

Strategic Plan



White Sturgeon Recovery

Interpretive Centre

Vanderhoof, British Columbia



Strategic Plan for the Nechako White Sturgeon Recovery Facility and Interpretive Centre

STRATEGIC PLAN

For the Nechako White Sturgeon Recovery Facility and Interpretive Centre

March 2007

Acknowledgements

This plan is the result of the cooperative effort and active participation of the government agencies, First Nations, industry, and non-government organization partners listed below.

Freshwater Fisheries Society of BC

District of Vanderhoof

BC Ministry of Environment

Alcan Primary Metal BC

Nechako White Sturgeon Recovery Initiative

Carrier Sekani Tribal Council

Nechako Watershed Council

Lheidli T'enneh First Nation

Fisheries and Oceans Canada

Tl'azt'en First Nation

Fraser Basin Council

Stellat'en First Nation

Regional District of Bulkley-Nechako

College of New Caledonia

City of Prince George

This plan was prepared by Compass Resource Management Ltd.



Executive Summary

The Nechako White Sturgeon is currently on the path toward extinction. Although the problems are complex, and the solutions multi-faceted, there is significant interest among community, government, First Nations and industry to take immediate recovery action.

In 2004, a Nechako White Sturgeon Recovery Plan was prepared that focused on two critical recovery efforts – a conservation fish culture program and research and recovery activities associated with habitat, recruitment, and restoration.

This current plan has been prepared for the purposes of securing resources for up-front capital and a stable source of long-term funds to construct and operate a “Recovery Facility” in the Saik’uz Territory in the District of Vanderhoof. The facility will be a major, tangible step toward achieving the overall recovery goal of ensuring a self-sustaining population of white sturgeon in the Nechako River.

While sturgeon recovery is central to this plan, local communities and First Nations envision that a regionally significant interpretive centre, linked to the sturgeon recovery efforts, could present simultaneous opportunities to enhance tourism, education, and environmental stewardship, while strengthening community and First Nations partnerships and become an integral component of the region’s long-term economic diversification and development strategy.

By agreeing in principle to provide the required land and site preparation for the Facility, the District of Vanderhoof has provided the first major step toward achieving the goals and vision of the plan.

Total Budget		Nechako White Sturgeon Recovery Facility and Interpretive Centre			
Component	Item	Land	Conservation Fish Culture	Habitat, Recruitment and Restoration	Stewardship, Outreach & Education
Capital		\$ 724,000	\$ 2,588,615	\$ -	\$ 4,521,000
Annual Operating & Maintenance		\$ -	\$ 475,000	\$ 275,000	\$ 165,000
		✓			
		Secured	Required	Required	Required

The estimated capital cost and operating expenses for the *Conservation Fish Culture* component were made with a reasonably high degree of confidence, whereas the Interpretive Centre estimates are more uncertain and will be refined following a feasibility study. Annual operating budget requirements for the *Habitat, Recruitment and Restoration* program components should be viewed as exemplary of the requirements in the short to medium term. An adaptive approach will be needed for these programs given that priorities may change over time as further monitoring, assessments and research are completed.

Given the range of certainty in component requirements and the urgency to scale-up recovery activities, it is proposed that a staged development strategy be pursued that ensures that the conservation fish culture components be implemented immediately, followed shortly thereafter by the other programs.

It is critical that a stable source of funding is established to ensure continuous operations and maintenance throughout the recovery period. The partners firmly believe that an endowment fund would best meet this objective.

Assuming an average annual return of approximately 4%, an estimated initial capital investment of approximately \$13 M dollars would be required to fund the *Conservation Fish Culture* program. To fund the *Habitat, Recruitment and Restoration* programs in addition, would require a total initial investment of \$20 M dollars, and finally to fund all future programs would require a total initial investment of \$25 M dollars.

A Board of Directors will be formalized to meet the new financial management and operating responsibilities. The District of Vanderhoof will own the facility and will retain the services of the Freshwater Fisheries Society of BC to perform the conservation fish culture component of the recovery initiative.

The current status of the SARA-listed Nechako White Sturgeon demands immediate action or this endangered population will become extinct. A Recovery Facility in the District of Vanderhoof is required immediately to scale-up conservation fish culture efforts and facilitate other priority recovery activities. Implemented strategically, this plan will also enhance local community and First Nation capacities and socio-economic development in the region.

Table of Contents

1	INTRODUCTION	1
1.1	The Urgency to Act.....	1
1.2	The Partners Involved	2
1.3	Purpose of the Plan	4
2	BACKGROUND AND CONTEXT	5
2.1	The Nechako White Sturgeon Recovery Initiative	5
2.2	The 2006 / 2007 Pilot Efforts	8
2.3	The Broader Nechako River / Watershed Context	10
3	VISION AND STRATEGIC GOALS	11
3.1	Vision.....	11
3.2	Strategic Goals.....	12
4	FUNDING STRATEGY	19
4.1	Land and Site Preparation.....	19
4.2	Conservation Fish Culture	20
4.3	Habitat, Recruitment and Restoration Activities	21
4.4	Stewardship, Outreach & Education.....	22
4.5	Summary	23
4.6	Endowment Fund	24
5	ORGANIZATIONAL STRATEGY	27
5.1	Financial Management	27
5.2	Ownership and Operations	28
6	FACILITY REQUIREMENTS.....	29
6.1	Conservation Fish Culture	31
6.2	Habitat, Recruitment and Restoration Activities	35
6.3	Stewardship, Outreach & Education.....	36
7	References	39

List of Tables

Table 1 - Priority Recovery Activities	7
Table 2 - Recovery Targets for the Recovery Initiative.....	13
Table 3 – Land and Site Preparation Costs	20
Table 4 – Conservation Fish Culture Costs.....	21
Table 5 – Habitat, Recruitment and Restoration Costs.....	22
Table 6 – Stewardship, Outreach & Education Costs	23
Table 7 – Total Budget	24
Table 8 – Endowment Fund Calculation.....	25
Table 9 – Two-way Sensitivity Analysis for Endowment Fund	26

List of Figures

Figure 1 – Parallel Paths to Nechako White Sturgeon Recovery ..	6
Figure 2 – Challenges, Impacts, and Solutions for 2007 Pilot.....	9
Figure 3 – Vision	12
Figure 4 - Projected Trend of Wild Sturgeon Populations.....	14
Figure 5 - Site Location, Vanderhoof	30
Figure 6 - Conservation Fish Culture Process	32
Figure 7 – Recovery Program Activities	35
Figure 8– Stewardship, Outreach and Education	36

Acronyms

BCMOE–	British Columbia Ministry of Environment
CNC –	College of New Caledonia
CSTC –	Carrier Sekani Tribal Council
FFSBC –	Freshwater Fisheries of British Columbia
NEEF –	Nechako Environmental Enhancement Fund
NFCP –	Nechako Fisheries Conservation Program
NWC –	Nechako Watershed Council
NWSRI–	Nechako White Sturgeon Recovery Initiative
SARA –	Species at Risk Act
UNBC –	University of Northern British Columbia



1 INTRODUCTION

Nechako White Sturgeon have not successfully reproduced in 40 years and will go extinct without intervention. Although the problem is complex, and the solutions multi-faceted, there is significant interest among community, government, First Nations and industry to take immediate recovery actions.

This document presents the plan for securing resources to develop a Nechako White Sturgeon Recovery Facility to be located in the Saik'uz Territory in the District of Vanderhoof, British Columbia. The Recovery Facility would house a conservation fish culture program, other high priority recovery programs and an interpretive center for educational outreach and tourism. The plan has been prepared based on the input and active engagement of a broad range of interested parties including government, First Nations, NGOs, the local community and industry. The impetus to develop a Recovery Facility is to support priority recovery activities for the endangered white sturgeon population and to provide an opportunity to enhance and diversify the local economy through tourism.

1.1 The Urgency to Act

Since the time of dinosaurs 175 million years ago, the sturgeon family has survived ice ages and substantial climatic upheavals. Human activities have altered this long-term success and today, some populations are on the very brink of extinction, with populations of the Nechako/Stuart, Upper Fraser, Kootenay and Columbia officially designated as endangered under the Federal Species at Risk Act (SARA). As North America's largest freshwater fish, the White Sturgeon can live for over 100 years, weigh more than 600 kilograms, and measure 6 metres in length (BCMOE, 2007). The need to develop a conservation fish culture facility for the Nechako population is immediate, since the number of available adult spawning females is decreasing with each passing season.



