

# **Cheverie Creek Salt Marsh and Tidal River Restoration Project**

**Project Number: #2.42C.1-03/04**

Final Project Report to Wildlife Habitat Canada (WHC)  
For fiscal year 2005/2006

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## 1.0 EXECUTIVE SUMMARY

This final project report covers activities that occurred during the period between February 1, 2006 and June 30, 2006 for the Cheverie Creek Salt Marsh and Tidal River Restoration Project.

The primary purpose of the Ecology Action Centre's Salt Marsh Restoration Project is to facilitate the restoration of a more natural tidal regime to a tidally restricted marsh and wetland system. With the loss of over 80% of salt marsh habitat in the upper Bay of Fundy, efforts to restore degraded and lost habitats are necessary as protection is no longer sufficient. This began as a pilot project for Nova Scotia with the intention to not only restore tidal flow, fish passage and habitat to restricted system, but to also show that salt marsh restoration is feasible.

The Cheverie project achieved its originally stated goals both at the site itself where approximately 30 hectares of tidally restricted salt marsh habitat has benefited from the removal of a restrictive culvert, and the community has now taken ownership over a planned education and interpretative centre, but on a larger scale as well. The restoration process at Cheverie has fostered the development of a restoration community in the Maritimes, led to the implementation of other salt marsh restoration projects in the region, and generated and disseminated a wealth of information about Bay of Fundy salt marshes and restoration.

What follows is a brief summary of project activities during the period of February 1<sup>st</sup> and June 30, 2006 with some attempt at summarizing overall project accomplishments.

## 2.0 GOALS & OBJECTIVES

### **Project Goals and Objectives:**

#### **1. Plan, implement, monitor, evaluate, and document a salt marsh restoration project (Cheverie Creek) to be replicated in the region.**

The Ecology Action Centre (EAC) is very pleased that the implementation of the restoration project was completed last December 2005 with the replacement of the culvert at the restoration site. As described below, we are currently ensuring that the monitoring and documentation is being completed by the appropriate regulatory agencies using appropriate methodologies. With support from Gulf of Maine Council on the Marine Environment, we will be hosting a synthesis workshop on the lessons learned from restoration projects in the Bay of Fundy.

As reported in the January 31<sup>st</sup> interim project report, construction at the Cheverie Creek site started on October 14<sup>th</sup>, 2005. The construction phase of the project was carried out by Dexter Construction (through a Dept. of Transportation and Public Works – DOTPW tender) and consisted of replacing the original restrictive wooden culvert with a new 9.2m

wide aluminum culvert thus restoring close to full tidal flushing to an approximately 30 hectare area of upland salt marsh. Construction was completed December 17<sup>th</sup>, 2005. Photos and an engineering drawing of the new culvert were submitted in the January 31<sup>st</sup> interim progress report to WHC.

Post restoration monitoring is being conducted by CB Wetlands and Environmental Specialists (Tony Bowron and Nancy Chiasson) in 2006 and will last for five years. CB Wetlands Consulting is undertaking this work through a contract with DOPTW who have the overall responsibility for long term post restoration monitoring at the site. The five year restoration plan which CB Wetlands Consulting will undertake is included as Appendix 1 of this report.

The monitoring protocols used by CB Wetlands Consulting are modified from the Global Program of Action (GPAC) monitoring protocols for the Gulf of Maine. A Masters Thesis completed by Tony Bowron assessing the suitability of these protocols for Bay of Fundy conditions is included as Appendix 2. The thesis was researched and partially written while Tony Bowron was coordinator of the EAC's Salt Marsh Restoration project from 1999-2004.

While the technical aspects of the monitoring are now being carried out by other partners, the Ecology Action Centre also continues to support a community monitoring project with students at the Dr. Arthur Hines Elementary School in Summerville. A number of photo stations were established at various points on the marsh and nearby barrier beach. During an annual Coast Walk in celebration of Oceans Day, students, teachers and EAC volunteers visit the photo stations, record any changes at the site and take photos. This year, the community monitoring activity took place on June 15<sup>th</sup>, 2006 and involved over 100 students and 6 EAC volunteers. The EAC plans to continue to participate in this activity as long as the school remains committed to the project.

The Cheverie project was conceived as a pilot salt marsh restoration project for the region. It has already inspired other restoration efforts such as Walton in Hants County, NS (completed by DOPTW in the fall of 2005) and Musquash (a partnership between CCNB and DU) in NB. The EAC will now take a lead role in synthesizing the lessons learned from these restoration efforts. With funding from the Gulf of Maine Council, we will be organizing a workshop entitled "Moving from Ideas to Action: Lessons Learned from Salt Marsh restoration in the Bay of Fundy." The proposal describing this workshop is included on the accompanying CD of supporting materials under "Next Steps."

