked to the above the bridge spawning grounds on June 3rd.

Egg Mat Program

Egg mats were sampled from May 30 to July 12th and eggs were caught on June 4th and 5th, 2011. Sixteen large mats that were used in previous years were strategically placed within the study area (rkm 141 to rkm 135.7). Also deployed within the two gravel placement areas were 3 large mats and 72 smaller egg mats on the upper site and 3 large and 60 smaller on the lower gravel pad. The small egg mats were checked one day and then large egg mats the next day resulting each mat being checked every other day.



Brian Toth, CSTC, checking for sturgeon eggs on an egg mat (2010).



Radio-racking tagged sturgeon in the Nechako River (2010).

Project Updates for 2011-2012

Adult Spawn Monitoring Continued

Egg Mat Program Continued

Eggs were first found on June 4th on the lowest positioned large egg mats (rkm 136.8); the eggs were collected and placed in a solution of 50% ethanol and 50% water. On June 5th eggs were found on the small egg mats that were deployed on the lower gravel pad. Those eggs were also collected and placed in an ethanol/water solution. The big egg mats had 11 and 8 eggs caught respectively. The smaller egg mats just above the bridge had approximately a dozen eggs caught.

A fixed wing aircraft aerial telemetry run was conducted on June 12th, flying from the Vanderhoof spawning ground to Isle Pierre and then to Diamond Island and return to Vanderhoof. Sixteen fish were located. The fish were grouped at the confluence of the Stuart (rkm 125) and 2 above the bird sanctuary (rkm 130-132).

The water temperature ranged from a low of 7.5C to a high of 13.5C on June 7th, 2011.

Drift Net Program

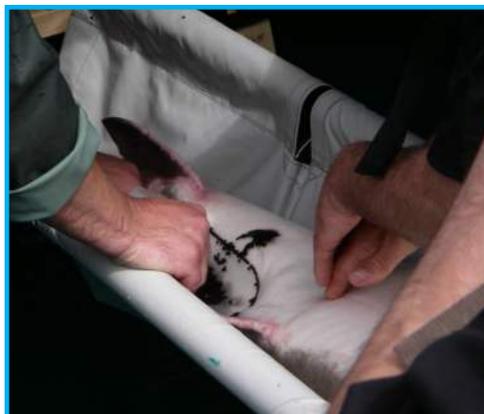
Drift nets were deployed at the sites that eggs were previously detected in hopes of capturing larvae. Crews sampled for 19 days between June 10th and July 23rd in an attempt to detect larvae and then 15 day olds. Overnight sampling was also conducted. No larvae were caught. sampling efficiency was constrained by the lack of water flowing through the nets. If larvae emerged from hatch they were missed and subsequent river flow levels at the time to detect 15 day olds were even less which results in even lower capture success.

Upper Gravel Pad Sampling: Sampling for larvae on the upper gravel pad occurred the week of June 5-12, 2011. A total of six days of sampling resulted in 12 hours of effort (6 days of monitoring of 2 samples each); however, again no larvae were detected. Three possibilities were presented as to why no larvae were detected:

1. They did not survive;
2. They hatched and dove, and/or eggs sank, into the substrate; or,
3. The sampling window was missed (sampled too early or late).

We felt that scenarios 1 and 3 were unlikely. The high water levels made it difficult to conduct the drift net sampling program this year. We believe that these fish will begin to show up in samples in later years. Time will tell if some of these fish survived!

Milking a broodstock female for eggs that will be fertilized and released onto the gravel pads located at the Nechako White sturgeon spawning grounds, 2011. The survival of egg to larvae is monitored using the egg mat and drift net sampling programs.



Project Updates for 2011-2012

Spawning Habitat Manipulation Gravel Placement Project

Project Lead: Ministry of Environment

Funders: Rio Tinto Alcan \$142,000; Ministry of Forests, Lands and Natural Resource Operations \$36,000 and \$40,000 In-Kind; Fisheries and Oceans Canada \$75,000; Interdepartmental Recovery Fund \$37,390; Aboriginal Funds for Species at Risk \$36,350; Aboriginal Fisheries Strategy \$12,235