Source: NWSRI, 2004

The last 50 years has seen the Nechako white sturgeon population¹ drop from what some scientists believe was once over 8000 fish to

¹ The range (or distribution) of Nechako white sturgeon is defined as upstream of the confluence of the Nechako and Fraser rivers at Prince George. The Nechako stock also

less than 350 today. With virtually no recruitment and very few sturgeon less than 40 years old, an entire generation is already missing (NWSRI, 2007). It is currently estimated that less than 150 mature females remain in the Nechako River. Spawning infrequently, the recruitment failure means approximately 5-10 fewer females are available to restore the genetically distinct population each year. The lack of juveniles in the Nechako population has resulted from an extremely low survival rate amongst the young. The March 2004 Recovery Plan for Nechako White Sturgeon noted that a conservation fish culture program was a key priority recovery action to maintain the genetic diversity of the Nechako population in the absence of natural juvenile recruitment (NWSRI, 2004). The imminent threat to this population cannot be stressed enough. In the short term, an immediate fish culture response is necessary or this unique population will disappear forever. In the long term habitat issues will need to be addressed to support full recovery. A summary of priority recovery activities outlined in the Recovery Plan is presented in section 2.1 below. A recovery facility in Vanderhoof is viewed as a logical home for these recovery activities.

While sturgeon recovery is the central activity noted in this plan, it is not the sole driving force. Long-term declines in the salmon fisheries, and the recent impacts from the Mountain Pine Beetle epidemic are examples that signal fundamental shifts in the local and regional socio-economic outlook. With such forces in mind, local communities and First Nations are looking for new employment and skills development opportunities. A regionally significant interpretive centre, linked to the sturgeon recovery efforts, is anticipated to provide new opportunities in tourism and education, strengthen community and First Nations partnerships, and hence become an integral component of the region's long-term economic diversification and development strategy.

1.2 The Partners Involved

For more than 6 years, the White Sturgeon Recovery Initiative has been guided by a Technical Working Group and a Community Working Group that work together to ensure the technical soundness of sturgeon recovery activities and meaningful participation with First Nations and the local communities. The initiative has formed strong

includes sturgeon living in the Stuart and Nautley rivers and their complex series of lakes (NWSRI, 2007).

relationships amongst partners and attracted wide support from stakeholders. The following partners have been actively involved in the preparation of the Strategic Plan for the Recovery Facility:

Government

- BC Ministry of Environment
- Fisheries and Oceans Canada

First Nations²

- Carrier Sekani Tribal Council³
- Lheidli T'enneh First Nation
- Stelat'en First Nation
- Tl'azt'en First Nation

Local Community

- District of Vanderhoof
- City of Prince George
- Regional District of Bulkley-Nechako

Industry

- Alcan Primary Metal BC

NGOs

- Nechako White Sturgeon Recovery Initiative
- Freshwater Fisheries Society of BC
- Fraser Basin Council
- Nechako Watershed Council
- Nechako White Sturgeon Recovery Initiative

Academia

- College of New Caledonia

Letters of support for the initiative are available in Appendix A.

² Nothing in this plan shall be interpreted in a manner inconsistent with the exercise of any existing Aboriginal and Treaty right as recognized and affirmed in s. 35 of the Constitution Act, 1982, which include rights now existing by way of land claims agreements or which may be acquired under land claims agreements.

³ CSTC membership includes twelve thousand members from eight First Nations communities, including Burns Lake Band (Ts'il Kaz Koh First Nation), Nak'azdli Band, Nadleh Whut'en, Saik'uz First Nation, Takla Lake First Nation, Tl'azt'en Nation, Stelat'en First Nation and Wet'suwet'en First Nation).

1.3 Purpose of the Plan

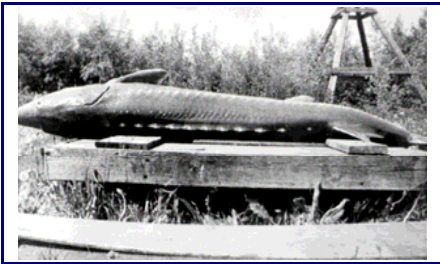
The purpose of this plan is to secure the resources necessary to implement the Nechako White Sturgeon Recovery Activities and to develop an Education and Interpretive Centre to be located in the Saik'uz Territory in the District of Vanderhoof, British Columbia. The plan outlines the vision, strategic goals, funding and other resource requirements as identified by the participating partners. The plan contributes to BC's vision of a *Golden Decade* to lead the world in sustainable fisheries management, and is fundamentally linked to both the Nechako White Sturgeon Recovery Initiative and the long-term socio-economic aspirations of the people and communities in the Nechako watershed.



The Centre of British Columbia
Vanderhoof, BC

2 BACKGROUND AND CONTEXT

In Canada, the white sturgeon can be found in the Fraser, Nechako/Stuart, Columbia and Kootenay river systems. All populations are genetically distinct and have experienced serious declines in recent years. In 1995, the province of BC initiated an intensive five-year study of the white sturgeon in the Nechako River and results indicated that the species faces a near certain risk of extinction within the next generation if the situation is not remedied immediately. In addition, a Draft version of the National Recovery Plan for the White Sturgeon has affirmed this conclusion.



*Sturgeon caught in the 1950s.
Source: Norcan*

The white sturgeon was once a valuable commercial species and is still highly valued for societal and cultural reasons, both recreationally and traditionally. Some First Nations peoples have harvested white sturgeon for subsistence purposes since long before Europeans arrived (Echols 1995, Cadden 2000, UCRRP 2002) (Ptolemy, 2003).

In 1994, the provincial and federal fisheries agencies closed commercial and recreational sturgeon fisheries (in both fresh and salt water). At the same time First Nations in the area voluntarily stopped harvesting Nechako White Sturgeon and continue to release those caught incidentally while salmon fishing. The province has also closed the recreational 'catch and release' fishery on the Nechako River and its tributaries, including the Stuart River.

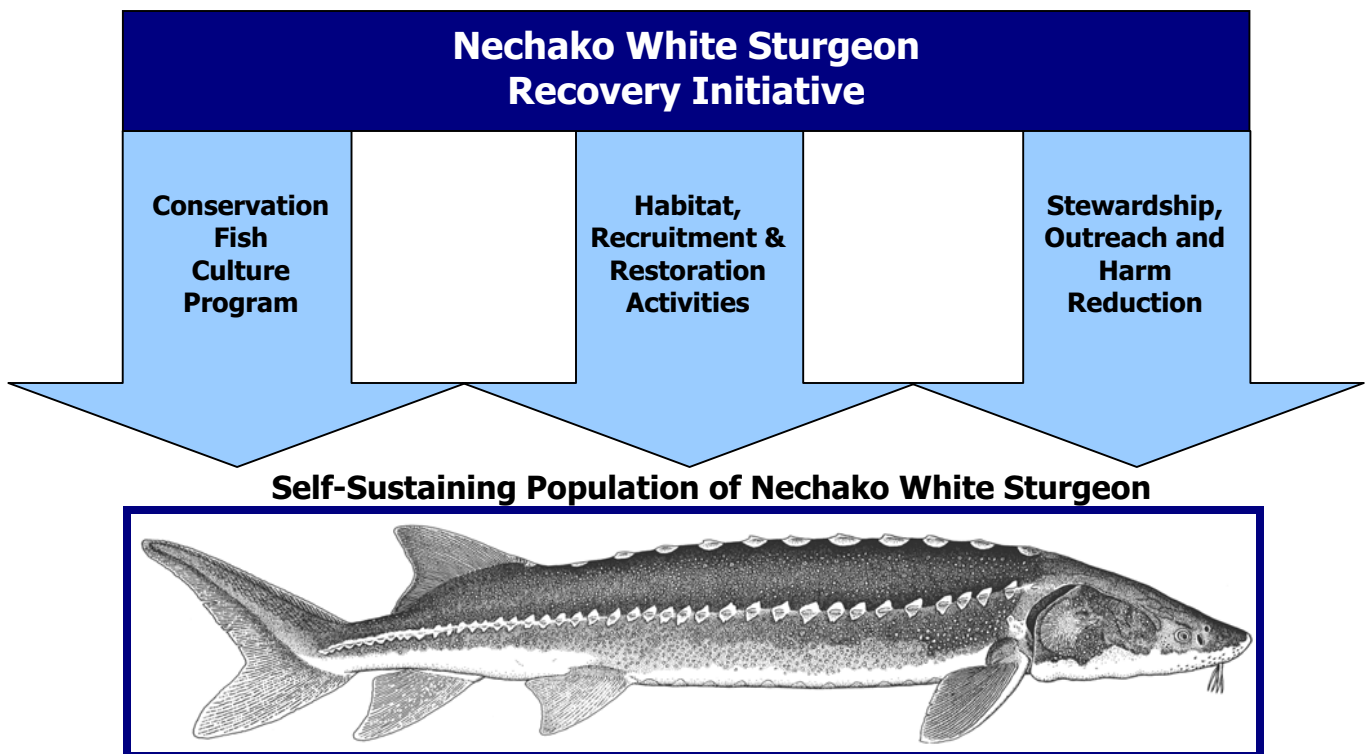
The reasons for the dramatic decline of the Nechako White Sturgeon are currently being studied. The diversion of water flows and changes to the level and timing of water flows in the Nechako River, resulting from the construction of the Kenney Dam are likely to have had the most substantial effects on the sturgeon. Other contributing factors may include other habitat changes following dam construction, fishing effects, pollution and changes to the river landscape by human construction (NWSRI, 2007).

