



NECHAKO ENVIRONMENTAL ENHANCEMENT FUND SOCIETY

Annual Report

December 31, 2021

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NEEF SOCIETY ANNUAL REPORT

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Report from the Chair

I am pleased to report one new project was approved for funding this past year. The Ministry of Environment and Climate Change Strategy was granted \$445,000 over two years for the Nechako White Sturgeon Recovery Project. This project supports the work of the Nechako White Sturgeon Recovery Initiative (NWSRI) and addresses two main areas of current focus for the NWSRI: habitat restoration to address recruitment failure and investigation of factors leading to diminished juvenile survival.

In total there were five active projects in 2021 and \$664,744 paid out in grants.

The Freshwater Fisheries Society entered year nine of the White Sturgeon Conservation Fish Culture Program project. The University of British Columbia Phase 2 Integrated Watershed Research in the Nechako River Basin project entered year four.

The Cheslatta Carrier Nation Umam (Pygmy Whitefish) Surveys project was successfully completed during this past year.

With \$8,638,786 dollars committed to date, we look forward to 2022 and funding additional projects that support on-going environmental enhancement, research and stewardship activities linked to the Nechako River.

Respectfully,

Shawn Rice
Chair, Nechako Environmental Enhancement Fund Management Committee
Chair, Nechako Environmental Enhancement Fund Society

1. Society Overview

A. Background

As part of an Agreement between the Province of British Columbia and Rio Tinto (previously Alcan), Rio Tinto agreed to establish and contribute, on a matching dollar basis, up to \$50,000,000 to the Nechako Environmental Enhancement Fund (NEEF).

In accordance with Schedule 4 of the BC/Alcan 1997 Agreement, the Nechako Environmental Enhancement Fund Management Committee (NEEF MC) was tasked to review, assess and report on options that may be available for the downstream enhancement of the Nechako watershed area.

Between 1999 and 2001 the NEEF MC undertook public consultation and completed a number of technical studies. At the conclusion of their work, the NEEF MC decided, amongst other things, that a Cold Water Release Facility (CWRF) be constructed at Kenney Dam to enable downstream enhancement of the Nechako Watershed.¹

Between 2001 and 2011, BC and Rio Tinto provided funding through NEEF to support the Nechako Watershed Council (NWC), to undertake technical investigations needed to develop the criteria necessary to design, construct, commission and operate such a facility.²

Mindful of the information made available between 2001-2011 regarding the potential benefits and costs of a water release facility, the Province and Rio Tinto asked the NEEF Management Committee to reconsider previous decisions for use of the fund. Revisiting these decisions encompassed consideration of all options for environmental enhancement including a water release facility at Kenney Dam. In its September 2012 report, the NEEF MC identified a number of options for use of the fund: support for construction of a Water Release Facility at Kenney Dam, restoration in Cheslatta watershed, support for Nechako White Sturgeon Recovery, restoration in tributaries, stewardship activities, and integrated Watershed Research. The Fund has been accepting proposals for projects that meet those criteria since October 2012.

In 2015, the Management Committee formed the NEEF Society to administer the projects and funds as directed by the NEEF Management Committee.

¹ Report of the Nechako Environmental Enhancement Fund Management Committee, June 2001.

² Kenney Dam Cold Water Release Facility, 2003-2007 Interim Report, April 2008 and Kenney Dam Cold Water Release Facility, Addendum to April 2008 Interim Report (2008 – 2009)

B. Guiding Principles

The 2012 report identified the following guiding principles for NEEF to manage the funds:

Openness and Transparency

The Management Committee seeks public input into the identification, assessment and review of options to enhance the Nechako watershed area. The public process will be carried out in an open and transparent manner.

Inclusiveness

The Management Committee will provide opportunities for input from all interested parties in order to provide an opportunity for diversity of viewpoints.

Decision-Making

Members of the Management Committee will seek to make decisions by consensus. Decisions of the Management Committee will be binding on the parties.