Year: 2 and ongoing

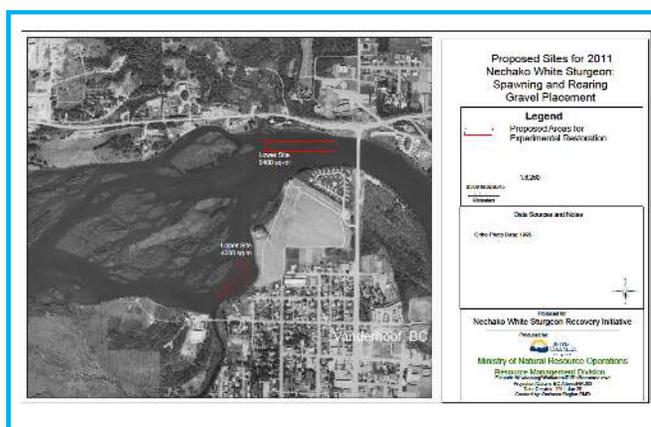
In the spring of 2011 two pads of cleaned and sorted gravel substrate were placed in two sections on the bed of the Nechako River near Vanderhoof, BC. The NWSRI believes that spawning success may be impaired by an excess of fine sediments that have accumulated in present substrates of the known spawning areas at Vanderhoof. The addition of clean substrate was planned as part of the research into the cause of spawning failure and to develop rehabilitation measures. The placed gravel pads will serve as temporary spawning, incubation and rearing platforms for Nechako white sturgeon. Specifically, the objectives of this project are to:

- 1) Determine if laboratory results obtained with sturgeon egg to larvae development in a captive setting are similar to sturgeon spawning and development in the wild; and,
- 2) Examine the sediment infilling rates of the placed gravel pads.

The two gravel pads were placed in the river approximately two weeks before spawning using a small barge and excavator. This project is not meant to be a permanent solution to the problem but rather is being used to aid our understanding of the problem in its true setting, the Nechako River spawning grounds, for the purpose of informing future habitat restoration.



Placing cleaned and sorted gravel into the Nechako River to form the Stoney Creek site experimental spawning pad at the Nechako white sturgeon spawning grounds, 2011.



Location of the two experimental gravel pads placed in the Nechako River at the white sturgeon spawning grounds, 2011.

Project Updates for 2011-2012

Spawning Habitat Manipulation Gravel Placement Project Continued

The gravel pads are monitored for the sediment infilling rates (physical monitoring) as well as to evaluate white sturgeon spawning, egg incubation and early larval rearing success for the endangered Nechako white sturgeon (biological monitoring).

Physical Monitoring of the Gravel Pads: sediment infilling rates were monitored to obtain quantitative data on infilling rates. Sites were sampled 27-28 September, 2011, using freeze-core and underwater video sampling methods. Freeze core sampling involves placing liquid nitrogen into a 2.5-3 m long metal pipe and then hammering the filled pipe into the pad. Heat is extracted out of the substrate which allows the substrate to freeze to the core.

Upper Site: there were few fines detected within the samples taken from the upper site. The cobbles and particles did not stick to the tube because there were not a lot of fines. The upper site remains in good shape!

Lower Site: the lower site contained a lot of sand. It is thought that the sand is coming off of the islands and being transported through the thalweg - the sediment source is off the islands and across the channel. Underwater video was also taken of the pad and sand was noted across the site.

Biological Monitoring of Gravel Pads: The egg mats were positioned where the gravel was placed with additional mats placed above and below. The eggs and milt from brood-captured fish were deposited on the gravel pads and wild spawning was also noted on the pads/mats (refer to broodstock capture, pg. 7). No larvae or 15 day olds were sampled but the conditions for conducting this type of sampling were not favorable. For more results on the drift net monitoring program please refer to page 10.



Physical Monitoring of the Gravel Pads:
Andre Zimmerman from NHC Consulting pours liquid nitrogen into a metal pipe. The freeze core substrate sample is obtained by pounding the pipe through the gravel pad, 2011.

Project Updates for 2011-2012

Effects of River Substrates on Larval White Sturgeon Behaviour

Project Lead: Ministry of Environment, University of British Columbia

Funders: This project was funded using carryover from last year (Rio Tinto Alcan \$19,000)

Year: 5 and complete

Investigations of the role of substrate in the recruitment failure of Nechako River white sturgeon have been ongoing since 2004. Marcus Boucher as part of his M.Sc. research project at the University of Northern BC completed his Master's thesis on the effects of substrate and temperature on Nechako and Columbia sturgeon, titled, *The effect of substrate rearing on the growth, development, and survival during early ontogeny*. He performed one experiments in 2009 and one in 2010. In 2009 Nechako fish were reared within and without gravel at two different temperatures (both gravel and no gravel fish were reared at 13.5°C and 17.5°C temperature). In 2010 (second year) he used only one temperature and the following treatments: gravel, no gravel and an artificial substrate that could be used in a cultured environment such as a hatchery. His key findings were as follows:

