Nechako White Sturgeon Recovery Initiative 2007-2008 Annual Report

NECHAKO RIVER WHITE STURGEON

RECOVERY INITIATIVE

Mike Keehn, FFSBC, holding a young sturgeon.

Over the past 50 years, local residents, First Nations and government biologists have observed a steady decline of white sturgeon numbers in the Nechako River. In order to assess what was happening to the species, the Province of British Columbia coordinated an intensive study of white sturgeon in the Nechako River between 1994 and 1999. The study came to an unwelcome conclusion - the Nechako white sturgeon are in a critical state of decline. Unless something is done, and done soon, these great creatures will become extinct.

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, 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, 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 all sturgeon, from juveniles to adults, continue to live in the Nechako River for many generations to come.

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Ken Scheer, FFSBC, carrying coolers for fertilized eggs.

Messages from the Chairs

Technical Working Group

Although there were very significant challenges due largely to record water levels, 2007 marked another very successful year with significant progress made on Nechako White Sturgeon Recovery Programs. Early 2007 saw completion of the Strategic Plan for the Nechako White Sturgeon Recovery Facility and Interpretive Center. Work is ongoing to make this critical recovery project a reality. Brood stock capture and start-up of the enhanced pilot fish culture program in 2007 proceeded as planned and despite a forced move to Prince George due to record high water, FFSBC and CSTC produced close to 4500 juveniles for release by the fall.

Ongoing work on the diagnosis of recruitment failure resulted in new information on the biology of larval white sturgeon of significance not only to the NWSRI, but to many other sturgeon researchers and recovery programs. With this information, along with information gained through spawn monitoring and updated habitat models, the TWG has begun the planning of pilot projects concerned with habitat restoration for spawning sturgeon in the coming years.

Finally, I would like to congratulate all members of the Recovery Initiative for your continued hard work and dedication. Clearly this work has meaning for you and our successes and strong partnerships have been recognized around the region and provincially with a Silver Premier's Award. All the best for 2008!

Cory Williamson, Chair
Technical Working Group
BC Ministry of Environment
March 31, 2008

Cory Williamson, TWG Chair

Community Working Group

In 2007 the Community Working Group again marked the year with a public event to release conservation cultured juvenile sturgeon into the Nechako River. School students of all ages from around the region came to Vanderhoof and were joined by members of the Nechako White Sturgeon Recovery Initiative and political leaders to release over 1000 juvenile sturgeon. This pilot project is an important part of the Recovery Initiative. The development of the Recovery Initiative Strategic Plan was another milestone that brought many community members together for this important project. Enhancing awareness of the status of sturgeon and providing information on how everyone can help save the Nechako white sturgeon will remain the focus of the Community Working Group's efforts in the coming year. If you are interested in learning more about Nechako white sturgeon or would like to join the Community Working Group, contact the Recovery Initiative coordinator or any member of the Recovery Initiative. Contact information can be found on the back of this Annual Report.

Justus Benckhuysen, Chair
Community Working Group
Rio Tinto Alcan Inc.
March 31, 2008

Justus Benckhuysen, CWG Chair

The Teams

Technical Working Group

The Technical Working Group (TWG) was formed in September 2000, and is made up of 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 basin.

This team of scientists is responsible for coming up with the answers as to *why* the white sturgeon 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 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 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.

Partners Involved During 2007-2008

The members of both the Technical Working Group and Community Working Group represent a wide range of organizations. Those involved during the 2007-2008 fiscal year included:

BC Ministry of Environment
Carrier Sekani Tribal Council
City of Prince George
District of Vanderhoof
Federation of BC Naturalists
Fisheries and Oceans Canada
Fraser Basin Council
Fraser River Sturgeon Conservation Society
Freshwater Fisheries Society of BC
Lheidli T'enneh
Rio Tinto Alcan Inc.
Sports Fisher representative
Spruce City Wildlife Association
Nechako River Alliance
Nechako Watershed Council
Tl'azt'en Fisheries Program

Members of the NWSRI team with John Rustad, MLA, releasing Anna, one of 2007's broodstock females.

