

2015 ANNUAL REPORT

A HEALTHY ENVIRONMENT AND THRIVING SOUTH SHORE COMMUNITIES



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LIST OF SPECIES ILLUSTRATIONS

PAGE 2 Roseate tern (*Sterna dougallii*)

PAGE 5 Northern redbelly dace (*Chrosomus eos*)

PAGE 6 Brook floater (*Alasmidonta varicosa*)

PAGE 9 North Atlantic right whale (*Eubalaena glacialis*)

PAGE 22 Spotted pondweed (*Potamogeton pulcher*)

PAGE 26 American eel (*Anguilla rostrata*)

PAGE 29 Atlantic whitefish (*Coregonus huntsmani*)



BLUENOSE COASTAL ACTION FOUNDATION 2015 ANNUAL REPORT

ABOUT COASTAL ACTION

The Bluenose Coastal Action Foundation is a community-based charitable organization with a mandate to address the environmental concerns along the South Shore of Nova Scotia. Coastal Action's goal is to promote the restoration, enhancement, and conservation of our ecosystem through research, education, and action. The organization has been an established member of the Lunenburg County community since its inception in December 1993. Over the past 20+ years, Coastal Action has successfully completed a number of projects in the South Shore region of the province. Project themes have included such issues as River Restoration on the Mushamush, Gold, and LaHave River systems; Water Quality Monitoring in the Petite, Gold, and LaHave River watersheds; Endangered Species Projects addressing the Roseate tern, Atlantic whitefish, Atlantic salmon, and American eel; Climate Change and Pollution Prevention initiatives (i.e., Active Transportation, Water and Energy Conservation, Solid Waste Education, etc.); Environmental Education Programs; and Clean Boating.

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DISCLAIMER

This report is for information purposes only. Readers should use the data with caution and at their own risk.

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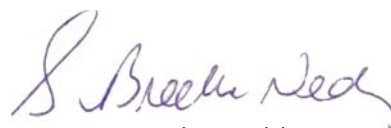
MESSAGE FROM OUR EXECUTIVE DIRECTOR



I am extremely excited to be launching Bluenose Coastal Action Foundation's first ever Annual Report! This report showcases all of our projects, programs, contract work, and committee participation from the April 2015 to March 2016 fiscal year. The Coastal Action senior staff members put a great deal of thought and effort into the development of this report – a big thank you and sigh of relief goes out to them all! If you would like more in-depth information on any of the topics summarized in this report, please visit the Coastal Action website at www.coastalaction.org or contact any of our staff (all staff contact information can be found on the website).

2015-16 was a bit of a transitional year for Coastal Action. The staff and board worked diligently on adopting a new organizational business plan and annual review process with the wonderful support of Jamie O'Neill, formerly with Bluteau DeVenney now with Uprise Consulting. Major achievements that stemmed from our 2015 business plan included the complete overhaul of our website which was re-launched June 18, 2015 at our Annual General Meeting; a renewed focus on our use of social media (follow us on Facebook at www.facebook.com/bluenose.coastal); a successful commitment to establish a GIS platform at the office and engage and train senior staff on how to use it; as well as the development and delivery of a quarterly e-newsletter (make sure to sign up for our email mailing list). Much was achieved in our first year using this new planning approach and there is still much more that needs to be accomplished in the coming years. Energized from this first year, Coastal Action is committed to continuing our work on improving the organization.

Coastal Action would also like to take the time to officially thank all of those dedicated volunteers who continue to support and strengthen our organization – our success is your success! From our Board Members to the student projects to project-specific committee members, every contribution is appreciated.



Brooke Nodding



COASTAL ACTION BOARD MEMBERS

KELLY WILSON CHAIR

Retired Engineer / Brew Master

GRANVILLE VEINOTTE VICE CHAIR

Retired DFO Fisheries Officer / Fish
Habitat Biologist

JEREMY HOPKINS TREASURER

Michelin North America (Canada) Inc.

RICK WELSFORD PAST CHAIR

Biologist / Project Manager

AMY WESTON

NSLC Adopt-A-Stream Program Manager

JESSE MCLEAN

Inspector, Nova Scotia Environment

KARL NAUSS

Councillor, Town of Mahone Bay

BRAD ARMSTRONG

Retired Carpenter / Councillor,
Municipality of the District of Chester

JEFF STEVENS

Native Council of Nova Scotia /
Business Owner

MIKE ALLEN

Inspector, Nova Scotia Environment

PAUL MACLELLAN

Heritage Carpentry Program, NSCC

MICHAEL GRAVES

Councillor, Town of Bridgewater

PETER MOSHER

Councillor, Town of Lunenburg /
Business Owner

ERROL KNICKLE

Member at Large

COASTAL ACTION STAFF



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Whitefish Project Coordinator



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American Eel Project
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Climate Change Project
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EMMA KINLEY
Petite Rivière Project
Coordinator



ARIEL SMITH
Marine Debris
Project Coordinator



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Morton Centre Program
Manager



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Morton Centre Project
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NICK AMATO
Field Technician



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Field Technician



PHILIP LONGUE
Fisheries Technician



TAYLOR CREASER
Field Coordinator



BLAIRE SLAUNWHITE
Field Coordinator



CLARE KELLOCK
Morton Centre Project Support



SAM REEVES
Field Technician



MATTHEW SLAUNWHITE
Field Technician



GORD PATCH
Field Technician

ELIZABETH ROBINSON
NSYCC Crew Member



BAILEY BOEHNER
NSYCC Crew Member

FINANCIAL STATEMENT

Table 1: Coastal Action funding breakdown for 2015-16.

Breakdown of Funding 2015-16	
Federal Government	\$269,890.44
	Habitat Stewardship Program for Species at Risk
	Fisheries and Oceans Canada
	Atlantic Ecosystem Initiative
	Recreational Fisheries Conservation Partnerships Program
	National Wetland Conservation Fund
	Canada Summer Jobs Program
	Eco Canada Youth Internship Program
	Digital Skills Youth Internship Program
Provincial Government	\$89,134.70
	NS Student Career Skills Development Program
	Province of NS
	Community Recreation Capital Grant
	NS Habitat Conservation Fund
	NS Strategic Co-operative Education Incentive
	NS Department of Transportation & Infrastructure Renewal
	NS Graduate to Opportunities Program
	Climate Change Adaptation Fund
	Tourism NS
	Workforce Innovation and Productivity Skills Incentive
Municipal Government	\$26,189.10
	Municipality of the District of Lunenburg
	Town of Bridgewater
	Municipality of the District of Chester
Industry	\$146,100.45
	Michelin North America (Canada) Inc.
	Mountain Equipment Co-op Community Investment Grant
	Commercial Elver License Holders
	Intact Foundation
	Horseshoe Bay Marine Group
Charities / NGOs	\$88,600.00
	Rural Communities Foundation
	Canadian Wildlife Federation
	Sage Environmental Program
	Atlantic Salmon Conservation Foundation
	NSLC Adopt-A-Stream Program
	Gros Morne Institute for Sustainable Tourism

Breakdown of Funding 2015-16 <i>(continued)</i>	
Charities / NGOs <i>(continued)</i>	\$88,600.00
	TD Friends of the Environment Foundation
	LaHave River Salmon Association
	Nova Scotia Youth Conservation Corps
	Eastern Charlotte Waterways Inc.
Academia	\$13,130.11
	Acadia University
Donations / Program Fees	\$13,586.92
	Morton Centre Program Registration fees
	Donations
Total	\$646,631.72

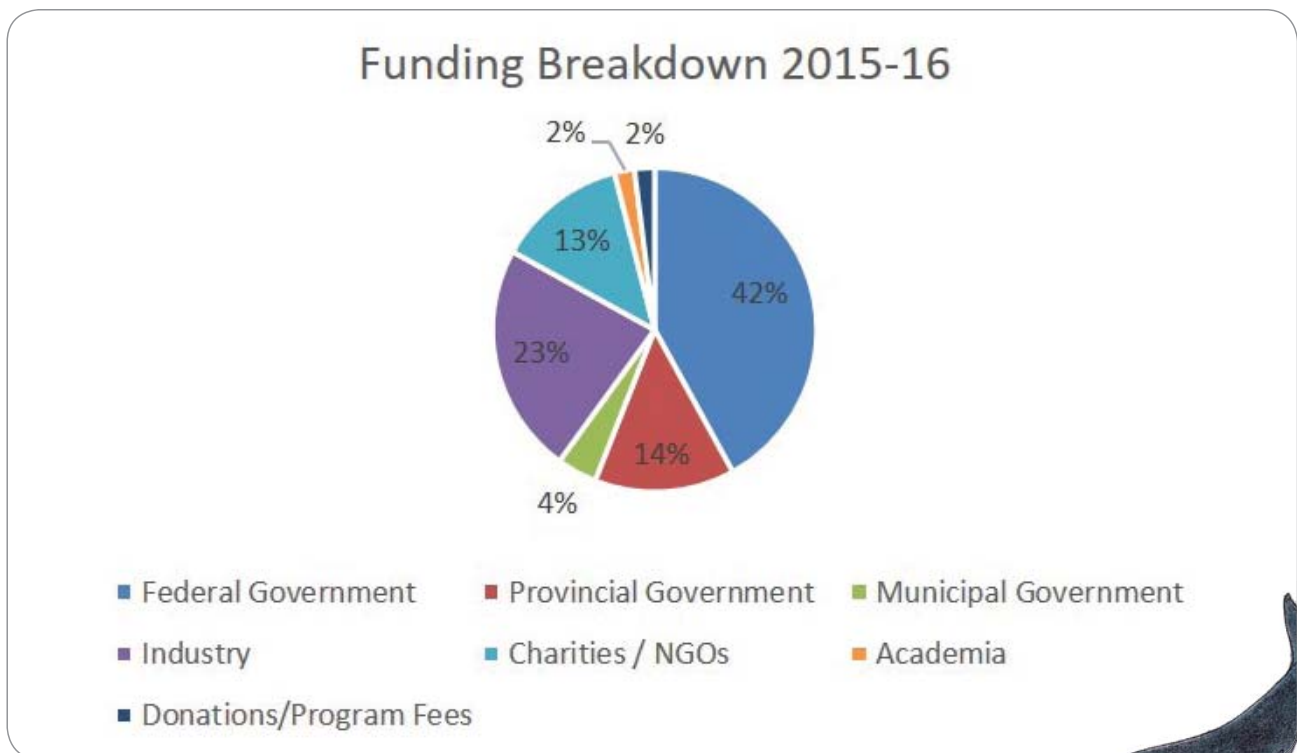


Figure 1: Coastal Action funding breakdown for 2015-16.



