



Basin Head Marine Protected Area: 2015-2016 Management Plan Implementation Progress Report

Fisheries and Oceans Canada, Gulf Region
343 Université Avenue, P.O. Box 5030
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2016

Gulf Region Basin Head Management Series 2016/01






Gulf Region Basin Head Management Series

The Gulf Region Basin Head Management Series of publications are reports on management initiatives and monitoring undertaken in the Basin Head Marine Protected Area in the Gulf Region. This series consist of monitoring progress reports, operational management plan, consultant reports, scientific studies, workshops and other public documents related to the Basin Head Marine Protected Area. The Basin Head Management Series was established in 2014. Reports in this series have been written by or prepared under the guidance of staff of the Department of Fisheries and Oceans - Gulf Region. The content of this series is meant as a source of information for public and internal dissemination.

Série sur la gestion de Basin Head dans la Région du Golfe

La série de publications sur la gestion de Basin Head de la Région du Golfe regroupe des rapports au sujet d'initiatives de gestion et de monitoring entreprit dans la zone de protection marine de Basin Head dans la région du Golfe. Cette série se compose principalement de rapport de progrès sur le monitoring effectué à Basin Head, plan de gestion opérationnel, d'études scientifique, de rapports de consultants, d'ateliers et d'autres documents publics relié à la zone de protection marine de Basin Head. La série sur la gestion de Basin Head a été créée en 2014. Ces rapports ont été rédigés par le personnel du Ministère de Pêches et Océans ou ont été préparés sous la direction de ceux-ci – dans la Région du Golfe. Le contenu de cette série se veut une source d'information pour une diffusion publique et interne.




Gulf Region Basin Head Management Series

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2015-2016 MANAGEMENT PLAN IMPLEMENTATION PROGRESS REPORT

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TABLE OF CONTENTS

LIST OF FIGURES.....	vi
LIST OF TABLES.....	vi
ABSTRACT	vii
RÉSUMÉ.....	vii
1.0 INTRODUCTION.....	1
2.0 MANAGEMENT HIGHLIGHTS FOR 2015-16	2
3.0 CONSERVATION OBJECTIVES AND ACTIONS TAKEN	4
4.0 ACTIVITY PERMIT APPLICATIONS.....	10
5.0 ENFORCEMENT AND COMPLIANCE.....	13
6.0 PUBLIC AWARENESS AND EDUCATION	14
7.0 NEXT STEPS AND PRIORITIES	15
8.0 REFERENCES.....	15



LIST OF FIGURES

Figure 1: Basin Head Marine Protected Area 1
Figure 2: Sign installed at Basin Head in spring 2016. 14

LIST OF TABLES

Table 1. Basin Head MPA Regulatory Conservation Objectives and Management Actions..... 5
Table 2. Basin Head MPA Non-Regulatory Conservation Objectives and Management Actions. 8
Table 3. Activity Approvals in Basin Head MPA during 2015-16..... 10



ABSTRACT

This Progress Report for the Basin Head Marine Protected Area outlines the activities and monitoring associated with the four regulatory conservation objectives that occurred during the 2015-16 fiscal year. This report also highlights the different management actions taken in 2015-16 and the future steps and priorities for the integrated management of the Basin Head Marine Protected Area.

RÉSUMÉ

Ce rapport de progrès pour la zone de protection marine de Basin Head décrit les activités et la surveillance associé avec les quatre objectifs de conservation réglementaires qui ont eu lieu au cours de l'année financière 2015-16. Ce rapport met également en lumière les différentes mesures de gestion prises en 2015-16 ainsi que les prochaines étapes et les priorités pour la gestion intégrée de la zone de protection marine de Basin Head.

1.0 INTRODUCTION

The Basin Head Marine Protected Area (MPA) was designated on September 26, 2005. This MPA has been established via regulations under the statutory authority of Canada's *Oceans Act* (Basin Head Marine Protected Area Regulations).

The MPA encompasses Basin Head, a tidal inlet and harbour, as well as an adjacent offshore buffer zone, in eastern Prince Edward Island within the Gulf of St. Lawrence bioregion (Figure 1). The MPA was designated by regulations to conserve and protect a unique form of an otherwise common marine alga, Irish moss (*Chondrus crispus*). This form of *Chondrus* is thought to exist only within the confines of Basin Head. It is believed that certain habitat conditions within the inlet, not yet understood, give rise to this form of *Chondrus*. Thus the MPA was designated under the *Oceans Act* Section 35, paragraph (1) c (conservation and protection of unique habitats), as well as paragraph (1) e.