## **2. Galvanize the support of property owners, community and government for the restoration project at Cheverie Creek.**

This objective was also met successfully by this project. From February 2006-June 30<sup>th</sup> 2006, the community began taking an even stronger role in planning the future of the site.

In March 2006, the Municipality of West Hans purchased a piece of property on Cheverie Creek with the purpose of developing a boardwalk and interpretive signage on the site.

Residents formed an association to plan for site development. Students from the Dalhousie University School of Architecture are designing the boardwalk. EAC is working with the Hants Shore Crossway Salt Marsh Project Society and DOTPW to design the signage. Two community meetings were held about the boardwalk project on May 23<sup>rd</sup> and May 30<sup>th</sup> and a planning activity was conducted with the students on June 15<sup>th</sup>. The final plans for the site will be unveiled in mid July during a community marsh day celebration.

The EAC plans to help organize the marsh day celebration and in the future be available as resource people as called upon by the community. However, at this point, ownership of the project has clearly been transferred to the local community and our role is mainly supportive – a clear indication that our outreach work has been a success.

### **3. Raise awareness and support about the protection and restoration of tidal rivers and wetland systems in the Bay of Fundy:**

As reported above, the salt marsh project at Cheverie Creek has been a success at building local community support and involvement in coastal wetland protection and restoration.

Now that the culvert has been replaced, this project serves as an important regional example of how communities, NGOs, and government can collaborate to restore wetlands in their areas. Between February 1<sup>st</sup> and June 30<sup>th</sup>, 2006 we continued to work closely with the Coastal Coalition of Nova Scotia to increase awareness of the need for protect coastal wetlands within the context of overall coastal planning and management. A copy an article on Nova Scotia's New Wetlands Designation Policy which appeared in a special coastal themed issues of *Between the Issues*, the EAC's quarterly publication is an example of how we try to approach wetlands protection and restoration within a larger coastal policy context.

Project staff and volunteers have participated in, and presented at, a variety of workshops and meetings during this reporting period including: Bi-monthly Coastal Coalition of Nova Scotia meetings; June 8<sup>th</sup> – Oceans Day Celebration at the Maritime Museum of the Atlantic; June 15<sup>th</sup> – Coastal Hike in Summerville, as well as a number of elementary schools and naturalists groups. A copy of a typical power point presentation delivered to elementary schools and a Atlantic Salmon and tidal barriers board game used with school groups are included on the accompanying CD of supporting materials. At these presentations and meetings our main message was to raise awareness of wetland restoration and specifically highlight the Cheverie Creek project. Additionally, the Cheverie project was featured in articles in Canadian Geographic and the Chronicle Herald (enclosed), and is about to be featured on the local East Link Cable station and local CBC-TV.

During this project period we were completing a project funded by Habitat Stewardship Canada (which ended on March 31<sup>st</sup> 2006) to work on raising awareness of the effect of Tidal Barriers on Inner Bay of Fundy Salmon. This project was a logical extension of our

project work at Cheverie Creek and involves identifying other tidal barriers with high restoration potential and raising awareness with local communities about these sites. Examples of fact sheets, brochures, and tabloid prepared during this project are included in the CD of supplementary materials. These materials were distributed during the many presentations staff made about salt marsh restoration and tidal barriers.

**4. Restore the tidal connection between Cheverie Creek and the Minas Basin by replacing the poorly sized and placed wooden box culvert with one designed to restore a more natural hydrologic regime to the system.**

As explained above, the design, permitting and replacement of the Cheverie Creek culvert was coordinated by the Department of Transportation and Public Works (DOTPW) in close coordination with the EAC, and the actual construction work was conducted by Dexter Construction between October 14<sup>th</sup> and December 17<sup>th</sup>, 2005. Photos of the original (1.5m wide) restrictive culvert and new (9.2m wide) culvert were included in the January 31<sup>st</sup> interim report. Efforts were made to involve community members throughout the project period in design considerations, effects on local land, and inform them of ecological changes that would likely be noted after culvert replacement. Communications methods included community meetings, letters to local residents, and written articles in local and provincial media sources. The replacement culvert that has been installed is an aluminum arch structure with an estimated life span of 50-75 years. Aluminum was decided upon over concrete due to its superior resistance to salt water and its relatively quick installation time compared to concrete. We estimate that the culvert replacement will directly benefit a 30 hectare area of salt marsh at Cheverie Creek.

**5. Restore a salt marsh ecosystem to provide habitat for anadromous fish and invertebrate species, as well as birds and terrestrial mammals.**

See above.