2.1 The Nechako White Sturgeon Recovery Initiative

The Nechako White Sturgeon Recovery Initiative (NWSRI) was launched in September 2000 to bring together stakeholders along the entire length of the Nechako River that were interested in

collaborating on recovery efforts. Working through both a Technical Working Group and a Community Working Group, the NWSRI developed a recovery strategy made up of priority actions aimed at restoring the Nechako white sturgeon to self-sustaining population levels (Table 1). There are three critical recovery efforts that will be proceeding along parallel paths; the Conservation Fish Culture Program, the Habitat, Recruitment, and Restoration Activities, and the Stewardship, Outreach and Education Activities (Figure 1).

Figure 1 – Parallel Paths to Nechako White Sturgeon Recovery



In the short term, a key NWSRI priority is to develop a conservation fish culture program to rebuild and maintain the population until the cause of the decline can be determined and corrected. In the medium to long term, the goal is for restoration of natural recruitment. The NWSRI believes that a conservation fish culture facility could produce, for the present, the juveniles necessary to preserve the next generation of Nechako white sturgeon while the

factors for the decline in natural spawning are addressed.⁴ Eggs and juvenile sturgeon produced in a conservation fish culture program are also required to test various habitat research and restoration activities. If such a conservation fish culture program is not immediately implemented, there is little hope for the survival of the endangered Nechako White Sturgeon population.

Table 1 - Priority Recovery Activities

Conservation Fish Culture

1. Preserve the remaining population diversity in the absence of juvenile recruitment.
-

Water Management

1. Define flow requirements necessary to promote natural spawning, incubation, rearing, recruitment, and survival of Nechako River sturgeon.
-

Water Quality and Habitat

1. Evaluate restoration of the natural temperature regime of the Nechako River.
 2. Evaluation of changes to the turbidity regime.
 3. Investigate changes to the geomorphology of the Nechako River.
-

Population Assessment, Monitoring, and Research

1. Protect existing sturgeon population using available regulatory mechanisms and planning processes.
 2. Periodic adult population assessments.
 3. Spawning investigations.
 4. Juvenile indexing.
 5. Essential habitats.
 6. Recruitment bottlenecks.
 7. Genetic baseline.
 8. Population analysis.
 9. Sturgeon Community interactions.
-

Information and Education

Source: NWSRI, 2004

⁴ The Initiative is working with sturgeon experts to develop a risk management plan to make sure that the conservation fish culture program has appropriate controls to contain disease, and that the breeding plan is designed to preserve the unique genetic composition of the Nechako white sturgeon (NWSRI, 2007). The intent is to minimise, where possible, the impacts of non-natural interventions to restore the population to self-sustaining levels.



FFSBC's Kootenay Conservation Fish Culture Program

The Freshwater Fisheries Society of BC (FFSBC) have extensive experience in conservation fish culture and have partnered with both the upper Columbia and Kootenay River white sturgeon recovery initiatives to deliver the British Columbia conservation fish culture components of these programs. In 2006 they developed a pilot conservation fish culture facility on the Nechako River in Vanderhoof with the support from the Ministry of Environment, ALCAN, the Carrier Sekani Tribal Council, and the District of Vanderhoof.

2.2 The 2006 / 2007 Pilot Efforts

In March 2006, the Freshwater Fisheries Society of BC led the developing of a pilot fish conservation program in Vanderhoof. A second-hand bulk-shipping container was purchased, two pumps were installed in the river, and spare rearing containers, equipment, and staff from FFSBC's other conservation fish culture facilities were relocated to Vanderhoof. The tight schedule meant that the temporary conservation fish culture facility was completed just 1-day before spawning was induced.

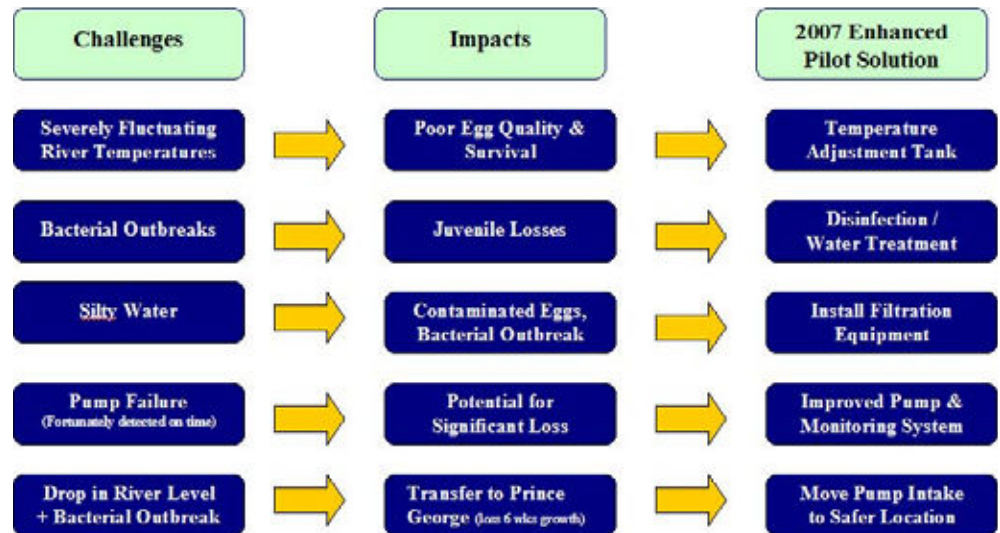
In a 10-day period, 33 White Sturgeon were captured, but only two females (220 and 240 lbs) were suitable for spawning. These fish were transported to FFSBC's Prince George Facility for spawning where two distinct families were produced. Eggs were then transported to the conservation fish culture facility in Vanderhoof for incubating and rearing. Following spawning, a public event attracting over 400 people and the media was held in Vanderhoof to watch one of the large sturgeon being returned to the river.

While the expedited ad-hoc design of the rearing facilities in Vanderhoof allowed the small-scale pilot conservation fish culture facility to get underway in time for the spawning season, the effort was not without serious challenges. Problems included severely fluctuating and very warm river water temperatures, water quality (silt) problems, bacterial outbreaks, one serious pump failure and extremely low river levels (Figure 2).



2006 Vanderhoof Pilot Facility

Figure 2 – Challenges, Impacts, and Solutions for 2007 Pilot



Despite the water supply issues and being severely under-funded, the pilot program achieved its optimistic goal of releasing 4,000 juvenile sturgeon. The juvenile release once again raised the profile of the Recovery Initiative within the Vanderhoof community as over 1,000 schoolchildren each released a 4-month-old juvenile sturgeon into the river.



2006 Juvenile Sturgeon Release Event

The 2006 pilot program would not have been a success had the NWSRI not received considerable summertime assistance from CSTC fisheries staff and enjoyed strong collaborations amongst agencies and local communities.

An Enhanced Pilot Facility program is currently underway for the 2007 spawning season. The program retains much of the same equipment from the 2006 season, but takes additional measures to address many of the challenges faced last year. These measures include additional staffing, relocating the water intake site, purchasing water filtration and disinfectant equipment, and improving the water pumping and monitoring system. To effectively manage risks, the Enhanced Pilot Project will proceed with a reduced sturgeon production goal (~3000 juveniles) until adequate funding becomes available to develop a more permanent and safer rearing facility. Higher number of juveniles from more families will be required to meet recovery objectives.

2.3 The Broader Nechako River / Watershed Context

The Nechako River system has played a major role in the history and development of north central British Columbia, and continues to be important for its' ecological attributes, its' commercial, First Nations and recreational fisheries, and as water supply for agricultural purposes, power generation, and various outdoor recreational activities.

The Nechako Environmental Enhancement Fund (NEEF) was established as part of a 1997 Agreement between ALCAN and the Government of BC to review, assess and report on options that may be available for the downstream enhancement of the Nechako watershed area.



The Nechako River

In 1998, the Nechako Watershed Council (NWC) was established as a multi-interest group of First Nations, business, community and government parties interested in collaborating to develop new water management strategies that incorporate solutions to the longstanding conflicts in the watershed. In 2002/2003 the NWC prepared a workplan with its partners to assess the feasibility of a Cold Water Release Facility at or near the Kenney Dam as a potential means of improving habitat conditions in the river.