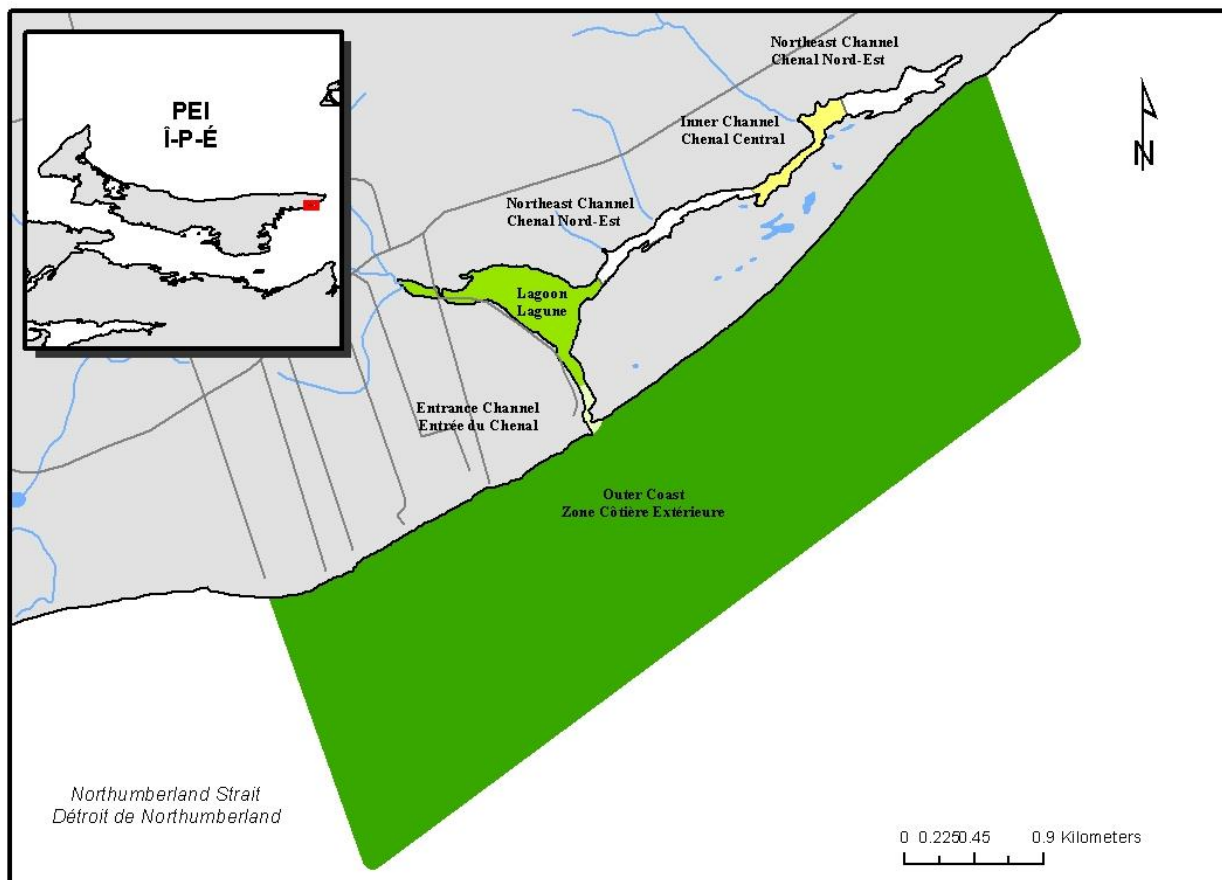


Figure 1: Basin Head Marine Protected Area

The updated Basin Head MPA Operational Management Plan (OMP) was published in 2016, to serve as a guide for informed decisions in the management of this unique ecosystem. The management plan forms the basis for development of comprehensive conservation and management strategies. It provides information on regulatory measures, monitoring, enforcement and compliance, managing certain human activities via an activity approval process and other non-regulatory management measures. It also provides the detail required to ensure that management decisions, prohibitions, and activity applications processes are clearly



understood.