Geographic Scope

The NEEF MC will address matters related to the Nechako watershed area with a focus on the downstream area. This encompasses all tributaries to the Nechako, the reservoir and the river of its confluence with the Fraser River at Prince George.

Timeliness

The Management Committee will complete its work in a timely manner which does not compromise the thoroughness of the public process.

Cost-Effectiveness

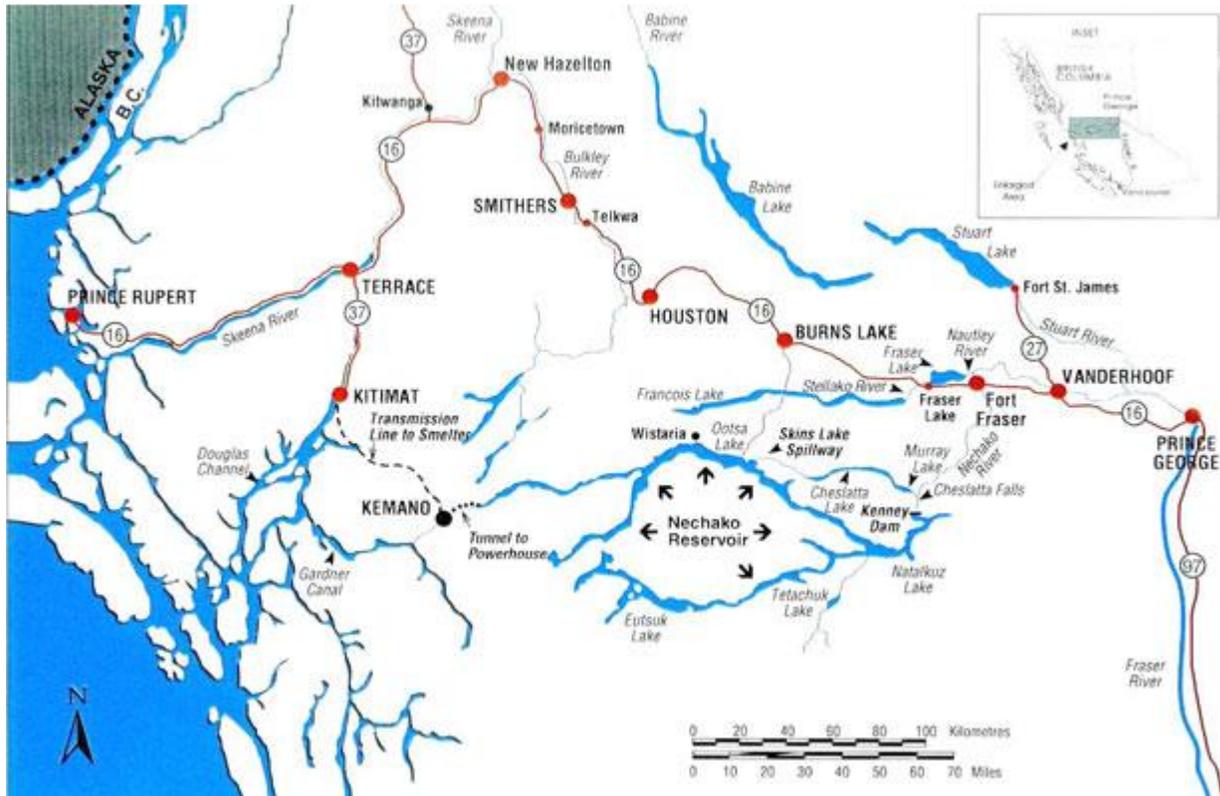
The Management Committee will consult in a cost-effective manner in order to minimize costs wherever possible, without compromising effectiveness. The Committee will build on existing information.

Financial Accountability

The Management Committee will observe sound business practices in the way the fund is managed.

C. Investment Area

The purpose of this fund is for downstream enhancement of the Nechako watershed area. NEEF encourages applications from local governments and legally incorporated non-profit organizations.



