



ANNUAL REPORT

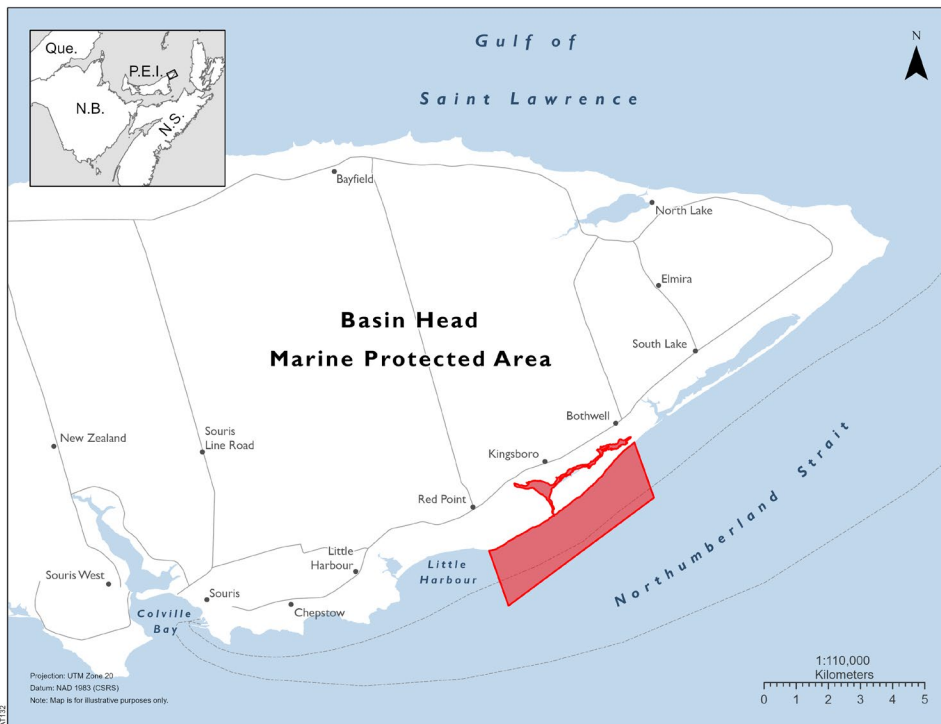
| Basin Head
| Marine Protected Area

2023



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At-a-glance

Date of designation:

September 26, 2005

Size:

9 km²

Contribution towards the marine conservation targets:

< 0.01%

Location:

The Basin Head MPA is located between Souris and East Point, Prince Edward Island (PEI). The MPA is within the Estuary and Gulf of St. Lawrence bioregion; Atlantic Ocean.

Managed by:

Fisheries and Oceans Canada (DFO)

Acknowledgement:

The Basin Head MPA is located within the unceded territory of the Epekwitnewaq Mi'kmaq.

Zones:

There are 3 management zones, including:
 Zone 1 – The Inner Channel extends from the Main Basin eastward for approximately 3 km. It has the highest level of protection and covers the only habitat occupied by giant Irish moss.

Zone 2 – The Main Basin or lagoon, along with the west end of the inner channel and the entrance channel, is a buffer zone for sensitive Zone 1.

Zone 3 – The Outer Coast extends from the mouth of the lagoon to 1 nautical mile seaward and 3 nautical miles from east to west. It is a buffer to protect the integrity of the dune structure.



Key highlights

Scientific research was at an all-time high in 2023, working towards filling in existing knowledge gaps and better understanding the giant Irish moss's behavior and impacts of anthropogenic pressures on the MPA. The Basin Head watershed has provided an easily accessible site for university level students to research many ecosystem types, such as estuarine, salt marsh and riverine, expanding the knowledge base and reach of the MPA.

Throughout 2023, DFO and partners focused on increasing the education and outreach presence of the Basin Head MPA. Some activities included:

- giving 4 presentations at the Fifth International Marine Protected Area Congress (IMPAC5)
- developing outreach material contracts
- giving tours to potential partners to create education-based content

A new contribution agreement was signed with the Mi'kmaq Confederacy of PEI who will host cultural events at the Basin Head Provincial Park that borders the MPA throughout the 2024 and 2025 summer seasons.





