

# The Atlantic Salmon Conservation Foundation

## Final Report

This form has been developed to simplify the reporting of your accomplishments to the ASCF. Please use this form for your Final Report. Do not send final report in other formats.

ASCF relies on receiving accurate and transparent information. The information you provide will be used to document the specific and overall accomplishments of your project and the effectiveness of the ASCF grants and may be subject to audit.

This report is distinct, and may be different, from other final reports you may prepare for your project. The ASCF wishes to receive those reports in addition to this report.

### Please note:

- Your Final Report and a statement of expenditures are due on the date provided in Schedule “C” of your contribution agreement.
- Attach copies of receipts for all ASCF funded expenditures.
- Any remaining balance of ASCF grant funds must be returned to the ASCF with the Final Report.
- Do not “refer to attachments” for information requested in this form.
- A final report is required on the date agreed to in your funding agreement. If it is not submitted, future applications to ASCF will not be considered. Amendment of the dates for reporting may be made by mutual agreement

For projects located in **New Brunswick** or **Québec**, or that resulted from an RFP for applied **scientific research**, please submit your completed report along with an invoice for your final payment by email to **Charline McCoy** at: [charline@salmonconservation.ca](mailto:charline@salmonconservation.ca)

For projects located in **Nova Scotia**, **Prince Edward Island** or **Newfoundland and Labrador**, please submit your completed report along with an invoice for your final payment by email to **Gert Lawlor** at: [gert@salmonconservation.ca](mailto:gert@salmonconservation.ca)

Call us at 506-455-9900

## Section A: Project Information

ORGANIZATION: NASHWAAK WATERSHED ASSOCIATION INC			
Project Title: Dam Removal on Campbell Creek			
Year Grant Acquired:	2021	End date:	November 30 <sup>th</sup> , 2021
Contact Person: Marieka Chaplin, Executive Director			
Address: PO Box 314, Station "A", Fredericton, NB E3B 4Y2			
Phone: 506 261- 4664		Fax:	
Email: <a href="mailto:director@nashwaakwatershed.ca">director@nashwaakwatershed.ca</a> and <a href="mailto:coordinator@nashwaakwatershed.ca">coordinator@nashwaakwatershed.ca</a>			

## Section B: Project Description

Category of Project (check all that apply):

- A) Development of an Atlantic salmon and salmon habitat watershed plan
- B) Protection and restoration of salmon habitat
- C) Rebuilding of stocks and restoration of salmon populations
- D) Restoration of access to critical salmon habitat
- E) Education and awareness on the importance of salmon conservation

<input type="checkbox"/>
<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

Summary

*Please state the importance, the objectives as stated in your funding agreement and the major results of this project.*

### Importance

The NWA has identified numerous major barriers to fish passage in the watershed. The Campbell Creek Dam, property of the City of Fredericton, was one of the primary barriers to fish passage in the watershed, and the highest priority for removal given the length of high quality upstream habitat it obstructed. The dam was no longer functional, and in an advanced state of deterioration. It had impeded fish passage to a cold-water tributary for over a century.

In 2016, the aging dam failed and Campbell Creek began to restore itself quickly. However, in late 2017 the opening in the dam was illegally blocked through vandalism and the headpond refilled, continuing to inhibit fish passage. In 2019, the City approved the removal of the dam, after funding was secured by multiple ENGOS. In 2020, a design for the dam removal was developed along with a management plan for restoring the stream channel and former headpond. In the summer of 2020 the dam was drained using gravity siphons over the period of a week, and notched to prevent it from filling to capacity, should it be back again.

In September of 2021 the dam was successfully removed and access restored to Campbell Creek for anadromous species like Atlantic salmon, which have been provided with a net gain of 22 km of quality spawning and rearing habitat. For the first time in over a century the creek is freely flowing. We expect water quality will be improved in the years to come, and access to this cold water creek will provide salmon thermal refuge both in the brook and at its confluence with the Nashwaak River.

The former headpond of the dam was planted with ~ 3000 Acadian Forest tree species, including: eastern white pine, eastern hemlock, red oak, red spruce, white & yellow birch. The riverbanks in the restored stream channel were staked with red tipped and pussy willow. The restored headpond and riparian zone will provide habitat for terrestrial species and shade the restored stream.

### **Objectives**

Objectives for 2021 were to:

- Continue pre-removal assessment activities to determine stream conditions
- Remove the dam and restore fish passage to the stream channel
- Restore the former headpond and streambanks through revegetation with native species, as per our management plan
- Conduct initial post-removal monitoring of new stream conditions

### **Results**

In spring NWAI staff staked over 800 willows and dogwood in the streambanks above the dam to facilitate stream restoration. However, due to difficulties with local landowners who were resistant to the dam removal, these were destroyed.