D. Society Board

The NEEF Society is governed by a Board of Directors. Board seats during the past year were held by:

Shawn Rice, Province of BC
 Andy Lecuyer, Rio Tinto
 Phil Zacharatos, Independent Director, selected by agreement between BC/RT
 Justus Benckhuysen, Rio Tinto (Outgoing March 2021)

Administrative services are provided through a contract with Macrolink Action Plans Inc., based in Prince George, British Columbia.

2. Grants

E. NEEF MC Decisions

Between 1999 and 2001, the NEEF MC undertook an extensive process of consultation, completed a number of technical studies and decided that the NEEF be used to build a Cold Water Release Facility (CWRP) at Kenney Dam. At the request of the Parties, the NEEF MC engaged in a second consultation process in 2011 regarding the use of the fund. In September 2012, the NEEF MC made 10 new decisions for use of the funds and identified milestones related to some of the funding options. Milestones related to funding availability for a spillway at Kenney Dam and establishing a Legacy Fund have not been met and as of December 31, 2018, \$42,895,944 is unallocated and new decisions for the use of these funds are required.

In the fall of 2018, NEEF MC reviewed its previous decisions and the objectives of the fund in order to prepare revised decisions for the use of the fund.

F. Decisions for Use of the Fund - Amendment to 2012 Decisions

In 2012, the NEEF Management Committee made 10 decisions for use of the NEEF, some of which included time-restricted milestones. The NEEF Management Committee has amended the 2012 decisions on the use of the fund because these milestones were not met. The objectives of the fund have not changed, and the new decisions do not change the scope of projects that could qualify for funding. The amended decisions provide an inclusive funding strategy that builds on past successes and enables NEEF Management Committee and the parties to the agreement to respond to Nechako water stewardship-related challenges into the future. The Decisions document is available at <https://www.neef.ca/guidelines/neef-mc-decisions>

G. Funding Details

In 2021 one new project was approved for funding. An amount of \$445,000 was approved for the Ministry of Environment and Climate Change Strategy Nechako White Sturgeon Recovery project.

H. Projects Summary

The following table summarizes the projects approved and/or in progress during the 2021 fiscal year. Descriptions of each project follow.

Recipient	Project Approved	Approval	Payments to Date
Nechako White Sturgeon Recovery Initiative in Partnership with	White Sturgeon Conservation Fish Culture Program	\$4,363,454	\$3,583,742.50

Freshwater Fisheries Society of BC			
University of Northern British Columbia	Phase 2 Integrated Watershed Research in the Nechako River Basin	\$499,950	\$350,000
Cheslatta Carrier Nation	LiDAR	\$200,000	\$100,000
Cheslatta Carrier Nation	Umam (Pygmy Whitefish) Surveys	\$46,236	\$45,535.50
Ministry of Environment and Climate Change Strategy	Nechako White Sturgeon Recovery	\$445,000	\$107,500.00

3. Project Descriptions

White Sturgeon Conservation Fish Culture Program

Proponent: Nechako White Sturgeon Recovery Initiative in Partnership with Freshwater Fisheries Society of BC

NEEF Funding: \$4,000,000.00 (\$400,000.00 per year for 10 years)

Additional Funding: \$363,454.00 (to cover 10-year project shortfall)

Total Project Budget: \$8,551,857.00

Start Date: March 2013

End Date: March 2023

Description:

A comprehensive 5-year study on the Fraser River populations of white sturgeon, including the Nechako River, concluded that the Nechako River population of white sturgeon is a genetically distinct population, that is isolated from Fraser main-stem populations, and has experienced a decline in juvenile recruitment that started in the early 1960's and has resulted in no measurable juvenile recruitment since the late 1960's. Recent research has affirmed this assertion and the current estimated total population size is approximately 600 fish. There is a high probability of extinction within a few decades without immediate intervention to prevent further declines.

In January 2001, the provincial Nechako White Sturgeon Recovery Initiative was established to address the critical state of the population. The purpose of the recovery initiative is to stabilize the remaining population by preventing further declines and to rebuild a self-sustaining population.