In the spotlight: benefits

| Ecological | Socio-cultural | Economic |
|---|---|---|
| <p>The Basin Head MPA was designated to protect a unique form of seaweed, known as the giant Irish moss. The giant Irish moss develops wide deep-red fronds and is anchored by Blue mussels in a clump-like structure. This symbiotic relationship also provides habitat for many other organisms in the ecosystem.</p> <p>The Basin Head watershed is a diverse habitat consisting of:</p> <ul style="list-style-type: none"> • an estuarine lagoon • salt marsh • eelgrass beds • tributaries • sand dunes • a riparian buffer zone <p>The watershed supports a high level of biodiversity and some features (marshes, eelgrass) can act as a climate change buffer for the surrounding land.</p> | <p>The Basin Head MPA works with many partners to achieve its objectives and has agreements with a local watershed group, Souris and Area Branch of the PEI Wildlife Federation and with universities to address knowledge gaps of the system. A new agreement with the Mi'kmaq Confederacy of PEI was also recently signed to bring cultural events and exhibitions to the area.</p> <p>Marine Planning and Conservation collaborated with L'Nuey to lead interviews capturing the stories and perspectives of Indigenous Elders and youth about their connections to the Basin Head area, the ocean, traditional fisheries and nature in general, with the goal of producing educational videos for the public.</p> | <p>Since the Basin Head MPA is a coastal site, it creates the opportunity to build upon existing tourism in the area. Working closely with the Province of PEI, the MPA provides an additional draw to the already popular beach destination, the Basin Head Provincial Park and the local Basin Head Fisheries Museum.</p> <p>The MPA has provided the justification to upgrade the boat slip in the MPA and create an interpretive day park for tourists to enjoy. Through contribution agreements, DFO also funds research and monitoring capacity of a local watershed group, who hires and spends their money locally.</p> |



Education and outreach

As a coastal MPA, Basin Head has ease of access for on-site education and outreach events. In August 2023, the MPA hosted Ocean School, a program of the Ocean Frontier Institute in partnership with the National Film Board of Canada. It provided the group the opportunity to participate in restoration activities, and demonstrating some of the opportunities and challenges that come with working in the area. Educational and outreach tools about the MPA are being developed through collaboration with partners.



The Basin Head MPA was also represented by 4 presentations by DFO and partner Souris and Area Branch of the PEI Wildlife Federation at IMPAC5 in February 2023. Presentations highlighted the:

- intricacies of managing a small, coastal MPA
- Environmental Non-Governmental Organization (ENGO) perspective
- ongoing MPA restoration efforts

DFO was invited to operate a touch tank and information stand at the Basin Head Fisheries Museum’s 50th anniversary event in July 2023. At this event, key ecosystem components were displayed for the public to explore in an interactive way.



Research and monitoring

In 2023, several organizations (DFO, academic and ENGOs) conducted research and monitoring in the Basin Head MPA:

- 1) The DFO Science sector conducted sampling to conduct a genetic study of the giant Irish moss and took sediment cores to determine the internal nutrient load of the MPA, in addition to routine monitoring of environmental

conditions. The team is currently working on an ecological monitoring plan for Basin Head, which is expected in 2026. Environmental DNA (eDNA) samples were also taken to inform on invasive species presence.

- 2) Dalhousie University – PhD and Master’s students gathered measurements to determine the nutrient, thermal and sediment regimes and created models of the estuary’s hydrodynamic and hydraulic processes. The impacts of Hurricane Fiona on the Basin Head ecosystem was recently published from this work ([Bonnington et al., 2023](#)).
- 3) University of PEI – Researchers took measurements of Irish moss health using PAM fluorometry and conducted a comparison study to determine the effectiveness of the current Green crab removal program which was recently published ([Tummon Flynn et al., 2023](#)).
- 4) Souris and Area Branch of the PEI Wildlife Federation (SAB) – SAB staff operated a Green crab removal program, facilitated the restoration of giant Irish moss clumps (an Irish moss and Blue mussel combination) and planted native trees and shrubs in the surrounding riparian buffer zone. They also collected water samples and tributary flow measurements to assist in DFO’s calculations of nutrient load from the surrounding streams.



| Activity | Lead | Outputs | Outcomes |
|---|---|--|---|
| Irish moss surveys | DFO | 7 survey days | Estimation of Irish moss coverage in the MPA. |
| Irish moss restoration | Souris and Area Branch of the PEI Wildlife Federation | 2,624 Irish moss clumps planted | Supplementing the Irish moss population |
| Green crab removal program | Souris and Area Branch of the PEI Wildlife Federation | 117,742 Green crab removed and disposed | Reducing pressure on the ecosystem caused by Green crab |
| Collection of Irish moss and sediment core samples | DFO | 67 sediment cores and 59 Irish moss clippings (40 from Basin Head) | Knowledge gaps filled: Internal nutrient load of estuary; genetic study of Irish moss |
| Nitrate, thermal and sediment loading to the MPA research study | Dalhousie University | Graduate student research papers Ex. Bonnington et al., 2023 | Knowledge gaps filled: Modelling of hydrodynamic and hydraulic processes in the estuary |
| Giant Irish moss ecology research study | University of Prince Edward Island | Graduate student research papers Ex. Tummon Flynn et al., 2023 | Knowledge gaps filled: Irish moss interactions with surrounding environment; efficiency of the Green crab removal program |

Collaborations and partnerships

The Basin Head MPA was established through a committee of local community members who proposed the creation of an MPA to DFO. This committee later became the first Basin Head Advisory Committee, which still provides management and operational recommendations to DFO to this day.