Project Updates for 2007-2008

Juvenile Indexing Program

Project Lead: Carrier Sekani Tribal Council
Funders: Aboriginal Funds for Species at Risk $50,000, Rio Tinto Alcan Inc. $30,000
Year: 4 and ongoing

This is the 4th year of the project that focuses on the capture and assessment of sturgeon under one meter in length. The intent is to develop a methodology for a long term indexing program for the purposes of monitoring natural juvenile recruitment levels, as well as the growth, survival and distribution of conservation cultured juveniles. The project is key to detecting the Nechako sturgeon population's responses to recovery efforts. This year, technicians dealt with record high flows and a challenging environment for sampling. Unfortunately, extensive efforts to capture individuals from the first cohort of conservation cultured juvenile sturgeon (1+ years old in the summer of 2007) were unsuccessful. Efforts to detect the radio tags implanted in a small number of these conservation cultured fish prior to their release were also largely unsuccessful. However, a small number of these fish were detected on occasion, and 2007's efforts should not be taken to indicate that these fish experienced poor survival. As previously noted, conditions for sampling were challenging, as were conditions for tracking and detecting the juvenile's tags, and our efficiency at capturing small sturgeon needs to be improved. In the end, two fish were caught throughout the study area. A report from this year's activities is available as is a comprehensive 4 year summary report which recommends the format of future recruitment monitoring activities.

We learned a lot about our abilities to monitor juvenile sturgeon in 2007, and have adapted our strategies accordingly. A small number of the second cohort of conservation cultured juveniles (released in fall 2007) were implanted with acoustic tags, which should facilitate the tracking of movements and determinations of short-term survival rates, as well as improve the efficiency of juvenile sampling efforts.

Adult Sampling

Project Lead: Carrier Sekani Tribal Council
Funders: Carrier Sekani Tribal Council $5,000 In-Kind
Year: 2 and ongoing

A small amount of adult sampling was completed in 2007 for the purposes of applying radio tags and continuing to assess white sturgeons' presence, distribution, and abundance in Nechako watershed habitats outside the Nechako River mainstem. A small amount of sampling was completed in Fraser Lake but no sturgeon were captured. A total of 13 adults were captured in the Nechako and 3 radio tags were applied. Further efforts will be undertaken to capture adults in 2008 from non-Nechako mainstem areas, including Stuart and Fraser lakes.

CSTC staff, James V. Prince, Jeano Nooski and Colin Helin on the juvenile index project.

Adult Spawn Monitoring

Project Lead: Rio Tinto Alcan Inc.
Funders: Rio Tinto Alcan Inc. $55,000, Carrier Sekani Tribal Council $5,000 In-Kind, Interdepartmental Recovery Fund $30,000
Year: 4 and ongoing

In order to better understand white sturgeon spawning in the Nechako River, Technical Working Group (TWG) members need to increase their understanding of sturgeon spawning and how it relates to environmental conditions such as flow and temperature. There is also a need to better understand the timing and duration of spawning events, and to describe the specific habitat used for spawning in relation to habitat for early life stages of sturgeon. This type of work will aid the identification of the cause(s) of recruitment failure as well as help guide habitat rehabilitation measures.

In 2007 it was again confirmed that white sturgeon are spawning in the Nechako River near Vanderhoof. Several spawning events are believed to have occurred and twenty six eggs were captured on egg-mats spread over several kilometres of river bed. Over 30 eggs were collected and a small number of these were hatched in the pilot conservation fish culture facility.

