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Management Review of the Musquash Estuary Marine Protected Area 2007-2012





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Background

Musquash Estuary is a unique coastal marine ecosystem located in the Bay of Fundy approximately 20 km southwest of Saint John, New Brunswick. It encompasses a productive estuary and salt marsh environment that provides habitat for many species of fish, invertebrates and marine plants. The estuary is one of only a few remaining in the region that has not been significantly impacted by human development. In addition to its natural attributes, Musquash Estuary plays an important role in the heritage of the region. It is believed that Aboriginal groups established seasonal camp sites along the shores of the estuary. French settlers, followed by United Empire Loyalists, are also thought to be associated with early settlement of the area.

In 1998 the Conservation Council of New Brunswick, with support from the Fundy North Fishermen's Association, proposed Musquash Estuary and the surrounding intertidal area as a candidate Marine Protected Area (MPA) under the *Oceans Act*. On December 14, 2006, the proposed Musquash Estuary MPA and Administered Intertidal Area¹ (AIA) received formal designation as a protected area.² The estuary's protected status reflects the cooperative efforts of community and government. Fisheries and Oceans Canada (DFO), on behalf of the Government of Canada, is responsible for managing the MPA and AIA in collaboration with the Musquash Estuary MPA Advisory Committee (MAC). Members of the MAC represent government, non-government organizations, industry, First Nations and community groups that have an interest in the MPA and AIA.

The Musquash Estuary Marine Protected Area and Administered Intertidal Area Management Plan³ was developed to support the Regulations⁴ and provide guidance for the protection and management of the area. The purpose of the Management Plan is to outline DFO's approach to managing activities in the Musquash Estuary MPA and AIA. The plan lays out an overarching vision and identifies a number of conservation objectives and priorities for management of the Musquash MPA and AIA (Box 1). The plan also outlines key management commitments and proposed actions to help meet management objectives, and describes roles and responsibilities for DFO, the MAC, and other government regulators for managing the area.

¹ The Administered Intertidal Area refers to the submerged provincial Crown lands and waters that were under administration and control of the Provincial Government of New Brunswick and were transferred to the Government of Canada to be conserved as a protected area.

² The waters of the estuary below the ordinary water mark are now a federal MPA designated by regulation under the *Oceans Act*. The Administered Intertidal Area has also been afforded conservation status through an agreement between the Government of New Brunswick and the Government of Canada. The Musquash Estuary MPA Regulations provide legal protection status to the MPA, while the *Fisheries Act* and New Brunswick *Trespass Act* are the legal means by which DFO ensures that human activities in the AIA are undertaken in a manner consistent with the objectives of the MPA.

³ DFO, 2008. Musquash Estuary: A Management Plan for the Marine Protected Area and Administered Intertidal Area. Oceans, Habitat and Species at Risk Branch, Fisheries and Oceans Canada, Dartmouth, N.S. 44 pp.

⁴ Musquash Estuary Marine Protected Area Regulations (SOR/2006-354)

Marine Protected Area management effectiveness is the degree to which management actions contribute to the goals and objectives of the MPA.⁵ The Convention on Biological Diversity's *Programme of Work on Protected Areas* calls for all participating nations (including Canada) to develop and implement systems for assessing the management effectiveness of protected areas (Goal 4.2).⁶ DFO's *Marine Protected Areas Policy* and the Government of Canada's *Federal Marine Protected Areas Strategy* also call for the evaluation of site management effectiveness against stated goals and objectives as part of MPA program implementation.⁷ Similarly, *Canada's Oceans Strategy* stresses the need for "results-based management and accountability frameworks for measuring progress, relevance and effectiveness".⁸ Furthermore, the *National Framework for Establishing and Managing Marine Protected Areas*, and the internal *Oceans Act Marine Protected Areas Policy and Operational Framework: A Practitioner's Guide* both address the need for periodic review of site effectiveness with public input to determine if management objectives are being met.⁹ Finally, the Musquash Estuary MPA and AIA Management Plan lists "Develop a review process to evaluate the effectiveness of the management plan in 2015" as one of its Management Priorities (Box 1).¹⁰

Assessing and reporting on management effectiveness can serve a multitude of purposes. It can help MPA site managers prioritize activities, highlight successes, identify gaps and challenges, encourage appropriate resource allocation, capture staff knowledge, and inform adaptive management and management planning.¹¹ Transparent reporting on results of management

⁵ Pomeroy, R.S., Parks, J. E., and Watson, L. M., 2004. How is your MPA doing? A guidebook of natural and social indicators for evaluating marine protected area management effectiveness. IUCN, Gland, Switzerland and Cambridge, UK. Xvi + 216 pp.

