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FINAL REPORT

**EVALUATION OF THE FISHERIES PROTECTION  
PROGRAM AND ITS AQUATIC INVASIVE  
SPECIES COMPONENT**

PROJECT NUMBER 6B139

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EVALUATION DIRECTORATE  
CHIEF FINANCIAL OFFICER SECTOR  
FISHERIES AND OCEANS CANADA

## ACKNOWLEDGMENTS

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## ACRONYMS

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ADM	Assistant Deputy Minister
AIS	Aquatic Invasive Species
C&A	Central and Arctic
DFO	Fisheries and Oceans Canada
EFM	Ecosystems and Fisheries Management Sector
EOS	Ecosystems and Oceans Science Sector
FPP	Fisheries Protection Program
FTE	Full-time equivalent
GLFC	Great Lakes Fishery Commission
HMP	Habitat Management Program
NGOs	Non-governmental organizations
NHQ	National Headquarters
O&M	Operations and Maintenance
PAA	Program Alignment Architecture
RFCPP	Recreational Fisheries Conservation Partnerships Program
US	United States

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## **EXECUTIVE SUMMARY**

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### **Introduction**

This report presents the results of the evaluation of Fisheries and Oceans Canada's (DFO) Fisheries Protection Program (FPP) and its Aquatic Invasive Species (AIS) component. The evaluation also incorporates an assessment of the Recreational Fisheries Conservation Partnerships Program and an evaluation of the Asian Carp Initiative. In 2014-15, total spending on the FPP and its AIS component was \$60.9 million.

The evaluation covers the period from April 2010 to January 2016 and was conducted by DFO's Evaluation Directorate. This is the first evaluation of the Fisheries Protection Program. Aquatic Invasive Species was evaluated in 2008-09.

### **Program Profile**

The Fisheries Protection Program and its Aquatic Invasive Species component support the Minister of Fisheries, Oceans and the Canadian Coast Guard's responsibility to protect fish and fish habitat. The FPP administers the fisheries protection provisions of the *Fisheries Act* and certain provisions of the *Species at Risk Act*. The primary activities undertaken by the FPP include the review and authorization of proposed projects taking place in and near Canadian waters. The FPP monitors projects that have the potential to harm fish and fish habitat, and collaborates with fishery officers from the Conservation and Protection Directorate, who perform an enforcement function. The Recreational Fisheries Conservation Partnership Program (RFCPP) is a contribution program under FPP that funds multi-partner projects at the local level, which restore compromised and/or threatened recreational fisheries' habitat.

The Aquatic Invasive Species component of FPP aims to protect fish, fish habitat and fisheries by preventing the introduction, establishment and spread of aquatic invasive species into Canadian waters. Activities include producing scientific research pertinent to the management and control of aquatic invasive species, monitoring and managing selected existing populations of aquatic invasive species.

### **Evaluation Methodology**

During the evaluation period, the Fisheries Protection Program underwent significant changes to its structure. The FPP transitioned from the Habitat Management Program (HMP) in 2012-13; the Recreational Fisheries Conservation Partnerships Program was added in 2013-14; and the AIS component was brought under FPP in 2014-15. These changes to the FPP's structure meant that the evaluation was frequently unable to compare performance data, financial data and expected results from one year to the next.

The Evaluation Directorate elected to conduct a process evaluation to address the challenges to evaluation that resulted from the FPP's restructuring. This methodology allowed the evaluation to focus on assessing how well the FPP was being implemented, rather than on whether or not it had achieved all of its expected outcomes.

A key challenge for the AIS component is that its success is measured by the *absence* of AIS, in other words, maintaining *status quo*. The evaluation considered the AIS component's strengths, achievements and challenges in light of the ongoing need for preventative action and AIS research.

## **Evaluation Findings**

### **Relevance**

The Fisheries Protection Program fulfills an ongoing need to protect fish and fish habitat across Canada, because all projects near or in Canadian waters, from large-scale developments to small private docks, have an impact on proximal aquatic ecosystems. The FPP is aligned with federal roles and responsibilities and government priorities. The FPP is aligned with DFO's responsibility to protect fish and fish habitat, and contributes to two departmental strategic outcomes: Sustainable Aquatic Ecosystems and Economically Prosperous Maritime Sectors and Fisheries. The Recreational Fisheries Conservation Partnerships Program is also geared toward protecting and restoring fish and fish habitat, and the fisheries that depend on the sustainable use of these resources.

The Aquatic Invasive Species component of FPP is aligned with federal priorities and a broader strategy against AIS and partially responds to an ongoing need to prevent the introduction, establishment and spread of AIS into Canadian waters. The AIS component has been successful to preventing the introduction and establishment of Asian Carp, and controlling Sea Lamprey in the Great Lakes, but risk analyses and the presence of AIS in many parts of Canada, demonstrate that freshwater and marine waters across Canada are also threatened. The potential damage some AIS can cause should not be underestimated; once AIS established, they can multiply and spread rapidly; and control measures can take many years to produce results. The damage that some AIS have caused and can cause far outweighs the cost of prevention.

For years AIS activities have been more reactive than proactive and the uneven distribution of funds has resulted in a focus on two species in the Great Lakes (i.e., Sea Lamprey and Asian Carp). With the continued increase in international trade and travel, the threat of AIS introduction will continue to grow, which supports the need for AIS related research, prevention and/or control activities.

### **Governance**

The governance structure of the Fisheries Protection Program's two 'arms' functions well, but there is an opportunity for closer collaboration in some instances (e.g., development of standards and guidelines).

For the AIS component, it had limited national direction, and the establishment of priorities and activities related to aquatic invasive species was at the discretion of each region. The AIS component's lack of clear national objectives and has perpetuated this regionally-driven operational reality. There are additional challenges related to the integration of the AIS component within the Fisheries Protection Program, i.e., reporting challenges and a need to

clarify roles and responsibilities of both the Ecosystems and Oceans Science Sector and the Ecosystems and Fisheries Management Sector with respect to the AIS component.

### **Effectiveness**

The former Habitat Management Program demonstrated success in providing advice and regulatory direction to proponents, which contributed to the prevention of harmful alteration, disruption or destruction of fish habitat. However, the HMP experienced a continued challenge in monitoring and measuring success in preventing harm to fish habitat. The implementation of a self-assessment tool in 2014 exacerbated these challenges. The lack of oversight and monitoring combined with the introduction of this tool has increased the risk that the Department is not adequately safeguarding fish and fish habitat.

Additional standards and guidelines are needed to continue to harmonize regulatory review across the country and to make it more efficient; more collaboration between the two FPP ‘arms’, for the development of these key documents, would be advantageous. In addition, the FPP’s Client Liaison, Partnerships, Standards and Guidelines ‘arm’ was not as productive as anticipated due to the implementation of the Recreational Fisheries Conservation Partnerships Program, for which it provided resources. The RFCPP achieved all its expected results in its first two years, but continues to be funded without allotments for operations and maintenance or salary dollars.

The AIS component has contributed to undertaking and/or facilitating research related to risk assessment, pathways of AIS introduction and spread, species biology and establishment, and in a few cases, control measures. It has been successful in controlling Sea Lamprey, while keeping Asian Carp from establishing in the country, to date. However, there is a disparity between what the AIS component aims to achieve and its current capacity: outside of the Great Lakes, AIS work has been limited by its funding model and governance structure.

### **Resource Utilization**

The Fisheries Protection Program (excluding its AIS component) would benefit from a reassessment of its allocation of human resources and its operational structure to ensure that the workload is balanced within and across regions. In 2014-15, close to 20% of all FPP employees were funded through two initiatives, which use B-base funding. Reliance upon temporary funding represents a risk to FPP. The Recreational Fisheries Conservation Partnerships Program administrative overhead is approximately 14%, which is commensurate with many start-up programs. However, its continued impact upon the FPP human resources should be considered, particularly given RFCPP continued growth since its inception.

The AIS component’s aims were found to exceed its capacity. More than 80% of AIS funding is dedicated to two species in the Great Lakes (i.e., Sea Lamprey and Asian Carp); remaining funds are spread among all regions and National Headquarters for all other species and pathways. The current governance and funding model has resulted in activities primarily occurring in the Central and Arctic Region; and the majority of the AIS component’s efforts being focused on only two species.

## **Recommendations**

The evaluation resulted in the following three recommendations:

**Recommendation 1:** It is recommended that the Senior Assistant Deputy Minister, Ecosystems and Fisheries Management Sector, develop a clear plan to ensure that the required standards and guidelines are developed and implemented.

**Recommendation 2:** It is recommended that the Senior Assistant Deputy Minister, Ecosystems and Fisheries Management Sector, ensure that there is adequate oversight and monitoring of projects taking place in or near water, to mitigate potential impacts on fish and fish habitat.

**Recommendation 3:** It is recommended that the Senior Assistant Deputy Minister, Ecosystems and Fisheries Management Sector, in collaboration with the Assistant Deputy Minister, Ecosystems and Oceans Science Sector, identify clear national objectives for the AIS component, which are achievable based upon resource allocations, and a governance structure that ensures accountability for results.