Prior to dam removal it was necessary to conduct archeological surveying, testing and monitoring of the site throughout construction, due its proximity to a paleo-shoreline. Archeological research permits were acquired for this purpose. A final report on this work is being compiled by Colbr Consulting.

Before construction took place we carried out pre-removal eDNA sampling for Atlantic salmon, American eel and wood turtle.

We also acquired a WAWA permit for the dam removal (issued by DELG and approved by DFO), after which the construction component of the project was tendered out to Gulf Operators.

The dam removal took place over approximately 1 month from late August to late September. The concrete from the dam was crushed and buried locally in the former headpond, after which it was covered in topsoil. The concrete was tested thoroughly beforehand to ensure that it was safe to bury adjacent to the watercourse, and contained no contaminants or toxins. During construction it was necessary to divert the stream channel several times to minimise the construction footprint, and ensure continuous flow through the creek. Several fish rescues were carried out during this process to remove fish from the construction zone and minimise mortality. We were please to find over 8 salmon parr in the creek downstream of the dam during one of these rescues.

Working in tandem with the construction team volunteers from Community Forests International planted the former headpond with over 3000 tree seedlings, staff from NWAI staked and planted over 150 willows along the restored stream channel, and seeded the disturbed area in the construction zone, as per our management plan for this project.

As part of the public outreach and education component of this project we are in the process of completing an engagement video detailing the entire dam removal and site restoration, including interviews with many of our project partners.



Figure 1. LEFT: Campbell Creek prior to removal in fall 2020, RIGHT: Campbell Creek post dam-removal and tree planting in fall 2021. As can be seen in the image on the right, the former stream channel, comprising gravel beds and bedrock has now been exposed and flushed of silt that had accumulated in the headpond.

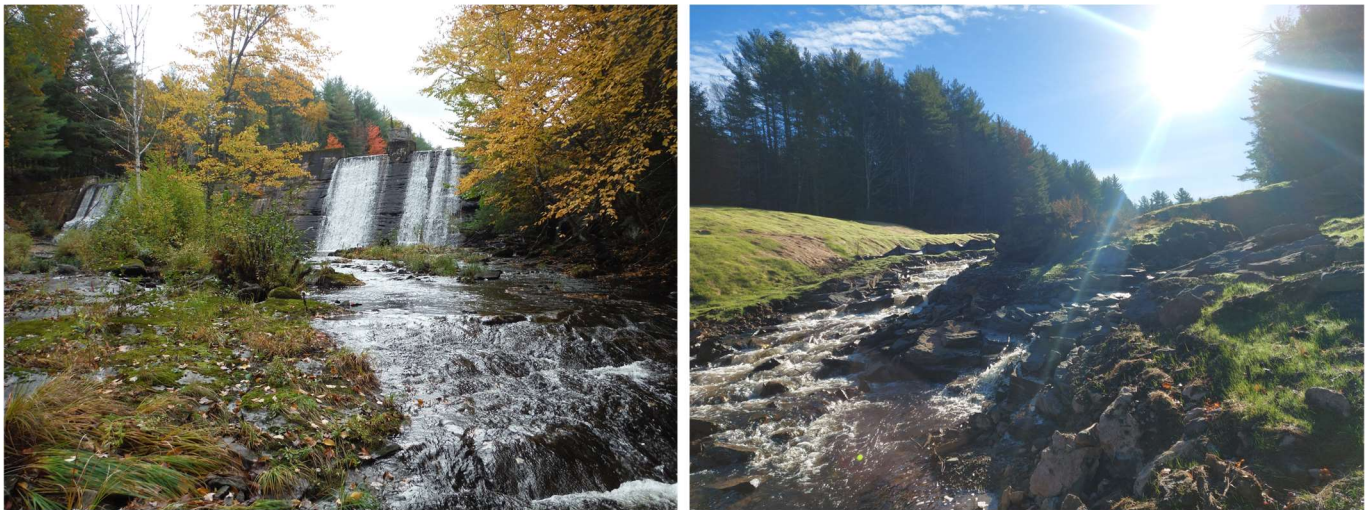


Figure 2. LEFT: Campbell Creek downstream of the dam prior to removal in 2020, RIGHT: Campbell Creek downstream of former dam, with reconstructed stream channel post-removal in October 2021. As can be seen in the image on the right, the construction zone, which was heavily seeded with grass and planted with trees, has greened up nicely.





Figure 2. LEFT: Photo of one of several fish rescues conducted throughout the dam removal process. RIGHT: Dam removal, mid-construction. The creek channel was diverted several times during this process.

Following the successful dam removal and headpond restoration, we are in the process of collating our data to update our baseline conditions report for Campbell Creek.

A presentation on the dam removal will be given to City Council this December, in which we will acknowledge the success of this project and the support of our funders and partnerships that allowed this project to come to fruition.