Personnel from Ecosystems Management, Fisheries and Oceans Canada (DFO), Gulf Region are responsible for efforts at achieving the objectives described in the OMP. Management of the MPA is also guided by the advice of the local community and stakeholders, other federal and provincial government departments, and Aboriginal groups, acting through the Basin Head MPA Advisory Board.

The Basin Head MPA OMP is intended to serve as a “living” document which may be amended as required to ensure management objectives and monitoring requirements are met. The OMP is scheduled to be reviewed every five years with provisions for amendments on a continuing basis. The periodic reviews will examine the conservation objectives of the MPA to determine if they remain appropriate, evaluate the success of management actions in achieving the conservation objectives, and identify emerging priorities for subsequent reviews of the OMP.


The purpose of this Progress Report is to record activities in the Basin Head MPA during the 2015-16 fiscal year. This report and past reports will serve as guides for the Operational Management Plan review.

2.0 MANAGEMENT HIGHLIGHTS FOR 2015-16

- In 2015, DFO deployed dissolved oxygen and pH continuous recorders in the northeast arm in addition to regular monitoring for water quality (May – November) and aquatic species populations (June – August).
- The number and location of mussel spat on natural substrates in northeast arm were collected and assessed at varying intervals from June through October 2015.
- Sock cultivation of Irish moss at the mouth of northeast arm resumed in 2015 using free-floating fragments of Irish moss collected from the beds. The aim was to conserve free-floating fronds and develop biomass for field experiments.
- Because of difficulties relocating clumps using the wading transect method, Irish moss clumps were marked using numbered agricultural flags, starting in 2014. Later the GPS positions of clumps were recorded and some clumps were protected using open or closed cages. In 2015 the diameter, location and means of attachment of each mussel-moss clump located during surveys of the Irish moss beds were recorded. Water depth at low tide, sediment type and depth, numbers of mussels in each clump, morphology and reproductive status were all recorded for each tagged clump. Throughout the field season, Irish moss beds were resurveyed to record the continuing presence or absence of marked clumps, and to flag newly appearing clumps and note changes in frond size and condition. Cages deployed in 2014 were removed in 2015 because of problems with siltation. A new strategy using mussels to form a protective ring around clumps was tested to determine if this would result in better retention of clumps.
- Surveys performed in early summer 2015 revealed that some Irish moss biomass was lost over the winter. Recruitment into the Main bed was dominated by spriggy plants on holdfasts. As was true in 2014, losses of giant fronds continued through both summer and

winter, leading to the conclusion that without intervention, the population of giant Irish moss was facing imminent extinction.

- In 2015, initial test plots were planted using commercially sourced young mussels attached to the giant Irish moss fronds sourced from NRC. Test plots included clumps planted at various densities, inside and outside of the current beds at Main and Corduroy Road.
- The 2015 estimate of naturally-occurring biomass is 5 m² in the main bed (70% giant moss and 30% holdfast moss) and 1.8 m² in the Corduroy Road bed (almost 100% giant). An additional 3.8 m² of cultivated giant Irish moss is now present in both the main and Corduroy Road bed and also at Oyster Cross. The moss was procured from the cultivation tanks at the NRC in Sandy Cove, NS; giving a total biomass of 10.6 m². It took 150 kg of mussels and 20 kg of Irish moss from Sandy Cove to create this additional biomass. Surveys in 2016 will reveal whether this has stabilized the biomass and reversed the downward trend.
- To monitor rates and processes of settlement of Irish moss on hard substrate, six native sandstone rocks were placed in the main Irish moss bed in August 2014. Each rock was scored on top to provide recessed areas for algal settlement and two settling plates were attached to each rock (side and top). These rocks were monitored in 2015 to assess the utility of enhancing the habitat for settlement of Irish moss spores. The settling plates were removed by ice scour over winter. The rocks themselves were colonized by Irish moss, but these did not appear to be giant form.
- A series of studies were initiated in 2014 with the University of Prince Edward Island to evaluate Irish moss – green crab interactions at Basin Head. This project includes four milestones that will be developed to different degrees during three consecutive field seasons (fall 2014, and spring-fall 2015 and 2016). Green crab population assessment was performed by trapping by UPEI. Irish moss – mussel – crab interactions were investigated by both UPEI and DFO researchers in 2015. Field experiments by DFO have led to a better understanding of the size range of mussels vulnerable to crab predation, and the influence of mobile sediments on Irish moss and mussels. Measures to help sustain the Irish moss population were hypothesized and are being tested and the research will be formally reported. Densities of green crab reported in 2014 and 2015 were relatively low compared to numbers seen in the past in Basin Head. This may have been due to the unusually long (and cold) winters. By contrast, the winter of 2015-16 was relatively short and mild, with little accumulation of ice and snow on northeast arm.
- Systematic sampling of benthic organisms was conducted along transects in the Irish moss beds. The numbers and types of all organisms detected were documented and reported. Large areas of the bottom that used to support a diverse array of plants and animals numbering hundreds or thousands per square meter, are now barren. Few species were found in very small numbers in some quadrats.
- In general, there is an overall declining trend in Basin Head. Irish moss biomass & bed size suffers net loss year to year, eelgrass cover within the Northeast Arm is almost entirely gone; there is seasonally heavy coverage of large areas of the bottom by sea lettuce; and there has been a severe decline in abundance and diversity of benthic invertebrates in the Irish moss beds. There are persistently high concentrations of nitrogen and phosphorus in the water and hypoxic or anoxic conditions at the inner end of Northeast Arm in summer: these conditions are expanding towards the Irish moss beds. There is a noticeable loading