## **1.0 INTRODUCTION**

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### **1.1 Report Structure**

Section 1 presents the evaluation's purpose, scope and context; and contains a diagram of the operational structure of the Fisheries Protection Program (FPP) and its Aquatic Invasive Species (AIS) component. Section 2 gives an overview of FPP and AIS responsibilities and their financial and human resources. Section 3 describes the evaluation's methodological approach and the lines of evidence that were used to gather qualitative and quantitative data for analysis. Section 4 provides the evaluation's main findings related to the relevance and performance of the FPP and its AIS component. Findings within the relevance sub-section (4.1) focus upon the AIS component; while findings related to the FPP are primarily discussed within the performance sub-section (4.3). Section 5 presents the evaluation's conclusions and recommendations, Section 6 presents the Management Action Plan; and is followed by a series of annexes.

### **1.2 Purpose of the Evaluation**

This report presents the results of the evaluation of Fisheries and Oceans Canada's (DFO) Fisheries Protection Program and its Aquatic Invasive Species component. In accordance with the Treasury Board's *Policy on Evaluation (2009)*, the evaluation examined the relevance and performance of the FPP and its AIS component (see Diagram 1). The evaluation also included an assessment of the Recreational Fisheries Conservation Partnerships Program, a contribution program; and fulfilled the Department's commitment to conduct an evaluation of the Asian Carp Initiative by 2016-17.

### **1.3 Evaluation Scope and Context**

This is the first evaluation of the Fisheries Protection Program; Aquatic Invasive Species was evaluated in 2008-09.

The evaluation was conducted internally by DFO's Evaluation Directorate. It assesses FPP and AIS activities undertaken between April 2010 and January 2016 in the National Headquarters (NHQ) and all six DFO regions (Newfoundland and Labrador, Maritimes, Gulf, Quebec, Central and Arctic, and Pacific). Two horizontal initiatives that contribute funding to the FPP were deemed out of this evaluation's scope: the Major Projects Management Office Initiative, led by Natural Resources Canada; and the Federal Contaminated Sites Action Plan, led by Environment Canada. Separate horizontal evaluations of these initiatives are planned for 2017-18; however, the Evaluation Directorate explored possible risks and impacts related to the temporary nature of this funding on the FPP.

The Fisheries Protection Program has undergone many changes since 2010-11, which increased the complexity of the evaluation. Furthermore, the FPP operates differently from the way in which it is represented in DFO's Program Alignment Architecture (PAA), and thus, the way in which it is reported on (e.g., expenditures, number of staff). The evaluation was mindful of these



differences, and framed its analysis and the report to correspond with the operational reality of the FPP and its AIS component.<sup>1</sup>

The predecessor of the FPP was called the Habitat Management Program, and performed many of the same key activities that the current FPP performs, including regulatory review. Amendments to the *Fisheries Act* in November 2013 required a modernization of DFO's policies and operations related to its mandate for fisheries protection. The Habitat Management Program became the Fisheries Protection Program in 2013-14. That same fiscal year, the Recreational Fisheries Conservation Partnerships Program was launched under FPP. In 2014-15, Aquatic Invasive Species, which had been a stand-alone program, was relocated under the FPP.<sup>2</sup>

Diagram 1, compiled by the Evaluation Directorate, presents the FPP and its AIS component as they functioned at the time the evaluation was conducted. Operationally, the FPP is delivered by staff working within three administrative 'arms,' under the Ecosystems and Fisheries Management (EFM) Sector:

1. Triage and Planning & Regulatory Review 'arm'
2. Clients Liaison, Partnerships, Standards and Guidelines 'arm'
3. Aquatic Invasive Species component

Although the Aquatic Invasive Species component was relocated under the FPP in the 2014-15 PAA, the vast majority of AIS activities are primarily delivered by staff working under the Ecosystems and Oceans Science (EOS) Sector.

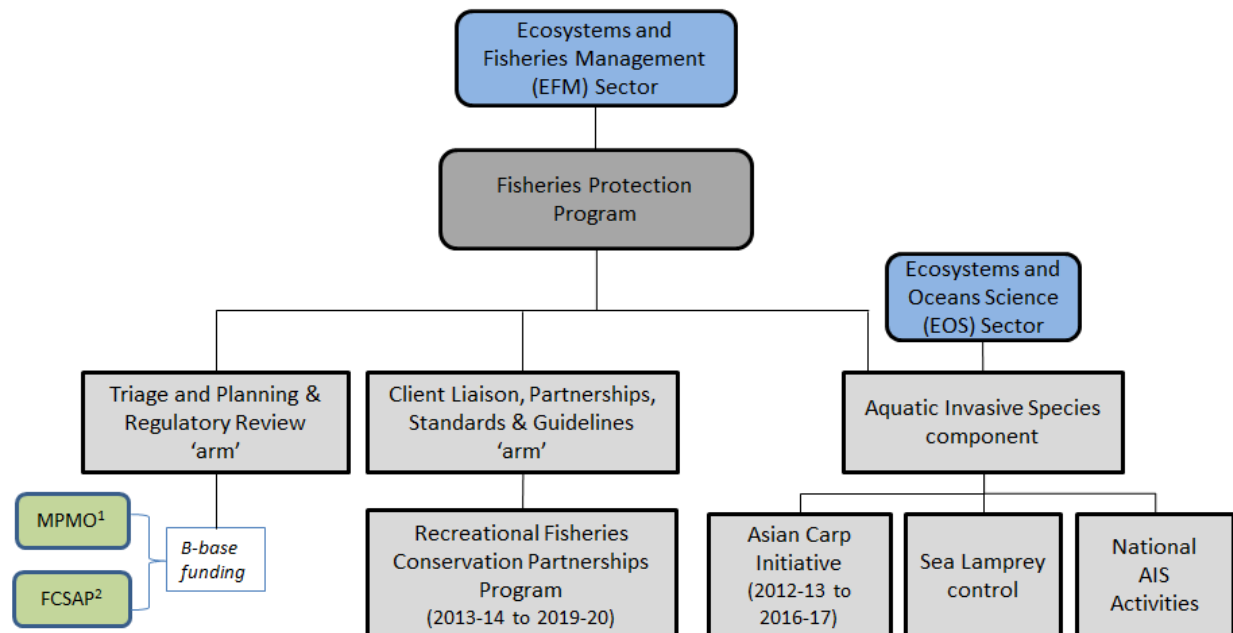
National AIS activities include: AIS research, monitoring for selected aquatic invasive species, and providing science advice on AIS (e.g., risk assessment) in all DFO regions. Science staff in National Headquarters coordinates and reports on these regional activities but is not involved in the Asian Carp Initiative or the Sea Lamprey control. The Central and Arctic Region administers the Asian Carp Initiative and Sea Lamprey control.

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<sup>1</sup> Annex A gives a description of the differences between the Fisheries Protection Program and its AIS component's PAA and operational structures.

<sup>2</sup> In DFO's 2010-11 PAA, AIS was located under the Science for Sustainable Fisheries and Aquaculture Program; from 2011-12 to 2013-14 it was a stand-alone program.

Diagram 1 – Operational Representation of the Fisheries Protection Program and its Aquatic Invasive Species Component, 2015-16



\*Note: The B-base funding for FPP’s Triage and Planning & Regulatory Review ‘arm’ is highlighted because it comes from initiatives led by other departments.

<sup>1</sup> Major Projects Management Office Initiative (Lead department: Natural Resources Canada)

<sup>2</sup> Federal Contaminated Sites Action Plan (Lead department: Environment and Climate Change Canada)

## 2.0 PROGRAM PROFILE

### 2.1 Program Responsibilities

Canada’s freshwater and marine fish species and fish habitat play an important role in Canada’s sustainable aquatic ecosystems and economic prosperity. Diverse activities undertaken in and near freshwater and marine fisheries’ waters, such as oil and gas exploration; and the development of forestry, mining, hydroelectric power generation and agriculture, have the potential to negatively impact fisheries by causing serious harm to fish and fish habitat.

The Fisheries Protection Program is responsible for the administration of the fisheries protection provisions of the *Fisheries Act* and certain provisions of the *Species at Risk Act*. These include the establishment of guidelines and regulations that prevent harm or mitigate risks to the fish and fish habitat, which are vital to fisheries. The FPP has specific legislative responsibilities in relation to federal environmental assessment regimes including the *Canadian Environmental Assessment Act (2012)*, regimes that apply in the territories, and responsibilities within land claims agreements. The FPP also fulfils its *Section 35 Constitution Act (1982)* duty to consult with respect to authorization decisions.