Even if the recruitment problem is immediately rectified, the mature population would continue to lose numbers of mature fish for the next 25 years to natural mortality given the lag time between juvenile recruitment and maturation for this population. Genetic diversity will also continue to be eroded without immediate intervention. The specific reason(s) for recruitment failure is not precisely known, and while analysis of this problem is progressing substantially, recruitment restoration cannot be guaranteed, a conservation fish culture is paramount to preventing extinction of this population until wild recruitment can be re-established.



A conservation fish culture program can act immediately serving as an interim measure to preserve the genetic diversity in the remaining population, halt the continued loss of juvenile recruitment and initiate the rebuilding of age structure in the population. In addition, cultured sturgeon can facilitate a number of research initiatives that will reduce the uncertainty associated with many components of the recovery program including the reason(s) for recruitment failure.

The sturgeon conservation centre, built in Vanderhoof, became operational in May 2014. The capital funding was provided by Province of BC, Rio Tinto Alcan, District of Vanderhoof and other partners. It will be operated by the Freshwater Fisheries Society of BC under the auspices of the Nechako White Sturgeon Recovery Initiative.

\$4 million dollars will be provided by Rio Tinto Alcan through Nechako Environmental Enhancement Fund over the next ten years to operate the facility. An additional \$50,000 per year for operations has been provided from Rio Tinto Alcan directly. The conservation centre will be able to produce up to 12,000 juvenile sturgeon per year from up to twelve adult pairs, helping to secure the genetic diversity of this imperilled population for future generations.

Phase 2 Integrated Watershed Research in the Nechako River Basin

Proponent: University of Northern British Columbia

NEEF Funding: \$499,950.00

Total Project Budget: \$1,000,000.00

Start Date: January 2018

End Date: December 2022

Description:

The Integrated Watershed Research Group (IWRG) of UNBC was initiated in response to the growing recognition of the environmental, socio-economic and health implications of watershed dynamics (Owens 2008; Parkes et al. 2010). This led to the application for an initial phase of research (Phase 1: 2014-2017), which was supported by matched funds from NEEFS. Phase 1 has reinforced our awareness of the demand for watershed research, monitoring and evaluation frameworks that integrate a range of relevant information, knowledge and perspectives to better understand and respond to interrelated issues in the Nechako River Basin (NRB), and contribute to enhanced decision-making at the basin scale.

Informed by the insights and outcomes from Phase 1 research, this 5-year project will pursue research in three interrelated themes: Water security and climate change; Fine-grained sediment sources and dynamics; and Tools for integration in watershed management and governance.

Project Goals: The IWRG aims to fill gaps in knowledge about the NRB, and to contribute to the integration of information, knowledge and perspectives to better understand and respond to interrelated issues at the watershed scale. The IWRG will achieve this through three interrelated themes, each with their respective goals and objectives.

Theme 1: Water security and climate change

Theme 2: Fine-grained sediment sources and dynamics

Theme 3: Tools for integration in watershed management and governance



The expected outcomes of the project are:

- To apply and validate a state-of-the-art hydrological model (the Variable Infiltration Capacity model with glacier dynamics or VIC-GL) to the NRB that incorporates the effects of glaciers, lakes and reservoirs in addition to climate variability and trends on flows;
- To establish recent variations and trends in water temperatures across the NRB and their driving mechanisms;
- To develop and test a diagnostic water temperature model for the NRB;
- To project potential future influences of flow regulation and climate change on NRB flows and water temperatures.
- To use compound-specific stable isotopes as sediment fingerprints to investigate the contribution of sediment from different land cover types (e.g., forest vs agricultural crops vs pasture) to the sediment load delivered to the Nechako main stem;
- To use persistent organic pollutants (POPs, e.g., PAHs, PCBs, legacy pesticides) to identify the contribution of specific agricultural practices and areas impacted by forest disturbance (i.e., wildfire) to the sediment load delivered to the Nechako main stem;
- To further assess the quality of the sediment delivered to the Nechako main stem in terms of POPs and heavy metals;
- To provide guidance on the likely roles of projected changes in land use, watershed management and climate change on sediment sources in the NRB.
- To further develop and enhance the Nechako watershed portal through an expanded “Portal User Research Group” of current collaborators and new research partners;
- To couple community-based monitoring with youth engagement and research in the NRB, and to leverage overlaps between the areas of School District 91 and the NRB;
- To examine and apply frameworks for integrative watershed reporting that reflect combined environmental, community and health issues within the NRB, with a particular orientation to understanding the cumulative impacts of resource development;
- To evaluate the contributions of the web-portal development, youth engagement on community-based monitoring and integrative watershed reporting as tools and processes that inform and support intersectoral action and watershed governance.