THE MORTON CENTRE



Children hiking a trail at the Morton Centre during one of the week-long day camps.

The Morton Centre is a 99-acre property located on Heckman's Island, near Lunenburg, Nova Scotia. The property is ecologically diverse and is comprised of five different ecological areas: secondary-growth mixed coniferous and deciduous forest, two large hay fields, freshwater ponds, a salt marsh, and nearly two kilometers of shoreline. A network of trails run across the property. The property also boasts a cottage, with amenities to accommodate summer staff and retreat visitors, a variety of outbuildings, and a 17-foot yurt which provides further programming space in the summer months.

The Morton Centre was originally an active farm, owned by Dr. Harry and Rachel Morton. Their wish was to see the property protected and used for environmental research and education. They gifted the property to Acadia University in 1995, and since then the Centre has been used primarily as a field station for Acadia student research. Recently, Acadia has shifted the purpose of this site to become a place for public environmental education, and in 2013 they partnered with Coastal Action to deliver environmentally-themed programs to engage and educate local children and youth. These programs intend to help participants build a connection with the natural world, increase environmental stewardship and awareness within the community, and address the lack of environmentally-focused education within our public education system. Primary funding for these programs comes from Michelin North America (Canada) Inc.

The Morton Centre Environmental Education Programs have expanded since their humble beginnings in 2013. Originally offering only four programs - Cycle Savers, Eco-Scientists, Pirates' Cove, and TIME (a high school environmental leadership program) - Coastal Action now delivers four programs in addition to several community events such as our Family Campfire Nights and our Open House and Family BBQ. The four programs currently being offered at the Morton



Campers receiving their certificates for completing Eco-Scientists.

Centre are Cycle Savers, Wild Adventurers, Eco-Scientists, and Pirates' Cove.

Cycle Savers is an intriguing, hands-on, earth education program for grade four students based on a mystery code and club theme. This program incorporates a leadership component for high school students, who are given two days of program and leadership training, then lead the groups of grade fours, in pairs, on a captivating adventure to appreciate, understand, and respect the cycles of life through an action-packed field trip at the Morton Centre. Students complete activities in a natural setting, which address grade four science curriculum outcomes, as they decipher the lost manual of the Cycle Savers Club, learn how their household is affecting the environment, and what they can do to make a difference.

Wild Adventurers, a new program which ran for the first time in 2015, is intended for youth ages 9-12. Campers become adventure-seekers that learn from wild creatures about how to explore and survive in the natural world and how to live in harmony with our environment. All week long, campers learn valuable survival skills like knot-tying, compass navigation, and leave-no-trace principles. At the end of the week they use the knowledge they gain to represent their creature at the mysterious 'Council of All Beings'. At the end of the week, campers put their wilderness survival skills to the test by building and sleeping in their own tarp shelters!

Pirates' Cove and **Eco-Scientists** are half-day camps for our younger participants, ages 6-8. During Pirates' Cove, campers are immersed in a week of exploration and investigation to reduce their impact on the natural

environment, to reuse old materials in up-cycling efforts, to learn proper recycling methods, and to rethink the ways we use resources and materials. Throughout Eco-Scientists, campers use the scientific method and engage their senses to explore the natural world and consider how humans impact the earth. They follow instructions from the mysterious "Dr. Science" to complete a series of scientific experiments, discover the cycles of life, and learn how to use their new science skills to continue exploring and caring for the world around them.

Coastal Action's other events at the Morton Centre include our **Open House & BBQ** and our **Family Campfire Nights**. The Open House & BBQ is a fun, community-building and awareness-raising event which includes a free BBQ, informational displays, nature activities, crafts for kids, and a walking tour of the property. In 2015, Coastal Action also offered a Lichen Walk- hosted by Frances Anderson - on the property to encourage awareness of these unique organisms. Family Campfire Nights are intended to reconnect families with nature and build awareness about the Morton Centre property and Coastal Action within the community. The evenings include nature activities, a tour of the property, and a fun-filled evening of stories, songs, and snacks around a campfire.

The Morton Centre Environmental Education Program at Coastal Action has expanded more than just its suite of programs. Originally only hosting 3 grade four classes with just 6 volunteer leaders for Cycle Savers in 2013, this year, Coastal Action delivered the program to 5 classes with 10 volunteer leaders, reaching over 100 children and youth. For our summer camp programs, we have increased our attending participants by 67% from 2013, and increased our staff capacity from 2 part-time positions to 2 full-time positions. Coastal Action aims to continue delivering quality educational programs to youth, and offer more opportunities for children, adults, and families.



Campers exploring the forest, on a trail within metres of the Morton Centre cottage, during one of the week-long day camps.

MARINE PLASTICS AND SOLID WASTE



Microplastics found on a beach. Credit: 5 Gyres

In 2015, Coastal Action developed a marine conservation program with a focus on plastics and solid debris projects. The goals and objectives of Coastal Action's marine debris initiative are three fold: research, education, and action.

RESEARCH

Coastal Action is dedicated to collaborating with other environmental groups around Atlantic Canada to develop and execute a strong sampling project in Newfoundland, Nova Scotia and New Brunswick. The project consists of a minimum of two sampling seasons. A project proposal and application was submitted to Environment Canada's Atlantic Ecosystems Initiative (AEI) and is as follows:

The Atlantic Canada Microplastic Research Project, led by Bluenose Coastal Action Foundation is aimed at addressing the environmental problem of marine plastic pollution, specifically microplastic (<5 mm in diameter). The project is an ecosystem-based research initiative that aims to quantify microplastic distribution and concentration across three locations in Atlantic Canada: the Bay of Fundy, the Bay of Islands (i.e., Gulf of St. Lawrence), and the LaHave River Estuary (i.e., Atlantic Coast).

The proposed project involves two years of microplastic sampling within the three study areas. Sampling methodologies will replicate those used by researchers in the Great Lakes and the St. Lawrence River in order to compare the results of those studies to data collected in Atlantic Canada. Samples will be collected from surface water trawls and benthic sediment grabs to quantify microplastic particles and determine concentrations. Year 1 data collection will provide a broad representation of microplastic distributions and concentrations throughout the three study areas. Results from this sampling will be used to identify areas with the highest concentrations of microplastic pollution in order to focus the sampling efforts in year 2. Sampling in year 2 will focus on these high concentration areas and potential pollution sources. Chemical analysis of these samples will assist in the identification of pollution sources.

Action initiatives will be the focus of an international workshop event to share and discuss results of microplastic data with researchers, scientists, non-government organizations and students. Final decisions on actions and solution-

based initiatives are dependent on the information gathered by the research phase of the project. Action will therefore be informed by the quantity of plastic in given locations as well as subsequent research on chemical composition. Additional research (not proposed in this project) regarding microplastic ingestion by aquatic species can be performed after the project's baseline data has been collected and analyzed.

As the project is concerned with several aquatic ecosystems that cross a variety of boundaries, collaborative partnerships have been established with two other Atlantic province stakeholders: Atlantic Coastal Action Program (ACAP) Humber Arm in Newfoundland and Huntsman Marine Science Center in Saint Andrew's, New Brunswick. Consultation and support from academic advisors and researchers have also been drawn upon to better understand the environmental stressor of microplastic debris in Canada's Atlantic waterways. The microplastic project has allowed us to expand our partnership network across Atlantic provincial borders, providing new opportunities to learn from other organizations and continue to strengthen our work here at Coastal Action.

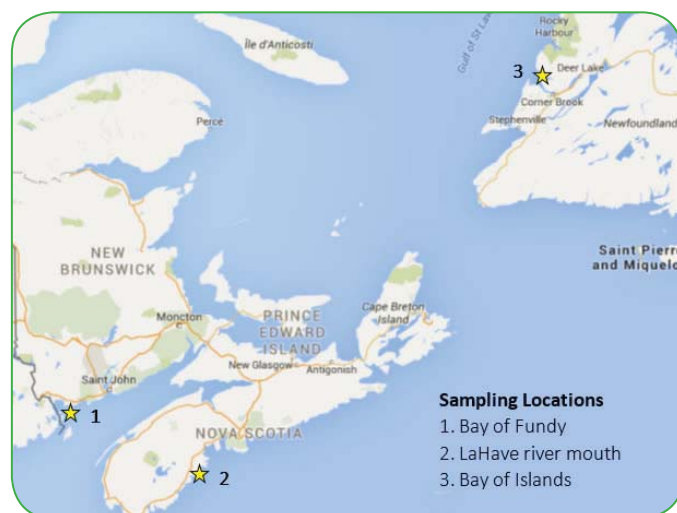


Figure 2: Atlantic Canada Microplastic Research Project proposed sampling locations. Map by Bluenose Coastal Action Foundation.