Regulatory review is a central activity undertaken by the Fisheries Protection Program. It involves the review and authorization of proposed projects taking place in and near Canadian waters that may affect fish and fish habitat. When necessary, the FPP provides advice to those who submit project proposals, enabling them to avoid and mitigate the potentially harmful effects of projects on fish and fish habitat. When harm cannot be avoided, the FPP ensures that projects comply with the *Fisheries Act* and the *Species at Risk Act* by issuing, when appropriate, authorizations and permits with conditions to avoid, mitigate and offset serious harm to fish.

The Fisheries Protection Program includes a contribution program called the Recreational Fisheries Conservation Partnerships Program (RFCPP). The RFCPP supports multi-partner projects at the local level, which restore compromised and/or threatened recreational fisheries' habitat. The RFCPP was launched in 2013 as a two-year program and has since been extended until 2019-20.

The Aquatic Invasive Species component of FPP aims to prevent the introduction, establishment and spread of aquatic invasive species into Canadian waters; to manage selected existing populations of AIS; and to provide decision-makers and those developing policy and legislation with scientific research pertinent to the management and control of AIS.<sup>3</sup> The AIS component supports the Minister of Fisheries, Oceans and the Canadian Coast Guard's responsibility to protect fish and fish habitat, under the *Fisheries Act*.

AIS-related research, risk assessments, and monitoring for selected aquatic invasive species are examples of activities undertaken by AIS Science staff in all six DFO regions. The Central and Arctic Region (C&A) receives most of the AIS component resources and expends the vast majority on two AIS in the Great Lakes: Asian Carp and Sea Lamprey. The Asian Carp Initiative, administered in the C&A Region, is a five-year initiative (2012-13 to 2016-17) which is focused on preventing the introduction and establishment of Asian Carp into the Great Lakes basin and educating the public about the risks posed to fisheries and the Canadian economy by Asian Carp. Sea Lamprey control work is coordinated by the Great Lakes Fishery Commission, a bi-national effort between Canada and the United States that was established in 1955, with the Canadian portion administered in the C&A Region.

## 2.2 Program Resources

### 2.2.1 Financial Resources

In 2014-15, total expenditures for the Fisheries Protection Program, including its AIS component, were \$60.9 million. Table 1 presents combined expenditures for the FPP and AIS component over the evaluation period. Expenditures in 2014-15 were \$2.6 million less than in 2010-11.

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<sup>3</sup> In scientific publications, aquatic invasive species are often referred to as "AIS." In this report, AIS refers to both the Aquatic Invasive Species component of the FPP and the species, depending upon context.

Table 1 – Fisheries Protection Program and Aquatic Invasive Species Expenditures, 2010-11 to 2014-15, in Millions of Dollars

	2010-11	2011-12	2012-13	2013-14	2014-15
Aquatic Invasive Species*	10.5	11.3	12.6	13.5	13.8
Fisheries Protection Program **	53.0	50.6	47.1	48.0	47.1
<b>Total Expenditures on FPP and AIS</b>	<b>63.5</b>	<b>61.6</b>	<b>59.7</b>	<b>61.5</b>	<b>60.9</b>

Sources: Cognos Financial System, DFO and Departmental Performance Reports.

\*The AIS component received funding from different sources between 2010-11 and 2014-15.<sup>4</sup> \$8.1 million annually is dedicated to Sea Lamprey control. AIS only began to contribute to total FPP spending in 2014-15.

\*\*Habitat Management Program (2010-11 to 2012-13); Fisheries Protection Program (2013-14 to 2014-15).

Examined separately, FPP expenditures decreased by \$5.9 million between 2010-11 and 2014-15; while AIS expenditures increased by \$3.3 million. This is despite the fact that both FPP and the AIS component received new funds in the years after 2012, from the Asian Carp Initiative and the Recreational Fisheries Conservation Partnerships Program.

In 2012-13, DFO directed \$17.5 million over five years toward Asian Carp prevention, and launched the Asian Carp Initiative in the Central and Arctic Region. A portion of the AIS component's funding is composed of B-based funds from the Initiative, which ends in 2016-17.<sup>5</sup>

B-based funding has also increased as a proportion of FPP's total expenditures. In 2013-14, the Recreational Fisheries Contribution Partnerships Program was launched under FPP. RFCPP contributed \$3 million to FPP's total expenditures in 2013-14, and \$5.1 million in 2014-15 (17% of FPP's total expenditures).<sup>6</sup> When one removes RFCPP expenditures from FPP totals, the FPP's expenditures decreased by \$11 million between 2010-11 and 2014-15.<sup>7</sup>

In the last year, between 2013-14 and 2014-15, total spending on AIS and FPP decreased by \$600,000, despite the additional funding for the Asian Carp Initiative and an increase in RFCPP's funding to \$5.1 million (from \$3 million). Meanwhile, FPP's responsibilities grew: the AIS component was relocated under FPP; and the contribution program – RFCPP – more than doubled. RFCPP is implemented by FPP and all RFCPP funding is dedicated to contribution agreements, with no additional funding to support salaries and Operations and Maintenance.

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<sup>4</sup> The Government of Canada's Budget 2010 renewed approximately \$4 million in funding from 2005 through the Invasive Alien Species Strategy to facilitate an AIS monitoring system and to meet assessment needs, such as research funding, biological risk assessment, regulatory policy development. In 2012, the Government of Canada allocated \$17.5 million over five years to protect the Great Lakes from Asian Carp under the Asian Carp Initiative.

<sup>5</sup> The AIS component's expenditures have been primarily for the Sea Lamprey control and Asian Carp Initiative since its launch (2012-13); then all Regions share approximately \$4 million annually.

<sup>6</sup> Percentage is based upon FPP's disaggregated total (excluding AIS) for 2014-15: \$47.1 million.

<sup>7</sup> The RFCPP was initially granted \$4M in 2013-14 and \$6M in 2014-15; the Economic Action Plan 2014 extended the program for one year with \$15M (an additional \$5M in 2014-15 and \$10M in 2015-16). The RFCPP was last extended by Economic Action Plan 2015 with \$30M over three years, ending in 2019-20.

### 2.2.2 Human Resources

The Fisheries Protection Program and its AIS component are implemented by two DFO sectors, and its employees are unevenly distributed between the six regions.

In 2014-15, the FPP and AIS employed a total of 356 Full-Time Equivalents (FTEs). The majority of these FTEs worked within the FPP's two 'arms' under the Ecosystems and Fisheries Management Sector (280 FTEs or 79%).<sup>8</sup> The AIS component employed 76 employees (mostly located in the Central and Arctic Region), all of whom belonged to the Ecosystems and Oceans Science Sector with the exception of two FTEs, who worked at National Headquarters and belonged to the Ecosystems and Fisheries Management Sector.

During the evaluation period, the Fisheries Protection Program (excluding the AIS component) experienced a reduction in its workforce of up to 50% in some regions. As a whole, it went from 543 FTEs to 289 between 2010-11 and 2014-15. That is a reduction of 254 FTEs or 47%. In contrast, the AIS component's FTEs were reduced by three FTEs (4%) in total during the period under evaluation.

Table 2 – Fisheries Protection Program and Aquatic Invasive Species Full-time Equivalents, 2010-11 to 2014-15

	2010-11	2011-12	2012-13	2013-14	2014-15
<b>Aquatic Invasive Species*</b>	N/A	79	75	76	76
<b>Fisheries Protection Program**</b>	543	524	468	339	289
<b>Total FTEs in FPP and AIS</b>	N/A	<b>603</b>	<b>543</b>	<b>415</b>	<b>365</b>

Source: Cognos Financial System, DFO

\*The AIS component was not relocated under the FPP until 2014-15. AIS data was not available for 2010-11, when it was aggregated under the Science for Sustainable Fisheries and Aquaculture Program. Previous years are given, to show FTEs working on fisheries protection and AIS in this five-year period.

\*\*Habitat Management Program (2010-11 to 2012-13); Fisheries Protection Program (2013-14 to 2014-15)

### 2.3 Program Partners and Stakeholders

The Fisheries Protection Program and its AIS component collaborate with a wide range of provincial, territorial and municipal governments; Aboriginal groups; other federal departments; internal DFO partners; industries; and non-governmental organizations (NGOs). For example, until 2016, the AIS component's research activities were undertaken by six DFO laboratories in collaboration with 31 researchers from 13 partner universities who made up the Canadian Aquatic Invasive Species Network. Annex B provides a list of FPP and AIS partners and stakeholders.

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<sup>8</sup> 226 FTEs were A-base funded; 54 FTEs were B-base funded by two horizontal initiatives (42 FTEs by the Major Projects Management Office, led by Natural Resources Canada and 12 FTEs by the Federal Contaminated Sites Action Plan, led by Environment Canada.

## **3.0 EVALUATION METHODOLOGY**

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### **3.1 Evaluation Design and Approach**

The Evaluation Directorate selected a process evaluation approach for this evaluation, to account for the newness and the complexity of the Fisheries Protection Program and its AIS component; and because the FPP had undergone many changes during the period being evaluated. Process evaluations focus on assessing how well a program is being implemented, rather than whether or not it has achieved all of its expected outcomes; they are useful in a context where only partial information about outcomes is available. A key challenge for the AIS component is that its success is measured by the *absence* of AIS, in other words, maintaining *status quo*. The evaluation considered the AIS component's strengths, achievements and challenges in light of the ongoing need for preventative action and AIS research. The Evaluation Directorate gathered information from multiple lines of evidence, which were triangulated in order to corroborate findings. Lines of evidence are detailed below, in section 3.2.