Project Updates for 2007-2008

Outreach and Harm Reduction Program

Project Lead: Carrier Sekani Tribal Council
Funders: Habitat Stewardship Program $20,500, Carrier Sekani Tribal Council $35,650 In-Kind
Year: 4 and ongoing

The CSTC's eight member First Nation communities all actively fish for sockeye and other fish species within the Nechako watershed, and have voluntarily refrained from the directed harvest of white sturgeon since 1994. The focus of the outreach and harm reduction program is to share information with member communities about the Nechako White Sturgeon Recovery Initiative, the CSTC's role in the initiative, and the status of the Nechako's white sturgeon population. Information is also provided regarding techniques for releasing sturgeon and how to reduce harm to the fish when they are by-captured in gear targeting other species. This year there was a great deal of information shared by fishers within the communities, feedback was provided to the CSTC regarding by-catch, and the majority of sturgeon captured were released unharmed.

The second component of this project involves assessing options for transitioning First Nation food fisheries back to selective methods, which would see sturgeon by-captures no longer an issue. In 2007, the planned selective beach seine fishery could not be conducted due to extreme high water levels and much smaller than forecast sockeye returns. The intention is to continue to develop and provide selective fishing options for CSTC member First Nations.

Funding initially intended to support selective fishery development was redirected toward the purchase of acoustic tags for implantation in conservation cultured juvenile sturgeon and the necessary acoustic tracking and detection system.

Diagnosing the Causes of Recruitment Failure

Project Lead: Ministry of Environment
Funders: Ministry of Environment $8,000 In-Kind
Year: 2 and ongoing

Understanding the causes of recruitment failure is particularly challenging due to the historic nature of impacts. However, the longevity of white sturgeon allows us to use the present age composition of the population to 'hindcast' the timing and magnitude of past recruitment (i.e., an index of past abundance of juvenile production). This analysis indicates that recruitment failure occurred about 1967, which is 15 years after the completion of Kenney Dam. Analysis of air photos and other data sources have identified a sand wave near Vanderhoof, after the Cheslatta avulsions that occurred at the same time as the start of recruitment failure. The TWG is conducting additional studies to determine whether a causal link exists between the alterations to flow, and substrate and recruitment failure.

Effects of River Substrates on Larval White Sturgeon Behaviour

Project Lead: Ministry of Environment, University of British Columbia
Funders: Interdepartmental Recovery Fund $20,000, Rio Tinto Alcan Inc. $20,000, Ministry of Environment $10,000 In-Kind
Year: 1 and ongoing

Potential linkages between recruitment failure and the arrival of a sand wave near Vanderhoof underscore the need to understand the mechanisms by which changes in substrate may contribute to recruitment failure. Studies were therefore undertaken to investigate larval white sturgeon behaviour in relation to various flow and substrate conditions.

Tests to date have focused on behavioral variables such as the timing of hiding when suitable substrates are available (e.g., gravel). Results to date suggest that in the absence of appropriate substrate (e.g., gravel), larvae have an increased tendency to drift downstream. Predation tests under these conditions have shown that larval mortality rates are much higher when hiding habitat is not available. Further tests are planned to continue this work, but these preliminary results suggest that a shift from gravel to sand substrates could increase larval drift and predation rates, and both changes would decrease recruitment.

Larval white sturgeon produced during river substrate experiments.

Project Updates for 2007-2008

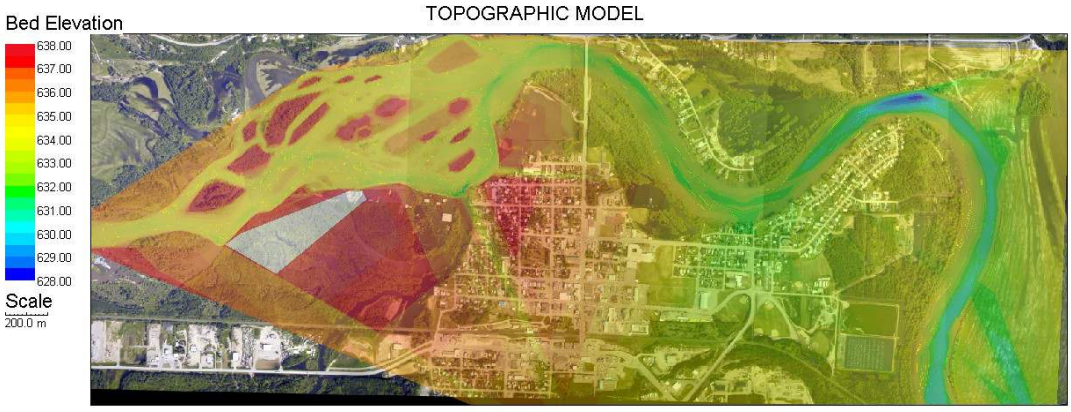
Investigations of the Geomorphology of the Nechako River