The Cold Water Release Facility has been proposed in order to facilitate a more natural flow regime and thus was identified as the preferred option for downstream enhancement of the Nechako River watershed area. A water release facility would access cooler water from lower levels of the reservoir so that less water would be required to meet summer water temperature requirements for fish in the Nechako. This would "free up" water that could be redistributed at other times of the year to mimic a more natural flow regime and meet other downstream needs.

Another initiative is the Nechako Fisheries Conservation Program (NFCP), which was formed to ensure the effective implementation of the 1987 Settlement Agreement between ALCAN, Fisheries and Oceans Canada, and the Provincial Government on the regulation of the Nechako River. The NFCP undertakes aquatic management and monitoring of Nechako River temperature conditions, reservoir water flow releases, and adult Chinook salmon spawner numbers.

3 VISION AND STRATEGIC GOALS

All partners recognize the critical need to expeditiously secure a stable source of funding in order to implement the vision and strategic goals of the conservation fish culture, habitat, recruitment, and restoration activities, and the community programs outlined below.

The following vision and strategic goals for the Nechako White Sturgeon Recovery Facility and Interpretation Centre is the result of two planning workshops with over twenty participants representing government agencies, First Nations, industry, and non-governmental organisations held in the District of Vanderhoof in January and March 2007.

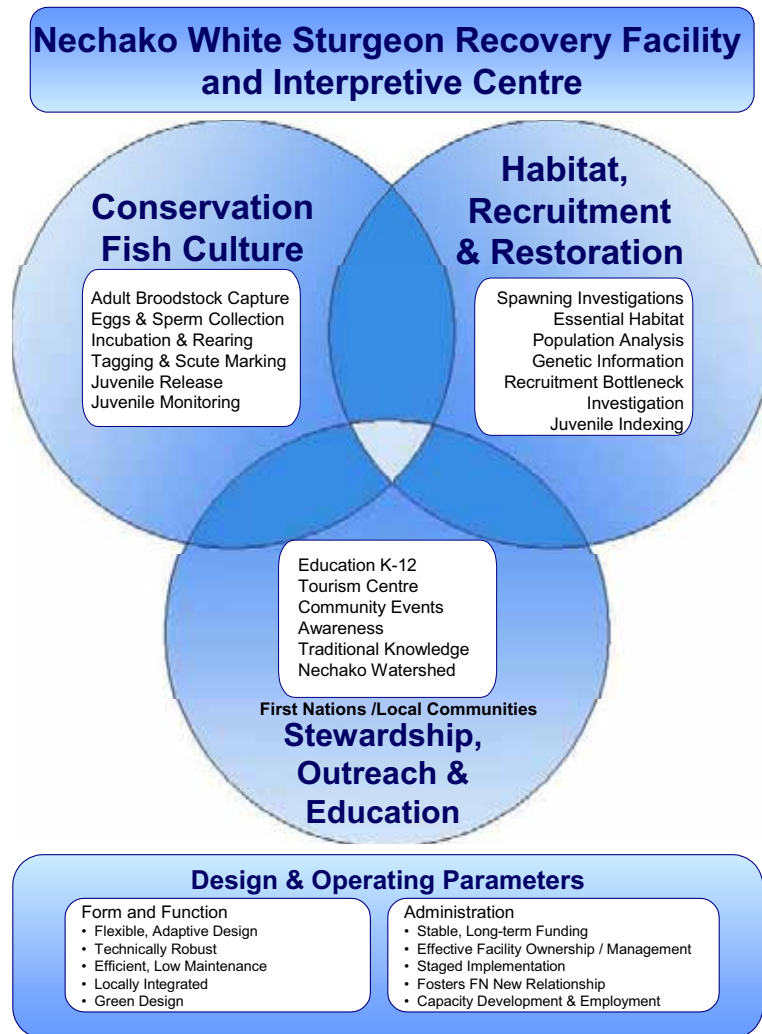
3.1 Vision

There is an immediate need for tangible recovery action to protect the Nechako White Sturgeon from becoming extinct. This action can build upon and foster partnerships and community development opportunities. The partner's vision is that:

The Recovery Facility and Interpretive Centre will create and support the establishment of a self-sustaining population of Nechako White Sturgeon while enhancing local economic opportunities through a strong Community / First Nations relationship based on the principles of sustainability and sound environmental stewardship.

This vision recognizes the integrated role of science-based recovery programs and community-based stewardship programs (Figure 3). Partners also identified a set of design and operating parameters for the form, function and administration of the facility that serve to complete the vision.

Figure 3: Vision for the White Sturgeon Recovery Facility and Interpretation Centre



3.2 Strategic Goals

The goals of the Recovery Initiative are outlined in the Recovery Plan and are briefly summarised in Table 2. The goals for the White Sturgeon Recovery Facility support the objective for white sturgeon recovery while simultaneously capturing the broader vision of the local community, First Nations, and the watershed's other stakeholders.

Conservation fish culture program

Goal: *To provide the infrastructure and expertise necessary to implement the conservation fish culture program of the NWSRI.*

The aim of the conservation fish culture program is to help rebuild the population to acceptable levels, maintain the genetic diversity of the Nechako population and to provide eggs and juvenile fish for necessary research activities until such time that natural recruitment can be sustained.

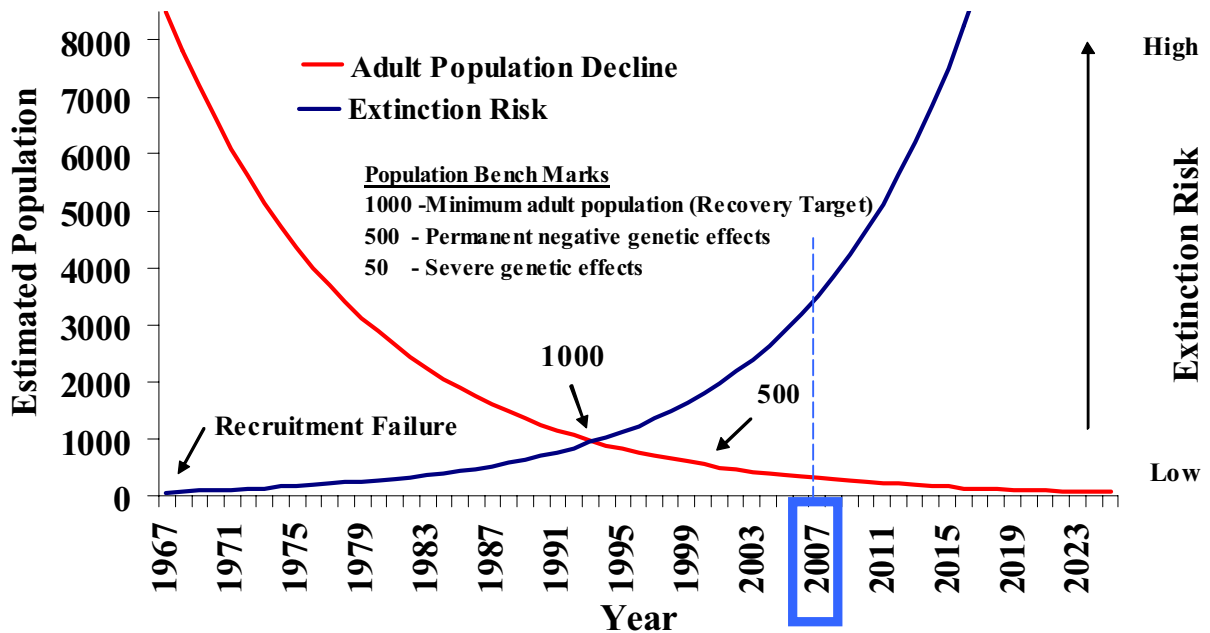
Recent estimates for the Nechako population indicated that in 1999 approximately 571 white sturgeon remained (RL&L 2000). Franklin (1980) suggested that an effective population size of at least 500 individuals would be necessary to maintain the long-term adaptive potential for a population. At populations less than this (as is the case today), permanent negative genetic effects arise, and below 50 adult individuals severe genetic effects occur. Considering the current low population size, the ongoing lack of recruitment, the unique genetic structure and the limited number of adults maturing annually, each sturgeon mortality within the Nechako population represents a potential permanent loss of genetic information, resulting in a loss of adaptive potential for the local population as well as for white sturgeon as a species. Figure 4 illustrates the relationship between adult population decline and extinction risk, and highlights the critical need for immediate action.

Table 2 - Recovery Targets for the Recovery Initiative

- (i) Minimum adult population size of 1,000
 - ii) Natural recruitment of juvenile population size sufficient to support desired adult population size.
 - ii) Stable or increasing trends in adult and juvenile numbers.
 - v) Stable size and age distribution.
 - v) Genetic diversity (including rare allele frequencies) similar to current levels.
 - /i) Long-term fishery objectives will be reached when natural production rates are sufficient to support at least minimal sustenance fishery uses or incidental impacts of white sturgeon monitoring programs.
-

Source: NWSRI. 2004

Figure 4 - Projected Trend of Wild Sturgeon Populations



It is important to note that a self-sustaining wild population of sturgeon will only be realized if both the conservation fish culture component and the habitat, recruitment, and restoration activities are performed as soon as possible.