Evaluation questions were determined on the basis of the Treasury Board's *Policy on Evaluation* (2009), a review of key program documents, and results from preliminary discussions with key program personnel (FPP and AIS). Questions covered relevance and performance, including effectiveness, efficiency and economy. The Evaluation Matrix (Annex C) lists the evaluation questions alongside the lines of evidence and complementary research methods, which were used to ensure the reliability of the information and data that was collected.

Finally, it is important to note that this evaluation of the Fisheries Protection Program and its Aquatic Invasive Species component reflects the efforts and challenges of both DFO sectors that are involved in their implementation: the Ecosystems and Fisheries Management Sector and the Ecosystems and Oceans Science Sector. The evaluation was conducted using documents, in addition to staff, stakeholder and partner input, from both sectors.

### **3.2 Data Sources**

The following lines of evidence were used to gather qualitative and quantitative data for the evaluation.

#### **Document Review**

A review of relevant existing program documentation provided perspective on the activities and outputs of the FPP and its AIS component, and was used to address all evaluation questions.

#### **Key Informant Interviews**

A total of 45 key informants were interviewed individually or in small group interviews. Fisheries Protection Program and Aquatic Invasive Species employees within NHQ and all regions were interviewed; as were external partners in the Central and Arctic Region, divided as follows:

- FPP and AIS Senior management and Program staff, NHQ and all regions (n = 28)
- FPP and AIS External partners, Central and Arctic Region (n = 17)

### **Site Visit to Central and Arctic Region in Southern Ontario**

A site visit of regional operations in Southern Ontario took place in January 2016. The Central and Arctic region was selected because its staff members are involved in activities from both FPP ‘arms’ and the AIS component. Moreover, the Central and Arctic Region receives more than 80% of AIS funding; and all activities related to the Asian Carp Initiative and Sea Lamprey control are conducted from the C&A Region.

### **Recreational Fisheries Conservation Partnerships Program Formative Review**

Findings from the 2015-16 formative review of the Recreational Fisheries Conservation Partnerships Program were considered in the evaluation of the Fisheries Protection Program. The review’s methodology consisted of a document review; an analysis of five case projects; a review of administrative data; interviews with 26 program personnel and stakeholders; an online survey of 280 project proponents; and a review of six Grants and Contributions online application systems.

### **3.3 Methodological Limitations and Mitigation Strategies**

The evaluation encountered some challenges, which were primarily due to the significant restructuring of the Fisheries Protection Program and the addition of its AIS component during the period under evaluation.

The evolution of the Habitat Management Program into the Fisheries Protection Program in 2013 resulted in two sets of performance data (pre- and post-2013), that could not be compared. Likewise, performance indicators and expected outcomes from pre- and post-2013 were not comparable, because they were modified after the amendments to the *Fisheries Act* in 2013.

An analysis of FPP and AIS budgets; and human resources by ‘arm’, component and initiatives was likewise challenging, both because this information was frequently not available in a disaggregated format; and more importantly, because the FPP does not conduct its activities as described in the PAA.

The evaluation chose to use a process evaluation approach to address some of the challenges posed by incomparable data and expected outcomes pre- and post-2013; and FPP was assessed by its operational structure, rather than its PAA structure (Annex A).

Data and reporting challenges were mitigated, where possible, through the use of multiple lines of evidence and the triangulation of data. This approach ensured the reliability and validity of the evaluation’s findings, and that conclusions and recommendations were based on objective and documented evidence.

## 4.0 FINDINGS

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### 4.1 Relevance

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**Key Finding:** The Fisheries Protection Program is aligned with federal roles and responsibilities and government priorities. The FPP fulfills an ongoing need to protect fish and fish habitat from projects taking place in and near Canadian waters.

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**Key Finding:** The Aquatic Invasive Species component is aligned with federal priorities and a broader strategy against AIS and partially responds to an ongoing need to prevent the introduction, establishment and spread of AIS into Canadian waters. The AIS component has successfully prevented the introduction and establishment of Asian Carp, and controlled Sea Lamprey in the Great Lakes; risk analyses and the presence of AIS in many parts of Canada, demonstrate that freshwater and marine waters across Canada are also threatened. The potential damage some AIS can cause should not be underestimated; once AIS established, they can multiply and spread rapidly; and control measures can take many years to produce results. The damage that some AIS have caused and can cause far outweighs the cost of prevention. For years AIS activities have been more reactive than proactive and the uneven distribution of funds has resulted in a focus on two species in the Great Lakes (i.e., Sea Lamprey and Asian Carp). With the continued increase in international trade and travel, the threat of AIS introduction will continue to grow, which supports the need for AIS related research, prevention and/or control activities across Canada.

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#### 4.1.1 Continued need for the Program

Canada's economic prosperity is intimately linked to the strength of its freshwater and marine fisheries industry. Together, commercial, recreational and Aboriginal fisheries contribute billions of dollars to the Canadian economy.<sup>9</sup> For example, in 2013, commercial fisheries across Canada generated \$2.1 billion. In 2010, the recreational fisheries sector contributed \$8.3 billion to the Canadian economy.<sup>10</sup> In 2012, the value of commercial Aboriginal fisheries was reportedly \$109.2 million (5.7%) of the commercial fishery in Atlantic Canada; and \$20 million (6.8%) of the Canadian Pacific commercial fishery.<sup>11</sup>

Canadian fisheries are supported by fish and fish habitat. There is an ongoing need to oversee and monitor human activities undertaken in and near freshwater and marine waters, which have the potential to negatively impact the fishery industry by causing serious harm to fish and fish habitat. Fish and fish habitat and the fisheries they support are also threatened by aquatic invasive species.

Fisheries protection and the threat of aquatic invasive species are visible public issues, which are regularly reported in the media (see Graph 1). These issues are often discussed through a

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<sup>9</sup> Same-year comparative data for all three sectors is not reported.

<sup>10</sup> The recreational fisheries sector's contribution includes a broad range of revenues (e.g., sales of boats and fishing equipment used for recreational purposes).

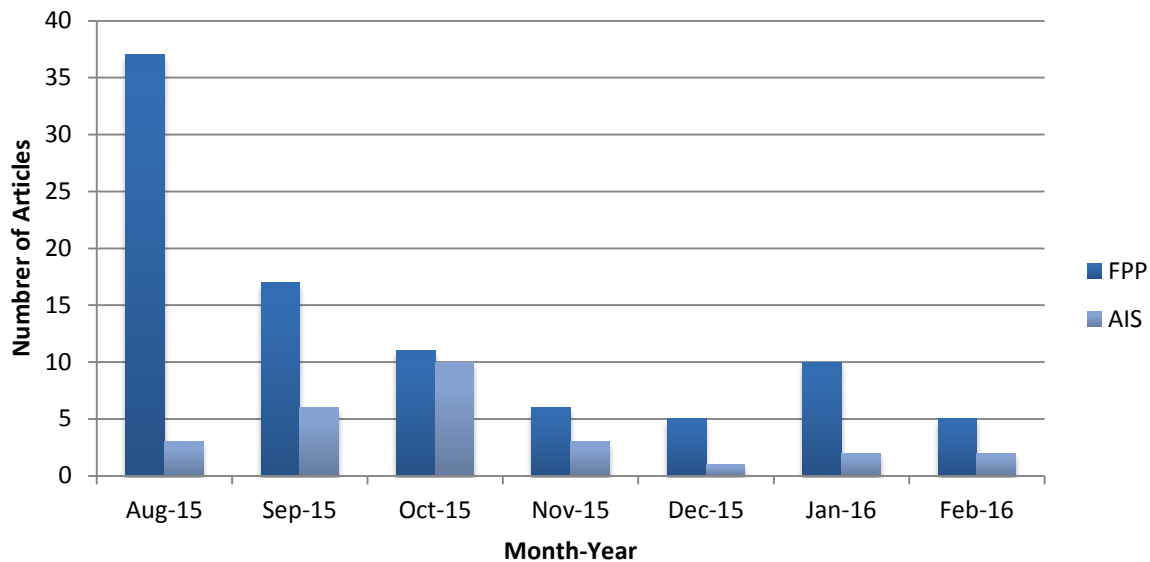
<sup>11</sup> Aboriginal fisheries exist for commercial, food, social and ceremonial purposes. The aforementioned figures are for commercial Aboriginal fisheries only.



regional lens, e.g., protection of marine or freshwater fisheries, and threats posed by AIS to particular regions.

The Fisheries Protection Program and its AIS component respond to an ongoing need to monitor human activities in and near freshwater and marine waters; and to address public concern over the protection of Canadian fisheries and threats posed by AIS.