**6. Provide visitors, school children, and community members with opportunities to learn about salt marshes.**

As described above, the Cheverie Creek restoration site continues to be an attraction for residents and visitors to the area. The project has brought significant attention to the region and to the broader issues of coastal wetland conservation in Nova Scotia. The Ecology Action Centre continues to work closely with local elementary school students, teachers, and parents to make this site an area for long term ecological learning. An important component of this project over the last year has been the integration of our work on Salt Marsh restoration at the site level (Cheverie) with the overall coastal protection goals of our coastal campaign.

This ability to work at both the site specific level but also at the broader policy level is one of the key assets of the work that we are doing and allows us to increase partnerships on the ground but also at the “higher” government levels necessary for recreating restoration success and proactive coastal policy in other areas. Examples of how we are

using the Cheverie project to draw attention to larger coastal issues include: articles helping make connections between wetland policy protection and coastal planning (enclosed), school presentations explaining that salt marshes are just one type of coastal ecosystem we need to protect (enclosed) upcoming presentation on what Cheverie can teach us about coastal wetlands policy (to be presented at upcoming BOFEP workshop (abstract enclosed), and our upcoming “lessons learned workshop” (proposal enclosed). We have also brought up salt marsh restoration and coastal planning during meetings with all three provincial caucuses arranged through the Coastal Coalition of Nova Scotia. We are also on the advisory council for a national Municipal Volunteer Stewardship Program led by Evergreen Canada.

**7. Develop a handbook on salt marsh restoration in the Bay of Fundy that can be used by community groups and government agencies.**

In mid-April 2005 we sent out a summary report to community members and other project partners who had been involved in the project on the ground at Cheverie Creek. This summary report was intended to be a resource that community groups in Cheverie and other areas can use to learn about the field activities involved with a salt marsh restoration project. While this document was initially developed specifically for keeping the Cheverie community informed about their specific project the summary report intends to also serve as a resource for other community groups working on salt marsh restoration.

The proceedings of the “Lessons Learned” workshop on experiences with salt marsh restoration will also serve as a resource for other groups planning restoration work in the region. The objectives and outputs of the workshop are described in the workshop proposal on the supporting materials CD.

**8. Conduct an audit of tidal barriers along the coast of Cumberland Co. and Kings Co. in order to complete the inventory of tidal crossings for the Nova Scotia side of the Upper Bay of Fundy and identify opportunities for future salt marsh and tidal river restoration projects.**

Tidal barrier audit reports for Cumberland and Kings Counties and the lower part of the Bay of Fundy were completed in April 2005 and distributed to project partners. A copy of the reports was included on a CD with the interim progress report.

3.0 PARTNERS

- Gulf of Maine Council/NOAA
- Wildlife Habitat Canada
- NS. Dept. of Transportation and Public Works
- Federal Department of Public Works
- Avon Emporium
- Bay of Fundy Ecosystem Partnership
- Dr. Arthur Hines Elementary School
- Ducks Unlimited Canada (DUC)

- Hants Shore Concerned Citizens Association (HSCCA)
- NS Museum of Natural History
- St. Mary's University
- Unilever-Evergreen Foundation
- Kendall Foundation
- McLean Foundation
- Salamander Foundation
- Habitat Stewardship Program for Species at Risk

#### 4.0 ACTIVITIES & RESULTS

This section provides an update on the activities conducted between February 1<sup>st</sup> and June 30<sup>th</sup>, 2006, and the results achieved.

Activity	Outcomes
<ul style="list-style-type: none"> <li>• Proposal writing / research to continue work on the salt marsh project and specifically to fund environmental education activities and a fall 2006 salt marsh restoration workshop to summarize the lessons learned from five years of restoration efforts in the Bay of Fundy.</li> </ul>	<ul style="list-style-type: none"> <li>• Received funding from GOMC to hold lessons learned workshop</li> <li>• Two abstracts on lessons learned accepted at upcoming BOFEP workshop</li> </ul>
<ul style="list-style-type: none"> <li>• Planning for an April Cheverie Creek culvert celebration to be held in the Spring of 2006 (possibly linked with a celebration of Oceans Day)</li> </ul>	<ul style="list-style-type: none"> <li>• Participated in two planning meetings with local community</li> <li>• Participate in Oceans Day Marsh walk and other school activities on June 15<sup>th</sup></li> <li>• Currently planning culvert opening celebration for mid-July</li> </ul>
<ul style="list-style-type: none"> <li>• Ongoing collaboration with the Bay of Fundy Ecosystem Partnership, Salt Marsh Restoration and Tidal Barriers Working Group, DFO, and DOTPW to encourage and support</li> </ul>	<ul style="list-style-type: none"> <li>• Participated in SMARTS working group meetings to coordinate a series of synthesis workshops</li> <li>• Presentation at workshop on Salt Marsh Restoration as an Adaptation to Climate</li> </ul>