In order to achieve the desired long-term adult population size, the NWSRI’s Technical Working Group has identified the following actions for the conservation fish culture program at the Recovery Facility:

1. Develop the capacity to produce and release a sufficient number of juvenile sturgeon originating from a genetically diverse broodstock.
2. Produce larval and juvenile white sturgeon for habitat research.
3. Capture, incubate and rear wild origin eggs, larvae and fry onsite in isolation of other cultured fish.
4. Develop capacity to over winter unspawned adult sturgeon.
5. Adaptively manage production capacity and release juvenile sturgeon at appropriate life stages and times as the culture program is assessed.

Providing the infrastructure and expertise necessary to implement the conservation fish culture program of the NWSRI is one of the key goals of this strategic plan. The need for a full-scale conservation fish culture program was outlined in the Recovery Plan, and pilot studies have successfully illustrated that cultured juveniles can be reared from the wild Nechako population.

Facility construction must proceed expeditiously in order to effectively manage the operational risks identified during the pilot program and to simultaneously scale up operations to meet recovery targets (projected releases of 3000 in 2007 are expected to be too low to meet all recovery objectives).

Habitat, Recruitment and Restoration Activities

Goal: To provide the infrastructure and expertise necessary to support habitat, recruitment, and restoration activities outlined in the Recovery Plan for Nechako White Sturgeon.



Habitat Research & Recovery Activities

The conservation fish culture component is just one critical element of a two pronged strategy for recovery of Nechako White Sturgeon. Additional habitat, recruitment and restoration activities are required to meet the long-term goal of the recovery program. As the other recovery activities outlined in Table 2 are designed, implemented, and developed throughout the recovery initiative, it is the Technical Working Group's goal to provide the infrastructure, equipment and expertise necessary for staging, planning, and undertaking this work in a central facility located in Vanderhoof.

Recent habitat, recruitment and restoration activities associated with diagnosing causes of recruitment failure and investigation/implementation of remediation actions, included:

- Monitoring spawning to confirm spatial and temporal distribution.
- Monitoring spawning to examine egg and larval habitats.
- Undertake in-river substrate remediation/preference tests
- Monitoring habitat conditions before and after restoration work
- Rearing trials using wild spawned eggs (if feasible)
- Lab-based work on larval/juvenile substrate preferences

In upcoming years, it is intended that larger scale field tests will be undertaken, including large-scale habitat remediation, intensive spawn monitoring and documentation, and further examination of the relationship between larval distribution and substrate. Monitoring of the effects of the restoration trials will be subsequently performed to test the success of this project.

Stewardship, Outreach & Education

Goal: *To foster awareness and responsibility amongst all citizens in the recovery efforts and community programs, both for now and for the future.*

The NWSRI recognizes that environmental stewardship and capacity development are not simply catch phrases and one-off educational courses, but a fundamental philosophy that encompasses the entire initiative and a long-term commitment. The organizational structure has been designed to facilitate this view and will achieve this goal by effectively enhancing individual capacities, and providing multiple avenues for participation in either the recovery or community programs.

The establishment of an interpretive center is seen by the local community and First Nations as an opportunity to highlight the region's unique features while strengthening the local economy through increased tourism. The community programs could highlight the plight of the Nechako White Sturgeon, the holistic approach to management within the Nechako watershed, and the traditional knowledge of First Nations culture and traditional fishing practices in the region. In addition, the aim of the interpretive centre would be to attract tourists to the region to generate an increased source of revenue through product sales, visitor fees, and employment.



Stewardship, Outreach and Education

Other sturgeon recovery facilities such as at the Kootenay Sturgeon Conservation Hatchery near Fort Steele in the East Kootenay Region have successfully included interpretive facilities in their recovery efforts.

In addition to the interpretation component, an important element for implementing the technical aspects of the recovery plan is to perform outreach to the local communities, schools, First Nations and youth groups. Education and outreach will identify others with common interests and will raise awareness of those activities that benefit or detrimentally affect the recovery of white sturgeon (i.e. reducing the high volume of motorboat traffic in spawning areas, etc.). Sharing the experiences of the Recovery Initiative with school children K-12 can help foster a sense of sound environmental stewardship, strong science and traditional knowledge.

At a minimum, the following actions would likely be implemented to achieve the education goals of the Recovery Facility and Interpretation Centre:

1. Developing and strengthening partnerships with First Nations and other community and regional activities with shared goals.
2. Educating the public on the plight of the White Sturgeon, the Nechako Watershed, and First Nations Traditional Knowledge and Culture through outreach programs to schools (K1-12), community and youth groups.
3. Developing and distributing information and education materials to support the Interpretive Centre's goals.
4. Link with the training needs of school curriculums to develop associated learning materials to support teachers with student learning.
5. Provide the opportunity for field or laboratory research and other experiential learning activities in partnership with post-secondary institutions in the region.

Feasibility study requirement

In order to enhance the likelihood of success, a feasibility study would be performed prior to designing the Interpretation Centre component to the Recovery Facility. Issues to be assessed would include, but not be limited to, the following:



*FFSBC's Freshwater Eco-Centre in
Duncan, BC*

- Identifying a stable funding source to ensure quality staff and evolving exhibitions
- Potential number of visitors
- Regional demographic surveys
- Desired presentation methods and delivery mechanisms (i.e. human contact / fixed displays, etc.)
- Number of local schools interested in programs
- Duration of program activities
- Detailed identification of potential program opportunities (i.e. multiple messaging to diversify opportunities for other organizations to assist in funding, maintenance, supplies and interpreter wages, etc.)
- Identifying a fee structure that captures the inherent value of the program without detracting from visitation revenues.
- Gift shop
- Linkage opportunities with other facilities/operators, e.g. Vancouver Aquarium
- Hours of operation

4 FUNDING STRATEGY

In order to achieve the vision and strategic goals of the plan, the partners will need to obtain sufficient up-front capital resources and a long-term stable funding source for ongoing operations.

The up-front capital and annual operating and maintenance budget estimates are presented in the following sections, broken out by the three major components: 1) Conservation Fish Culture, 2) Habitat, Recruitment, and Restoration, and 3) Stewardship, Outreach, and Education. It is recognized that while all three components are integrated via the vision and goals above, that different funding sources may be pursued for each component.

4.1 Land and Site Preparation

The first key component of the funding strategy has already been secured, as the District of Vanderhoof has agreed in principle to provide the required land and site preparation (Figure 5).

The estimated value of the 28.58 acres parcel of land fronting on the Nechako River is approximately \$4.2 Million dollars. While the interpretation programs will make use of the surrounding natural environment of the entire parcel of land, it is expected that the Facility and Interpretive Centre would require roughly 3 acres of land. As such, a recognized land contribution of \$450,000 has been considered in this funding strategy. With additional site preparation and related contingency costs, the total contribution is \$724,000.

This contribution by the District of Vanderhoof represents the first major step toward achieving the goals and vision of the plan.

Table 3 – Land and Site Preparation Costs

Land		
Component	Item	Cost Estimate
Capital	Land	\$ 450,000
	Site Preparation	\$ 200,000
	Subtotal	\$ 650,000
	Professional Services (7%)	\$ 14,000
	Contingency (25%)	\$ 50,000
	Construction cost inflation (5%)	\$ 10,000
	Total Capital	\$ 724,000

✓ Secured

4.2 Conservation Fish Culture

There is a reasonably high degree of confidence in the initial capital cost estimates for the conservation fish culture component of the plan. The capital costs outlined in Table 4 below are based on preliminary engineering estimates and FFSBC experience with similar facilities. (These costs are based on the technically efficient design parameters described in Section 6.1 below.)

The annual operating budget requirements for the *Conservation Fish Culture* program for wages, supplies, operating expenses and juvenile monitoring and research are based on experience in the pilot programs (see Section 2.2) and other FFSBC facilities. The current strategy is to have the annual operating budgets for this component provided by an endowment fund – see Section 4.6 below. As the overall implementation of the recovery program evolves and the goal of achieving natural recruitment is realized, annual operating budgets for the conservation fish culture program are expected to reduce, making additional endowment fund resources available for other recovery or interpretive centre programs.