Graph 1 – Articles Published in the Canadian Media regarding Fisheries Protection and Aquatic Invasive Species, August 2015 to February 2016



Source: DFO Electronic Media Monitoring Bulletin

What follows is an analysis of the evidence that was available to the evaluation team. It demonstrates that there is an ongoing need for the control of Sea Lamprey and to preventing the introduction and establishment of Asian Carp. Moreover, it demonstrates that the damage that some AIS have caused and can cause far outweighs the cost of prevention. This evidence, combined with the presence of AIS in many parts of Canada, which have already had an impact on local economies and ecosystems, suggests the desirability for broadening DFO’s focus on AIS prevention and altering the funding model to reflect a more national approach. Several AIS that have had detrimental effects within Canada will be discussed in this section.

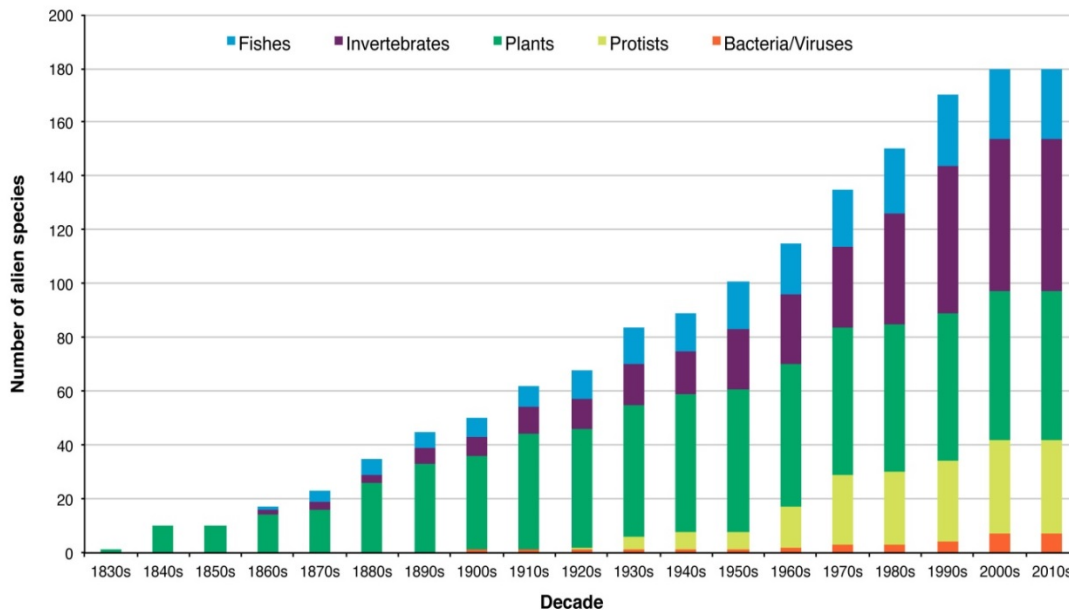
### *Aquatic alien species*

Hundreds of aquatic alien species are already present in Canada and the steady increase in international travel and trade, “especially in the case of goods or vessels from countries with similar climates to Canada,” means that the number of aquatic alien species being introduced into the country will only continue to grow.<sup>12</sup> Graph 2 demonstrates the rapid increase in aquatic

<sup>12</sup> [HTTP://WWW.DFO-MPO.GC.CA/SCIENCE/ENVIRONMENTAL-ENVIRONNEMENT/AIX-EAE/PUBLICATIONS/PLAN/PAGE03-ENG.HTML](http://www.dfo-mpo.gc.ca/science/environmental-environnement/aix-eae/publications/plan/page03-eng.html)

alien species that have established themselves in the Great Lakes between 1830 and 2010, by type.<sup>13</sup>

Graph 2 – Cumulative Number of Aquatic Alien Species in the Great Lakes, by Decade



Source: Ontario Biodiversity Council

The number of introduced aquatic alien species is not in itself the most pressing issue. Some introduced species are not able to establish themselves to the point where they can reproduce, thrive, and become invasive; and some establish themselves with little to no damage to the natural environment or threat to biodiversity.

***Aquatic invasive species: their nature, introduction, and spread***

Aquatic invasive species are fish, animal and plant species that, when introduced into host waters and established, cause harm to other species, the surrounding environment, infrastructure, the economy and/or society.<sup>14</sup> Aquatic invasive species can devastate host waters; alter aquatic ecosystems; deplete or kill off native species; create problems for industry by, for example, clogging pipes; and can affect humans by fouling waters used for leisure and/or drinking water.<sup>15</sup> Their destructive nature once established and the associated environmental and financial costs, explains why AIS efforts in Canada, in the United States and internationally have focused upon preventing the introduction of AIS to reduce the possibility of a destructive and costly invasion.

<sup>13</sup> <http://sobr.ca/indicator/alien-species-great-lakes/>

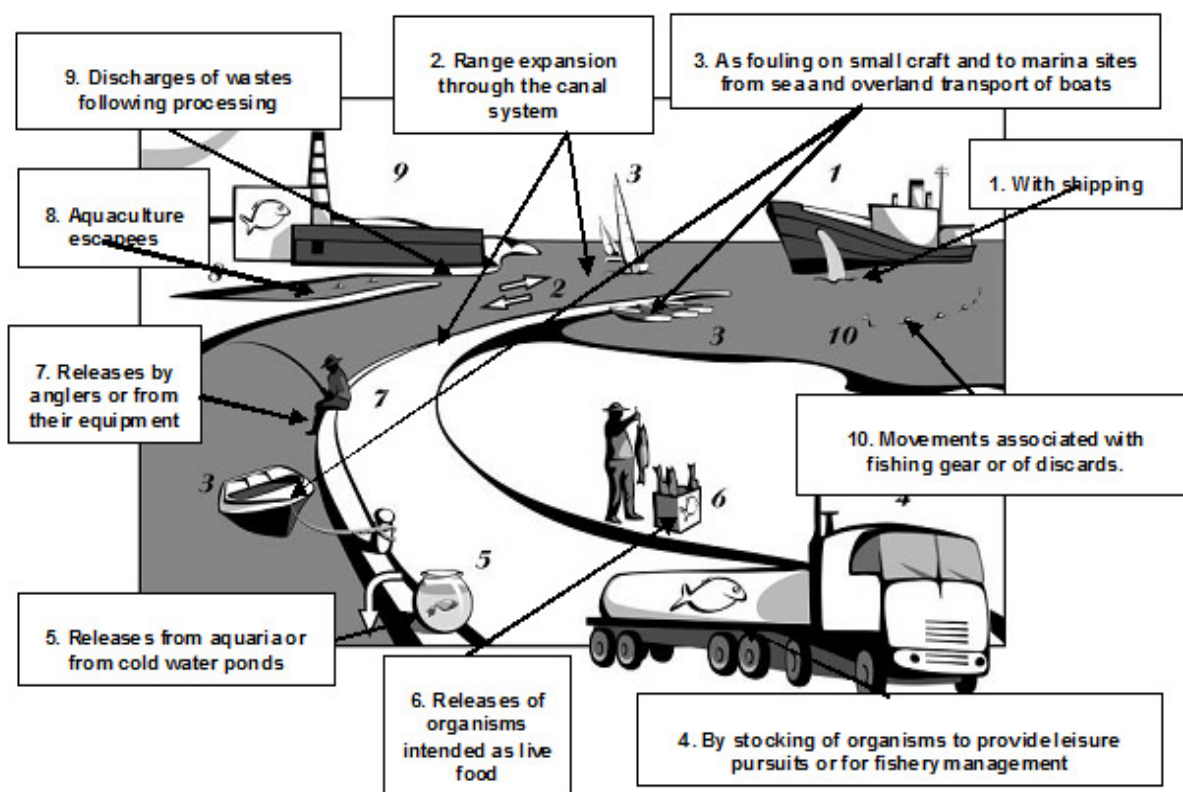
<sup>14</sup> Report of the Standing Committee on Fisheries and Oceans (April 2013)

<sup>15</sup> Report of the Standing Committee on Fisheries and Oceans (April 2013)

In May 2015, the *Aquatic Invasive Species Regulations* came into force. The Regulations enable federal and provincial governments to prevent the introduction of AIS into Canadian waters, to respond to an invasion and to manage the spread of established AIS.<sup>16</sup>

Aquatic invasive species are introduced to Canadian waters through a number of pathways, intentionally, accidentally or illegally. Examples of intentional and illegal introductions include fish harvesters importing AIS to create new fishing opportunities and the transportation of live fish and shellfish for sale. AIS are mostly introduced accidentally in the ballast water of ocean-going vessels and the bottom of leisure craft.<sup>17</sup> The main pathways for AIS introduction and spread are illustrated below.