- He found a marked increase in mortality for fish reared at 17.5°C versus those reared at 13.5°C when they emerge after consuming the yolk sack. Significantly less mortality was noted for those fish that were reared in gravel.
- Those fish reared in gravel had significantly higher overall survival than the other treatments (20% greater overall survival). Survival of fish was also higher in colder water. Conversely, those reared in warmer water had higher mortality than those reared in colder water. The highest survival rates were therefore for fish raised in gravel and at a lower water temperature.
- Fish reared in warmer water grew at a faster rate. By further investigating the accumulated thermal units (summation of daily average temperature) he found that growth was delayed for fish reared in cooler water.

Second experiment: if more yolk sack energy is put into growth for fish reared in gravel where is all that energy going for fish reared without gravel (why are growth and survival so different)?

- Fish reared in gravel were significantly larger than those reared without gravel. However, there was no difference between those reared in gravel and those reared in artificial substrate.
- Fish reared in substrate had: Improved growth and survival, greater metabolic scope and more liver lipid and glycogen reserves. Fish reared in gravel moved less.



Development of white sturgeon larvae subjected to different substrate and temperature conditions. Photo courtesy of Marcus Boucher from his Master's thesis.

Community Education, Outreach & Harm Reduction Programs for 2011-12

Save-Our-Sturgeon (SOS) Spring Spawning Celebration

Project Lead: NWSRI Community Working Group

Funders: Resources North Association \$2,500; Integris Credit Union \$1,500; Fisheries and Oceans Canada \$1,230 In-Kind; District of Vanderhoof \$1,150 In-Kind; Carrier Sekani Tribal Council \$775 In-Kind; College of New Caledonia \$630 In-Kind; Freshwaters Fisheries Society of BC \$400 In-Kind; Ministry of Forests, Lands and Natural Resources Operations \$350 In-Kind; Nechako White Sturgeon Recovery Initiative Community and Technical Working Group Members \$2,715 In-Kind.

Year: 5 and ongoing

Approximately 300 people were in attendance at Riverside Park in Vanderhoof on May 29, 2011, for the *Save our Sturgeon (SOS) Spring Spawning Celebration*. The event date coincided with the timing of the natural sturgeon spawn and was complemented by a beautiful, sunny day. The only recorded Nechako white sturgeon spawning grounds occur in the river surrounding Riverside Park and sturgeon spawning in the reach normally takes place during the last week of May through the first week of June, when the water typically reaches the appropriate temperature. The focus of the *SOS Spring Spawning Celebration* was to increase the public's awareness 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.

The celebration was welcomed by Vanderhoof's Mayor, Gerry Thiessen, Saik'uz First Nation's Chief, Jackie Thomas, and NWSRI Community Working Group Chair, Brian Frenkel. Participants of all ages were also treated to engaging and fun-filled activities that focused on the biology, ecology and research of sturgeon within the watershed. NWSRI biologists and working group members provided demonstrations on how sturgeon are radio-tracked, examples of sturgeon food obtained from the Nechako River, and sturgeon life cycle displays. There was a sturgeon biology table where the special features of the Nechako white sturgeon were discussed as well as an educational talk. Educational talks focused on the sturgeon's status, the need for conservation, special biological features of the sturgeon, and research projects planned for this year.



The Stoney Creek dancers performed traditional First Nation dances, 2011.



Roy Argue, DFO & CWG member, discusses sturgeon biology with SOS participants, 2011.

Outreach and Harm Reduction Programs, 2011-2012

Save-Our-Sturgeon Spring Spawning Celebration Continued

A 20 minute video played throughout the event featuring NWSRI's Spawning Habitat Gravel Placement Research Project, and showcased sturgeon capture, tagging, and radio-tracking as well as interviews with research biologists. Participants were also treated to an interpretive walk around the sturgeon spawning grounds that finished at the bridge where they looked for spawning sturgeon from key locations. Children could also enjoy face painting, sturgeon colouring sheets, a sturgeon banner competition, and a bouncy castle. A barbeque served up free hotdogs and hamburgers.



Children watch the video of NWSRI projects and interviews with biologists. The video was created by Ty Roberts of CNC and Henry Klassen, CWG member.



The crowd gets a look at this male sturgeon prior to his release, 2011.