of sediments into the estuary each year from agricultural runoff, *Ulva* bloom decomposition and deposition of ice scoured marsh sods.

- DFO Science conducted an eelgrass survey in September 2015 in the main basin of the lagoon. In general, the area of eelgrass cover was found to have moved towards the outlet of the lagoon.
- The Memorandum of Understanding between DFO Gulf Region and the National Research Council (NRC), for the maintenance of 10 kg of Basin Head *Chondrus* at the NRC's Sandy Cove facility, was renewed for 2015-2016. Biomass from cultivation was reintroduced to Basin Head and placed into cultivation on site to provide plants for both experimental purposes and for planting trials.
- The Basin Head Marine Protected Area Advisory Board met on November 26, 2015 at the Fisheries and Oceans Area Office in Charlottetown, PEI. Members were updated on research conducted in the 2015 field season, on communication, and outreach activities. A presentation on high-resolution cartographic methods for Basin Head research & monitoring was given.

3.0 CONSERVATION OBJECTIVES AND ACTIONS TAKEN

Conservation objectives describe the desired ecological outcome of establishing an MPA and are based on the best available scientific and traditional ecological knowledge. These objectives guide the MPA establishment and management process by providing the basis for determining management measures. They also allow the setting of limits within which the nature and magnitude of human impacts on ecosystems and/or key ecological features of the MPA are assessed. Economic opportunities compatible with these conservation objectives may be permitted within the MPA or within specific zones.

There are four conservation objectives for Basin Head MPA:

Conservation objective 1: Maintain the quality of the marine environment supporting the *Chondrus crispus*.

Conservation objective 2: Maintain the physical structures of the ecosystem supporting the *Chondrus crispus*.

Conservation objective 3: Maintain the health (biomass and coverage) of the Basin Head *Chondrus crispus*.

Conservation objective 4: Maintain the overall ecological integrity of the Basin Head lagoon and inner channel. This includes avoidance of excessive *Ulva* growth, maintenance of adequate oxygen levels, and maintenance of diversity of indigenous flora and fauna.

Management actions taken during the 2015-16 fiscal year to fulfill short and long-term management goals for both regulatory and non-regulatory conservation objectives are shown in Table 1 and 2, respectively.

Table 1. Basin Head MPA Regulatory Conservation Objectives and Management Actions.