Table 4 – Conservation Fish Culture Costs

Conservation Fish Culture		
Component	Item	Cost Estimate
Capital	Site Civil	\$ 56,500
	Site Utilities	\$ 141,000
	River Intake	\$ 170,000
	Hatchery	\$ 417,000
	Mechanical Process	\$ 905,000
	Vehicle, Ancillary Equipment	\$ 200,000
	Subtotal	\$ 1,889,500
	Professional Services (7%)	\$ 132,265
	Contingency (25%)	\$ 472,375
	Construction cost inflation (5%)	\$ 94,475
Total Capital	\$ 2,588,615	Required
Operation & Maintenance	Wages	\$ 100,000
	Supplies	\$ 100,000
	Operating Expenses	\$ 200,000
	Juvenile Monitoring/Research	\$ 75,000
	Annual Operating & Maintenance	\$ 475,000

4.3 Habitat, Recruitment and Restoration Activities

The annual operating budget requirements for the Habitat, Recruitment and Restoration program components shown in Table 5 are based on the recent NWSRI program plans, and should be viewed as exemplary of the requirements in the short to medium term. At this time, long-term capital costs for restoration are unknown and are therefore not considered in this strategy. It is recognized that an adaptive approach is needed for these programs, and that priorities

may change over time as further monitoring, assessments and research are completed.

Up-front capital costs for the habitat, recruitment and restoration activities are not expected to be significant and have not been included in this funding strategy.

Table 5 – Habitat, Recruitment and Restoration Costs

Habitat, Recruitment and Restoration		
Component	Item	Cost Estimate
Capital		\$ -
Operation & Maintenance	Spawning Monitoring	\$ 90,000
	Recruitment Failure Diagnosis	\$ 70,000
	Geomorphology & Restoration	\$ 50,000
	Various projects (eg. Adult monitoring; DNA; Ageing, Population Estimates, etc.)	\$ 65,000
Annual Operating & Maintenance		\$ 275,000
		Required

4.4 Stewardship, Outreach & Education

In contrast to the Recovery Facility, the up-front capital costs and operating cost estimates for the Interpretive Centre are more uncertain, as they are dependant on the need for a more detailed development of potential options. For this reason, an initial feasibility study is included as the first necessary capital requirement for the centre. The preliminary cost estimates (Table 6) have been based on FFSBC’s experience with the development of a Freshwater Eco-Centre on the Cowichan River in Duncan, BC.

Table 6 – Stewardship, Outreach & Education Costs

Stewardship, Outreach & Education		
Component	Item	Cost Estimate
Capital	Feasibility Study	\$ 100,000
	Building Infrastructure	\$ 3,000,000
	Program Materials	\$ 200,000
	Subtotal	\$ 3,300,000
	Professional Services (7%)	\$ 231,000
	Contingency (25%)	\$ 825,000
	Construction cost inflation (5%)	\$ 165,000
Total Capital (preliminary estimate)		\$ 4,521,000
		Required
Operation & Maintenance	Wages	\$ 70,000
	Supplies	\$ 20,000
	Operating Expenses	\$ 75,000
	Annual Operating & Maintenance	\$ 165,000
		Required

4.5 Summary

Given this range of certainty in component requirements, the funding strategy accommodates a staged approach. Now that the land is already secured, the intent is to move forward with the Recovery Facility first, incorporating any necessary design flexibility to facilitate later addition of the Interpretive Centre component. The preferred source of stable funding would be through an endowment fund, however other targeted funding mechanisms will be considered in order to maintain the development schedule and achieve the goals of the recovery plan. Table 7 summarizes the capital and annual operating and maintenance costs for each component of the proposed plan. It should be noted that construction costs in the province are escalating rapidly. Further delays would likely result in higher capital costs.

Table 7 – Total Budget

Total Budget		Nechako White Sturgeon Recovery Facility and Interpretive Centre			
Component	Item	Land	Conservation Fish Culture	Habitat, Recruitment and Restoration	Stewardship, Outreach & Education
Capital		\$ 724,000	\$ 2,588,615	\$ -	\$ 4,521,000
Annual Operating & Maintenance		\$ -	\$ 475,000	\$ 275,000	\$ 165,000
		✓			
		Secured	Required	Required	Required

4.6 Endowment Fund

As previously indicated, it is critical that a stable source of funding is established to ensure continuous operations and maintenance throughout the recovery period. To date, a variety of funding sources have been pursued annually by the partners to implement these programs (e.g., Species at Risk Act Funds, Environment Canada funds, Pacific Salmon Foundation - Watersheds Program, etc). As these funding sources are not guaranteed and impose a significant administrative burden on the Nechako White Sturgeon Recovery Initiative, the partners firmly believe an endowment fund would best suit the stable funding needs of the recovery efforts. The partners are open to considering a variety of funding mechanisms and combinations thereof in order to ensure the long-term stable source of funds for the recovery facility and interpretive centre programs.

An endowment fund works on the principle that an initial, upfront capital investment is made to provide an investment return in perpetuity, in this case to fund ongoing program implementation requirements. The initial investment can be managed for a fee by a third party foundation or other trust mechanism (e.g., Northern Development Initiative Trust, Living Rivers Trust, Tides Canada Foundation, Vancity, etc.). Table 8 shows the basic calculation for an endowment fund.

Table 8 – Endowment Fund Calculation

Endowment Capital	\$ 13,000,000
Inflation-indexed, average annual return	4%
Average annual return	\$ 520,000
Funds administration fee *	\$ 35,100
Available for programs	<u>\$ 484,900</u>

* estimated fees based on those provided by the Northern Development Trust

To better understand the necessary endowment capital investment required to cover the annual operating costs, and the need to actively manage implementation efforts for variations in annual returns, a two-way sensitivity analysis was performed for combinations of endowment capital and average annual rate of return – Table 9. Assuming an average annual return of approximately 6%, a 2% re-investment into the fund to protect against inflation and to retain the purchasing power of the endowment in perpetuity, an initial capital investment of approximately \$13 M dollars would be required to fund the *Conservation Fish Culture* program (estimated based on administration fees provided by the Northern Development Initiative Trust). To fund the *Habitat, Recruitment and Restoration* programs in addition, would require a total initial investment of \$20 M dollars, and finally to fund all future programs including the initial estimates for the Interpretive Centre programs would require a total initial investment of \$25 M dollars. These investments would be required to cover the annual operating and maintenance costs of the various programs. Additional up-front capital investments for facility infrastructure, etc. would be required in addition to these funds.

Two key points regarding the application of an endowment fund are:

1. Capital additions into the fund could be made to over time to match the start dates and requirements of programs over time, and
2. Regardless of the capital investment into the fund, it should be expected that future annual returns will fluctuate, and hence a process of annual budgeting will need to be developed.

Table 9 – Two-way Sensitivity Analysis for Endowment Fund

		Capital				
		\$ 10,000,000	\$ 13,000,000	\$ 15,000,000	\$ 20,000,000	\$ 25,000,000
Return Rate	0%	-\$ 27,000	\$ 35,100	-\$ 40,500	-\$ 54,000	-\$ 67,500
	1%	\$ 73,000	\$ 94,900	\$ 109,500	\$ 146,000	\$ 182,500
	2%	\$ 173,000	\$ 224,900	\$ 259,500	\$ 346,000	\$ 432,500
	3%	\$ 273,000	\$ 354,900	\$ 409,500	\$ 546,000	\$ 682,500
	4%	\$ 373,000	\$ 484,900	\$ 559,500	\$ 746,000	\$ 932,500
	5%	\$ 473,000	\$ 614,900	\$ 709,500	\$ 946,000	\$ 1,182,500
	6%	\$ 573,000	\$ 744,900	\$ 859,500	\$ 1,146,000	\$ 1,432,500
	7%	\$ 673,000	\$ 874,900	\$ 1,009,500	\$ 1,346,000	\$ 1,682,500
	8%	\$ 773,000	\$ 1,004,900	\$ 1,159,500	\$ 1,546,000	\$ 1,932,500
	9%	\$ 873,000	\$ 1,134,900	\$ 1,309,500	\$ 1,746,000	\$ 2,182,500
	10%	\$ 973,000	\$ 1,264,900	\$ 1,459,500	\$ 1,946,000	\$ 2,432,500

Conservation Fish Culture

Conservation Fish Culture +
Habitat, Recruitment and Restoration

Conservation Fish Culture +
Habitat, Recruitment and Restoration
+
Interpretive Programs

5 ORGANIZATIONAL STRATEGY

To date the members of the Technical Working Group and the Community Working Group of the Nechako White Sturgeon Recovery Initiative have provided a functional organizational structure in which to carry out some of the short-term priority activities. As the Recovery Facility and Interpretive Centre are developed, the organizational structure will be adapted and formalized to reflect new partners and to meet the new financial management, operations and maintenance responsibilities.

5.1 Financial Management

It is the intention of the partners involved to create a board of directors to provide the leadership and visioning for the Recovery Facility and Interpretive Centre. In order to ensure that all of the elements of this strategic plan for the Nechako White Sturgeon Recovery Facility and Interpretive Centre are implemented as expeditiously as possible, the Technical Working Group and the Community Working Group of the Nechako White Sturgeon Recovery Initiative (NWSRI) will temporarily undertake the financial management and operations oversight duties until such time that these members can formalize a Board of Directors.