EDUCATION

In the spring of 2015, we also partnered with the Italian-Canadian organization, The Blue Dream Project, located in Lunenburg. Partnering with Francesco Nanni, the founder of The Blue Dream Project, has expanded our knowledge of the marine debris issue and allowed us to explore new educational and outreach programs. The Blue Dream Project has been building a wooden schooner on Lunenburg's historic waterfront since July 2014 in efforts to use the vessel for research and education initiatives on the issue of marine plastic pollution and prevention. To this effect, a Blue Dream 'Fleet' initiative has been launched to encourage boat owners and crew members around the world to fly the 'Blue Dream' flag and share the message of marine conservation and plastic reduction in our oceans. Our very own Sorca, captained by Rick and Dave Welsford, has joined this fleet and is dedicated to sharing the mission of Coastal Action and The Blue Dream Project to educate others on marine plastic pollution.

Joint Coastal Action and The Blue Dream Project presentations on marine plastic pollution at elementary and high schools in Lunenburg county have been prepared and will take place in February 2016.

ACTION

As stated in the project's proposal, one objective of the microplastic sampling project is to use data in a way that will effectively inform action on the issue of microplastic debris in our Atlantic Canadian waterways. This includes a workshop with academics, experts and other non-governmental organizations in which we will discuss and work through viable local solutions to the plastic debris issue. These solutions will vary and can range from prevention and clean-up to from-the-source reduction and the promotion of plastic alternatives.

GARDEN LOTS SALT MARSH TRAIL



View of Garden Lots salt marsh from the newly constructed platform.

Coastal Action, with their partners Bay to Bay Trails Association and High Liner Foods Incorporated, have been successful in creating a 200 metre, shared-use, recreational interpretative trail leading to a viewing platform overlooking the salt marsh located in Garden Lots, Lunenburg County, Nova Scotia.

Salt marsh habitats have been identified as one of the most biologically productive habitats on earth and it is estimated that more than 50% of salt marshes in Nova Scotia have been lost since the early 1700s. They are ecologically important, providing habitat for a variety of species including invertebrates, molluscs, birds, mammals, and fish. Animals use this habitat for food, shelter, spawning, nursery areas, and refuge from predators, giving salt marshes high commercial and recreational value as well. Salt marshes also provide erosion control, protect infrastructure from storm surges, and improve water quality.



Trail building crew awaiting instruction from Cobequid Trail Consulting.

The trail was designed by Coastal Action with help from Cobequid Trail Consulting, interpretive trail building experts, and was completed in the spring of 2015. Trail construction occurred with support from some of Coastal Action's board members, staff, and volunteers, helping Cobequid Trail Consulting, and was completed over the week of June 21, 2015. The trail building consisted of clearing a pathway, grubbing, placement of gravel material, constructing a boardwalk over a wet area of trail, and construction of the viewing platform.

Coastal Action staff conducted habitat surveys to determine the various flora and fauna species present at the salt marsh. Consultation with members of the

Nova Scotia Bird Society, NS Department of Natural Resources (NS DNR), as well as native plant expert, Professor Ruth Newell (Acadia University), assisted in determining the species present at the site. With results from the habitat surveys and consultations with ecological and biological experts, Coastal Action staff were able to provide content for interpretive panels for the trail. This content was provided to Kinley Graphic Design to develop three 3x2 foot interpretive panels to be placed along the trail.

Garden Lots salt marsh is a great example of an altered marsh that naturally restored itself to its former condition, making it a great place to increase community knowledge, respect, and awareness of salt marshes. This trail is meant to be a public space where members of the community can learn about the natural environment through the interpretive panels, as well as an area for educational programming for youth, and could also be included in Coastal Action's existing Morton Centre Environmental Education Program. The trail has already been used by local residents, High Liner Foods Inc. staff members, as well as local birders, and will be used for future public and youth education. Coastal Action plans to host a grand opening at the interpretive trail - keep an eye on our website and social media (Facebook and Twitter) for updates on the salt marsh trail grand opening date and time!



Coastal Action staff carrying lumber material into the trail to use in construction of a boardwalk and viewing platform.

COASTAL ACTION STORIES: ROSEATE TERN

The Roseate tern (*Sterna dougallii*) is an endangered seabird which resides in colonies with other species of terns (Common and Arctic) on shorelines and marine islands of Nova Scotia, including the Mahone Bay area. In 2003, Coastal Action initiated the Roseate Tern Recovery Project, with our primary goal being to re-establish nesting sites for Roseate terns, as well as to aid in the restoration of historic tern colony distribution.

Over the years we used a combination of strategies, including: monitoring (from boat and land), tern decoys, tern nesting boxes, sound systems playing attractive tern vocalizations, as well as predator deterrence and control measures, on Quaker, Grassy, Crow, Gully, and Westhaver islands.

Unsuccessful attempts to attract a breeding colony to Mahone Bay, increasing numbers for other existing tern colonies in Nova Scotia, and lack of federal funding led to the project discontinuing in 2013. Coastal Action is still involved in Roseate tern monitoring, as well as both a public outreach and tern colony signage program. Our goals are to now decrease human disturbance of tern colonies - which may lead to healthier Common and Arctic tern populations - and, in turn, we hope will lead to attracting and sheltering Roseate terns, as well.



Roseate tern perched atop a nesting box on North Brother Island, in West Pubnico. Photo credit: Ted D'Eon

FISH FRIENDS



Young Fish Friends releasing newly hatched fish into a stream.

Coastal Action has been assisting with the delivery of the Fish Friends program in Lunenburg County for many years. The school program is best suited for grade 4, 5, and 6 students and can be easily incorporated into the habitat component of the Nova Scotia curriculum. The Atlantic Salmon Federation developed the program for use in both Canada and the United States, but now the program is administered through the Nova Scotia Salmon Association and the Nova Scotia Department of Fisheries and Aquaculture.

Fish Friends provides elementary school students with an understanding of freshwater and marine environments, as well as the life cycle of the Atlantic salmon (*Salmo salar*). The program offers children the opportunity to raise native fish, at one time Atlantic salmon but due to the low abundance of the species the program now uses brook trout, in their classroom. Participating classes receive their fish as fertilized eggs and keep them to the fry stage. At this point the students have the opportunity to release their fish into local rivers and streams.

In 2015, Coastal Action coordinated the Fish Friends program in 10 local schools. Coastal Action staff provided maintenance, educational presentations, monitoring, and assistance with the release of fry into several rivers and streams throughout Lunenburg County.

Schools involved in the Fish Friends program in 2015 included:

Petite Rivière Elementary School
Bridgewater Elementary School
Bluenose Academy
West Northfield Elementary School
Chester Elementary School

Centre Scolaire de la Rive Sud
Bayview Community School
Hebbsville Academy
New Germany Rural High School
Chester Area Middle School

VERMICOMPOSTING AND WASTE MANAGEMENT



A sample from the vermicompost bin, with busy red wigglers (Eisenia fetida) working hard at transforming food scraps into usable compost.

Coastal Action has been involved in a variety of waste management projects, programs, and awareness campaigns over the last number of years in Lunenburg County. This past year, we have worked alongside Kirk Symonds from the Resource Recovery Fund Board (RRFB) to provide hands-on educational presentations regarding vermicomposting and recycling at Bluenose Academy. Kirk has been providing these waste management educational sessions to grade 5 classes around Lunenburg County and we have had the opportunity to join and participate. The students are introduced to the idea of making their own compost using food waste. The students are responsible for feeding and maintaining the worm bins through the school year. Ariel Smith (our Marine Plastics & Solid Waste Coordinator) and Kirk have checked in on the bins several times during the year. In April, the students harvest the vermicomposting and use it for different projects. The project teaches students about the value of food waste as well as soil sciences. This is one of only a half dozen projects like this in Nova Scotia.

Our involvement with education initiatives regarding waste management continues to expand. Most recently, Ariel joined Kirk again at Bluenose Academy to assess the recycling practices of the school during elementary and middle school lunches. Additional site visits were made in January and February of 2016 to check that all recycling signs were clear and updated to ensure that kids understand how to recycle properly while at school. In January of this year, Kirk and Ariel presented again to the grade 5 classes on the topic of recycling, in efforts to provide the younger grades with the understanding of what items should be recycled, composted, or returned. This partnership with RRFB and Region 6 Solid Waste Management at Bluenose Academy will continue throughout the spring of 2016 and expand to other projects in the coming year, such as shoreline and roadside cleanups, town hall presentations, and other South Shore events.

GOLD RIVER CATCHMENT LIMING



Coastal Action staff "lugging" buckets of powdered lime in the Ted Creek catchment area.

Southwestern Nova Scotia has some of the most acidic freshwaters in North America. The two main factors involved in creating these highly acidified conditions are the province's location downwind of major emission sources as well as the resistant geology which offers little buffering capacity. Southwestern Nova Scotia is also known for being an area extremely rich in natural biodiversity; hence, the recent UNESCO designation of the Southwest Nova Biosphere Reserve. These highly acidic conditions within the region's watersheds are threatening the health and survival of a number of the native freshwater species, in particular the Atlantic salmon. Catchment liming has proven to be a very effective mitigation option for acid-impacted freshwater systems in Scandinavia; however, has not been field tested in Nova Scotia. Coastal Action partnered with Dalhousie University, the Atlantic Salmon Federation, and Environment Canada to develop a pilot catchment liming project that would attempt to mitigate these increased acidic conditions within freshwater systems of Southwestern Nova Scotia.

The purpose of the project is to field test the catchment liming technique in watersheds within Lunenburg County; more specifically, the Gold River watershed within the Municipality of the District of Chester.

2015 marked the final year of a four-year focused pilot project that took place within the Gold River watershed; the first three years in Maria Brook, a sub-watershed of the Gold River in the New Ross area of Lunenburg County, and the final year, 2015, in Ted Creek, another small sub-watershed in the Gold River system, located in New Russell.