	Management Goals	Action Taken in 2015-2016
<p>Regulatory Conservation Objective:</p> <p>Maintain the quality of the marine environment supporting the Basin Head <i>Chondrus crispus</i></p>	<p>Short Term Goals (3 years):</p> <p>To maintain twice-monthly water quality monitoring (May through October) at 11 water stations within the MPA. Information will be collected on nitrate, nitrites, phosphates, chlorophyll, turbidity, temperature, dissolved oxygen and salinity.</p>	<p>11 sites sampled weekly to biweekly from May to November, 2015, near high tide.</p> <p>Dissolved oxygen continuous recorders were deployed in the northeast arm in 2015.</p> <p>pH continuous recorder deployed at Corduroy Road bed in 2015. Data was retrieved between August and October.</p>
	<p>To monitor continuous water temperature in the inner channel station and the main basin.</p>	<p>Temperature loggers at three permanent locations were retrieved, downloaded, and re-deployed.</p>
	<p>To monitor 3 stations in the basin to test for <i>E.coli</i> contamination</p>	<p>Canadian Shellfish Sanitation Program (CSSP) sampling was not conducted in 2015.</p>
	<p>Long Term Goals (10 years):</p> <p>By using the data collected, determine if there is a significant decline in the quality of the marine environment supporting the Basin Head Irish moss.</p>	<p>Young's Hill Road continued to be monitored in 2015 as a point source of sedimentation.</p> <p>Souris and Area Branch of the PEI Wildlife Federation has been enhancing the main branch (1-2 km) for the last three years from East Point Rd. to a hanging culvert on Snake Rd. In 2015, they reported that the culvert on East Point Rd needed to be assessed. Photos have been sent to the PEI Department of Transportation, Infrastructure and Energy. In 2016, approx. 200 Brook Trout were observed downstream of the culvert on East Point Rd. A Double Crested Cormorant was also observed feeding on trout.</p>
<p>Regulatory Conservation Objective:</p> <p>Maintain the physical</p>	<p>Short Term Goals (3 years):</p> <p>Establish the limits of the barrier dune structure at the ocean entrance and northern limit.</p>	<p>An estuary model, which was developed in 2011, can be used to study scenarios of physical changes to the dune system and entrance channel. No further action taken in 2015-2016.</p>

	Management Goals	Action Taken in 2015-2016
structures of the ecosystem supporting the <i>Chondrus crispus</i>	Long Term Goals (10 years): Monitor the land use activities and erosion of the watershed area.	No action taken in 2015-2016.
	Develop water circulation model to evaluate any water circulation changes.	No action taken in 2015-2016.
	Regulatory Conservation Objective: Maintain the health (biomass and coverage) of Basin Head <i>Chondrus crispus</i>	Short Term Goals (3 years): Establish monitoring transects within the <i>Chondrus crispus</i> bed to evaluate biomass and coverage. Due to drastic decline in <i>Chondrus</i> , aerial photography and glass bottom boat deemed no longer useful and Irish moss survey is now done by walking/swimming along transects spaced 4 m apart until biomass increases.
	Continue weekly photo mosaic at three locations (i.e. eastern end of the arm, vicinity of the <i>Chondrus</i> bed and Ching's Bridge) to quantify the green algae (<i>Ulva lactuca</i>) coverage.	Photographs were taken at Chings Bridge, Elliot's Look Off and Foul Bay from May to November 2015, to establish a record of green algal (<i>Ulva</i>) bloom development and decline.
	Long Term Goals (10 years): Maintain the biomass and coverage of the Basin Head <i>Chondrus crispus</i> to healthy and sustainable levels.	A major factor in the <i>Chondrus</i> decline has been the invasive green crab (Cairns <i>et al</i> 2012.), which removed successive year classes of mussels, leaving only a few ageing individuals to hold the Irish moss population in place. Experiments have shown that eutrophication and the resulting smothering of areas by <i>Ulva</i> and anoxic silts also contributes to loss of clumps. Sock cultivation of Irish moss at the mouth of northeast arm resumed in 2014 using free-floating fronds; this was augmented with cultivated stock from the NRC marine station at Sandy Cove.