⁶ Programme of Work on Protected Areas. Online materials: <http://www.cbd.int/programmes/pa/pow-goals-alone.pdf>

⁷ DFO, 1999. Marine protected area policy. Fisheries and Oceans Canada, Marine Ecosystems Conservation Branch, Oceans Directorate, Ottawa, ON. 11 pp.; Government of Canada, 2005. Canada's federal marine protected areas strategy. Fisheries and Oceans Canada. Communications Branch, Fisheries and Oceans Canada, Ottawa, ON. 18 pp.

⁸ DFO, 2002. Canada's Oceans Strategy. Oceans Directorate, Fisheries and Oceans Canada. Ottawa, ON. 39 pp.

⁹ DFO, 1999. National framework for establishing and managing marine protected areas. Online materials: <http://www.dfo-mpo.gc.ca/oceans/publications/mpaframework-cadrezipm/index-eng.asp>; Government of Canada, 2009. *Oceans Act Marine Protected Areas Policy and Operational Framework: A Practitioner's Guide*. Ottawa, ON. 110 pp.

¹⁰ *Supra* note 1.

¹¹ *Supra* note 2; National Oceanic and Atmospheric Administration, 2007. Performance evaluation manual for the National Marine Sanctuary Program. 72 pp. Online materials: http://sanctuaries.noaa.gov/management/pdfs/performancemanual_2007.pdf; Day, J., Hockings, M., and Jones, G, 2003. Measuring effectiveness in marine protected areas - principles and practice. Paper presented at the World Congress on Aquatic Protected Areas, Cairns, August 2002. 16 pp.; Hockings, M., Stolton, S., Leverington, F., Dudley, N., and Courrau, J., 2006. Evaluating Effectiveness: A framework for assessing management effectiveness of protected areas. 2nd Edition. IUCN, Gland, Switzerland and Cambridge, UK. xiv +

effectiveness can help stakeholders understand the challenges and constraints faced by protected area program staff, and can help build cooperation and support for these initiatives by improving accountability. Repeated assessments provide an opportunity to collect information in a regular, structured way to allow for trends monitoring. Additionally, the evaluation process itself creates an opportunity for program staff to reflect on past performance and encourages experiential learning by planning, acting, reviewing, and adapting.

Box 1: Musquash MPA and AIA Management Plan Vision, Objectives, and Management Priorities

Vision

Conservation and protection of the MPA and AIA marine ecosystem.

Conservation Objectives

Ensure no unacceptable reduction or human-cause modification in:

- Productivity so that each component (primary, community, population) can play its role in the functioning of the ecosystem by maintaining abundance and health of harvested species;
- Biodiversity by maintaining the diversity of individual species, communities, and populations within the different ecotypes;
- Habitat in order to safeguard the physical and chemical properties of the ecosystem by maintaining water and sediment quality.

Management Priorities (2010-2015)

- Inform federal and provincial regulators of their roles and responsibilities in management of the MPA and AIA
- Inform estuary users of the allowed and prohibited activities in the MPA and AIA
- Develop and implement an activity plan application form submission and evaluation process for the MPA and AIA
- Develop and implement a monitoring plan for the MPA and AIA
- Develop a review process to evaluate the effectiveness of the management plan in 2015

A comprehensive evaluation of site effectiveness must consider the biophysical, social, and governance aspects of the MPA.¹² The ecosystem monitoring plan/program for Musquash Estuary MPA (currently under development) contains indicators, protocols, and strategies for evaluating the biophysical aspects. However, the social and governance aspects of the site were

105 pp.; Hockings, M., Cook, C.N., Carter, R.W., and James, R., 2009. Accountability, reporting, or management improvement? Development of a state of the parks assessment system in New South Wales, Australia. *Environmental Management*. 43:1013-1025.

¹² *Supra* note 2; Wilson, R., and Tsang, P., 2007. Generic monitoring indicators for evaluating MPA effectiveness. Report prepared by 2WE Associates Consulting Ltd. for the Oceans Policy and Planning Branch, Fisheries and Oceans Canada, Ottawa ON. 115 pp.

not considered part of the ecosystem monitoring plan. As such, the framework described here was developed to evaluate these components of management effectiveness for the MPA. Please note that this review of management effectiveness for the Musquash Estuary MPA and AIA is not a formal DFO program evaluation typically carried out by the Evaluation Branch in the National Capital Region.