Figure 1 – Main Pathways for Aquatic Invasive Species Introduction and Spread



Source: Globallast Partnerships website.<sup>18</sup>

Because AIS are introduced through a variety of pathways, not every region of Canada experiences the same type of AIS risks. For example, the shipping pathway has introduced the most established AIS in coastal regions and the Great Lakes; in provinces like Alberta and Saskatchewan, which do not experience AIS risk from the shipping pathway, AIS are introduced

<sup>16</sup> <http://laws-lois.justice.gc.ca/eng/regulations/SOR-2015-121/FullText.html>

<sup>17</sup> [HTTP://WWW.PAC.DFO-MPO.GC.CA/AIS-EAE/INDEX-ENG.HTML](http://www.pac.dfo-mpo.gc.ca/AIS-EAE/INDEX-ENG.HTML) and <http://www.dfo-mpo.gc.ca/science/environmental-environnement/ais-eae/publications/plan/page05-eng.html>

<sup>18</sup> <http://globallast.imo.org/the-invasive-aquatic-species-2/>

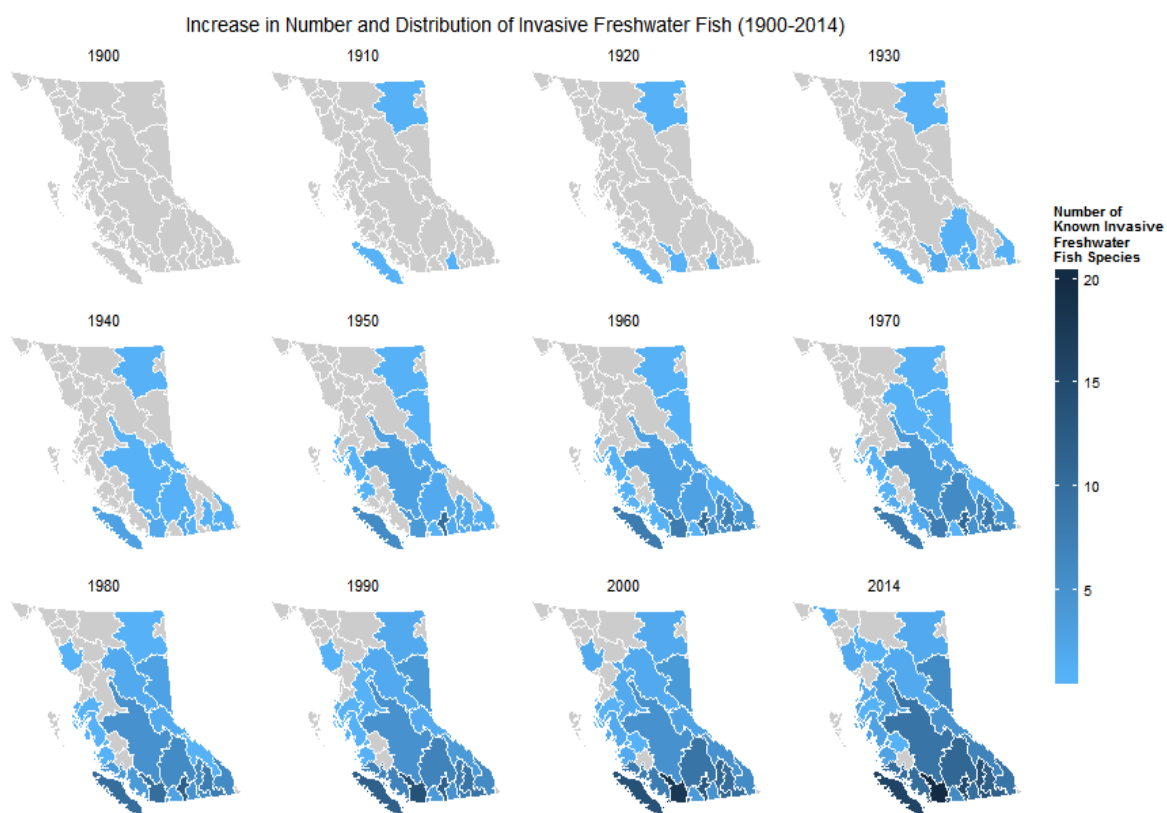
and spread by means of other pathways, such as recreational and commercial boating, and the aquarium trade. “The flexibility to allow for regional and jurisdictional differences in priorities is an integral component” of preventing and managing AIS on a national-scale.<sup>19</sup>

The threat of AIS introduction will continue to grow, with the continued increase in international trade and travel, so too will the need for continued AIS work, including research and prevention efforts.

***AIS are found across Canada and the spread and establishment of some AIS results in extensive ecological and economic damage***

Once introduced and established into a body of water, historical data shows that some AIS can multiply and spread rapidly for reasons that may include a lack of natural predators in their new environment. Figure 2 shows the rapid spread of invasive freshwater fish species found in British Columbia, between 1900 and 2014.<sup>20</sup>

Figure 2 – Increase in the Number and Distribution of Invasive Freshwater Fish (1900-2014)



Source: Ministry of Environment, British Columbia

<sup>19</sup> <http://www.dfo-mpo.gc.ca/science/environmental-environnement/ais-eae/publications/plan/index-eng.html>

<sup>20</sup> [http://www.env.gov.bc.ca/soe/indicators/plants-and-animals/invasive\\_species.html](http://www.env.gov.bc.ca/soe/indicators/plants-and-animals/invasive_species.html)

The potential damage some AIS can cause should not be underestimated. If they are established in an ecosystem, some AIS can radically alter their host habitat, reducing biodiversity, causing reductions in, or extinctions of, populations of indigenous fish, degrading water and habitats, altering infrastructure, introducing disease, and reducing recreational opportunities.

Historical experience has shown that AIS can inflict devastating damage on fish and fish habitat, and by extension, on the fisheries that rely upon healthy fish populations. Control measures can take many years to produce results. One case in point is the Sea Lamprey, an eel-like parasitic aquatic invader that attacks and will kill many species of fish in the Great Lakes. According to the Great Lakes Fishery Commission, “each individual (Sea Lamprey) is capable of killing” the equivalent of 18 kilograms of fish in its “12-18 month feeding period.”<sup>21</sup>

Sea Lamprey spread from Lake Ontario to the rest of the Great Lakes in the early 1900s. Before they were established in the Great Lakes basin, Canada and the United States had been harvesting approximately 15 million pounds of lake trout annually, but by the 1960s, they were harvesting only 300,000 pounds; sea lampreys were killing a large percentage of Great Lakes fish and hundreds of thousands of workers lost their jobs in the region.<sup>22</sup>

The ongoing suppression of Sea Lamprey requires a substantial effort and costs \$25 million per year and is indicative of the potential economic consequences associated with AIS.<sup>23</sup> The Great Lakes Fishery Commission has been directing Sea Lamprey control since its establishment in 1955. Vigilant control measures have reduced Sea Lamprey in many areas of the Great Lakes basin by 90%. Because it is impossible to eradicate sea lampreys from the Great Lakes, DFO and its partners continue to explore new methods of control, to support the prosperity and use of the Great Lakes.<sup>24</sup> Investing in Sea Lamprey control and research helps to protect the Great Lakes fishery industry, which contributes approximately \$1.3 billion to the Canadian economy.



The Sea Lamprey’s suction mouth attaches to fish and wounds them, weakening many to the point of death.

Source: Great Lakes Fishery Commission<sup>25</sup>

<sup>21</sup> <http://www.glfsc.org/sealamp/index.php>

<sup>22</sup> <http://www.glfsc.org/sealamp/>

<sup>23</sup> Ontario Invasive Species Strategic Plan 2012, pg. 6; and Aquatic Invasive Species Regulations (2015) <http://canadagazette.gc.ca/rp-pr/p2/2015/2015-06-17/html/sor-dors121-eng.php>

<sup>24</sup> <http://www.dfo-mpo.gc.ca/species-especes/lamprey-lamproie-eng.htm>

<sup>25</sup> This picture is also reproduced on DFO site <http://www.dfo-mpo.gc.ca/species-especes/lamprey-lamproie-fra.htm>



Sea lampreys feeding  
on a fish.

Photo Source: DFO<sup>26</sup>

Zebra Mussel is another example of an AIS found across Canada and in the United States, whose establishment has resulted in substantial damage to aquatic ecosystems, infrastructure, and provincial economies. Native to the Black Sea region of Eurasia and believed to have been introduced in Ontario in the late 1980's by ballast water from transoceanic ships, zebra mussels are now found throughout the Great Lakes, in other Canadian freshwater lakes (e.g., Lake Winnipeg) and in the United States.<sup>27</sup>

Canada's experience with Zebra Mussel lends weight to the importance of preventing the introduction of AIS: its invasion is so aggressive that it has been impossible to eradicate once established. Female zebra mussels can produce up to one million eggs per year; and zebra mussels are able to heavily colonize hard and soft surfaces.<sup>28</sup> Colonies of zebra mussels have colonized docks, boats, break walls and beaches, and even other native species of mussels. They destroy infrastructure by obstructing water-intake pipes for public drinking water supplies and cooling systems; and clogging intake structures in power stations and water treatment plants.<sup>29</sup> Zebra mussels alter their host aquatic ecosystem and threaten native fish and wildlife by altering the food web through filter-feeding and attaching to native mussels and crayfish. Zebra mussels even affect recreational boating and leisure: sharp shells across beaches harm visitors and decaying zebra mussels produce foul odors.<sup>30</sup>

Information related to the cost of managing zebra mussels and their impacts on infrastructure is not readily available for all of Canada as some costs are borne by industry and provincial

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<sup>26</sup> <http://www.dfo-mpo.gc.ca/science/environmental-environnement/freshwater-eauxdouces-eng.htm>

<sup>27</sup> Zebra mussels impede the growth of food sources, such as plankton; increase toxic algae blooms; and may threaten fish spawning locales, affecting the survival of fish eggs.