Cheslatta Carrier Nation LiDAR Project

Proponent: Cheslatta Carrier Nation

NEEF Funding: \$200,000

Total Project Budget: \$400,000

Start Date: November 2016

End Date: March 31, 2022

Description:



The purpose of the proposed project is to acquire LiDAR³ point cloud data and high resolution airborne digital imagery combined with post acquisition data analysis to define the current state of the terrain and hydrology in the Cheslatta River Corridor and watershed.

The CCFNLP will provide a comprehensive and thorough base of data to support:

- Integrated Watershed Research
- Tributary Watershed Restoration and Stewardship
- Cheslatta Watershed Restoration

Specific Project Deliverables will be the identification and definition of:

- Streams, rivers and lakes that will support a fish habitat
- Streams, riverbanks and lake shorelines that require stabilization
- Streams, rivers and lakes that will benefit from reduced sedimentation and erosion
- Riparian zones that have been denuded
- Streams, rivers and riparian zones that require fencing to prevent livestock intrusion.
- Streams that require hardening for livestock crossing
- Streams that require the installation or replacement of culverts to ensure proper fish passage

Cheslatta Carrier Nation Umam (Whitefish Surveys) Project

Proponent: Cheslatta Carrier Nation

NEEF Funding: \$46,236

Total Project Budget: \$92,472

Start Date: September 1, 2020

End Date: March 31, 2021

Description:

The purpose of this project is to conduct a preliminary presence/absence survey for Umam within the Cheslatta watershed. Initial surveys will provide information regarding Umam presence and distribution that will help create a foundation for future management decisions that facilitate the recovery of Umam populations.

Project Goals:

1. Provide an avenue for CCN members to further develop skills and training in fish habitat assessment and management.
2. Determine the presence of Umam populations within the Cheslatta Watershed.
3. Provide an example of how Traditional Ecological Knowledge can inform wildlife conservation management.
4. Conduct a field survey over nine days in the Cheslatta Watershed, based on historical Umam spawning areas as documented by CCN elders, using minnow traps, Backpack Electrofishers, and/or seine nets.

³ Light Detection and Ranging.

5. Completion of fish cards for all fish species captured to submit to the regulatory agencies and for CCN records.
6. Collection of habitat characteristics of each surveyed site including:
 - a. Catch per unit effort (CPUE),
 - b. Number of mature versus juvenile fish caught,
 - c. Stream characteristics,
 - d. Water temperature (°C),
 - e. eDissolved oxygen (mg/l).

Ministry of Environment and Climate Change Strategy Nechako White Sturgeon Recovery Project

Proponent: Ministry of Environment and Climate Change Strategy

NEEF Funding: \$445,000

Total Project Budget: \$1,025,000

Start Date: May 25, 2021

End Date: March 31, 2023

Description:

This project includes planning and implementation of further action in support of the Nechako White Sturgeon Recovery Initiative (NWSRI). The project includes components that address two main areas of current focus for the NWSRI: habitat restoration to address recruitment failure and investigation of factors leading to diminished juvenile survival. The outcomes of this work are expected to provide a substantial and timely contribution to the recovery of the Nechako white sturgeon population.

The project components will address the following main areas:

- Habitat restoration - planning and implementing next steps.
- Spawning locations – effects of environmental variables.
- Juvenile survival – identifying factors that influence juvenile survival rate.
- Juvenile habitat - winter habitat evaluation.
- Juvenile monitoring - genetic tracing of wild recruits and evaluation of lake releases.