Objectives of the Assessment

- 1) To evaluate the social and governance aspects of Musquash Estuary MPA and AIA management effectiveness, based on commitments laid out in the Management Plan and other *Oceans Act* MPA program guidance and policy documents.¹³
- 2) To make recommendations for improving Musquash Estuary MPA and AIA management performance and for meeting management commitments.

Scope

The assessment focused on Musquash Estuary MPA and AIA management activities in five fiscal years, from 2007 to 2012.

Methods

Overview of the Assessment Framework and Questionnaire

The framework developed to evaluate Musquash Estuary MPA and AIA management effectiveness considered 49 indicators, which were designed to address management commitments under the following six categories:

- 1) Stakeholder interactions (seventeen indicators)
- 2) Education, stewardship and outreach (seven indicators)
- 3) Research, monitoring, and other permitted activities (eight indicators)
- 4) Planning (five indicators)
- 5) Capacity (four indicators)
- 6) Enforcement and compliance (eight indicators)

The framework included a master evaluation form and a MAC questionnaire. The evaluation form included all 49 indicators (mostly consisting of a question associated with four ranked, multiple choice answers worth zero to three points, as well as several open-ended questions), with space to provide further information, recommendations, and data sources used to answer each question. The evaluation form organized the 49 indicators into six sections, corresponding to the six management categories listed above.

¹³ *Supra* note 1; *Supra* note 4; *Supra* note 6.

The MAC questionnaire was developed to allow Committee members to evaluate a subset of the indicators. The questionnaire included 15 questions, corresponding to 12 of the indicators in the ‘stakeholder interactions’ section, and three indicators in the ‘education, stewardship and outreach’ section of the evaluation form. The majority of questions in the questionnaire offered four multiple choice answers and space to provide further elaboration. Although numerical scores were not associated with the response options for the questions as written in the questionnaire, the corresponding indicators in the evaluation form included point equivalents (zero to three points), just like the other indicators in the evaluation. Several open-ended questions were also included in the questionnaire. While these did not contribute to the scoring component of the assessment, they served to allow MAC members to provide useful qualitative feedback on various aspects of protected area site management.

Assessment Process

To complete the assessment, a lead evaluator reviewed relevant documents, electronic communications and education and outreach materials, and engaged in interviews and informal discussions with protected area program staff, and staff from other agencies who contribute to management of the Musquash Estuary MPA and AIA. For each indicator, the most appropriate multiple choice response (and associated score) was selected, and additional qualitative information, including recommendations and data sources, was documented on the evaluation form.

Electronic and hard-copy versions of the MAC questionnaire were distributed to organization representatives of the MAC. Respondents were asked to provide anonymous answers that reflected the views of the organizations they represented. Committee members were given two months to complete the questionnaire, and 15 of 29 representative organizations participated. Once all responses were received, the lead evaluator converted each respondent’s selections into the point equivalents. For each question, the average points awarded by all respondents were calculated to determine the score for the corresponding indicator, and any comments and supporting explanations were quoted and included in the space provided for qualitative information on the evaluation form.

Once the evaluation was complete, scores (percentage of total score possible) were calculated for each section and converted to color codes for reporting purposes, as follows:

Colour Code	Management Performance	Score
P	Poor	<50%
A	Adequate	50 – 74%
G	Good	75 – 100%

Findings and Key Recommendations

The following summarizes the findings for each of the six sections of the evaluation in terms of management strengths and weaknesses, and outlines key recommendations to improve Musquash Estuary MPA and AIA management effectiveness. For each of the key recommendations, proposed actions and target implementation dates are included in the Management Action Plan (Table 1).

A Stakeholder Interactions

Protected area program staff used meetings and email to inform MAC members about the results of research and monitoring, to discuss Musquash-related issues, and to encourage input on management activities. At the time of the evaluation, MAC membership included representatives from most key stakeholder groups such as federal and provincial governments and agencies, the Aboriginal community, fishing and other industries, environmental non-government organizations (ENGOS), and academics. The MAC membership list includes 42 individuals, well above the required 25 individuals which is the number deemed appropriate in the MAC Terms of Reference. Of these 42 individuals, some are representing the same organization, therefore, while there are 42 individuals, a total of 29 organizations are represented.¹⁴ The New Brunswick (NB) Departments of Tourism and Natural Resources and Natural Resources Canada have been invited to participate on the MAC, but at the time of the evaluation were not represented.