Maria Brook has a catchment area of 0.47 km² and over the three year period a total of 120 tonnes of powdered limestone was spread throughout this project site. Real-time monitoring stations captured both water quality and weather related data above and below the treatment site. Dalhousie University's Hydrology Research Group also conducted water grab samples for further analysis. Monitoring at the Maria Brook location wrapped up in November of 2015 and results are currently being analyzed by students at Dal.



The 2015 project site, Ted Creek, was located in the New Russell area on forestry land. Ted Creek received a total of 30 tonnes of powdered limestone, spread over 3.9 ha of the 48 ha catchment area. Coastal Action field staff first flagged the 3.9 ha into a grid with 20 m x 20 m measured plots. Each plot received a specific dosage of lime depending on its elevation within the catchment area. Rough terrain and bog habitat made for challenging field conditions at this location. A trail was built for ATV access to assist in the application of the limestone. Coastal Action field staff spent the month of July spreading the limestone within the pre-determined plots by hand. Water quality monitoring at the Ted Creek location was again conducted by members of the Hydrology Research Group from Dalhousie University from June to November 2015. Dalhousie University student, Jillian Haynes, will be spending the remainder of the university school year analyzing the results and incorporating them into her Honours thesis that will be completed by the end of April 2016.

As a result of this four-year pilot project, Coastal Action, along with their partners, will have developed a “guide book” for watershed liming that can be used by other community groups and other stakeholders throughout the region. This guide should be completed once all of the student research work has been completed at Dalhousie.



Coastal Action field staff “liming” at the Ted Creek catchment area.

COASTAL ACTION STORIES: STELLA'S SCIENCE PROJECT

When 12-year-old Stella Bowles found out the LaHave River - which is within eyesight of her home - was unsafe to swim and play in, she created a school science project to research the reasons behind why her river was polluted - and what could be done about it. Stella has been collecting and analyzing her water samples since November 2015. With the scientific guidance of various individuals and organizations experienced in water quality monitoring, Stella was able to identify significant fecal bacteria contamination in her river.

Stella, and many others, believe this contamination is caused, in large part, by untreated human waste, which continues to flow directly into the water via straight pipe septic systems from approximately 600 homes along the LaHave River. Straight pipes - which are illegal in Nova Scotia - are one of the biggest contributors to a serious bacteria pollution problem in the LaHave River Estuary. Simply put, it is not safe to swim in the estuary and even minimal contact through water recreation poses a risk to human health.

Stella's results, when compared to Health Canada's Guidelines for Canadian Recreational Water Quality, show evidence of dangerously high levels of fecal bacteria at all four of her sampling sites. Stella began making the results of her research public on a Facebook page she created called LaHave River: Stella's Science Project, which - at the time of this publication's release - has garnered 2,716 followers. Multiple local and national news media outlets have picked up Stella's story and have shared the importance of cleaning up the LaHave to make it safe for people to enjoy. Thanks to Stella, water quality monitoring of the LaHave River (which Coastal Action has been conducting since 2007) now has a public face: that of a local, hard-working student concerned for the health and safety of her river.



Stella prepares water samples she collected from the LaHave River for analysis.

LAHAVE RIVER WATERSHED PROJECT



Restored step-pool habitat in Ross Brook.

This was another busy year for the LaHave River Watershed Project (LRWP). 2015 marked the 9th year for the Water Quality Monitoring Program in the LaHave River Watershed. Fifteen sites are monitored on a monthly basis for physical, chemical, and biological water quality parameters using a YSI Water Meter and through the collection of water samples for laboratory analysis. A water quality report card and full water quality report for 2015 will be released in early 2016.

Additional water quality monitoring was performed in partnership with a group of volunteers called the Straight Pipe Citizens Group. This group collected water samples from five shoreline locations in the LaHave River Estuary every week from June to September, 2015. These water samples were analyzed for enterococci, which are the most

appropriate indicator of fecal contamination in marine recreational waters. The results of this monitoring showed a large number of exceedances of Health Canada guidelines established to protect the health of people engaging in water recreation. Straight pipes, which discharge untreated human sewage directly into the river, are suspected to be a significant contributor to this contamination. Additional likely sources of contamination include storm water runoff, combined sewer overflow pipes, waterfowl, sewage treatment effluent, and agricultural runoff.

Every year, the LRWP field crew works to improve fish habitat in the watershed through various in-stream restoration activities. In

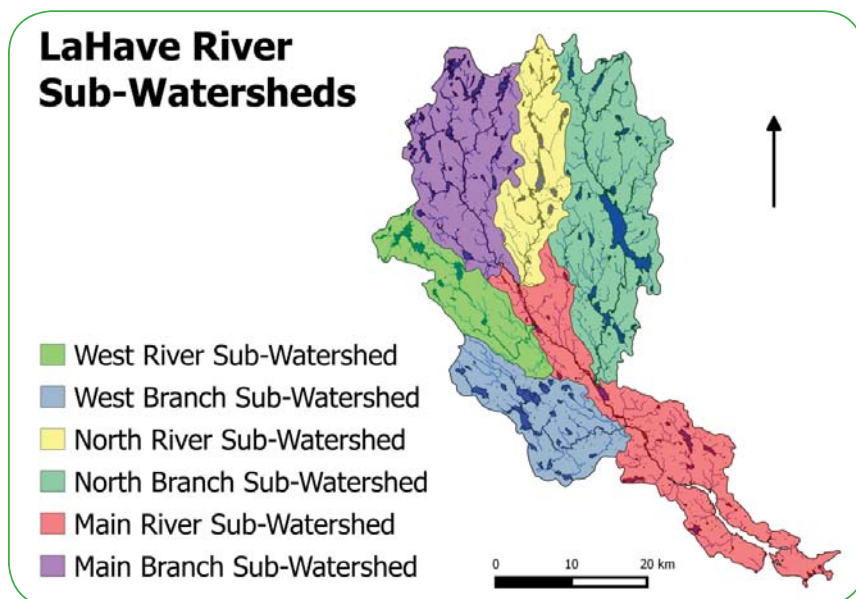


Figure 3: Six sub-watersheds of the LaHave River Watershed.

2015, fish habitat restoration projects were completed in the West Branch and Main River Sub-watersheds. Work in the West Branch Sub-watershed involved a 600 m tributary between New Canada Lake and Wagner Lake. This stream had aquatic connectivity issues and a significant amount of garbage in the stream and throughout the riparian habitat. A debris blockage was removed from the outlet of New Canada Lake to improve fish passage between the stream and the lake. Garbage was removed from 20,000 m² of riparian and in-stream habitat, including over 1,000 lbs of scrap metal. A culvert assessment was performed on a wooden box culvert on the stream and it was determined to be posing a barrier to fish migration. In order to restore fish passage through this culvert, the field crew installed 4 wooden baffles inside the culvert as well as a weir and chute system at the outflow, with the assistance of our project partner, Nova Scotia Salmon Association's Adopt-a-Stream Program. This project has improved fish habitat conditions in the stream and the health of the riparian zone, as well as restored fish passage to 3,000 m² of in-stream habitat and a 41.6 ha lake.

Fish habitat restoration work in the Main River Sub-watershed was conducted in Ross Brook, a 5 km tributary of the main LaHave River. Restoration work took place along a 500 m stretch of the stream. This area suffers from sedimentation as a result of an upstream pasture that allows cattle in the stream. Restoration work at this site included alder thinning, debris blockage removal, step-pool habitat enhancement, and the installation of two digger logs and one deflector. These activities have helped to reduce the sediment load in the stream and restored over 2,500 m² of fish habitat.

This year, the LRWP field crew began assessing aquatic connectivity throughout the watershed, starting with the Main River Sub-watershed. Over 150 stream crossings were assessed and 52 culvert assessments were performed to identify crossings which do not allow fish to migrate up/downstream to access the various habitats they need throughout their life cycles. These assessments have identified a number of full and partial barriers to fish migration. Four of these barriers were chosen for remediation in 2015; two culverts on Cooks Brook and two culverts on Hebb Brook in Bridgewater. By installing baffles, chutes, and weirs in these culverts, we have restored access to 12,900 m (72,600 m²) of stream habitat for our local fish populations.



Restoring fish passage through a barrier culvert on Hebb Brook.