Project Lead: Ministry of Environment, University of British Columbia
Funders: Endangered Species Recovery Fund $18,500, Rio Tinto Alcan Inc. $20,000
Year: 3 and ongoing

The geomorphology project seeks to understand how river geomorphology has changed since flow regulation, in particular at the Vanderhoof white sturgeon spawning site. The focus of 2006 was to complete extensive surveys and preliminary hydraulic modeling. Work in 2007 refined the model and calibrated it at high flows. These results allow the NWSRI to have a better understanding of past river changes, and assist with the conceptual development of restoration measures which may improve habitat for the white sturgeon.

Analysis of historic air photos indicates that the spawning reach historically contained gravel bars, but these have now become vegetated islands. Furthermore, higher pre-regulation flows previously flowed overtop of historic gravel bars. In contrast, the post regulation flows tend to flow around vegetated islands more often than they did historically.

The results from the river geomorphology investigations, in conjunction with results from larval behaviour studies, suggest that the greater historic abundance of gravel on the river-bottom may have provided suitable hiding and rearing habitat for early larvae, and its absence may be a key factor contributing to recruitment failure. A river flow model developed in 2006 improves our understanding of pre-regulation flow patterns, and with further improvements this model will be used to predict how substrates react to different flows. In addition, the flow model should help the NWSRI begin to plan future experimental restoration measures. Results from the Nechako River may also assist restoration efforts in the Columbia and Kootenay Rivers which also contain endangered populations of white sturgeon.



Topographic model of part of the Nechako River produced for the geomorphology project.

Pilot Broodstock Capture

Project Lead: Ministry of Environment, Carrier Sekani Tribal Council
Funders: Ministry of Environment $21,500, Carrier Sekani Tribal Council $19,900, Freshwater Fisheries Society of BC $8,900, Triton Environmental $5,970 In-Kind
Year: 2 and ongoing

Similar to 2006, the brood-capture project for 2007 had three objectives. There was one difference, in that one additional family was needed for conservation fish culture.

Objectives:

1) To assess the feasibility of capturing up to 10-12 mature adults for use in a full scale conservation fish culture program with 10-12 family groups.
2) Capture 3 pairs of mature adult white sturgeon for spawning in the enhanced pilot conservation fish culture program.
3) Capture and radio tag additional mature adults to aid the spawn monitoring project.

Despite the flood situation, 2007 was very successful, with 27 adult and 4 wild juveniles caught and tagged between May 7 and 18. A higher proportion of both mature adults and un-tagged sturgeon were captured this year compared with 2006. A total of 8 ripe females and 5 ripe males were caught. Four pairs (one for backup) were transported to Prince George for spawning. Seven new radio transmitters were applied to track both wild sturgeon spawners and untagged sturgeon used in conservation fish culture. 2007 also saw the largest Nechako sturgeon caught to date as part of NWSRI recovery activities. After being used as brood, Anna, a 291 cm (9.5 foot); 145.5 kg (320 lb) mature female white sturgeon was released in front of a large crowd at Riverside Park in Vanderhoof on June 1, 2007.