	Management Goals	Action Taken in 2015-2016
		<p>To monitor rates and processes of settlement of Irish moss on hard substrate, six native sandstone rocks were placed in the main Irish moss bed in 2014. Spriggy moss plants were quickly established on these rocks, and mussels also became attached to them.</p> <p>The MOU with NRC was renewed for maintenance of Basin Head <i>Chondrus</i> culture (10 kg) at the NRC research facility in Sandy Cove, Nova Scotia.</p> <p>A small number of two year old commercial mussels were brought into Basin Head in 2015 to stabilize existing Irish moss clumps and to make new clumps using Sandy Cove cultivars. The new clumps were planted along one edge of each bed as well as in square meter areas outside of the beds, and in a large contiguous plantation west of the Main Bed.</p>
<p>Regulatory Conservation Objective:</p> <p>Maintain the overall ecological integrity of the Basin Head lagoon and inner channel.</p>	<p>Short Term Goals (3 years):</p> <p>To continue the Community Aquatic Monitoring Program to monitor trends in community abundance and diversity of fish and benthic invertebrates within the Basin Head lagoon.</p>	<p>The CAMP Program was conducted in 2015 from June to August at Basin Head.</p>
	<p>To create detailed contour maps of percent cover by major plant species.</p>	<p>Benthic transects conducted in 2015 across northeast arm inside the Irish moss beds revealed the almost complete absence of fauna and flora over large areas. This reinforced the need for active management to stabilize the giant moss population and to restore productivity and biodiversity.</p>
	<p>Long Term Goals (10 years):</p> <p>Maintain the diversity of indigenous</p>	<p>Current conditions revealed by systematic sampling are dramatically different from the baseline data on</p>

	Management Goals	Action Taken in 2015-2016
	flora and fauna within the Basin Head Marine Protected Area by evaluating the effectiveness of the monitoring plans, indicators and triggers up to date.	<p><i>Zostera</i>, <i>Ulva</i> and <i>Chondrus</i> that was collected prior to 2007. <i>Zostera</i> is no longer found in northeast arm, and the Irish moss has been reduced by 99.9%. Ongoing research has flagged green crab and eutrophication as the primary threats to the giant Irish moss population that remains.</p> <p>In 2015 trials were initiated to test the viability of stabilizing existing clumps with young mussels and the planting of clumps made from commercial mussels and cultivated giant Irish moss.</p>

Table 2. Basin Head MPA Non-Regulatory Conservation Objectives and Management Actions.

	Management Goal	Action Taken in 2015-2016
<p>Non-Regulatory Objective:</p> <p>To ensure the participation of interested and affected stakeholders in the operation of the MPA.</p>	<p>Short Term:</p> <ul style="list-style-type: none"> Continuation of Advisory Board meetings to ensure stakeholder support and involvement. <p>Long Term:</p> <ul style="list-style-type: none"> Increase Aboriginal involvement in the MPA. 	<p>An advisory board meeting was held in Charlottetown on November 26, 2015.</p> <p>Deferred to next fiscal year</p>
<p>Non-Regulatory Objective:</p> <p>To increase the public awareness of the <i>Chondrus crispus</i>, the ecosystem of the Basin Head MPA and its conservation measures.</p>	<p>Short Term:</p> <ul style="list-style-type: none"> To develop a Basin Head MPA website. To enhance the existing on site laboratory to maximize education potential. <p>Long Term:</p> <ul style="list-style-type: none"> To increase public awareness through publication of brochures, interpretive touchscreen kiosk and involvement in community events. 	<p>No action taken in 2015. There is an existing link to MPA information on the DFO website.</p> <p>The on-site wet lab on the cannery wharf is frequently the site for processing of samples.</p> <p>There is an interactive computer kiosk and brochures about the MPA in the Basin Head Fisheries Museum. In addition, an interpretive sign was installed in spring 2016.</p> <p>Eco tours in the main basin were conducted by the PEIWF – Souris and Area Branch.</p>