Should an endowment fund be established, the NWSRI's Board of Directors would advise the Trustee of the desired financial management strategy for the investment portfolio and the level of risk deemed appropriate by the NWSRI's Board of Directors to ensure a stable annual return for the recovery activities and interpretive center (i.e. equity/fixed income portfolio mix).

Upon their appointment, the Board of Directors would be responsible for:

- Overseeing the Management of Finances
- Review of performance evaluations and quarterly financial statements.
- Approving annual operating budgets
- Developing implementation contracts for various aspects of program implementation (e.g., fish culture with FFSBC)

5.2 Ownership and Operations

It is proposed that the District of Vanderhoof own the assets of the Recovery Facility and Interpretive Centre. Their ownership of the land and long-term responsibility for economic development in the area integrate fully with the long-term vision for the facility. Implementation of the various programs within the facility will then be undertaken on a contractual basis with various partner groups.

The conservation fish culture and habitat, recruitment and restoration programs will be under the direction of the NWSRI's Technical Working Group. The Technical Working Group will review technical data and make requests to the Freshwater Fisheries Society of BC to undertake the technical delivery of the Conservation Fish Culture program. The FFSBC will lease the assets for implementation of the conservation fish culture program. Under the security of a long-term stable funding contract, their immediate mandate will include:

- Providing technical expertise for program implementation,
- Enhancing the capacity of Carrier Sekani Tribal Council and other local groups,
- Providing operations management services in the short term.

The Habitat, Recruitment and Restoration programs would be operated under the direction of the NWSRI technical working group. FFSBC or some other entity could be contracted to coordinate field implementation out of the Vanderhoof Recovery Facility.

The responsible party for implementing the Stewardship, Outreach and Education programs at the Interpretive Centre will be identified upon performing the feasibility study. The District of Vanderhoof and local First Nations will work together to design, develop, and operate the interpretive centre.

6 FACILITY REQUIREMENTS

The Recovery Facility and Interpretation Centre is to be technically robust to ensure the effective implementation of NWSRI programs. At the same time it must be flexible to quickly adapt to new opportunities, changes in the programs and new information from ongoing research, and the educational needs of its visitors. It is proposed that an adaptive modular design approach be taken for the facility's infrastructure.

Such an approach will enable those time-sensitive elements of the facility to proceed expeditiously without delay. For example, while the design requirements for the conservation fish culture component of the facility are well understood at this time, additional scoping studies are expected for the Interpretive and Education Center components.

The following sections describe the conceptual design requirements of the proposed Recovery Facility.

Siting Requirements

The proposed site for the Recovery Facility is located on an undeveloped lot owned by the District of Vanderhoof and located on the south east end of the Burrard Street Bridge in close proximity to a known sturgeon spawning area (Figure 5).

Figure 5 - Site Location, Vanderhoof



The basic site requirements include:

- Site preparation (fill and grading) to suit the predicted 200-year flood level (638.5 metres) of the Nechako River
- Access road and parking lot paving
- Minimal landscaping, fencing, and lighting
- Storm drains, sewerage and domestic water supply

- Full electrical, natural gas, telephone/cable servicing

The building design would also consider the natural surroundings and aim to be an extension to the bike routes and nature walk paths nearby. A shared vision is that the Facility should adopt Green Design principles such as recycled building materials, passive solar energy, and rainwater collection (without compromising the technical aspects of the conservation fish culture component of the Facility).

In time, the community has indicated that it is their preference that the infrastructure be used for alternative activities that could support the local economy and vision when wild sturgeon populations have returned to sustainable levels.

6.1 Conservation Fish Culture

Unlike commercial fish hatchery productions, the conservation fish culture facility is not intended to continue indefinitely, but will remain until such time that natural recruitment is restored. It is estimated that it will take 50 years to achieve a self-sustaining population of 1000 adults.

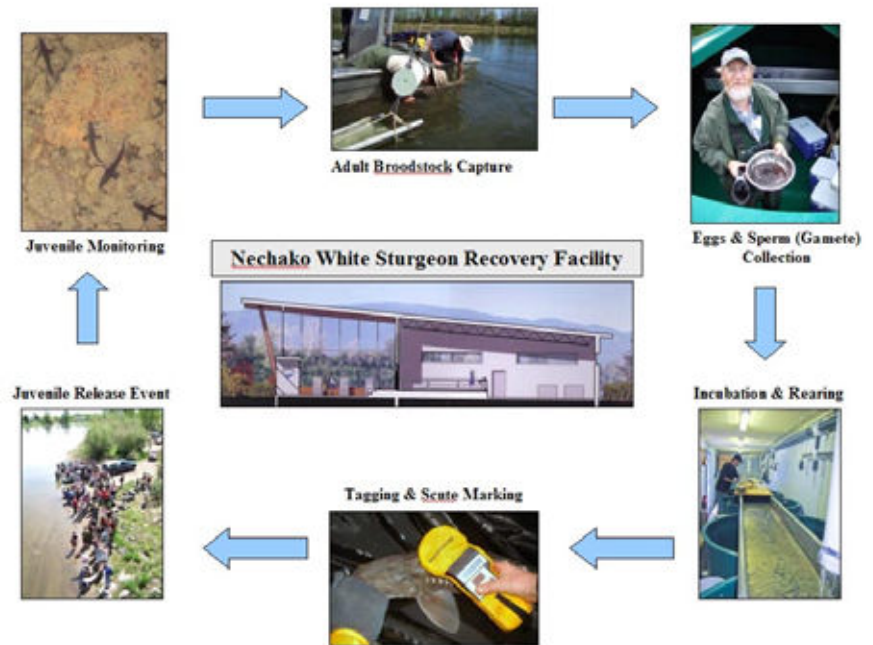
The basic requirements of a conservation fish culture program include juvenile monitoring, adult broodstock capture and containment, eggs & sperm (gamete) collection, incubation & rearing, tagging & scute marking, and juvenile release (Figure 6).

As noted previously, the facility itself will be designed to be modular and adaptive, capable of responding to the annual variations in broodstock capture or evolving production targets. If building design elements for other the programs in the Recovery Facility have not been finalised in time to meet the conservation fish culture program schedule, a staged approach would be adopted. In such a case, a Quonset-style building may serve the immediate needs for the conservation fish culture program, while the overall design and basic infrastructure (e.g., site preparations, foundations, etc.) will enable an expansion to include all other programs outlined in this strategic plan.

“Conservation fish culture is essential to preserve the remaining population diversity and to help identify the mechanism(s) that are preventing successful recruitment”

Source: NWSRI, 2004.

Figure 6 - Conservation Fish Culture Process



Fish Culture Water Supply & Wastewater Treatment

A fixed intake will be located downstream of the Burrard St. Bridge in deep water with a screened opening sized to prevent entry of sturgeon and salmonid fingerlings/fry. Incoming water will need to be filtered, disinfected, and aerated. Cooling and possibly heating of water may be required as the fish culture program progresses. Wastewater treatment would be designed to conform to the regulations in the "Land-Based Finfish Waste Control Regulation". At a minimum, wastewater from the facility would be directed to an open-air settling pond to reduce suspended solids, and, if required by environmental approval agencies, disinfected prior to disposal to the Nechako River.

Other equipment and design considerations for the incoming fish culture tank water supply and wastewater treatment include:

- Three electric powered vertical turbine pumps, each capable of delivering a minimum of 1000 lpm through the water treatment facility.
- The ability to shutdown water supply during the winter months.
- Temperature control system & cooling water supply.
- Emergency water storage capabilities.
- Back-up pumping system for safety.
- Auto-transfer emergency generator / controls.
- Potential to add water heating to over winter unspawned adult sturgeon. (This capacity will be implemented at a later date if required).

Fish Culture Equipment, Staff Facilities, and Security

Other design considerations for the conservation fish culture component of the Recovery Facility that are required include:

- Fish culture tanks, piping, controls and fittings.
- Work benches and fish culture equipment associated with:
 - Cultured larval fry for early release.
 - Isolation of wild origin larval fry and eggs
 - Broodstock capture and handling, rearing, tagging and release.
- Safety and security measures (fencing, back-up electricity, vehicle access, etc.)
- Staff facilities

Permitting and approvals

Permits and approvals for construction within the wetted perimeter of the river will need to be obtained from Federal and Provincial environmental and fisheries authorities and under the Navigable Waters Act. Other permits for facility development and operation will include appropriate zoning of property, adhering to local building

codes, water license for river water extraction, meeting all requirements of the Land-based Fin Fish Regulation for wastewater discharge, and approvals for fish culture activities through the Introductions and Transfers Committee.