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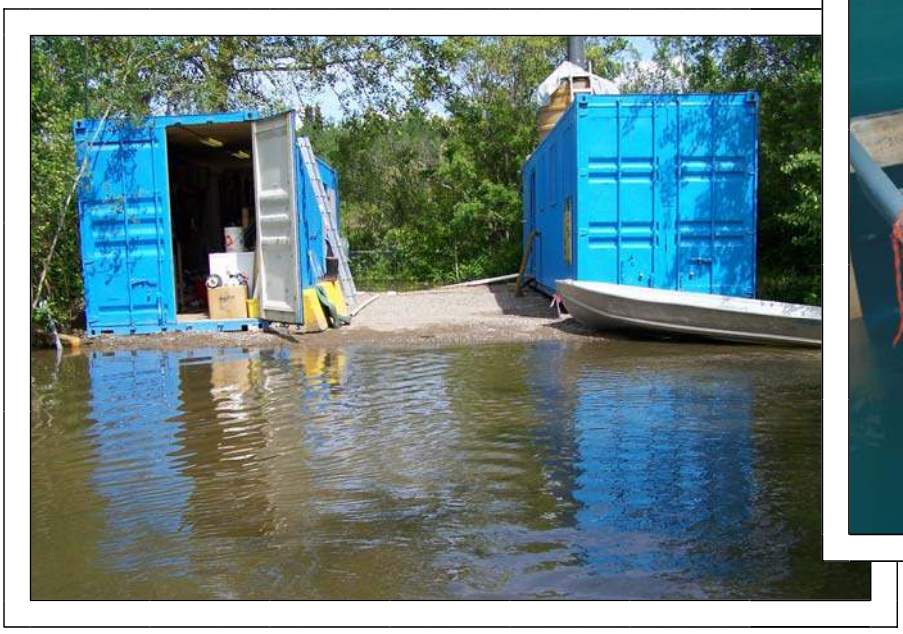
Andrea Heinrichs, MOE-BC Parks, and Geoff Giesbrecht, FFSBC, setting line to catch broodstock.

Project Updates for 2007-2008

Cory Williamson, MOE, holding a sub-adult sturgeon.

Ken Scheer, FFSBC, keeping a male sturgeon cool before spawning.



Pilot sturgeon rearing facility under evacuation during summer flooding in Vanderhoof.

Summer/Fall 2007 Pilot Conservation Fish Culture Program

Project Lead: Freshwater Fisheries Society of BC (FFSBC)
Funders: Ministry of Environment $120,000, Rio Tinto Alcan Inc. $120,000, Freshwater Fisheries Society of BC $45,000 & $40,100 In-Kind, Carrier Sekani Tribal Council $27,000 In-Kind, District of Vanderhoof $4,220 In-Kind
Year: 2 and ongoing

Releasing one of the captured adults into the river.

2007 marked the second year of a white sturgeon conservation based fish culture program on the Nechako River led by the Freshwater Fisheries Society of BC and supported by numerous partners. The enhanced pilot program included additional space which was the home for a new water treatment plant and a workshop/storage area.

As in the previous year, brood capture of maturing fish was led by Ministry of Environment staff and was successful in providing four maturing males and females for spawning purposes. The adults were again transferred to and held at the FFSBC owned and operated Prince George (PG) Trout Facility. The sturgeon adults held very well and were successfully advanced to maturity. As in 2006, all of the spawning (three of the four fish) took place over a 24 hour period. This one day spawn produced enough eggs for three distinct families. The remaining female was released back into the river along with the spawned females and males. The spawning process and release of the adults back into the river was supported by numerous interest groups and viewed by hundreds of people. A local television station also covered the spawning event.

All of the fertilized eggs were transported back to the Vanderhoof site where they were incubated. Just prior to completion of the hatch process we faced flood conditions and a forced evacuation back to Prince George. It took several months for the waters to recede so the majority of the fish culture took place at PG Trout Facility this year. The site was satisfactory, but had space and water limitations, forcing the team to be very innovative in ensuring the safe culture and growth of the juvenile fish.