The highlight of the celebration was the release of the three male sturgeon used for the broodstock program back into the Nechako River. The releases allowed participants to view, and some were even able to touch, this magnificent fish that lives within the Nechako-Stuart-Takla river system!



Children touch this male Nechako white sturgeon that was used in the 2011 broodstock program prior to his release back into the Nechako River.

Sturgeon photos courtesy of David Wlasitz (SOS participant).

In addition to our main SOS Event sturgeon information and/or presentations were also provided at the following events during 2011:

- Science and the World Around Us Expo, Prince George Civic Centre (April 11-12) by Jocelyn White, City of Prince George & CWG member.
- Fort St. John's Salmon Days (July 16) headed by Kevin Gedling, Parks Canada & CWG member.
- Resources North Association Showcase Event (Sept. 21) by Cory Williamson, MFLNRO & TWG Chair, CWG member and Cora McIntosh, Saik'uz First Nation.

Outreach and Harm Reduction Programs, 2011-2012

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 \$11,250 (boat kit) & \$12,350 (assemblies); Carrier Sekani Tribal Council \$9,000 In-Kind (boat kit) & \$3,500 In-Kind (assemblies); Nechako White Sturgeon Recovery Initiative In-Kind \$2,900.

Year: 1 and ongoing

Beginning part way through the 2011 fishing season, in an attempt to save the sturgeon in this system from extinction, the NWSRI in partnership with the CSTC requested that fishers live release any white sturgeon caught during the First Nation Food, Social and Ceremonial (FSC fishery) gill net fishery. The NWSRI and the CSTC recognize that First Nation people have lived in harmony with white sturgeon, utilizing and sustaining the population in this system for time immemorial. The recruitment problems currently facing the Nechako white sturgeon were not caused by the sustainable harvest or practices of First Nation people. Regardless the Nechako white sturgeon population has reached a critically low level and now all people must take an active role before it is too late to recover this magnificent fish. This FSC fishery is conducted using gill nets and as a result an unknown number of mature, breeding sturgeon are by-caught in these nets each fishing season. The idea for the *Emergency Sturgeon Live Release Boat Kit Program* began when the NWSRI and CSTC was informed that some sturgeon were dying as a result of being caught in these nets. When asked why accidental by-catch of sturgeon were not released alive from gill nets the overwhelming response was damage to the net and a lack of knowledge on how to successfully release a live sturgeon. This knowledge led to our proposed 2011/12 fiscal pilot program: The Emergency Sturgeon Release Boat Kit program.

The Boat Kit program has three main components: (1) 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*, and (3) an on-site community wide assembly that fully explains the program and why participation is critical to the future survival of the Nechako white sturgeon.

The focus of this pilot program is on the urgent need to maintain the existing wild breeding stock while we attempt to secure funding for a Recovery Facility and continue to work towards solving the recruitment problem so this population can once again become self-sustaining. We did not offer this program to sport fisheries for sturgeon because those have been closed in the North since 2000.



Cora McIntosh, 2011 by-catch monitor and Saik'uz First Nation Councilor, with Gerald Mole, Saik'uz First Nation member, measure a sturgeon accidentally caught during the 2011 FSC fishery using the materials contained within the Emergency Sturgeon Release Boat Kit.

Outreach and Harm Reduction Programs, 2011-2012

Emergency Sturgeon Live Release Boat Kit Program Continued

***The goal of this pilot program is an immediate reduction in the harm and deaths of sturgeon in the Nechako-Stuart-Takla system in the First Nation gill net salmon fishery. ***

The Kits: As a commitment to this Recovery Initiative we offered to provide an Emergency Sturgeon Live Release Boat Kit to 20 First Nation fisher families. The Boat Kit provides all of the tools necessary for the successful live release of by-caught sturgeon within a see-through waterproof bag that is small enough to remain within the boat at all times. Kits were developed in conjunction with First Nation Fisher Families, CSTC and NWSRI members. The Boat Kit also contains net mending tools and the webbing required to patch a gill net as damage to the net may result from the live release.

The Video: To accompany the Boat Kits we created the video: “Every Sturgeon Counts: Live Release of Gill Netted Sturgeon”. The video details how to live release sturgeon caught during the salmon gill net fishery and how to mend a net damaged as a result of a live release. The video is 45 minutes long and contains footage of the live release of a large and small sturgeon from a gill net that were caught during the 2011 FSC salmon fishery. It is partitioned into 6 chapters which allow the viewer to forward to the chapter of interest: Defining the Problem - Recruitment Failure; Salmon, Sturgeon and First Nations; the Boat Kit; You’ve Caught a Sturgeon; Net Mending; and Stewards of the Sturgeon. Providing the video in chapters allows the viewer to forward to their chapter of interest.