	Management Goal	Action Taken in 2015-2016
	<ul style="list-style-type: none"> Support the establishment of an Irish moss centre of expertise within the area. 	<p>PEIWF – Souris and Area Branch communicates regularly to local stakeholders through the “Souris & Area Watershed News” on activities that involve Basin Head.</p> <p>Public presentations of DFO research occurred in Charlottetown (hosted by Island Nature Trust in October 2015) and Souris (hosted by SAB-PEIWF in February 2016).</p> <p>Deferred to next fiscal year.</p>
<p>Non-Regulatory Objective:</p> <p>To promote scientific research to increase the level of understanding of the Basin Head MPA.</p>	<p>Short Term:</p> <ul style="list-style-type: none"> To continue to collaborate with Island Nature Trust, Souris and Area Branch of the PEIWF and University of Prince Edward Island to meet the monitoring requirements identified in the Operational Management Plan. Development of Activity Plans and Approvals as outlined in Section 5.0 of the Basin Head MPA Regulations. <p>Long Term:</p> <ul style="list-style-type: none"> To continue to identify potential partners for collaborative research projects. 	<p>A contract with PEIWF – Souris and Area Branch, was in place to provide assistance with the summer and fall water monitoring program.</p> <p>Approval Process in Place; activity plans for 2015 season were submitted and approved.</p> <p>On-going; PEIWF – Souris and Area Branch contracted to provide monitoring assistance plus public engagement in the greater watershed initiative.</p>
<p>Non-Regulatory Objective:</p> <p>To maintain and enhance the quality of the Basin Head ecosystem.</p>	<p>Long Term:</p> <ul style="list-style-type: none"> To implement best management practices to reduce the impact of nutrient enrichment on marine environmental quality within the Basin Head ecosystem. To reduce the spread of aquatic invasive species in the Basin Head ecosystem by public awareness or stewardship initiatives. 	<p>No action taken in 2015-2016. It has been reported that farmers are more diligent in the use of fertilizer, partly because of the cost; also new farm practices are being examined or considered for soil conservation.</p> <p>Monitored through the Aquatic Invasive Species program (AIS) and CAMP. In 2015 three invasive tunicate species were detected in bags of Irish moss hung on cultivation lines near the mouth of northeast arm. These were immediately destroyed and the lines</p>

	Management Goal	Action Taken in 2015-2016
		<p>disinfected.</p> <p>A study was initiated by UPEI in 2014 to evaluate the green crab population. Interactions among Irish moss, mussels and green crab were investigated experimentally by UPEI and DFO in 2015.</p> <p>The Basin Head Watershed Management Plan continues to be implemented.</p>

4.0 ACTIVITY PERMIT APPLICATIONS

MPA regulations recognize that certain activities within an MPA may be consistent with conservation objectives. For some of these activities, Basin Head MPA regulations stipulate requirements for activity plan submissions and specify approval conditions. Ministerial approval of activity plans is one of the primary means of governing the activities proponents undertake in MPAs.

Proposed activity plans are reviewed to assess environmental impacts of the individual activity along with the cumulative effect of all activities in the MPA, and to ensure that the activity is for the purpose of the conservation and/or management of the MPA, or for allowable scientific or educational purposes. Thus the requirement of the submission of an activity plan for certain activities is an important regulatory mechanism used to limit human impacts in MPAs before they occur.

Table 3. Activity Approvals in Basin Head MPA during 2015-16.

	Study Name	Researcher	Affiliation	Purpose	Date Approved
1	Temperature loggers	David Cairns	DFO - Gulf	To obtain a long-term and continuous temperature record for Basin Head (January – December 2015)	June 2, 2015
2	Irish moss monitoring	David Cairns and Irené Novaczek	DFO - Gulf	Estimate the quantity of Irish Moss in the Basin Head MPA by wading transects at low tide (January – December 2015)	June 2, 2015
3	Water quality monitoring –	Sara	DFO - Gulf	Annual water quality monitoring (nutrient load	May 26, 2015

	multi-site	Richard		and hydrographic parameters) (May 25, 2015 and November 30, 2015).	
4	Drone Surveys	David Cairns	DFO - Gulf	To provide accurate mapping of Irish moss locations and other biological features (January – December 2015).	June 2, 2015
5	Community Aquatic Monitoring Program	Monica Boudreau	DFO - Gulf	Monitor the diversity of fauna and flora captured in the Basin Head lagoon (May 1, 2015 – September 30, 2015)	May 19, 2015
6	Preliminary survey, benthic flora and fauna and sediment depth in Irish moss-mussel habitat	Irené Novaczek	DFO – Gulf	Determine the percent cover of benthic plants; relative abundance of Nereid worms and other benthic organisms; and the distribution of soft silts in the Irish moss bed (June 1, 2015 – August 30, 2015).	June 2, 2015
7	Assessing Basin Head's green crab relative densities and their potential effects on Basin Head's Irish moss	Pedro A. Quijon	UPEI	Assessing green crab relative densities and their potential effects on the Irish moss (August 15, 2014 – December 15, 2017)	May 19, 2015
8	Educational outreach within the Basin Head MPA	Fred Cheverie	Souris and Area Branch of the PEI Wildlife Federation	The educational activity will consist of a beach seine haul which will provide “hands-on” experience to further explore the marine community within the Basin Head MPA and educate the public. This	May 26, 2015