We are in the process of designing a heritage display to be installed in 2022 to commemorate the dam's history, its removal, and restoration of aquatic connectivity.

Throughout the year the NWA has joined project partners (City of Fredericton, MNCC, ASF, St Marys First Nation, Hilcon, and WNNB) on bi-weekly virtual meetings to discuss the progress of the project.

## Project performance and evaluation:

*Please provide an evaluation and assessment of the performance of your project according to the performance measures outlined in the funding agreement. Include problems you encountered and how they were solved, unexpected outcomes, budget inaccuracies, timing changes, and recommendations for future work.*

### **Evaluation & Assessment**

We surveyed from the mouth of the brook up to Rte. 8 (a total of 1,100 m length and 94,000 m<sup>2</sup> or 9.4 hectares in area).

We completed the following assessment activities:

- 4 rounds of water quality samples below the dam
- 3 temperature loggers installed (above and below the dam and below the mouth of the creek in the Nashwaak)
- electrofishing above and below the dam with the help of St Marys First Nation AFS staff
- CABIN benthic invertebrate surveys above and below the dam, as well as in the newly established stream channel
- a survey of the restored stream channel and re-vegetated headpond
- Pre- and post-dam removal eDNA sampling above and below the dam
- Post-dam removal flow monitoring with UNB Civil Engineering Department
- Planting over 3000 tree seedlings in the former headpond, and staking over 1000 willows in the streambanks and seeding of the construction zone with native grasses to facilitate revegetation and mitigate erosion.

25 volunteers provided 300 hours of work for tree planting, field surveys, project planning, and oversight.

The NWAI joined project partners for formal project planning 24 meetings this year. Project partners are: City of Fredericton, MNCC, ASF, St Marys First Nation, Hilcon, and WNNB.

### **Problems encountered**

Opposition from adjacent landowners resulted in the destruction of willows and trees planted late in 2020 and in spring 2021. In addition, interference and intimidation of NWAI and archeological staff from landowners hampered work. However, after intervention by the City of Fredericton and Fredericton Police, the landowners allowed work to continue, and no further destructive activity has been observed. All vegetation planted since September remains undisturbed and healthy. One landowner has granted NWAI staff site access through their property to continue post-removal monitoring and restoration going forward, as needed.

<b>Performance measure</b> <i>Please take from Schedule "A" of the Funding Agreement</i>	<b>Results</b>
Length and area surveyed	Length: 1.965 m of stream length from just below the dam to the distal end of the headpond.  Area: 2.5 ha
Number of temperature loggers	3 temperature loggers were deployed, two in Campbell Creek, one above the dam, one below, and a third logger immediately downstream of the creek in the Nashwaak River.
Number of water quality samples taken	4 rounds of water quality samples were taken during June, July, August and September.
Number of species found in electrofishing surveys above/below the dam	Electrofishing was carried out pre-, during & post dam-removal. We identified 6 species of fish, including Atlantic salmon parr below the dam, and American eel above and below the dam. Others include: creek chub, black nose dace, white sucker & common shiner.
Number of species of benthic invertebrates found in surveys	Post dam-removal CABIN assessments was done above and below the former dam, as well as in the restored creek channel. It was found that benthic macroinvertebrates have already begun to colonize the restored stream channel.  Species numbers detected:  Downstream of Dam: 23  Upstream of Dam: 24  New Stream Channel: 21
Number of eDNA samples	12 samples, 6 pre-removal and 6 post-removal.
Number of flow meter samples takes	Post-removal flow-monitoring of the restored stream channel was conducted with UNB Department of Civil Engineering in October 2021.

Update to report detailing baseline conditions	The report will be updated in fall/winter 2021.
Number of volunteers involved	3 project partners volunteered their time for meetings and project planning (ASF, SMFN, WNNB), and 22 people volunteered to conduct the archeological survey and tree planting on the former headpond.
Number of volunteer hours contributed	> 300 hours of volunteer time for project planning, meetings, site surveys and tree planting.
Work with City to obtain any permits required	<p>A WAWA was obtained by the City of Fredericton for the dam removal and channel restoration in July, and work was completed on the 21<sup>st</sup> of September.</p> <p>An Archeological Research Permit was obtained on the 14<sup>th</sup> of May to carry out an impact assessment and monitoring of the decommissioning of the dam.</p>
Number of discussions with partners	We held over 30 weekly to bi-weekly meetings with project partners throughout the year, in additions to phones calls, emails and site visits.
Number of photos/videos taken of removal progress	<p>We contracted Atlantic Media Works to film the dam removal process for engagement and outreach. The video is currently being edited, and will be finalised in December.</p> <p>39 photos of the dam removal were taken by NWAJ alone, as well as over 100 hours of additional film footage of the site.</p>
Number of trees planted & willows staked	Over 3000 trees were planted in the former headpond, and 1520 willow and red-osier dogwood staked.
Area of previously inaccessible habitat opened to fish	33 km <sup>2</sup>
Length of river made accessible to fish	30 m immediately up- and down-stream of the dam, 22 km, from the former dam to the headwaters of the creek.