MAC meetings were well attended by federal agencies, ENGOS, and academics. Most First Nations and industry members did not attend meetings. Some respondents noted that it was

¹⁴ The following organizations have two MAC representatives: Environment Canada, Fisheries and Oceans Canada, Kingsclear First Nation, New Brunswick Environment, New Brunswick Fisheries, New Brunswick Power, Oromocto First Nation, Saint John Port Authority, Union of New Brunswick Indians, and Woodstock First Nation. Friends of Musquash has four representatives on the MAC.

difficult to travel to the meetings and that communications are primarily conducted via email, which not all members have access to. Furthermore, the MAC membership list has not been formalized. A review of the MAC membership is needed to identify lead and alternate members from each representative organization/department. Part of this process should involve a reassessment of those parties who are interested in being included on the MAC distribution list, allowing them to remain informed of Musquash-related business, but removing the responsibility of MAC membership if they do not have the capacity to participate in MAC meetings.

Overall, MAC members who submitted responses to the questionnaire were satisfied with MAC-related meetings and activities. Most respondents were satisfied with the content and frequency of committee meetings, and committee-related interactions with DFO. All but two respondents indicated that DFO was doing a ‘good’ or ‘excellent’ job of managing the site, and all but one respondent agreed that the MAC is a necessary component of site management. All but two respondents felt that the MAC was either ‘mostly’ or ‘completely’ effective in contributing to the management of Musquash Estuary MPA and AIA. Most respondents expressed their hope that the MPA would continue to protect the ecology and marine habitat for generations to come and guide management of human activities in the area. One respondent stated that DFO should have more coastal MPAs and several suggested management of the Musquash MPA may benefit from expanded attendance and participation of the MAC in providing information and assisting with management decisions.

Key Recommendations:

- 1) Review and update MAC membership list and identify lead and alternate representatives for each organization.
- 2) Reengage those members who have been invited to participate on the MAC but do not regularly attend meetings.
- 3) Create opportunities (other than participating on the MAC) for other key stakeholders (*e.g.*, industry, NB Department of Natural Resources) to be involved in Musquash Estuary MPA management activities.

G Education, Stewardship and Outreach

The education, stewardship, and outreach activities and materials generated during the period evaluated were extensive and included brochures, presentations, a website and mail-outs directed at a variety of audiences. Educational materials for commercial interests and recreational boaters should be developed in an effort to encourage low impact activities.

Most MAC members who submitted responses to the questionnaire considered information about the MPA to be ‘mostly’ or ‘completely’ adequate. The website is current and informative but traffic to the site could be increased. Media related to the Musquash MPA was positive, but coverage has been limited.

Key Recommendations:

- 1) Continue to develop and refine education and outreach materials/activities for the Musquash MPA, particularly for commercial and recreational interests and ensure all materials contain the website address.
- 2) The Musquash website should be considered an important interface for engaging the public and efforts should be made to keep it up-to-date.
- 3) Efforts should be made to proactively promote the MPA to the public.

G Research, Monitoring, and Other Permitted Activities

Research and monitoring are critical for adaptive management. Musquash program staff encourage these activities provided they support MPA objectives and do not cause excessive, unnecessary, or unjustifiable disturbance, damage, destruction or removal of Musquash Estuary ecosystem components. Findings from research studies are regularly reported to MPA managers through verbal communication and written reports, and research is regularly published. There are few concerns regarding current research in the MPA. However, repeated benthic sampling could pose a risk to benthic ecosystems. Cumulative impacts from research activities should be monitored and considered as part of adaptive management for the MPA.

Research and monitoring occur in the Musquash Estuary MPA on a regular basis, but there are still some gaps in monitoring coverage. A scientific peer-review of the draft ecosystem monitoring framework was conducted and a Science Advisory Report was published in 2011, which proposes recommendations for potential monitoring indicators and appropriate protocols and strategies for the Musquash Estuary. Two regional peer review meetings occurred in 2013. The first reviewed preliminary results of relevant data that had been collected to establish a baseline for the biological and physical indicators identified in the Musquash Estuary MPA Ecosystem Monitoring Framework. The second 1) reviewed relevant data collected to establish a baseline for the indicators identified in the Monitoring Framework, and 2) provided recommendations on any changes to be made to the indicators, strategies, and protocols proposed in the Monitoring Framework. These meetings will inform the development of the ecosystem monitoring plan for the MPA. Research completed to date will contribute data towards some of the indicators identified in the Framework.