				activity is part of the eco-tourism venture of Basin Head organized by the local watershed group (Souris and Area Branch of PEI Wildlife Federation) and will occur up to a maximum of two times per week (June 1 – October 31, 2015).	
9	Irish moss biomass enhancement by cultivation	Irené Novaczek	May 26, 2015	Enhancing the Irish moss biomass by cultivation (May 1, 2015 – June 30, 2015)	June 2, 2015
10	Irish moss life history in Basin Head	Irené Novaczek	DFO – Gulf	To establish how Irish moss in Basin Head is currently maintaining its population (May 1, 2015 – October 31, 2015)	June 2, 2015
11	Documenting Irish moss and mussel clump dynamics	Irené Novaczek	DFO – Gulf	Documenting the Irish moss and mussel clump dynamics (May 1, 2015 – October 31, 2015)	June 2, 2015
12	Irish moss, mussel and green crab interactions	Irené Novaczek	DFO – Gulf	Preliminary test of hypothesis concerning interactions among Irish moss, mussels and green crab in the Basin Head MPA (June, 2015 – October 2015)	July 24, 2015
13	Eelgrass survey in Zone 2 (lagoon only)	Marc Ouellette	DFO – Gulf	To conduct an eelgrass coverage survey in the lagoon part of Zone 2 (mid-September (2 days))	September 4, 2015
14	Installation of dissolved oxygen and pH loggers	Sara Richard	DFO - Gulf	Measure dissolved oxygen and pH levels using loggers (May 25, 2015 – November 30, 2015)	May 26, 2015



5.0 ENFORCEMENT AND COMPLIANCE

As the Basin Head area is a frequent tourist destination and high traffic area for both visitors and locals, the local DFO Conservation & Protection office feel the need to patrol the area regularly to ensure compliance under the Management of Contaminated Fishery Regulations (MCFR's) and the Basin Head Marine Protected Area Regulations (BHMPAR) as well as the Maritime Provinces Fishery Regulations (MPFR's). There have been no issues reported, or identified, in regard to contraventions of the MCFR's or MPFR's. No enforcement issues were identified in the fiscal year 2015-16. These land based patrols are conducted throughout the year.

6.0 PUBLIC AWARENESS AND EDUCATION

Public education and outreach are critical factors in ensuring the long term success of an MPA. Compliance with MPA regulations is higher when community members, MPA users and the general public are aware of objectives and management strategies of an MPA. Education and outreach tools are most effective when they target appropriate user groups, stakeholders and the public, present a straightforward message, and use the most appropriate product to communicate the message.

Currently brochures and display panels explaining the purpose of the MPA are available to the public at the nearby Basin Head Fisheries Museum.

An interactive display kiosk was installed at the Basin Head Museum in 2014 using a computer monitor with touch-screen technology to give historical and biological information on Basin Head, as well as general information on the Canadian MPA program.

Brochures were updated in 2015 and an interpretive sign was installed on site in spring 2016 (Figure 2).

During the summer of 2015, the Souris and Area Branch of the PEIWF conducted educational activities consisting of a beach seine haul, which provided “hands-on” experience to explore the marine community within the Basin Head MPA. This activity was part of an eco-tourism venture and occurred up to four times per week throughout the summer.



Figure 2: Sign installed at Basin Head in spring 2016. (photo credit: I. Novaczek)



7.0 NEXT STEPS AND PRIORITIES

Fisheries and Oceans Canada will focus on several priorities related to the implementation of the management plan in the next fiscal year. Priorities include:

- Continue annual monitoring of water quality, habitat integrity and biota, at established levels of effort likely to be sustainable for the mid- and long-term.
- Continue multi-year studies, which include Irish moss cultivation, trial plantings and studies on population dynamics, clump dynamics and the effects of green crabs on the Irish moss.
- Follow up on the condition and potential repair of the Basin Head boat slip.

8.0 REFERENCES

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