Operation & Maintenance Requirements

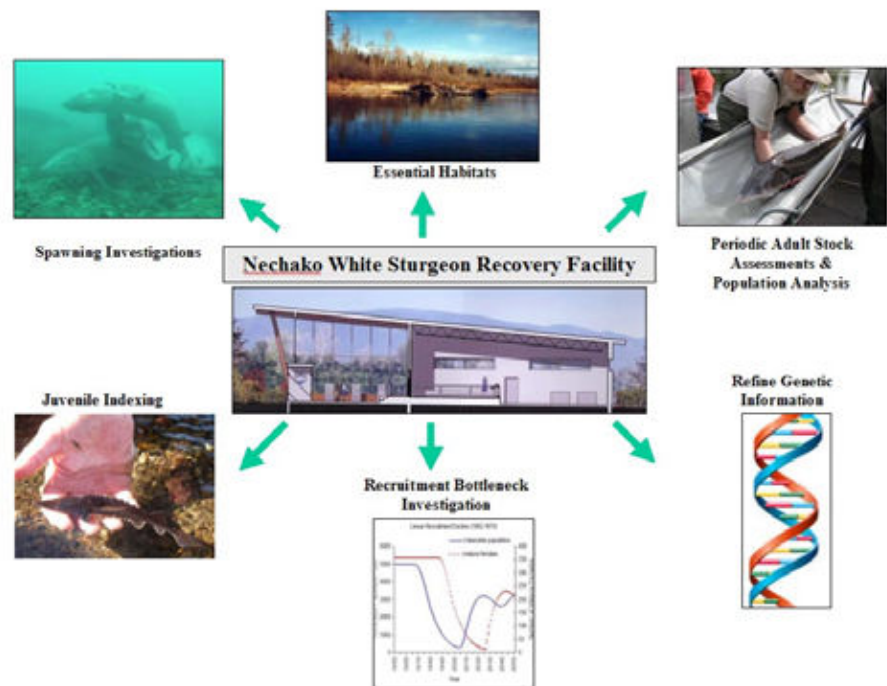
The conservation fish culture component of the Recovery Facility will operate 24-hours a day, 7-days a week from May 1st to approximately November 15th. One full time FFSBC staff member and up to 3 additional CSTC staff would be needed 7 days per week for an 8am – 4pm work shift (and available to respond to after-hours emergencies).

To ensure there are sufficient funds to maintain and replace aging or failing infrastructure, it is critical that the O&M budget remains stable during the lifespan of the Conservation Fish Culture program. Failure to quickly replace faulty equipment could result in an entire season of lost efforts and further jeopardizing the restoration of White Sturgeon population in the Nechako.

6.2 Habitat, Recruitment and Restoration Activities

In addition to developing a conservation fish culture program, priority recovery activities outlined in the Recovery Plan include the need to perform periodic adult population assessments, gather biological data as it relates to information on essential habitats for each life history stage, with particular emphasis on spawning and early life history (i.e. egg and larvae stages), as well as juvenile indexing, identifying recruitment bottlenecks, and further characterizing genetic baseline data (Figure 7). These activities would be performed annually, semi-annually, or periodically as the information needs require, and the Recovery Facility could provide a space to enable the designated NWSRI Team to develop and coordinate field implementation efforts. Over time, the Recovery Facility could evolve into an overall 'control centre' for habitat restoration and future planning activities.

Figure 7 – Recovery Program Activities



The modular design of the Recovery Facility would be flexible to accommodate the evolving needs of these recovery activities over the years (including expansion if necessary).

6.3 Stewardship, Outreach & Education

It is widely recognised that the construction of a long-term Recovery Facility for the Nechako White Sturgeon presents a unique opportunity for the local community and First Nations to share local and indigenous knowledge, enhance their tourism infrastructure, diversify their economy, strengthen community and First Nation partnerships, and educate the public, students and visitors on the region, its' values, and the White Sturgeon (Figure 8).

Figure 8– Stewardship, Outreach and Education



Interpretive Center

The interpretive center, to be located within the Recovery Facility, is intended to be versatile in order to capture the imagination of a broad variety of the local community, First Nations, and tourists. The interpretive center could have exhibits on the White Sturgeon recovery, traditional knowledge and First Nation culture, regional

issues (e.g., impacts of mountain pine beetle), and the Nechako watershed and its history. The exhibits would be rotated periodically and may be movable to allow room to double as a space for community meetings or training sessions.

Experience in other interpretive centres indicates that success requires an active outreach program to be incorporated into overall programming efforts. In addition to posters and interactive displays, it is proposed that a guide be on-site to be able to respond to visitor's questions and provide a more social and engaging experience. It is believed that without the human element, it is significantly more difficult to attract visitors to interpretive centers.

The facilities and programs for the interpretive center component of the Recovery Facility would be designed to meet the needs of locals, visitors, and staff.

Education Programs

This unique Recovery Initiative has itself attracted a wealth of fisheries experts, scientists and First Nations educators to a common cause. These individuals present a valuable asset to the local community schools and could share important lessons from the initiative and highlight benefits of a holistic approach to environmental management. The facility staff could welcome school children throughout K-12 for interpretive center and conservation fish culture tours or could approach the schools directly depending on the shared preferences.

The technical component of the white sturgeon recovery efforts also presents fertile grounds for performing post-secondary research. Local research bodies such as the University of Northern British Columbia and the College of New Caledonia have already expressed interest in having the opportunity to foster student research at the Recovery Facility.

Stewardship, Outreach, and Education Design Considerations

Some design considerations for the Community Program component of the Recovery Facility would include:

1. Wheelchair accessible
2. Space for tour bus parking available (two spaces)
3. Access for pedestrians and cyclists
4. Vehicle access (~14 spaces including handicapped space.)
5. Capable of accommodating large groups of visitors (school classes)
6. Views to the river
7. Full time tour guide
8. Alternate use for non-conservation fish culture related community events
9. Public washrooms
10. Provision of 3D and 2D displays (i.e. Traditional knowledge and fish practices, Nechako watershed, sturgeon, salmon, etc.)
11. Space for static information boards
12. Proximity and views to a variety of conservation fish culture operations and tanks to provide glimpses into the various stages of Sturgeon culturing.
13. Minimize interference with conservation fish culture operations
14. Picnic area – part of nature walk.
15. Safety and security

7 References

1. BCMOE (BC Ministry of Environment). 2007. "White Sturgeon (Acipenser Transmontanus) in British Columbia" from Ministry of Water, Lands and Air Protection website. Accessed 03/08/07 (<http://www.env.gov.bc.ca/wld/fishhabitats/sturgeon/index.html>)
2. BCMOE (BC Ministry of Environment). 2007. "White Sturgeon (Acipenser transmontanus) in British Columbia. Frequently Asked Questions on the status and consequences of listing" from the BC Ministry of Environment Environmental Stewardship Division website. Accessed 03/08/07. (<http://wlapwww.gov.bc.ca/wld/documents/whsturgeonfaq.pdf>)
3. Ptolemy, J. and R. Vennesland. 2003. Update COSEWIC status report on the white sturgeon *Acipenser transmontanus* in Canada, in COSEWIC assessment and update status report on the white sturgeon, *Acipenser transmontanus*, in Canada. Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Ottawa. Pg. 34.
4. Franklin, IR. 1980. "Evolutionary change in small populations, in Conservation Biology: An evolutionary-ecological perspective". M.E. Soulé and B.A. Wilcox (eds).
5. McAdam, Steven, Walters, Carl, Nistor, Craig. 2005. "Linkages between White Sturgeon Recruitment and Altered Bed Substrates in the Nechako River, Canada". Transactions of the American Fisheries Society, 134:1448–1456.
6. NEEF (Nechako Environmental Enhancement Fund), 2001. Report of the Nechako Environmental Enhancement Fund Management Committee. Pg. 6.
7. Norcan, 2000. Review of Historical White Sturgeon Distribution Within the Nechako River Watershed, Norcan Consulting Ltd. Prepared for BC Ministry of Environment.

8. NWSRI (Nechako White Sturgeon Recovery Initiative), 2007. From NWSRI Website. Accessed 02/21/07 (<http://www.nechakowhitesturgeon.org/sturgeon/>)
9. NWSRI (Nechako White Sturgeon Recovery Initiative), 2005. From NWSRI Newsletter Volume 2 - Issue 1, April 2005. Published by the Nechako White Sturgeon Recovery Initiative Community Working Group. Pg. 1.
10. NWSRI (Nechako White Sturgeon Recovery Initiative), 2004. Recovery Plan for Nechako White Sturgeon. Prepared by Golder Associates Ltd. 82pp + App.
11. RL&L Environmental Services Ltd. 2000. Fraser River white sturgeon monitoring program – comprehensive report (1995 to 1999). Final report prepared for BC Fisheries. RL&L report No. 815F: 92 p. + app.

APPENDIX A

Letters of Support