Project Goals:

1. Develop a habitat restoration plan to guide restoration work over the next 5 years.
2. Undertake initial habitat restoration actions in 2021.
3. Evaluate environmental factors potentially influencing spawning location within the Vanderhoof spawning reach.
4. Evaluate factors leading to diminished survival of juvenile Nechako white sturgeon.
5. Evaluation of overwintering habitat for Nechako white sturgeon to identify potential mitigation options.
6. Use genetic analysis to evaluate the parental origin of wild recruits.
7. Evaluate movement patterns of juveniles stocked in lakes



4. Financial Highlights at December 31, 2021

Income and Expenses	2017	2018	2019	2020	2021
Administration Expenses	21,415	21,733	15,508	24,418	18,104

An Audit was conducted by an independent accounting firm for the 2021 year-end. The audited financials are attached to this report.

In 2021, 2020, 2019 and 2018 an audit was conducted. In 2015, 2016 and 2017 Review Engagement Reports were completed. The accountant conducts the review, consisting primarily of inquiry, analytical procedures and discussion of Nechako Environmental Enhancement Fund Society's financial statements, in accordance with Canadian generally accepted standards for review engagements.

These audits and reports are available upon request.
Account Balances at December 31, 2021

NEEF Society Administration Account	\$ 28,399
Province of BC Account ⁴	\$1,033

⁴ In 2018 funds in the amount of \$78,000 paid by Rio Tinto and held in the Province of BC account were transferred to the NEEF Society Administration Account. A nominal amount of \$500 was retained in the Provincial Account.

5. Expenditures since Inception at December 31, 2021

Description	Detail	Total Commitment	Amount Paid to Date	Amount of Commitment Remaining	Total Remaining Uncommitted Funds
	Nechako Environmental Enhancement Fund	\$50,000,000			
NEEF Administration	Work of the Nechako Watershed Council. NEEF MC process and 2012 Report. Admin cost for legal work etc. for Society establishment. Society Administration expenses.	\$1,570,646	\$1,547,626	\$23,020	
Freshwater Fisheries Society of BC	White Sturgeon Conservation Fish Culture Program.	\$4,363,454	\$3,583,742	\$779,712	
Nechako White Sturgeon Recovery Initiative	Biochronology of Wild-Recruited Nechako White Sturgeon	\$10,000	\$10,000	\$0	
University of Northern BC	Integrated Watershed Research in the Nechako River Basin	\$500,000	\$492,052	\$0 ⁵	
Nechako Environment and Water Stewardship Society	Proposal Development	\$3,500	\$3,500	\$0	
Nechako Environment and Water	Nechako River Sustainability.	\$1,000,000	\$329,718	\$0	

⁵ Funds in the amount of \$7,948.00 went unused by the project and have been rolled back into the NEEF Fund and are included in the line-item Nechako Environmental Enhancement Fund Balance.

Stewardship Society ⁶					
Cheslatta Carrier Nation	Cheslatta LiDAR Project	\$200,000	\$100,000	\$100,000	
University of Northern BC	Phase 2 Integrated Watershed Research in the Nechako River Basin	\$499,950	\$350,000	\$149,950	
Cheslatta Carrier Nation	Umam (Pygmy Whitefish) Surveys	\$46,236	\$45,435	\$0 ⁷	
Ministry of Environment and Climate Change Strategy	Nechako White Sturgeon Recovery Project	\$445,000	\$107,500	\$337,500	
TOTALS		\$8,638,786	\$6,569,573	\$1,390,182	
Nechako Environmental Enhancement Fund Balance					\$41,361,214

⁶ Contract was cancelled at the request of the recipient. Unused grant funds in the amount of \$670,282 have been rolled back into the NEEF Fund and are included in the line-item Nechako Environmental Enhancement Fund Balance.

⁷ Project completed under budget and \$800 of the funding was unused.