## Section C : Project Results

1. *Stream(s) or river(s) where project was located :*

Campbell Creek, tributary to the Nashwaak River

2. Please provide the following information if it is relevant to your project. *Please include only new achievements that have not been reported to ASCF in past projects.*

Check	Indicator	Measure	Project Achievement
<b>Development of Atlantic salmon and salmon habitat watershed plan</b>			
<input type="checkbox"/>	Watershed plans developed/implemented	Number of watersheds involved	
		Number of plans	
		Km <sup>2</sup> of watershed area under planning and priority setting	
<b>Restoration of salmon habitat</b>			
<input checked="" type="checkbox"/>	In-stream habitat length restored	Length (m)	30
<input checked="" type="checkbox"/>	In-stream habitat area restored	Area (m <sup>2</sup> )	85
<input type="checkbox"/>	Riparian length restored or stabilized	Length (m)	
<input checked="" type="checkbox"/>	Riparian area restored or stabilized	Area (m <sup>2</sup> )	11,118
<input checked="" type="checkbox"/>	Trees and shrubs planted	Number of trees/shrubs	3950
<input type="checkbox"/>	In-stream structures installed	Number of structures	
<b>Rebuilding of stocks and restoration of salmon populations</b>			
<input type="checkbox"/>	Fish tagged	Number of fish tagged	
<b>Restoration of access to salmon habitat</b>			
<input checked="" type="checkbox"/>	Restored access to habitat	Area (m <sup>2</sup> )	33,000,000
<input type="checkbox"/>	Debris removed	Tonnes	
<b>Education and Awareness on the importance of salmon conservation</b>			
<input type="checkbox"/>	Type of project	Community stewardship	<input type="checkbox"/>
		Education and awareness	<input type="checkbox"/>
		Volunteer training	<input type="checkbox"/>
<input checked="" type="checkbox"/>	Target Audience and participants	Number of Grade k-12	
		Number of Post Secondary	
		Number of Landowners contacted	
		Number of audience members at public presentations	30
		Number of participants at community planning	
<b>Other indicators of success</b>			
<input type="checkbox"/>		<b>Value or unit of measure</b>	
<input type="checkbox"/>		Value or unit of measure	

## Section D: Communications and Media

1. Did you use the ASCF logo or sign? Yes ☒ \_\_\_\_\_ quantity No ☐  
If No, please explain why not:

2. Did you provide recognition to the Foundation for its grant? Yes ☒ No ☐  
Please explain the nature of the recognition:

We will acknowledge ASCF as a funder in our in our upcoming City Council presentation, and have done so throughout the year on our social media, and in our annual newsletter. In addition, the ASCF will appear as funder on the permanent heritage display commemorating the Dam's history and its removal in spring 2022.

3. Please indicate which communication tools were used to highlight the project as well as the quantity (check all that apply). Be sure to attach any news clippings to the Final Report.

Newspaper	<input type="checkbox"/>		quantity
Interview	<input checked="" type="checkbox"/>	<a href="#">CBC interviews</a>	2
Brochure	<input type="checkbox"/>		
Website	<input checked="" type="checkbox"/>	<a href="https://www.nashwaakwatershed.ca/2021/10/01/campbell-creek-dam-removal-project/">https://www.nashwaakwatershed.ca/2021/10/01/campbell-creek-dam-removal-project/</a>	1
Other	<input type="checkbox"/>	Blogposts: <a href="#">Canadian Wildlife Federation</a> , <a href="#">Atlantic Salmon Federation</a>	2

4. Are you submitting a project report (other than this one)? Yes ☒ No ☐  
If yes, please be sure to send the foundation a pdf copy.

5. Did you send your data and results to another organization or data warehouse where people can access the information? ☒ ☐  
Please state the organizations:

The data from our baseline monitoring report and management plan will be posted on our website:  
<https://www.nashwaakwatershed.ca/resources/reports/>

## Section E: Human Resources

1. Total number of staff (including students) paid:

through ASCF grant: 3  
through other organizations: 3

2. Total number of students paid:

through ASCF grant:	<u>0</u>
through other organizations:	<u>2</u>

3. Volunteers involved in the project:

Total number of volunteers	<u>25</u>
Total hours worked	<u>&gt;300</u>

## Section E: Statement of Expenditures

Please provide a detailed financial statement of ASCF grant expenditures, in-kind and other funds using the Financial Report spreadsheet.

Be sure to attach copy of receipts for ASCF expenditures only to this Final Report.

## Section F: Recommendations to ASCF

To assist us in improving our process, please provide any comments or suggestions you may have on your experience with the ASCF.