DFO has several ongoing contribution agreements with academic, ENGO and Indigenous partners for work in the MPA. DFO has a long-standing collaboration with SAB who is responsible for:

- restoration activities
- nutrient monitoring
- removal of invasive species
- co-chairing of the Advisory Committee

Dalhousie University and the University of PEI have graduate students conducting their research in the MPA and investigating the interactions of Irish moss with its environment and hydrodynamic and hydraulic processes. The Mi'kmaq Confederacy of PEI has been involved in the MPA since establishment and has recently signed a contribution agreement with DFO to host events to improve cultural awareness and local knowledge.



Surveillance and enforcement

The local DFO Conservation and Protection officers conduct land, sea and air-based (Aerial Surveillance Program) patrols within the MPA boundary throughout the year. Patrols are more frequent in the operational fishing season when commercial and recreational fisheries are more prevalent. These patrols ensure compliance under the:

- [Oceans Act](#)
- [Management of Contaminated Fishery Regulations](#)
- [Basin Head MPA Regulations](#)
- [Atlantic Fishery Regulations](#)
- [Fishery \(General\) Regulations](#)
- [Fisheries Act](#)
- [Maritime Provinces Fishery Regulations](#)

The public's cooperation is essential in ensuring compliance in the MPA as it helps to report individuals that may be in contravention of these acts and regulations.

In May 2023, Fisheries Officers responded to reports of a couple of individuals fishing in Zone 1

of the MPA. Warnings were issued and the catch was returned where it was taken.

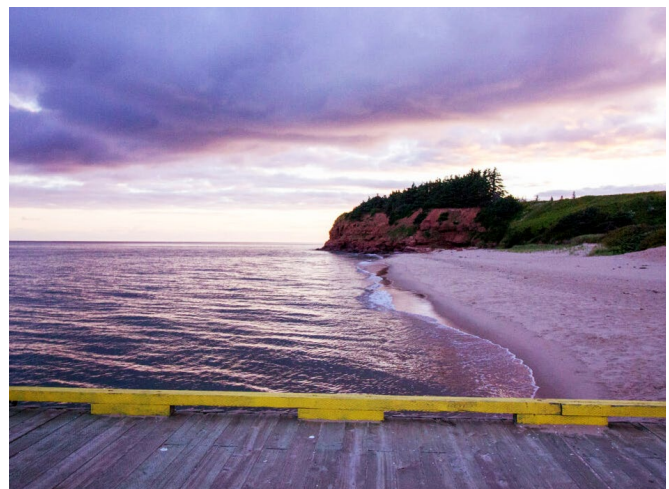
The enforcement plan for the Basin Head MPA is active and received an update in 2021 to include drone-based surveillance.



Management and governance

The [Basin Head MPA Operational Management Plan](#) describes all of the activities that are both occurring and plan to occur in the MPA over the plan's lifecycle. The management plan for Basin Head is in its third iteration and is currently scheduled to be updated in 2026.

The Basin Head MPA Advisory Committee meets annually to discuss the activities that occurred in the MPA over the last year and provide recommendations to DFO on how to improve the operation and management of the MPA.



This year, the annual committee meeting took place on November 29, 2023, with representatives from:

- provincial and municipal governments
- academia
- ENGOs
- local community

Based on the discussions throughout the meeting, a planning committee was established to support planning for the Basin Head MPA's 20th anniversary event in 2025.

The Marine Planning and Conservation team received, reviewed and approved 8 activity plans

for the 2023 field season. These plans came from 5 different proponents based on the requirements of the Basin Head Regulations. Activities ranged from invasive species monitoring and removal, to the restoration of giant Irish moss and the riparian zone. The majority of the activities in the MPA were operated under 3 contribution agreements between DFO and academic and ENGO partners. A new contribution agreement was signed with the Mi'kmaq Confederacy of PEI for the next 2 years to provide funding to host cultural events at the Basin Head Provincial Park.

Looking to the year ahead

Over the next year, DFO will renew its Interdepartmental Letter of Agreement with the National Research Council to continue maintaining and assist in conducting new research on its stock of giant Irish moss. This research will provide a better understanding of the Irish moss's tolerance and behavior in response to several environmental conditions. DFO will also:

- plan for the upcoming 20th anniversary of Basin Head MPA event
- establish contracts for outreach materials
- continue publishing an annual MPA progress report

Monitoring initiatives of the MPA will continue with the goal of developing an efficient monitoring plan and advancing toward methods that are less invasive and more adaptive in nature.





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