Another setback which occurred during the early rearing period was the lack of an adequate starter diet. Due to Canadian import regulations we were forced to use an alternate diet this year. This definitely did not meet the fishes' approval. By using certain additives we eventually succeeded in getting them on feed but losses during this period were much higher than normal. Furthermore, during the early growth period it became obvious that one of the families was less robust than other two and fewer than 100 fish were eventually released from this family. The other two families did substantially better and in total more than 4,500 fish were released in October and November. Prior to release these fish averaged approximately 18 grams in size and were PIT tagged and marked by the removal of a scute specific to this brood year.

During the past two years this pilot program has seen various challenges. Many of them have been successfully overcome. The knowledge gained from these experiences will be very useful in planning for the future program and permanent facility.

Project Updates for 2007-2008

Fall Juvenile Release with School District 91

Project Lead: Community Working Group
Funders: Community Working Group $400 and $1,500 In-Kind, Fisheries and Oceans Canada $4,600, District of Vanderhoof $2,500 In-Kind, Carrier Sekani Tribal Council $6,000 In-Kind
Year: 2 and ongoing

As in 2006, over 1,000 schoolchildren from School District 91 enjoyed the opportunity to release a four month old juvenile sturgeon into the Nechako River. Now named the SOS: Save Our Sturgeon Festival, the event took place on October 10th and 11th, and was highlighted by the "release" of a new white sturgeon stamp from Canada Post. Special presentations were made on October 11th with welcoming remarks from Minister of Environment Barry Penner, Canada Post representative Ken Buker, John Rustad (MLA - Prince George/Omineca), Len Fox (Mayor of Vanderhoof), Brian Frenkel (Councilor with the District of Vanderhoof) and Don Peterson (President of the Freshwater Fisheries Society of BC) .

Kathi Zimmerman, NWSRI, holding her juvenile sturgeon.

Students between Kindergarten and Grade 7 had the opportunity to ask members of the Community Working Group questions about white sturgeon biology as well as participating in a guided tour of the pilot conservation fish culture facility. The main event, however, was the chance to release their very own juvenile sturgeon. After naming and recording a unique PIT tag number, each fish was gently released into the Nechako River. Technical Working Group researchers will use the PIT tags to identify these juveniles in the river upon recapture. In 2008, upgrades to the NWSRI website will allow students to search for their fish by PIT Tag number. Information about their fish, including length, weight and where it was found will be included on the web site.

The fall juvenile release is one of the highlights of the Initiative program. It is an opportunity for Initiative members to connect with the community and share our message of sturgeon conservation.

CWG member Brian Frenkel explaining sturgeon biology to a Grade 1 class.

Student releasing his fish into the river.

Minister Barry Penner, Mayor Len Fox, Canada Post representative Ken Buker and MLA John Rustad unveiling the new white sturgeon stamp.

Project Updates for 2007-2008

NWSRI Coordination and Data Management

Project Lead: Carla Wainwright—NWSRI Coordinator
Funders: Ministry of Environment $25,000
Year: 6 and ongoing

The Nechako White Sturgeon Recovery Initiative requires coordination, administrative and technical support in order to be effective. 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 project proposal development and Terms of Reference for projects; assistance in the development of funding proposals; 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 recovery tasks.

The Nechako White Sturgeon Database continued to be updated with all new sampling, biological, tagging and radio telemetry data. Biological information on the several thousand juveniles raised and released through the pilot conservation fish culture program in 2006 and 2007 was also added to the database. The information in the database will be used in 2008 to produce both a current population update and a life history analysis.

Adam Goulding, BC Conservation Corps, stirring milt with a feather to fertilize eggs.