To view this video on U-Tube click here: <http://www.youtube.com/watch?v=YhrEJUEi-ow&feature=colike>

The Assemblies: During the winter 2011-12, we hosted assemblies on the plight of the sturgeon of the Nechako-Stuart-Takla system in each of the 6 First Nation Band’s community halls (Saik’uz, Tl’azt’en, Nak’azdli, Takla, Nadleh Whut’en and Lheidli T’enneh First Nations). At these assemblies we featured the emergency sturgeon release boat kit program and discussed sturgeon biology and conservation measures. We provided a PowerPoint presentation on sturgeon and played the video “Every Sturgeon Counts”. A sign-up sheet was provided to identify fisher families interested in receiving a boat kit. We also solicited member feedback regarding how NWSRI can be most effective at saving the remaining sturgeon of the Nechako-Stuart-Takla system, for example, we asked if there were specific outreach programs we should try to offer that would benefit sturgeon. A member and Councillor of the Saik’uz First Nation Band delivered the majority of the presentations.

Every fish counts! Preliminary Pilot Program Results

We are extremely pleased with the results of this pilot program! During the 2011 gill net salmon fishery **12 sturgeon were live released** using the ‘Emergency Sturgeon Release Boat kit’ by two of the participating bands (Saik’uz and Tl’azt’en).

Outreach and Harm Reduction Programs, 2011-2012

Promoting Harm Reduction and Monitoring By-catch in the Nechako Watershed FSC Fisheries

Project Lead: Carrier Sekani Tribal Council

Funders: Habitat Stewardship Program \$18,264

Year: 3 by-catch monitors and ongoing (year 7 First Nation outreach & harm reduction programs)

The Carrier Sekani Tribal Council (CSTC) hired a technician to directly interact with the First Nations fishers in order to increase fisher-peoples' knowledge and awareness of the plight of the Nechako White Sturgeon. The bycatch monitor was responsible for monitoring the First Nation Food, Social and Ceremonial (FSC fishery) gill net fishery because it results in the incidental catch of Nechako White Sturgeon (i.e., bycatch). Currently by-catch associated with the FSC fishery is the only known direct cause of anthropogenic harm to this species.

The bycatch monitor visited local fishing areas to assist with the safe release of sturgeon encountered. She demonstrated how the items in the Emergency Sturgeon Release Boat Kit are to be used to safely release sturgeon caught in a net. The bycatch monitor also provided background information on sturgeon and the research being done and in the safe release and efficient reporting of encounters.

The CSTC found that there was a broader acceptance and willingness to report encounters with white sturgeon to the bycatch monitor. Although bycatch was not previously formally monitored we believe that having a bycatch monitor on site resulted in a reduction in the number of sturgeon dying in association with the gill net fishery. By working with the CSTC we are reaching out to more community members, fishers and their families. Ongoing education of fishers and community members about how changing their fishing practices can help maintain the Nechako white sturgeon and its genetic diversity is critical to restoring this species to a naturally sustainable population.



Cora McIntosh, 2011 by-catch monitor and Saik'uz First Nation Councilor, with Gerald Mole, Saik'uz First Nation member, pulling gill nets set for the FSC fishery.



A sturgeon caught in the 2011 FSC gill net fishery is released after measurements are taken, September 2011. Note the radio-antenna coming out of the sturgeon's belly indicating that this sturgeon has been previously caught.

Outreach and Harm Reduction Programs, 2011-2012

River's Day in Vanderhoof & Sturgeon Street Banner Project

Project Lead: NWSRI Community Working Group

Funders: Carrier Sekani Tribal Council \$1,500 in-kind; NWSRI Community Working Group \$650 in-kind