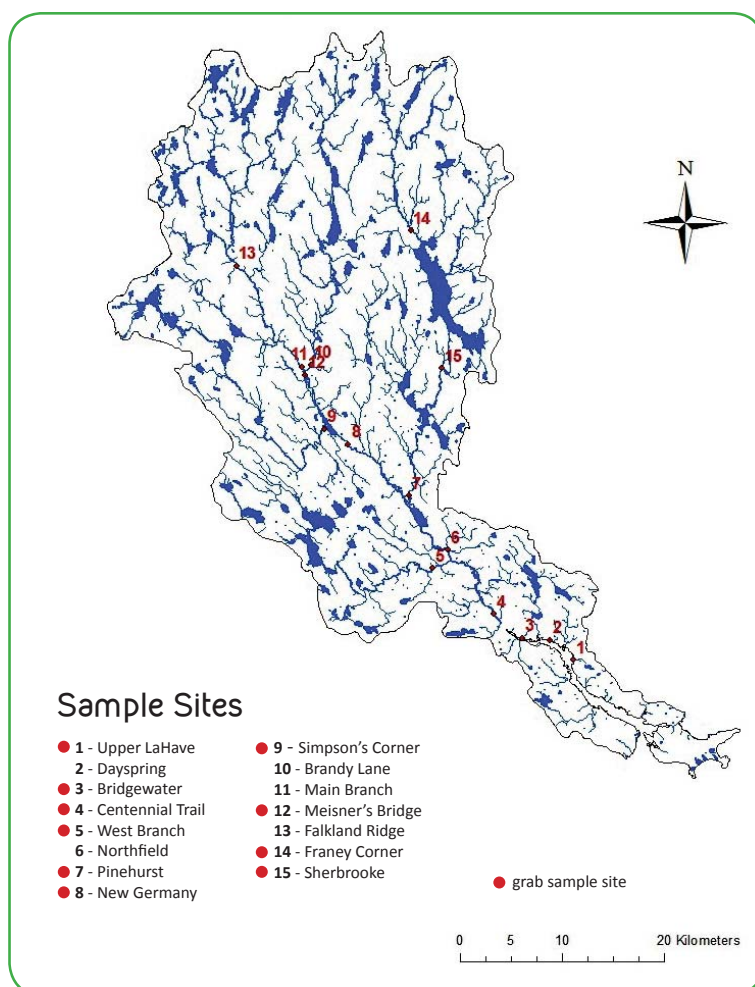


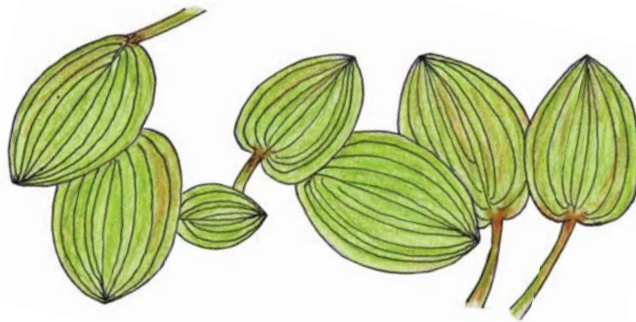
Figure 4: Water quality monitoring in the LaHave River Watershed.

During 2015, we completed an Estuary Health Assessment Project in the LaHave River Estuary.



Monitoring water quality in the LaHave River Estuary.

This project was carried out in partnership with several environmental organizations across Atlantic Canada, with Eastern Charlotte Waterways Inc., in Blacks Harbour N.B., acting as the project lead. Each partner organization assessed the health of their local estuary independently. The estuary health assessment involved monitoring for bacteria levels, general water quality, contaminants in sediment, eutrophication indicators, and aquatic biodiversity. Results from this project are currently being analyzed and will be used to produce an Estuary Health Report Card. These reports from each organization will be used to develop a Report on the State of Estuary Health in Atlantic Canada.



COASTAL ACTION STORIES: RUM & CHOWDER SOCIAL

Coastal Action's office was once the home of a rather well-known family from Lunenburg: Captain Angus Walters - captain of the Bluenose - and his family. The main floor of our office is open for public viewing, as there are aspects of the Walters' home which have been preserved. Just beyond our back yard is a view of Lunenburg harbour.

Every June, Coastal Action hosts our Rum & Chowder Social, a fundraising event which includes various local restaurants supplying an abundance of delicious chowders, as well as a wide variety of rum and the talents of musical guests. Our next Rum and Chowder Social is being held on Friday June 10th, 2016.

This fundraiser is growing in popularity each year; be sure to check Coastal Action's website (www.coastalaction.org) for news on how you can purchase tickets. See you there!



Sample a variety of delicious local chowders!

PETITE RIVIÈRE FISH HABITAT RESTORATION



Coastal Action summer staff installing a digger log to improve fish habitat.

The Petite Rivière Fish Habitat Restoration Project began in 2014, with a goal of assessing the health of riparian and in-stream habitats, as well as aquatic connectivity and land-use activities throughout the Petite Rivière watershed. A water quality monitoring program was established in this watershed in 2011, which involves year-round monitoring for several water quality parameters, on a monthly basis, at 18 sample site locations. Project activities include water quality monitoring, aquatic connectivity assessments, as well as habitat assessment and restoration activities. A Fish Habitat Restoration Plan is currently being developed for this watershed, which incorporates all of the data collected through various project activities and prioritizes restoration work needed throughout the watershed.

The Petite Rivière watershed is 244 km² in size, with 8 main tributaries, 26 lakes, and many wetland habitats. The largest bodies of water in the system are Fancy Lake (4.0 km²), Milipsigate Lake (3.5 km²), Minamkeak Lake (7.7 km²), and Hebb Lake (4.7 km²). Coastal Action has focused efforts on the Petite Rivière watershed because it hosts the only known population of the endangered Atlantic whitefish (*Coregonus huntsmani*) and also serves as the drinking water supply for the Town of Bridgewater.

In 2015, the Petite watershed crew completed over 30 km of stream assessments in Birch Brook, Wallace Brook, Fredericks Brook, Brown Brook, and Wildcat Brook. These assessments involve both riparian and in-stream fish habitat conditions and are used to identify areas in need of restoration work. Stream assessments and restoration work began in Wildcat Brook in 2014, with the installation of 4 digger logs and 4 deflectors, followed by an additional 4 digger logs and 4 deflectors installed in 2015; restoring a total of 400 m of in-stream fish habitat.



Wildcat Shale Pit Project site prior to remediation.

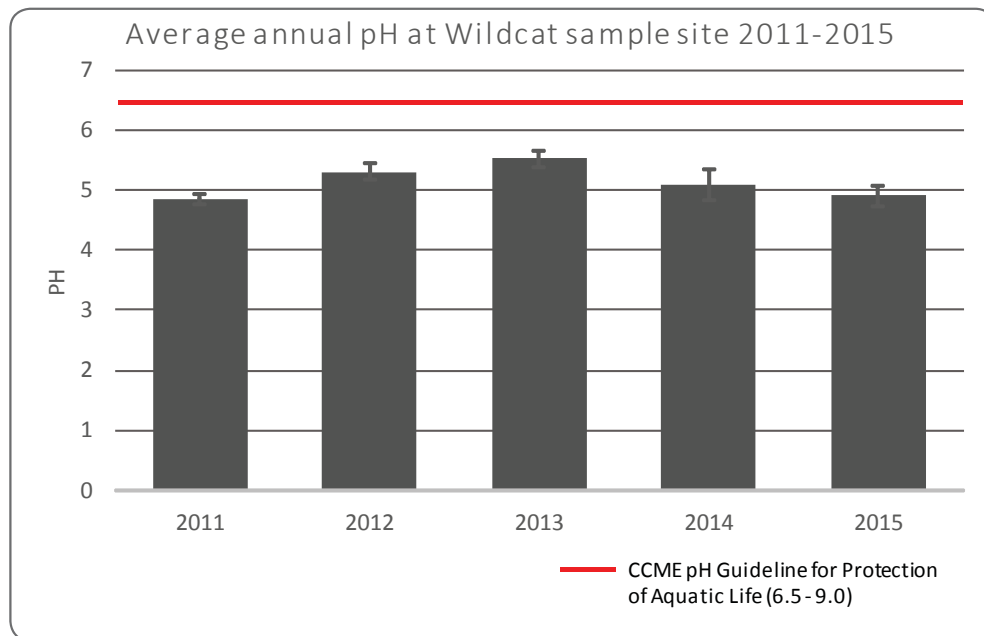


Figure 5: Average annual pH in Wildcat Brook from 2011-2015. Annual results fall below the Canadian Council of Ministers of the Environment (CCME) pH Guideline for the Protection of Freshwater Aquatic Life.

The Petite Rivière Watershed Water Quality Monitoring Program has identified many tributaries in the watershed that suffer from acidification. Wildcat Brook, in particular, suffers from extremely low pH due to the presence of two abandoned shale pit mining properties on either side of the stream. The exposed pyritic shale rocks in these pits release acid into the surrounding environment, which makes its way into Wildcat Brook during rainfall events. The resulting low pH conditions in Wildcat Brook have significantly reduced this stream's ability to support a healthy aquatic ecosystem.

Coastal Action has partnered with land reclamation experts, East Coast Aquatics Inc., to deliver the Petite Rivière Watershed Shale Pit Remediation & Wetland Expansion Project. This project involves converting the smaller of the two abandoned shale pits into a wetland habitat in order to prevent the further release of acids from the site and improve the water quality and aquatic ecosystem in Wildcat Brook, while creating valuable wetland habitat for local wildlife. Restoration work began in 2015 and will be completed in 2016, with the 1.1 ha site being completely covered in wetland organic materials and planted with native wetland and upland species. The installation of nest boxes for waterfowl and tree swallows, as well as bat roosting boxes, will enhance the conditions of this newly created wildlife habitat.



Organic soils being spread at the Wildcat Shale Pit Project site.

AMERICAN EEL



Danielle, Project Coordinator, and the largest eel of the 2015 season - 980 mm long! - captured in the rotary screw trap at the outflow of Connaught Lake.

American eel (*Anguilla rostrata*) have a complex life cycle, beginning as an **egg** in the Sargasso Sea, floating along ocean currents as **leptocephali** larvae, before reaching our rivers as unpigmented juvenile eels, known as elvers. From here, **elvers** migrate up rivers into freshwater, where they spend the majority of their life in the **yellow eel** phase, before becoming sexually mature **silver eel** and returning to the Sargasso Sea to spawn. A Joint Venture Project between Fisheries and Oceans Canada, and a group of elver fishers began in the late 1990's to study elver abundance and harvesting in Scotia-Fundy waters. In 2008, Coastal Action was contracted to begin an extension of this previous research to further obtain data on basic life history information of migrating elvers entering East River, Chester, Nova Scotia. Coastal Action has continued the project for seven consecutive years, which will contribute to estimating the run size of elvers, and provide an additional source of data on the biological characteristics of elvers entering this watershed.

ELVERS

The 2015 elver season was off to a slow start after a long winter, with the first elvers appearing in the East River, Chester on May 4th, caught by the commercial fishers. Traps were checked daily from May 18th to July 17th. The first elvers appeared in Coastal Action's trap boxes on May 19th, and gradually increased until tapering off on July 17th, when traps were removed. In past years, there has been a dramatic peak run of elvers; however, this year was a smaller, more gradual catch. This year saw only 657,113 elvers, compared to a record catch of 1,733,452 elvers in 2014.