Financial Summary for 2007-2008

During the 2007-2008 fiscal year, project funding levels reached over $786,000. Once again, project dollars came from a variety of sources including industry, government, environmental funding sources and even extending to sales of "Stuart' the Clay Sturgeon. The following is a breakdown of both financial and in-kind contributions to the NWSRI for 2007-2008:

BC Ministry of Environment — $150,000 and $43,500 In-Kind

Carrier Sekani Tribal Council — $133,300 In-Kind

District of Vanderhoof — $6,720 In-Kind

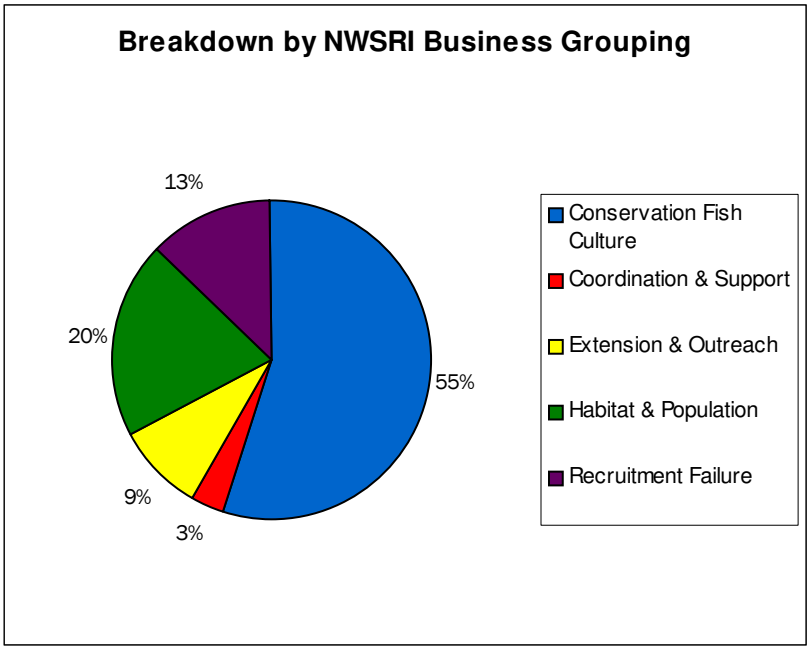
Endangered Species Recovery Fund - $18,500

Fisheries and Oceans Canada —$7,600

Freshwater Fisheries Society — $45,000 and $50,000 In-Kind

Habitat Stewardship Program — $20,500

Interdepartmental Recovery Fund (Federal Government) - $40,000



NWSRI Community Working Group - $400 and $1,500 In-Kind

Rio Tinto Alcan Inc. — $225,000

Sales of Stuart the Clay Sturgeon — $180

Species at Risk - Aboriginal Capacity Building Program - $50,000

Triton Environmental Ltd. — $5,970 In-Kind

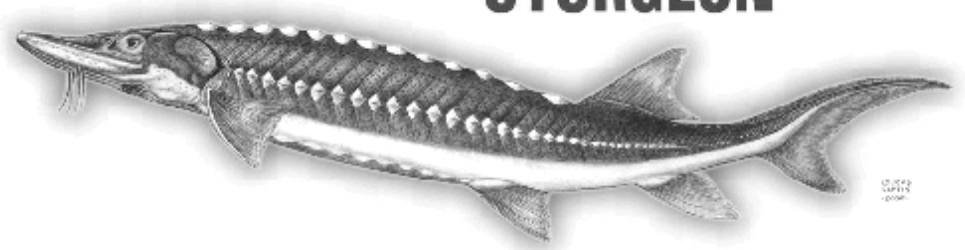
The NWSRI would like to extend its thanks to all groups and individuals who have contributed funds, time and other in-kind contributions. This support is essential to the success of the Initiative and the recovery of white sturgeon in the Nechako watershed.

Photo Credits:

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

- Carrier Sekani Tribal Council
- Freshwater Fisheries Society of BC
- Maureen Haley
- BC Ministry of Environment
- Nechako White Sturgeon Recovery Initiative
- Rio Tinto Alcan Inc.
- Triton Environmental Ltd.

NECHAKO RIVER WHITE STURGEON



RECOVERY INITIATIVE

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