<p>further restoration projects and assess the impacts of work to date.</p>	<p>Change workshop organized by Mount Allison University on June 16, 2006</p>
<ul style="list-style-type: none"> <li>• Support for local community boardwalk project at Cheverie Creek. This is a community based initiative working towards building an interpretive boardwalk at the Cheverie Creek site.</li> </ul>	<ul style="list-style-type: none"> <li>• Attended community meetings</li> <li>• Met with Dalhousie architecture students</li> <li>• Liaison with DOPTW</li> </ul>
<ul style="list-style-type: none"> <li>• Production of Tidal Barriers and Inner Bay of Fundy Atlantic Salmon education materials (for the Habitat Stewardship Program)</li> </ul>	<ul style="list-style-type: none"> <li>• Brochure, fact sheets, tabloid, and board game produced and distributed.</li> </ul>

## 5.0 COMMUNICATIONS ACTIVITIES.

The communications activities undertaken during this project consist mainly of attending workshops and meetings, making presentations, and distributing materials. The specific activities are discussed earlier in this report and copies of all materials are included in the CD of project materials.

6.0 FINANCIAL SUMMARY.

**A. Project Funding**

<b>Funding Sources April 2005 – June 2006</b>	
Unilever-Evergreen	750
Habitat Stewardship Project – Environment Canada	60,000
Salamander Foundation	2,000
McLean Foundation	10,000
Kendall Foundation (Kendall)	1,000
Dept. of Transportation and Public Works (DOTPW)	3,000
Wildlife Habitat Canada (WHC)	4,500
BOFEP	500
<b>Total Funding</b>	<b>\$81,750</b>

**B. Project Funding by Expenditure Category and Funding Source (2005-06)**

<b>Expenditure Category</b>	<b>Funding Source (Financial)</b>								<b>Received</b>
	<b>Evergreen</b>	<b>HSP</b>	<b>BoFEP</b>	<b>Kendall</b>	<b>Salamander</b>	<b>McLean</b>	<b>WHC</b>	<b>DOTPW</b>	
<b>Personnel</b>		40,000		850	2,000		3,000		44,850
<b>Restoration Costs</b>								2000	0
<b>Project Support</b>			500					500	1,000
<b>Travel</b>	400	10,000				3,000			13,400
<b>Publications and Educational Materials</b>	350	5,000				1,500	825		7,175
<b>Communications</b>		5,000				500			5,500
<b>Equipment/mat'ls/supplies</b>						2,000			2,000
<b>Volunteers</b>						1,000			1,000
<b>Contingent</b>					1,000	500			1,500
<b>Training and workshops</b>					700	500			1,200
<b>Subtotal</b>	<b>750</b>	<b>60,000</b>	<b>500</b>	<b>850</b>		<b>8,500</b>			<b>78,625</b>
<b>Admin</b>				150	300	1,500	675	500	3,125
<b>Total</b>	<b>750</b>	<b>60,000</b>	<b>500</b>	<b>1,000</b>	<b>1,000</b>	<b>10,000</b>	<b>4,500</b>	<b>3,000</b>	<b>\$81,750</b>

**C. In-kind Contributions (2005-06)**

<b>Source</b>	<b>Expenditure Categories</b>	<b>In-Kind Contribution Value</b>
<b>St. Mary's University</b>	Equipment, personnel, expertise	2,000
<b>Dalhousie University</b>	Equipment, volunteers, expertise	500
<b>NS Museum of Natural History</b>	Equipment	1,000
<b>Dr. Arthur Hines Elementary School</b>	Educational materials, project promotion, volunteers, meeting facilities & communication equipment	8,800
<b>Avon River Emporium</b>	Meeting space, project promotion (display space), food	300
<b>Ecology Action Centre</b>	Project support, communication & education (website, BTI, e-newsletters)	6,000
<b>Dept. of Fisheries and Oceans</b>	Project support, restoration/monitoring activities, staff time, project promotion	7,140
<b>Community Volunteers (office &amp; field)</b>	Volunteer Outreach Coordinator, field work, research, outreach & education activities, communication & promotion, participation in community events	12,750
<b>Total</b>		<b>\$38,490</b>

In-kind project budget does not include DOTPW contributions to the project relating to culvert design, permitting, cost of the new structure, instillation and related activities (staff time, promotion, additional monitoring & modeling which is spread over the duration of the entire project).

## 7.0 APPENDICES

All appendices can be found on the CD accompanying this report.

Appendix 1: Cheverie Creek 5 year monitoring program

Appendix 2: EVALUATION OF A SALT MARSH RESTORATION MONITORING  
PROTOCOL FOR USE BY COMMUNITY GROUPS IN THE BAY OF FUNDY,  
CANADA