Figure 6: Pigmentation changes in elvers throughout the 2015 season. a) Clear elver sampled early in season (May) and b) Pigmented elver sampled near end of season (July).

Biological samples were collected three times a week throughout the season and measured for length, weight, and pigment stage. As elvers enter the freshwater from the ocean, they undergo changes in length and weight, and become more pigmented as the season continues (see Figure 6). There is a noticeable change in pigmentation from elvers at the start of the season (stage one, or clear) compared to the end (stage seven, or fully pigmented).



Swim bladder of an American eel infected with *Anguillicoloides crassus*.

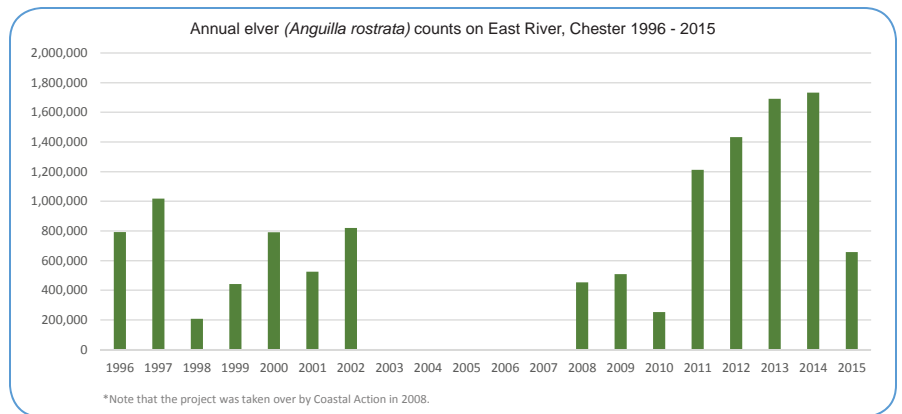


Figure 7: Annual elver counts on the East River, Chester. Note that Coastal Action took over elver recruitment monitoring in 2008.

AMERICAN SILVER EELS

Oakland Stream - Silver eel are sexually mature American eel that have lived the majority of their life in freshwater, and head back to the ocean in the fall. The Oakland Stream trap, at the outflow of Oakland Lake, was active from August 28th until November 6th, and saw a total of 555 eels (32 yellow, 523 silver). Due to low water levels, catches were low until rainfall occurred (see Figure 8), signalling the eel to run.

East River, Chester – Similar to Oakland Stream, the 2015 season was off to a slow start in Easter River, Chester. Four traps were placed in the East River, Chester watershed; a trapnet in the outflow of Officer Camp Lake, a rotary screw trap in the outflow of Connaught Lake, a wire mesh trap in the outflow of Little Whitford Lake, and a recapture trapnet in a branch of the Main River just below Highway 103. The first three served as tagging locations, on both the Canaan and East branches of the river, while the recapture net was placed below the tagging sites in the main branch, in an effort to catch tagged eel. Due to time constraints, not every eel captured was tagged. Biological measurements such as length, eye diameter, fin length, and head length were taken as time allowed.

In addition, 78 of the eels captured were sacrificed to be sampled for sex, gonad stage/weight, presence of swim bladder parasites (*Anguillicoloides crassus*), and collection of otoliths for aging. Collecting this information will help determine characteristics of the run. Of the 78 sacrificed, 47 were female, 31 were male, and 7 contained the invasive swim bladder parasite (4 from East River, Chester, 3 from Oakland Stream). The largest sacrificed eel, 852 mm long, was a female from the East River, consequently having the largest gonad weighing over 41 grams.

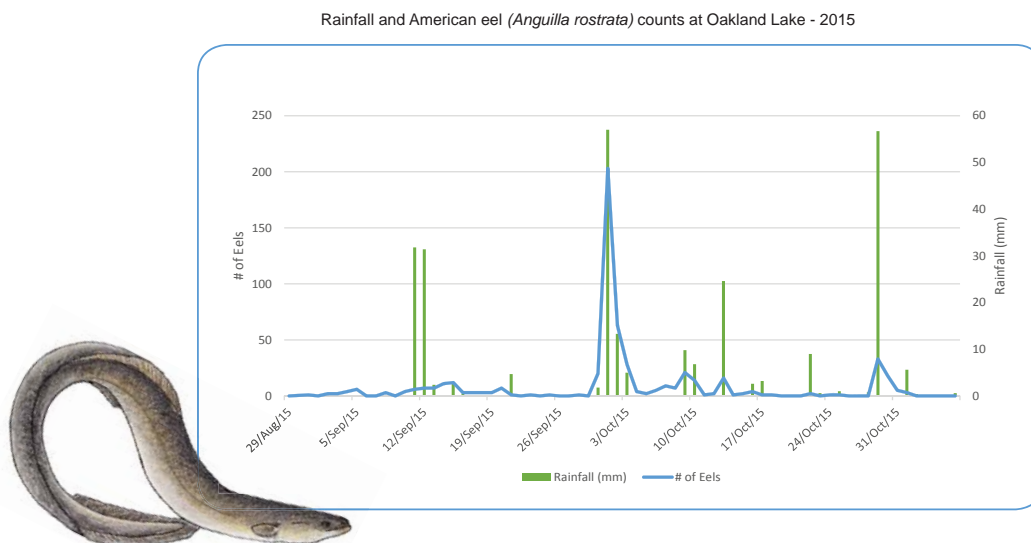


Figure 8: Comparing eel runs with rainfall events.

ATLANTIC WHITEFISH



Atlantic whitefish at Milipsigate Dam.

The Atlantic whitefish (*Coregonus huntsmani*) is a naturally anadromous, endangered fish species, which is endemic to eastern Canada. Currently, the only known wild population is located within three inter-connected lakes (Minamkeak, Milipsigate, and Hebb Lakes) in the Petite Rivière watershed, Lunenburg County, Nova Scotia; an area of 16 km². Historically, an anadromous population was known to inhabit the Tusket River watershed in Yarmouth County; however, this population has since been extirpated from that system. In 1984, the Atlantic whitefish became the first Canadian fish species to be classified as “endangered” by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). Its “endangered” status was reconfirmed by COSEWIC in 2000, and more recently in 2010. The Atlantic whitefish was also recognized as being threatened with imminent extinction and listed as “endangered” under Schedule 1 of the federal Species at Risk Act (SARA) in 2003. It is protected under the Maritime Fishery Regulations, the federal Species at Risk Act, and the Nova Scotia Endangered Species Act.



Andy Breen preparing to deploy a GoPro video camera to monitor fish underwater.

The spread of non-native species throughout Nova Scotia’s watersheds continues to pose a serious threat to native fish populations. The introduction of chain pickerel (*Esox niger*) into the Tusket-Annis watershed has been linked to the decline of several species, including the extirpation of the Atlantic whitefish. Another illegally introduced species, smallmouth bass (*Micropterus dolomieu*), has been identified as a potential threat to the remaining Atlantic whitefish population in the Petite Rivière watershed. Smallmouth bass were first introduced to Nova Scotia in 1908 and were first recorded in the Petite Rivière in 1994. Chain pickerel were first observed in the Petite system in 2013. This non-native predatory fish was illegally introduced and has the potential to decimate the remaining Atlantic whitefish population.

Coastal Action has been working towards the recovery of the Atlantic

whitefish since 2003. The main focus of the 2015 Atlantic Whitefish Recovery Project was targeting the two known invasive species present in the watershed - chain pickerel and smallmouth bass- to determine their abundance and range, as well as their direct impact on the Atlantic whitefish population. Results of this work will help to further develop a mitigation plan for the control of these species. Direct removals of as many invasives as possible through project activities continues to be a priority until the Atlantic Whitefish Conservation & Recovery Team establish a final mitigation plan for these species. Due to this increasingly worrisome threat, work was also focused on assessing migration patterns and habitat use of Atlantic whitefish so as to open up more available quality habitat to them in the lower Petite. Specific project activities included:

- 1) Stomach content analysis of all invasive species removed from the watershed (chain pickerel and smallmouth bass).
- 2) Catch Per Unit Effort (CPUE) study comparing data from 2013-14 to 2015.
- 3) Operation and monitoring of the Rotary Screw Trap (RST) located downstream from Milipsigate Dam.
- 4) Operation and monitoring of the trap at the Hebb Lake Dam Fish Passage Facility.
- 5) Population estimate of Atlantic whitefish through video footage of the area downstream from the RST.

Smallmouth bass and chain pickerel were captured using various techniques such as angling, electrofishing (backpack and boat methods), as well as through removals at the fishway and RST. All fish were sampled for length, weight, mouth gape, scale sample (to determine age), and stomach content. The stomach content analysis was carried out within 24 hours of capture.

The RST was deployed and monitored for any downstream migration at the base of Milipsigate Dam from May 5 to July 7, 2015. The holding box of the trap was inspected daily for any fish caught. The main purpose of using the RST was to further enhance our efforts for invasive species in this area and to assist in obtaining a population estimate for Atlantic whitefish.

The trap at the Hebb Lake Dam Fish Passage Facility was monitored daily from May 13 to July 13, 2015. A total of 4,986 fish were intercepted, comprising of six different species. The trap was once again monitored in the fall from September 14 to December 11, 2015. Unfortunately, during this time period, the fishway had to be closed several times due to low flow conditions and low lake levels. This resulted in 0 fish being captured in the fishway trap in the fall – a very disappointing end to the 2015 field season.