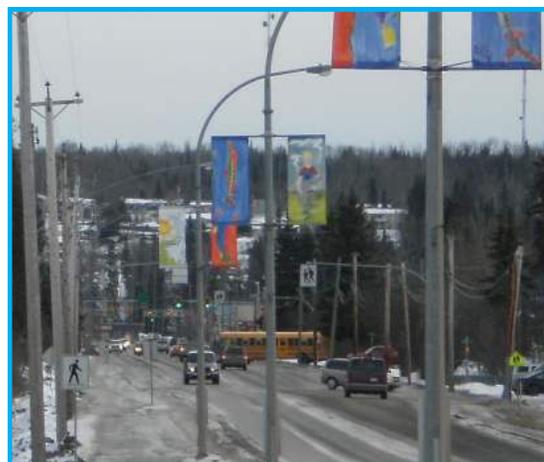
Year: 2 and ongoing

River's Day: After the NWSRI hosted the first River's Day event ever held in Vanderhoof in 2010 the District of Vanderhoof approached us to show case sturgeon in the 2011 River's Day event. The event was held at Riverside Park and this year it was hosted by the District of Vanderhoof, the Nechako Valley Food Network, and the Nechako Waste Reduction Initiative. NWSRI had a large part in the event with our working group members providing a Sturgeon 101 Biology Educational table that contained examples of sturgeon food obtained from the Nechako River and sturgeon life cycle displays. Educational talks focused on the sturgeon's status, the need for conservation, special biological features of the sturgeon, and research projects planned for this year. Two guided interpretive walks to view the sturgeon spawning grounds were provided by CWG members. Approximately 150 people visited the NWSRI display booth which we used as an opportunity to increase awareness regarding the decline of the Nechako white sturgeon population, habitat loss, and recovery activities. Once again Annerose Georgeson of the College of New Caledonia provided a wonderful river-related children's activity. Through our committed volunteers we also provided face painting with a focus on sturgeon!

Sturgeon Street Banner Project: Each year Arts Unlimited with the aid of Annerose Georgeson of the College of New Caledonia offers a street banner project that is implemented to replace banners that have worn over the winter. A theme is picked and young and old community members are offered the opportunity to paint banners that will be hung from the light posts on Burrard Street. The NWSRI requested from Vanderhoof's Council to use the Nechako white sturgeon as the street banner theme for 2011. Council accepted the request and 50 participants painted their vision of the Nechako white sturgeon on a street banner. The program is funded by the District of Vanderhoof Council and run by Arts Unlimited. The designs are entirely the work of local citizens ranging from 4 to 70+ years.



Participants paint sturgeon themed street banners, Vanderhoof, BC, in 2011.



Nechako White Sturgeon banners line the streets of Vanderhoof, BC, in 2011.

NWSRI Management & Conservation Goals

NWSRI Coordination and Data Management

Project Lead: Lana Ciarniello—NWSRI Coordinator

Funders: Department of Fisheries and Oceans via SARCEP \$30,000

Year: 10 and ongoing

This year was exciting for the Nechako White Sturgeon Recovery Initiative and I was glad I was a part of it! When I took over as the Recovery Coordinator in August 2010 I asked the working group members what they felt was the leading immediate threat to the remaining mature, breeding stock of Nechako white sturgeon aside from research-related habitat issues. I was told that a number of mature sturgeon were being incidentally caught during the First Nation Food, Social and Ceremonial salmon fishery. Working group members and field personnel alike expressed concern over the mortality of sturgeon associated with this fishery. A number of conversations ensued as to how to realistically address the problem and in the end the result was the beginning of the development of the *Emergency Sturgeon Live Release Boat Kit Program*.



Lana Ciarniello, NWSRI Recovery Coordinator (centre), with a Nechako white sturgeon.

The NWSRI was aware by-catch was occurring by the degree to which it occurred was unknown. Due to the late start up we engaged only two of the six First Nation Bands we were targeting but those two bands caught and live released 12 sturgeon! We were surprised at the number of sturgeon accidentally caught during this fishery. Time will tell if the large number of sturgeon by-catch was an anomaly. We are committed to finding funding and improving this pilot program and ultimately to maintaining the number of breeding adults by reducing by-catch, increasing releases of live sturgeon, and promoting the stewardship of sturgeon. Maintaining genetic diversity is particularly important as we continue to strive towards securing the funding for a Recovery Facility and ultimately determining long-term rehabilitation solution for the Nechako River.

As Coordinator I strive to ensure that all aspects of NWSRI technical and community outreach projects are carried out with effective coordination and communication within the NWSRI and 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.

Together in Conservation!

Lana Ciarniello, Recovery Coordinator

NWSRI Management & Conservation Goals

Conservation Fish Culture: Construct and Operate a Permanent Production Facility

Project Lead: Freshwater Fisheries Society of BC

Funders: Funding applications were not successful; Program Not Funded

Year: 2 of many years to come.

At the close of last years Annual Report (2010-11) the FFSBC had submitted a funding application to construct the Nechako White Sturgeon Recovery Facility to the Western Economic Diversification (WED) fund under the Western Economic Partnership Agreement. Through the beginning of 2011 we remained optimistic about the application. The application had the support of the District of Vanderhoof and Saik'uz Nation First Nation, who also sent a support letter to WED.