<http://www.invadingspecies.com/invaders/invertebrates/zebra-and-quagga-mussels/>

<sup>28</sup> [http://www.gov.mb.ca/sd/waterstewardship/stopais/zebra\\_mussel/index.html](http://www.gov.mb.ca/sd/waterstewardship/stopais/zebra_mussel/index.html)

<sup>29</sup> <http://www.invadingspecies.com/invaders/invertebrates/zebra-and-quagga-mussels/>

<sup>30</sup> [http://www.gov.mb.ca/sd/waterstewardship/stopais/zebra\\_mussel/index.html](http://www.gov.mb.ca/sd/waterstewardship/stopais/zebra_mussel/index.html)

governments; but is estimated at \$7 billion.<sup>31</sup> The Zebra Mussel's economic impact in Ontario is believed to be between \$75 million and \$91 million per year; a figure that includes public education, cleaning and the maintenance of equipment.<sup>32</sup> And controlling Zebra Mussel in water intake pipes alone in the Great Lakes basin costs \$250 million annually.<sup>33</sup>



Zebra mussels attached  
to metal (2004).

Thames River, Ontario.  
Fanshawe Reservoir.

Photo credit: Todd Morris  
Source: DFO Virtual Library

The Zebra Mussel is on the British Columbia government's priority list of invasive species and features prominently on other provincial government web pages devoted to invasive species, including Saskatchewan, Manitoba, and Ontario.<sup>34</sup>

Sometimes the primary effects of an invasion by AIS do not appear to be damaging, but secondary effects can be destructive. For example, when zebra mussels first established in the Great Lakes, their filter feeding actually increased the water's clarity; however, over time, the clearer water increased the "growth and spread of aquatic vegetation and increased the frequency and severity of toxic algal blooms."<sup>35</sup>

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<sup>31</sup> <http://globalnews.ca/news/2269026/zebra-mussels-cost-canadians-billions-each-year-cost-to-manitobans-still-unknown/>

<sup>32</sup> Ontario Invasive Species Strategic Plan 2012

<http://globalnews.ca/news/2269026/zebra-mussels-cost-canadians-billions-each-year-cost-to-manitobans-still-unknown/>

<sup>33</sup> <http://globalnews.ca/news/2269026/zebra-mussels-cost-canadians-billions-each-year-cost-to-manitobans-still-unknown/>

<sup>34</sup> <HTTPS://WWW.FOR.GOV.BC.CA/HRA/INVASIVE-SPECIES/PRIORITY.HTM#>

<HTTP://WWW.ENVIRONMENT.GOV.SK.CA/INVASIVESPECIES>

Zebra mussels have been established in the Great Lakes for many years; however, they were found in Lake Winnipeg in October, 2013. <http://news.nationalpost.com/news/canada/why-are-zebra-mussels-in-lake-winnipeg-such-a-calamity-when-theyve-been-in-the-great-lakes-for-decades>

<sup>35</sup> <HTTP://WWW.DFO-MPO.GC.CA/SCIENCE/ENVIRONMENTAL-ENVIRONNEMENT/AIS-EAE/DOCUMENTS/PLAN-ENG.PDF>

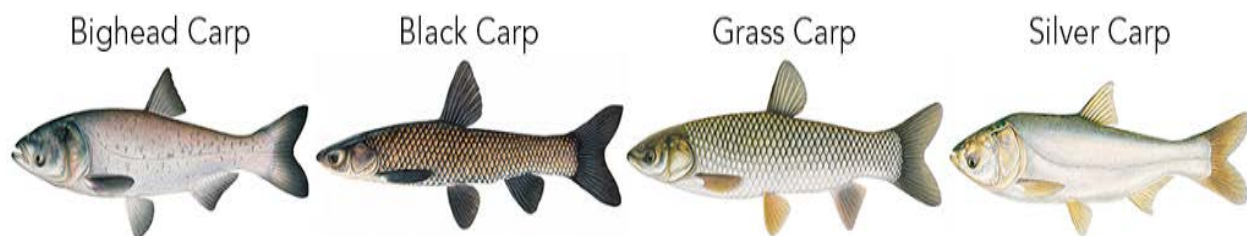
The Green Crab is another invasive species found across Canada; it is “one of the ten most unwanted species in the world.”<sup>36</sup> It was first recorded in Nova Scotia in the 1950s and is now found on the East and West coasts of Canada. Green Crab is believed to spread primarily while at its larval stage through ballast water transfers or by drifting on ocean currents. Green Crab threatens marine and estuarine ecosystems and fisheries by feeding voraciously upon a wide variety of intertidal animals (e.g., oysters, mussels, clams, and juvenile crabs) and out-competing native crab species and lobster for food and shelter. It harms the marine aquaculture industry by feeding on molluscs, damaging eels that have been trapped, and eating young finfish.<sup>37</sup>

Rainbow Smelt is a small (8 to 36 centimetres), schooling predatory fish native to north Atlantic coastal regions. Through deliberate stocking, Rainbow Smelt has invaded many inland lakes in Canada, including the Great Lakes, lakes Simcoe, Nipissing and Nipigon; lakes in northwestern Ontario; and lakes in Manitoba (e.g., Lake Winnipeg). In its natural habitat, it lives in marine waters and spawns in freshwater; however, it is capable of living its entire life in freshwater.<sup>38</sup> Rainbow Smelt eat plankton and the young of native fish (and its own). It is now established in Hudson’s Bay.<sup>39</sup>

### *The Asian Carp Initiative*

Asian Carp (i.e., Bighead, Black, Grass and Silver – see Figure 3) is group of aquatic invasive species that threatens indigenous fish by decimating their main food source and overcrowding bodies of water. Asian Carp eat approximately 20 per cent of their body weight in plankton per day and some can grow to 100 pounds in weight.<sup>40</sup> Of the four species of Asian Carp, Bighead and Silver Carp have spread the most aggressively and are considered to be the greatest threat to indigenous fish and fish habitat in the Great Lakes, should they gain entry to the basin.<sup>41</sup>

Figure 3 – Four Species of Asian Carp<sup>42</sup>



Source: Asian Carp Canada

<sup>36</sup> <http://www.dfo-mpo.gc.ca/science/environmental-environnement/ais-eae/species/european-green-crab-eng.html>

<sup>37</sup> <http://www.dfo-mpo.gc.ca/SCIENCE/ENVIRONMENTAL-ENVIRONNEMENT/AIS-EAE/SPECIES/EUROPEAN-GREEN-CRAB-ENG.HTML>

DFO, Rapid Assessment of Halifax Harbour (2014) : <http://waves-vagues.dfo-mpo.gc.ca/Library/354908.pdf>

<sup>38</sup> <HTTP://WWW.INVADINGSPECIES.COM/INVADERS/FISH/RAINBOW-SMELT/>

<http://www.dfo-mpo.gc.ca/Library/338381.pdf>

<sup>39</sup> <http://www.invadingspecies.com/invaders/fish/rainbow-smelt/>

<sup>40</sup> <https://www.nwf.org/Wildlife/Threats-to-Wildlife/Invasive-Species/Asian-Carp.aspx>; and also Status Report on Asian Carp from 2005: [http://www.dfo-mpo.gc.ca/csas/Csas/status/2005/SAR-AS2005\\_001\\_e.pdf](http://www.dfo-mpo.gc.ca/csas/Csas/status/2005/SAR-AS2005_001_e.pdf)

<sup>41</sup> Aquatic Invasive Species Regulation, Regulatory Impact Analysis Statement;