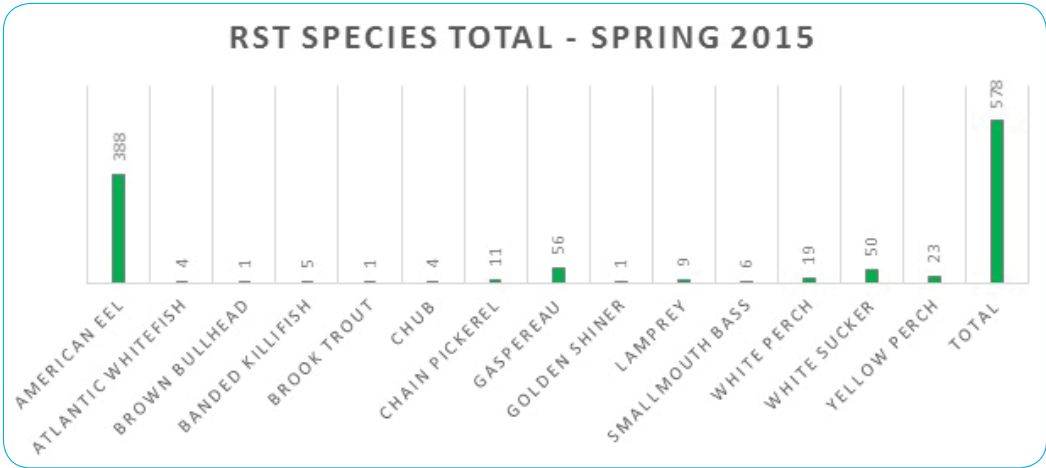


Figure 9: Fish species composition and abundance for Rotary Screw Trap situated at Milipsigate Outlet 2015.

Table 2: Fish species composition and abundance at Hebb Dam fishway trap Fall 2012 - 15.

Species	Abundance Fall 2012	Abundance Fall 2013	Abundance Fall 2014	Abundance Fall 2015
American Eel	2	0	0	0
Atlantic Salmon	4	0	1	0
Atlantic Whitefish	20	0	0	0
Brook Trout	13	2	0	0
Brown Bullhead	0	1	0	0
Chain Pickerel	0	2	0	0
Smallmouth Bass	3	1	5	0
White Perch	2	0	0	0
White Sucker	36	14	20	0
Grand Total	80	20	26	0



Two live snapping turtle hatchlings found inside the stomach of a chain pickerel (summer 2015).

To view video footage of Atlantic whitefish, smallmouth bass, and chain pickerel at Milipsigate Outlet please visit Coastal Action's Facebook page. For more details about the Atlantic Whitefish Recovery Project check out our website at www.coastalaction.org.



COASTAL ACTION STORIES: COASTAL POLICY

Environment Canada has stated that "climate change is one of the most important environmental issues of our time that requires urgent action". Although climate change is a natural phenomenon, human induced pressures have increased the rate at which change is occurring. One of the most worrisome results of climate change and global warming is sea level rise and increased storm surge events for coastal communities.

One aspect of mitigating climate change impacts across Nova Scotia is the development of comprehensive land-use planning strategies. Coastal Action partnered with the Municipality of the District of Lunenburg (MoDL) to host five public meetings from late June to early August 2014, following the MoDL's 2013 Climate Change Action Plan (MCCAP) and development of a local coastal policy. The five meetings began with a short presentation followed by an open house style discussion. The wide range of public concerns include erosion, storm surges, coastal flooding, property damage, not taking the proper action to mitigate effects of climate change, and cost to tax payers.

You can access our Public Consultation Summary Report by visiting the Projects section of Coastal Action's website (www.coastalaction.org) and selecting Coastal Policy, where you can download the report.



Coastal erosion on Heckman's Island in Lunenburg County, Nova Scotia.

CLIMATE CHANGE EDUCATION



Robin Tress at the shoreline of Westhaver Beach.

Vegetative buffers are necessary to protect coastal and inland shorelines from increasing erosion resulting from factors such as climate change and sea level rise, and to protect habitat for aquatic and riparian wildlife. Unfortunately, it is still common practice to build along the water's edge and remove or reduce vegetation in order to open up wider views of the water. South Shore municipalities currently have limited or no legislated protection of inland and coastal shoreline buffer zones and there is no provincial coastal policy or act. Educational programs and events are needed to help increase awareness in the South Shore area of shoreline erosion issues and solutions to help promote protection of these dynamic and valuable habitats.

In January 2016, Coastal Action received a grant from Nova Scotia Environment to organize an awareness event called "Shoreline Views: Photography and Adaptation Workshop". The free workshop was organized in partnership with the South Shore Chapter of the Council of Canadians and the Sierra Club Atlantic Chapter, and took place on March 12th, 2016 at the Mahone Bay Centre with up to 40 people in attendance. Laughing Whale Coffee Roasters donated fresh coffee to the event. The purpose of the workshop was to create a fun environment for South Shore and area residents to learn about shoreline habitat, erosion processes, and erosion mitigation strategies. Photography was used as a way to discuss artistic and scientific perspectives of shorelines.

Guest speaker, Robin Tress, from the Ecology Action Centre spoke about shoreline erosion processes and Living Shorelines methods of reducing erosion and local photographer, Kas Stone, provided in-house and outdoor instruction for photographing waterscapes. Living Shorelines involves vegetation planting and reducing erosion by promoting habitat-building processes, and has an added benefit of carbon sequestration. Workshop participants shared many great ideas for adapting to coastal erosion and climate change, including provincial regulations for coastal construction, awareness programs for youth, coastal stewardship councils, and community information sessions. The participants will be invited to submit shoreline photos and story cards to the Council of Canadians' Third Annual Canada Water Week photo exhibition held at the DesBrisay Museum in Bridgewater from April 10th to 24th, 2016. Some of these photos will be submitted to a Shoreline Views Exhibit that will be touring around Nova Scotia in summer of 2016.

STORMWATER MANAGEMENT



Amy, Project Coordinator, at one of the stormwater management project sites in Generations Active Park, Bridgewater.

An increasing number of storms and intensity of precipitation events from climate change will mean more stormwater management challenges for South Shore municipalities in the future. Stormwater is the runoff from rain water and snow/ice melt that flows across impervious surfaces such as roads and parking lots. Stormwater causes flooding challenges when infrastructure reaches capacity and also introduces pollutants into water bodies. Low Impact Development practices, such as rain gardens and permeable pavement, increase the area of pervious surfaces in urban environments to promote the evaporation of water and infiltration into the ground.

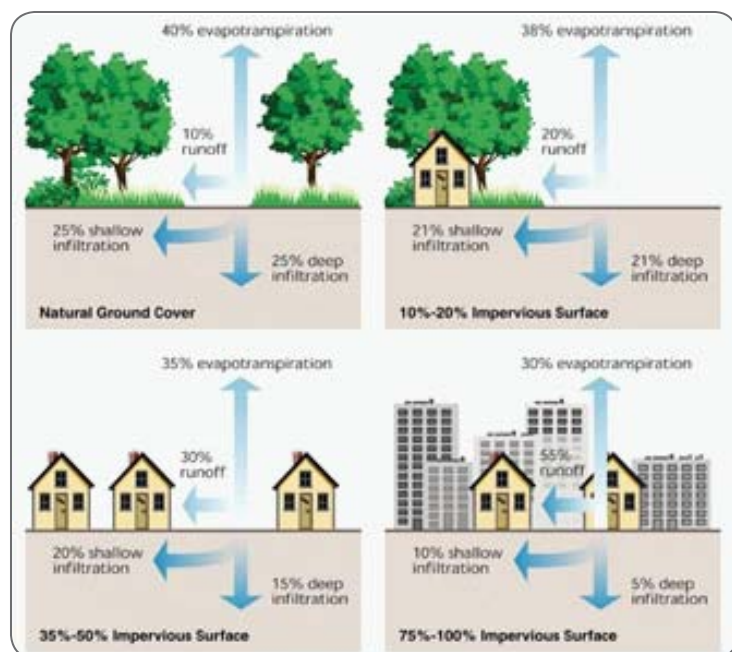


Figure 10: Water cycle changes with increased impervious area in urban environments (Image courtesy of lowimpactdevelopment.org).

Coastal Action is working in partnership with the Town of Bridgewater to investigate the potential for Low Impact Development (LID) practices to reduce stormwater runoff. Coastal Action received funding through the Intact Foundation in 2015 to host community workshops, implement some best management practices, and create a Stormwater Management Best Practices Guidebook for Town of Bridgewater staff to help them explore LID options.

In 2015, the Town of Bridgewater identified a site next to the Off-leash Dog Park in Generations Active Park to explore the use of LID measures to reduce the negative impact from stormwater runoff at the site. Stormwater was flowing from the park and adjacent private properties over the HB Studios Sports Centre parking lot, contributing to flooding during peak rainfall and introducing pollutants into the LaHave River. Coastal Action set out to build a rain

garden at the site, which would help to retain excess rain water, sink the water into the ground, and divert runoff to an existing bioswale (vegetated drainage channel) that drained away from the parking lot. Garden bed materials were ordered and delivered to the site in November for construction and planting in spring 2016. The Town of Bridgewater built a soil berm during the late fall and the Nova Scotia Community College Heritage Carpentry class donated bags of wood shavings for mulch.

An opportunity to build a second rain garden at that site arose when the Small Change Fund put out a call for applications at the end of November for the Aveda Atlantic Water Fund crowdfunding campaign. Coastal Action, in partnership with the Town of Bridgewater, initiated a crowdfund to support a rain garden that would include milkweed for monarch butterflies, a community building workshop, an interpretative panel, and a small rain barrel program. The campaign closed on January 29th 2016 having reached 89% of the goal (\$3,222). Amy (Coastal Action's Climate Change Project Coordinator) attended a Sustainable Landscape Design course delivered by Helping Nature Heal in January/February 2016 to gain knowledge on landscaping and the use of native plants; she created a landscape plan including both stormwater management site locations.



Flooding at the future rain garden site, following a heavy rainfall event.