Early this fiscal the WED application underwent the due diligence stage which checks if FFSBC and NWSRI are reputable characters and can properly manage the proposal. The FFSBC was then requested to provide the names of 3 companies that could provide an environmental assessment which will receive the invitation to quote. WED chose Avison Management Ltd. in Vanderhoof to conduct the environmental assessment. A full environmental assessment was not required because the facility is not going to be in the river and will be taking a maximum of 40L/minute from the river for its fish rearing operations. WED noted that they would like the environmental assessment completed by the middle of May. By April 2011 the paper work was complete on the Environmental Review and final walk through of the land was scheduled for when the snow had melted.

The Fisheries Society was set to contribute \$1.5 million (\$1.4 million is MOE money set aside through FFSBC and the DOV was contributing \$900,000 for land and development) and WED was being asked for \$1.5 million. WED also asked for assurance that there be at least five years of operational funding in place. Operational funding was estimated to be approximately \$350-500,000 per year and included brood capture and juvenile indexing. We were informed that May was WED's timelines for decisions and we were hopeful to begin construction in September 2011.

In the middle of June 2011 we were informed that the WED application for funding of the recovery facility was rejected in favour of WED funding Vancouver Island University's new International Centre for Sturgeon Studies whose main goal was for a sturgeon food fishery. The official reason given was that the application did not meet eligibility criteria. This decision seems quite inconsistent with recent information the partners on the application had been getting from WED. Upon subsequent enquires we were told that in the long run our application did not create enough jobs for the local economy.

The FFSBC, NWSRI, District of Vanderhoof, and Rio Tinto Alcan remained committed to finding the dollars to build and operate the recovery facility. At the NWSRI Technical Working Group meeting in November 2011 it was decided that the Recovery Facility would be the focus of the TWG activities for 2012-13. This meant that finding funding for the facility took precedent over any new research projects and existing projects would be sustained at minimal levels.

NWSRI Conservation Goal: Construct and Operate Facility

Conservation Fish Culture: Permanent Production Facility

The FFSBC continued to develop the plans of Facilities design and layout to assure they would be prepared if and when the funds come together for immediate implementation of the plan. The objective of the Nechako White Sturgeon Recovery Facility is for the centre to be the hub of white sturgeon recovery and assist in watershed stewardship. The facility will provide space for fish culture, community education, research, equipment storage and a permanent place to continue exploring the intricacies of the Nechako watershed ecosystem.

The facility itself is both a hatchery for eggs and larvae for return to the river and a nursery for juvenile sturgeon that are returned to the river in either the fall or the spring of the following year. The design follows the breeding plan and was driven by the Nechako white sturgeon recovery plan:

Recovery Plan: Breeding plan: 12 individual maternal families (pairs) can be held separately until they are large enough to receive a PIT tag, be scute marked and returned to the river—factorial mating design; 144 half-sib families; balanced contributions; 1,000 fish per maternal family.

Adult Holding: over-winter 2-3 female per tank and there are 4 female tanks, equating to 8-12 females and up to 18 males (6 male tanks, 3 per tank) overwintered at a time.

Juvenile Logistics: 6 families will fit comfortably while 12 families may be space limited. Maternal families work best.

The recovery centre is being designed as a recirculation facility in that the water that is in the facility is to be used over and over again. New water is only added to compensate for waste water removed and evaporation. For each time water circulates through the system only 0.4% is new. The facility is also biosecure leaving only a minuscule chance of disease transfer because there is only sturgeon waste going out.

At the end of the 2011-12 fiscal the FFSBC and NWSRI remain committed to finding the funding required to build the Nechako white sturgeon recovery facility. While examining funding options we will continue to advance the design and engineering phases so if and when funds become available we are ready to begin to recover this magnificent fish.



A concept schematic of the proposed Nechako white sturgeon Recovery Facility (in white), 2011.