The research approval process for the Musquash Estuary MPA is well-developed and incorporates lessons learned from management of other MPAs. Some updates and additions are needed to improve the process.

Key Recommendations:

- 1) Develop an ecosystem monitoring plan/program for the Musquash MPA and AIA.
- 2) Implement the Musquash ecosystem monitoring plan/program.
- 3) Update the activity application process.

A Planning

The Musquash Estuary MPA and AIA Management Plan is published and up-to-date. The Plan is scheduled to undergo review by 2015 and the final copy of this Management Review will be considered as part of the 2015 management plan review. Annual work plans have been created since the Musquash MPA has been established and the plans guide management activities each year. On average, 84% of the management commitments listed in the Musquash work plan were addressed for each year, and 100% of commitments were achieved both in 2010/11 and 2011/12.

The Musquash Estuary MPA and AIA Management Plan identifies “develop and implement a monitoring plan for the MPA and AIA” as a management priority for the site. The ecosystem monitoring program is currently under development and has yet to be fully implemented.

Currently, progress reports for Musquash MPA have not been produced. The Management Plan does not commit to these reports, but the internal *Oceans Act Marine Protected Areas Policy and Operations Framework Practitioner’s Guide*¹⁵ states that preparing progress reports is a best practice for MPA management. DFO’s National Oceans Program has developed a draft template for MPA progress reports which can be used as the basis for a bi-annual Musquash MPA Report.

Key Recommendations:

- 1) Continue efforts to keep work plans updated as new commitments arise throughout the year and make work plan items more specific to allow for better evaluation.
- 2) Review the Musquash MPA and AIA Management Plan and adjust management priorities accordingly.
- 3) Develop a semi-annual report that documents management accomplishments, current research, priorities and challenges.

A Capacity

Personnel capacity for Musquash management has remained consistent over the years since MPA establishment, with a regular contribution of a 0.6 full-time employee to the management of the Musquash MPA (note, this evaluation did not consider staff contributions from surveillance and enforcement partners or researchers from DFO Science). However, in February 2012, the St George, New Brunswick area office MPA manager position was removed due to structural reorganization in the Oceans Program. It is not clear how the loss of that position may impact future management of the Musquash MPA. Additional personnel support from other regional Departmental staff, contractors, interns, or volunteers could help to mitigate this loss.

The annual budget was determined to be generally acceptable for regular site operations during the evaluation period, however additional special project funds were needed for the development

¹⁵ Government of Canada. 2009. *Oceans Act Marine Protected Areas Policy and Operational Framework: A Practitioner’s Guide*. Version 1. pp. 103.

of an ecosystem monitoring plan. Additional funding will also be needed for implementation of the monitoring plan.

Inconsistent record keeping and changes in accounting processes have made it difficult in the past to track budgetary allocations and spending for MPAs, but this process has been improved considerably over the years, in part due to the lessons learned through the Gully MPA management evaluation.

Training is considered a priority for Departmental staff, and staff members are provided with regular opportunities to take advantage of training through courses and workshops. For example, staff have received training in a number of subjects important for MPA management, including financial administration, communications, regulatory impact analysis, performance management and other management sessions. Some staff have attended international workshops and conferences to learn how counterparts in other countries address MPA-related challenges, and to share Musquash MPA management experience. Knowledge gaps identified where training would be beneficial include legal regulatory processes, permit/approval processes, organizational training, Aboriginal relations, and conflict resolution.

Effective site management requires the establishment and maintenance of effective collaborative partnerships. Although protected area program staff have enlisted many partners to collaborate on site management activities, effort is needed to renew some of these relationships and take full advantage of potential opportunities. Some groups that have been identified as potential sources for opportunities for renewed partnerships and collaboration include the MAC, DFO fishery officers, the Canadian Coast Guard, Environment Canada, and Transport Canada. New partnerships could be developed with users (i.e. harvesters) or tourism agencies to enhance community engagement and stewardship activities.

Key Recommendations:

- 1) Maintain adequate personnel capacity to ensure management commitments are addressed.
- 2) Protected area program staff should continue to engage in relevant training to acquire the core competencies needed to effectively manage the Musquash MPA.
- 3) Renew and/or formalize collaborative relationships with other government departments, agencies, universities, ENGOs, and other organizations to take full advantage of available expertise and potential opportunities.
- 4) Conduct a full cost-accounting of all Musquash-related operations to determine the true cost of managing a nearshore protected area and to support requests for additional resources.