COASTAL ACTION STORIES: LIVING SHORELINES PROJECT

In 2015, Coastal Action partnered with the Town of Bridgewater and the Bridgewater Development Association's Riverfront Renaissance Team to restore an area of municipally-owned shoreline habitat which suffered from coastal erosion. This project included 'Living Shorelines' restoration techniques, which provide 'soft' engineering approaches to bank stabilization that mimic natural shoreline processes. Living Shorelines restoration activities can slow erosion rates, improve water quality, increase the resiliency of shorelines to withstand storm and wave action, and improve the health of coastal and aquatic habitats.

Coastal Action has restored over 500 m of shoreline and 4 acres of riparian habitat along the LaHave River, behind the Cineplex Cinemas in Bridgewater. Restoration activities included covering exposed soils and eroding banks with hay bales and hardwood woven mats, as well as planting willow stakes and 80 native trees and shrubs.

This newly-restored area will act as a Living Shorelines Demonstration Site as well as an 'outdoor classroom' for community and youth environmental education. Project work will continue in 2016, with the planting of more native trees and shrubs, and the installation of a trail, viewing platform, seating, and interpretive panels.



Coastal Action staff plant various species of native trees along the LaHave River.

FOX POINT LAKE WATER QUALITY MONITORING



Fox Point Lake.

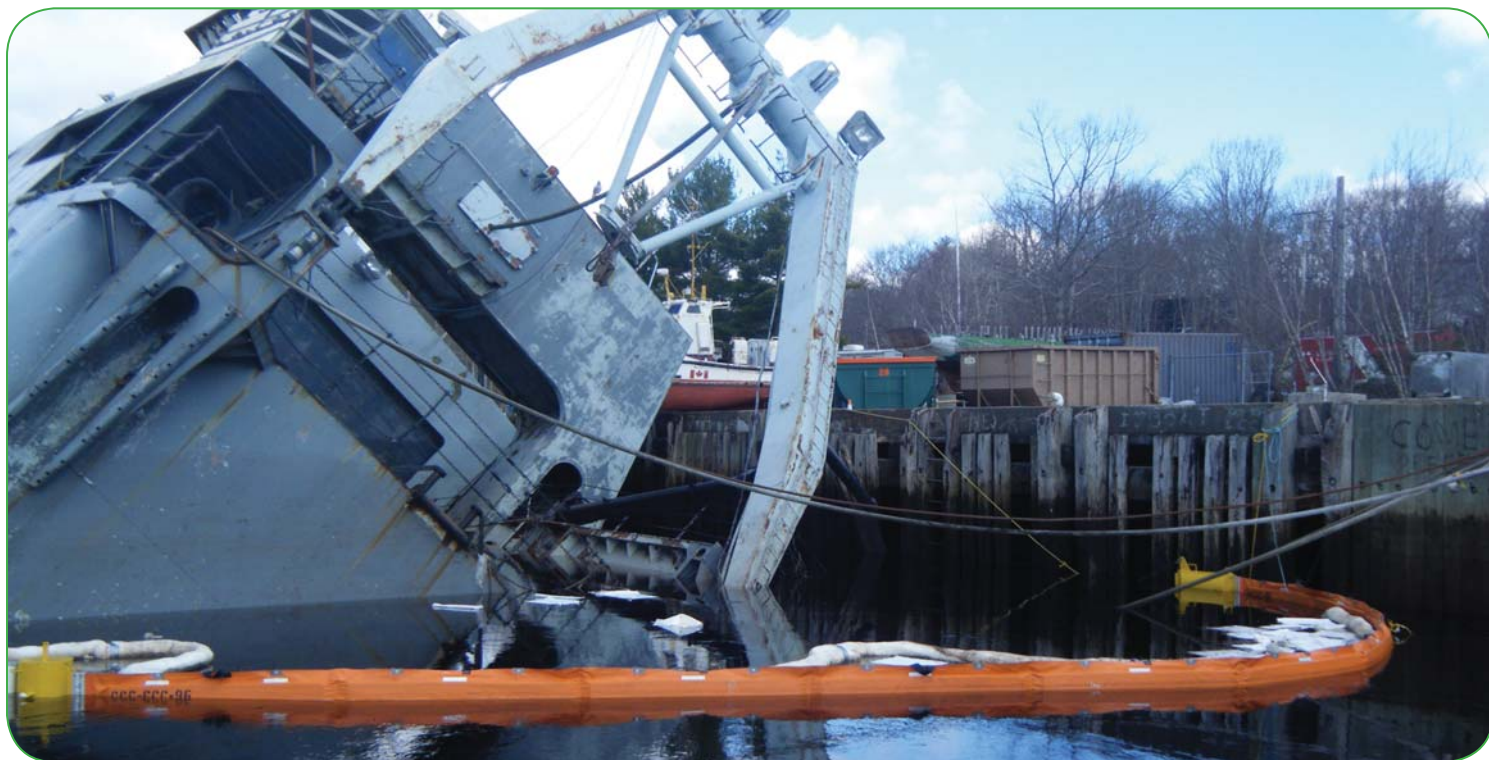
In early 2015, Coastal Action was contracted by the Municipality of the District of Chester to design and implement a water quality monitoring program at Fox Point Lake in Mill Cove. A Water Quality Monitoring Committee was appointed by the Municipality of the District of Chester to address ongoing concerns about a large-scale development project in the Mill Cove area. The development, known as Aspotogan Ridge, is a 550-acre family lifestyle community with over 500 residential units and an 18-hole golf course. A large proportion of this development project falls within the drainage basin for Fox Point Lake, leading to concerns about the possible impacts on the water quality of the lake.

Coastal Action developed a water quality monitoring program for Fox Point Lake and trained a small, dedicated group of local volunteers to monitor the health of the lake and its inlet and outlet streams over the initial monitoring period of May – October, 2015, with the assistance of the Coastal Action Project Manager. The volunteers were able to conduct bi-weekly monitoring during this time, thanks to Saint Mary's University's Community Based Environmental Monitoring Network, which loaned the necessary monitoring equipment to the group.

With the development project expected to take several years, the goal of the initial monitoring period was to establish a baseline of the water quality conditions and trophic status of Fox Point Lake as well as the condition of the lake's inlet and outlet streams. Four sample sites were established to monitor conditions in the north and south inlet streams, the outlet stream, and within the lake itself. An additional monitoring station was established on the shoreline of the lake to collect daily rainfall and water level data.

Following the initial monitoring period, Coastal Action analyzed the results and provided the Water Quality Monitoring Committee with a water quality report, which included recommendations for the monitoring program moving forward as the development project continues.

ENVIRONMENTAL MONITORING OF HMCS CORMORANT



Listed HMCS Cormorant at Port of Bridgewater. The orange boom surrounded the ship and maintained the oil absorbant socks and pads, seen floating within the boom.

When the HMCS Cormorant listed at the Port of Bridgewater in Spring 2015, Coastal Action provided third-party monitoring of the LaHave River. Coastal Action worked closely alongside the Canadian Coast Guard and Horseshoe Bay Marine Group, to ensure the health of the river. On a daily basis, Coastal Action staff assisted with monitoring and changing of the oil absorbent pads within the boom surrounding the ship, moving and anchoring the booms, and patrolling the river for any escaped materials and other observations.

Coastal Action is increasingly concerned with the larger environmental issue of what to do with decommissioned, derelict, and/or abandoned vessels, a national problem with current implications closer to home in both Bridgewater and Shelburne. Coastal Action is interested in exploring alternative options for the responsible disposal of these vessels and is currently seeking funding to undergo the academic exercise to assess the feasibility of different disposal options including the scuttling of these vessels for the creation of marine habitat.



Absorbent pads soaking up oil and other escaped ship materials.

OUTREACH EVENTS



Presentation at Camp Mushamush for Bayview Community School's grade 4 students. They learned about some of our local species at risk, why they are at risk and how they can help, then they drew their favourite species outside on the pavement with sidewalk chalk!

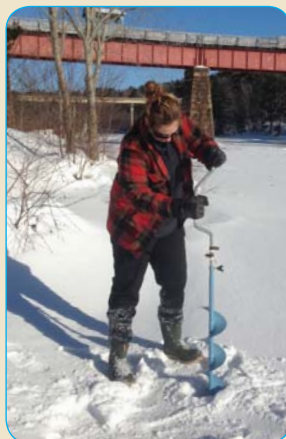
Coastal Action attended a number of outreach events and festivals throughout 2015, in addition to delivering numerous presentations. Some of the highlights included World Ocean's Day, which coincides with the Town of Lunenburg's birthday, and involved a presentation on American eel and the Sargasso Sea at the Fisheries Museum of the Atlantic, with Senator Wilfred Moore, as well as an intertidal touch tank exhibit. Several classrooms and school events were visited, including Bluenose Academy and Bayview Community School, where the importance of looking after our Earth and species at risk were discussed.

Table 3: Coastal Action outreach events in 2015.

Date	Event
April 17- 18, 2015	NSLC Adopt-a-Stream Eco Sale Event
June 5 - 6, 2015	World Ocean's Day
June 7, 2015	YMCA Healthy Kids Day
June 13, 2015	Michelin Health & Safety Fair
July 3, 2015	MoDL Summer Day Camp Program at the MARC
July 18, 2015	Morton Centre Open House & BBQ
August 7 - 8, 2015	Folk Harbour Festival
August 8, 2015	Morton Centre Family Campfire Night
August 13, 2015	Bridgewater Children's Fair
August 13, 2015	Chester Race Week
August 21, 2015	TD Atlantic Regional Advisory Board Meeting at the Morton Centre
August 23, 2015	Bridgewater's Growing Green Festival
March 17, 2016	White Point Beach Resort March Break Fun for the Family Event



A HEALTHY ENVIRONMENT AND THRIVING SOUTH SHORE COMMUNITIES



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