Financial Summary for 2011-2012

During the 2011-2012 fiscal year, project funding was \$631,977 (\$556,609 and \$75,368 in-kind) which is \$310,695 more than last year's budget, and the result of the funding required to complete the habitat manipulation gravel placement project as well as the hatchery set-up. Although In-Kind contributions were \$21,972 higher this year than last year they have been steadily declining since 2008 (Figure 1). Project dollars came from a variety of sources including industry, government, environmental funding sources, and volunteer hours. The following is a breakdown of both financial and in-kind contributions to the NWSRI for 2011-2012:

BC Ministry of Forests, Lands & Natural Resource Operations \$55,000 & \$47,350 In-Kind

Carrier Sekani Tribal Council \$14,775 In-Kind & \$148,175 from:

Aboriginal Fisheries Strategy — \$12,235

Aboriginal Fund for Species at Risk — \$58,550

Interdepartmental Recovery Fund—\$77,390

College of New Caledonia -\$630 In-Kind

District of Vanderhoof -\$1,150 In-Kind

Fisheries and Oceans Canada — \$134,000 & \$2,298 In-Kind via Species at Risk Committee (SARCEP) - \$30,000

Freshwater Fisheries Society of BC (FFSBC) - \$3,400 In-Kind

Habitat Stewardship Program — \$23,600 NWSRI & \$18,264 CSTC

Integrus Credit Union — \$1,500

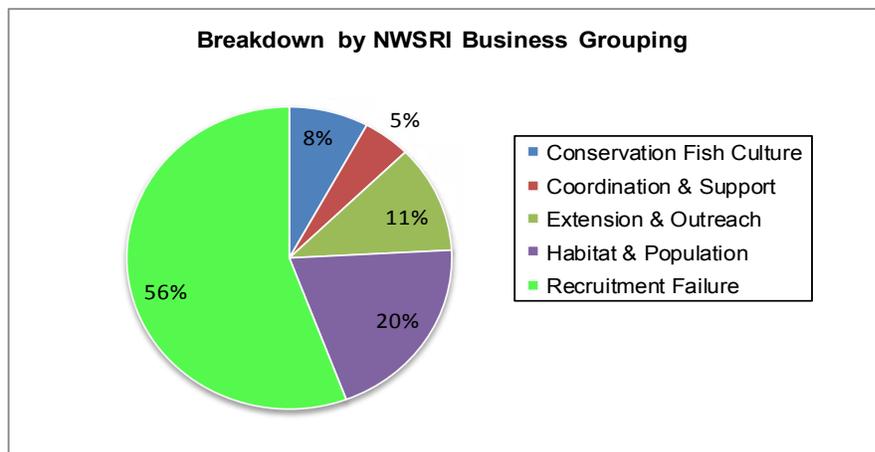
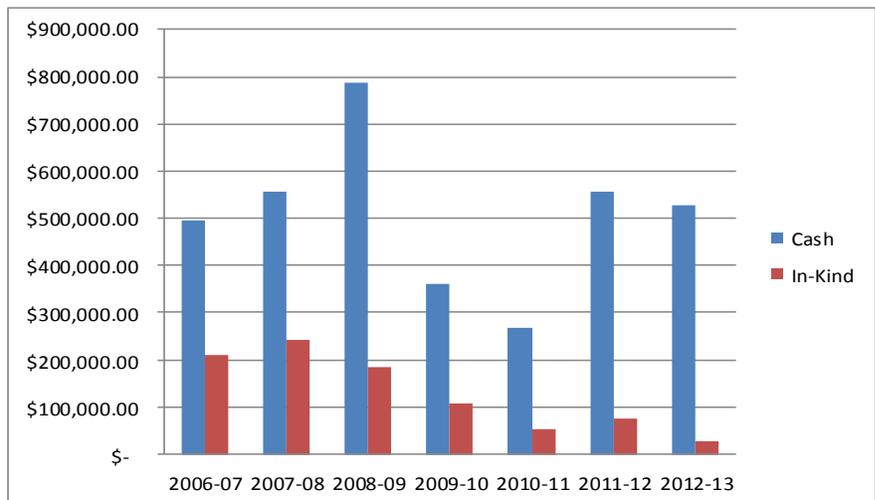
NWSRI Community and Technical Working Groups - \$500 & 5,765 In-Kind

NWSRI Donations—\$270 (\$150 UNBC Fish & Wildlife Club, \$100 Fraser Salmon & Watershed Program, \$20 Nechako Enhancement Society)

NWSRI Sales—\$800

Resources North Association — \$2,500

Rio Tinto Alcan Inc. — \$142,000



The NWSRI would like to extend 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:

- Carrier Sekani Tribal Council
- Freshwater Fisheries Society of BC
- BC Ministry of Environment
- Nechako White Sturgeon Recovery Initiative
- Zsolt Sary, MFLNRO
- David Wlasitz, SOS participant
- Marcus Boucher, UNBC
- Kevin Gedling, Parks Canada
- Ty Roberts, CNC



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