A Surveillance, Enforcement and Compliance

A review of the *Oceans Act* and Musquash Estuary MPA regulations found them to be mostly adequate to support the goals and objectives of the MPA. The *Oceans Act* only has authority in the marine environment up to the ordinary water level at low tide, which means MPA Regulations do not have authority in the AIA since it is above water at low tide. Without the

ability to uphold the MPA Regulations in the AIA, an alternative means is used to manage human activities in this area. In accordance with Section 18 of the *Federal Real Property and Federal Immovables Act*, a Minister of the Government of Canada has the authority to restrict and control human activities on lands and waters administered for the purposes of the department. With this authority, and as land owner of the AIA, DFO will uphold the conditions to human activities in the AIA as they are described in the MPA Regulations and the Government of New Brunswick Coastal Areas Protection Policy.

Replacement of DFO's Habitat Management program with the new Fisheries Protection Program may have implications for managing the MPA. Specifically, DFO's Gulf Region is now responsible for certain fish habitat related issues, formerly under the Maritimes Region's mandate, which may cause challenges due to having two regions managing different aspects of the same area.

There are a number of organizations involved in surveillance activities for the Musquash MPA and AIA including DFO fishery officers, Musquash Watch¹⁶, and Transport Canada. Surveillance involves primarily aerial and foot patrols. Despite these efforts, enforcement challenges remain. These include a lack of resources/tools for fishery officers to be able to determine speed of vessels (there are vessel speed restrictions in certain zones within the MPA) and limited reporting requirements for fishing activities in the area, which make it difficult to effectively monitor resource extraction.

There have been very few reports of illegal activities in the Musquash MPA since designation. However, a number of gaps in enforcement and compliance mechanisms that may impede detection of violations or contribute to failed prosecutions were identified. Compliance monitoring could be improved by more comprehensive monitoring of commercial fisheries active in the MPA, including improved reporting requirements.

Researchers and other user groups also participate in Musquash Estuary MPA surveillance and enforcement. Proponents who receive approval to conduct activities in the MPA (e.g., researchers, commercial tourism operators) are provided with contact information for reporting violations. Community members have been provided with contact information through the Musquash Watch initiative. Additional outreach is needed to engage harvesters.

An *Oceans Act* module has been developed and will soon be added to the training program for fishery officer recruits. This presents an opportunity to provide general training on *Oceans Act* MPA regulations. Musquash-specific training should also be provided for regional officers who patrol the Musquash MPA.

¹⁶ A community surveillance initiative made up of MPA users and local residents.

Contact and reporting information should be provided to user groups (i.e. harvesters) to improve stewardship. Furthermore, information about the Musquash MPA (i.e. closure areas) should be included in licence conditions for all relevant fisheries. A review of fisheries management measures is required to determine where improvement is needed.

Key Recommendations:

- 1) Maintain relationships with surveillance and enforcement partners.
- 2) Consider how replacement of the Habitat Management program with the new Fisheries Protection Program may impact management of the MPA and ensure communication occurs between MPA managers and Gulf Region staff.
- 3) Continue to research surveillance opportunities to ensure the most appropriate, cost-effective tools are being used, and to ensure available intelligence is accessible to inform decision-making.
- 4) Develop MPA-specific training for fishery officers who patrol the MPA and AIA.
- 5) Work with regulatory partners to ensure appropriate planning, procedural, and communication mechanisms are in place to support surveillance, enforcement and compliance.
- 6) Encourage users of the Musquash MPA (fish harvesters, researchers, etc.) to engage in surveillance and stewardship activities when they are in the area.
- 7) Conduct a review of fisheries management measures to determine where improvement is needed.

Conclusions

The Musquash Estuary MPA management effectiveness assessment has helped document staff knowledge, provided a venue for anonymous Advisory Committee feedback, identified strengths and weaknesses of Musquash MPA and AIA management, and provided important recommendations for enhancing Musquash management performance. This evaluation will 1) be used to guide work planning; 2) inform the management plan review scheduled for 2015; and 3) be repeated as part of a management cycle (resources permitting). While some of the key recommendations have already been addressed, the findings from the evaluation will continue to guide resource allocation and work planning for Musquash management over the next several years.