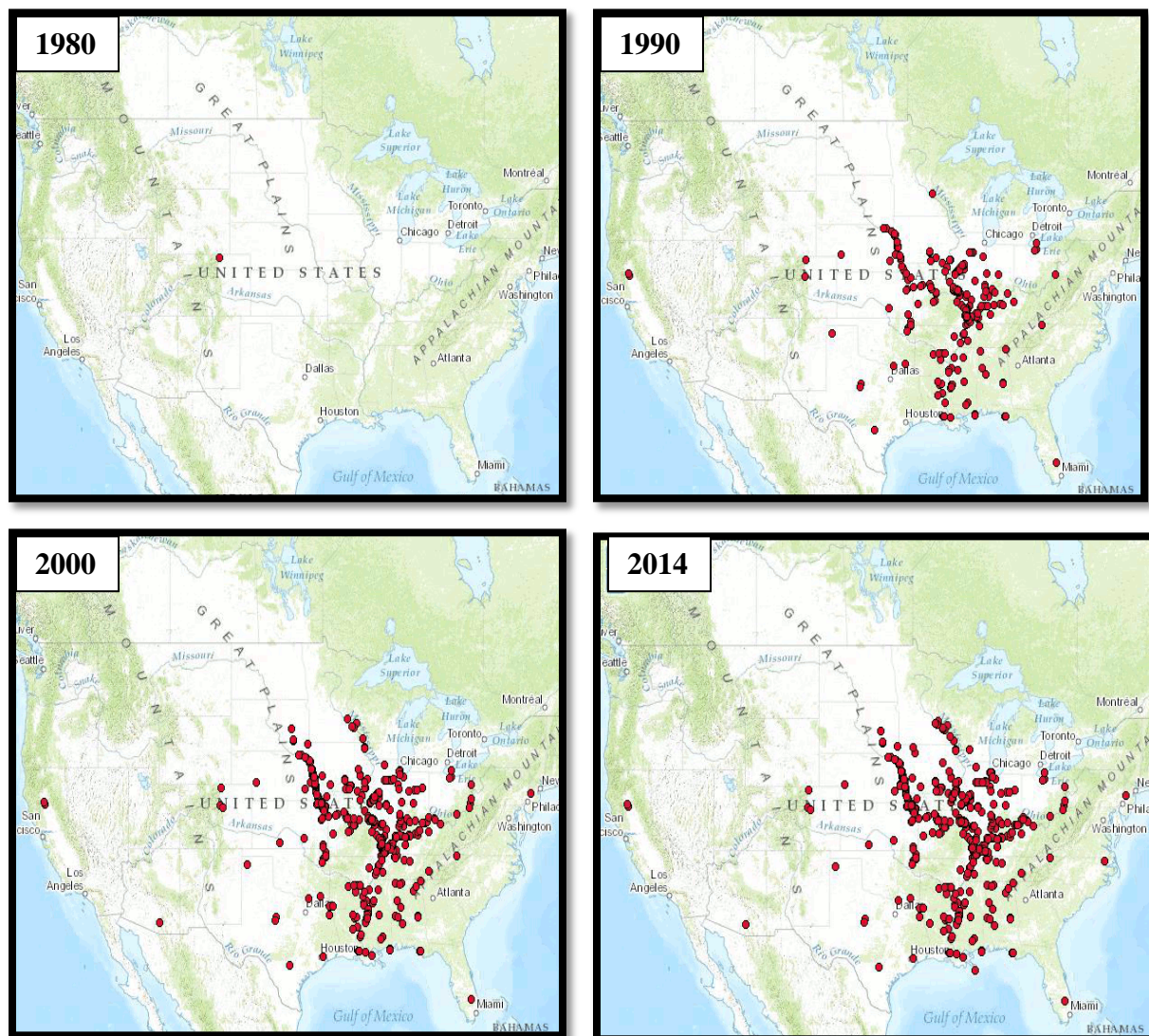
<HTTP://WWW.INVADINGSPECIES.COM/INVADERS/FISH/ASIAN-CARP>

<sup>42</sup> <http://asiancarp.ca/>



Asian carp were imported into the US in the 1970s to filter pond water in fish farms in Arkansas. Flooding allowed them to escape and establish reproducing populations in the wild by the early 1980s. Bighead carp have been found in the open waters of 23 states and silver carp in 17 states.<sup>43</sup> The following time series snapshots (Figure 4) illustrate the rapidity with which Asian Carp have spread across the United States, between 1980 and 2014.

Figure 4: Spread of Asian Carp through the United States, 1980 to 2014



Source: Asian Carp Canada website.<sup>44</sup>  
 Maps courtesy of United States Geological Survey.

<sup>43</sup> The spread of Asian Carp through the United States is thought to have initially occurred by flooding that connected waterways. <https://www.nwf.org/Wildlife/Threats-to-Wildlife/Invasive-Species/Asian-Carp.aspx>

<sup>44</sup> [HTTP://ASIANCARP.CA/ASIAN-CARPS/ABOUT-ASIAN-CARPS](http://asiancarp.ca/asian-carps/about-asian-carps)

The Chicago Area Waterway System is the likeliest point of entry for Asian Carp into Canada. The Waterway facilitates commercial maritime trade and is used extensively by recreational boaters. It is also “the largest known continuous connection between the Great Lakes and Mississippi River basins,” posing a significant risk for AIS transfer.<sup>45</sup> If Asian Carp were to establish in Lake Michigan, it could reach the connected Great Lakes basin and Canadian waters in fewer than five years.<sup>46</sup>

Both Canada and the United States are intent on preventing the spread of Asian Carp to the Great Lakes basin, which holds 20% of the world’s fresh surface water, is vital to the well-being of millions of Canadians and Americans, the commercial and recreational fisheries in both countries and their economies. The combined value of the Canadian and American commercial and recreational fishery industries in the Great Lakes is approximately \$9.4 billion (of which \$1.3 billion is the value for Canada (see Annex E)). In 2010, the Great Lakes supported approximately 40% of Canada’s economic activity, including 45% of its industrial capacity and 25% of its agricultural capacity.<sup>47</sup>

Many initiatives within the United States and Canada have been undertaken to respond to the threat of Asian Carp to the Great Lakes basin. Beginning in 2002, the U.S. Army Corps of Engineers built electric barriers on the fringes of Chicago, Illinois, to prevent Asian Carp from spreading into the Chicago Area Waterway.<sup>48</sup> These barriers are electrical fields in the waters that control the movement of fish through waterways, but do not interfere with vessel traffic. DFO launched the Asian Carp Initiative, \$17.5 million over five years, in 2012-13; on May 31, 2016, the Quebec provincial government announced \$1.7 million over three years to establish Phase 1 of a new program to prevent the establishment of Asian Carp<sup>49</sup>; and the United States launched the Great Lakes Restoration Initiative in 2010.<sup>50</sup> In 2016, more than \$US17.5 million of the Great Lakes Restoration Initiative funding, in addition to more than \$US39.8 million of American federal agency base funding, will be used by partners to implement key projects and initiatives to safeguard the Great Lakes from invasive Bighead, Silver, Grass and Black Carp.<sup>51</sup>

The Asian Carp Regional Coordinating Committee (ACRCC) is a collaborative effort among federal, state, provincial and other agencies to prevent the introduction, establishment, and spread of Asian carp into the Great Lakes. The ACRCC is chaired by the White House Council on Environmental Quality.<sup>52</sup> DFO joined the ACRCC in 2013; and the Ontario Ministry of

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<sup>45</sup> <http://asiancarp.ca/MONITORING-PREVENTION-AND-RESPONSE/Efforts-in-the-Chicago-Area-Waterway-System>

<sup>46</sup> Regulatory Impact Analysis Statement

<sup>47</sup> Salim Hayder, “Socio-Economic Impact of the Presence of Asian Carp in the Great Lakes Basin,” Fisheries and Oceans Canada (2014): [HTTP://WWW.DFO-MPO.GC.CA/SCIENCE/ENVIRONMENTAL-ENVIRONNEMENT/AIS-EAE/PUBLICATIONS/REPORT-SE-RAPPORT/INDEX-ENG.HTML](http://www.dfo-mpo.gc.ca/science/environmental-environnement/ais-eae/publications/report-se-rapport/index-eng.html)

<sup>48</sup> <http://www.asiancarp.us/documents/ACDistribution.pdf>

<sup>49</sup> Gouvernement du Québec, Ministère des Forêts, de la Faune et des Parcs, « *Programme québécois de lutte contre les carpes asiatiques* » (2016), <http://mffp.gouv.qc.ca/carpe-asiatiques-programme-quebecois-de-lutte/>

<sup>50</sup> <http://greatlakesrestoration.us/>

<sup>51</sup> The Initiative was launched in 2010.

<http://asiancarp.ca/Portals/0/Documents/Action%20Plan%20Press%20Release.pdf>

<sup>52</sup> [ftp://ftp.mrn.gouv.qc.ca/Public/Defh/DBMF/Comit%20scientifique%20carpes%20asiatiques/Comit%20c%20carpes%20asiatiques\\_20141006/ACRCC/ACRCC%20Pr%20sentations/ACRCC\\_JohnGoss\[1\].pdf](ftp://ftp.mrn.gouv.qc.ca/Public/Defh/DBMF/Comit%20scientifique%20carpes%20asiatiques/Comit%20c%20carpes%20asiatiques_20141006/ACRCC/ACRCC%20Pr%20sentations/ACRCC_JohnGoss[1].pdf)

Natural Resources and Forestry and the Quebec Ministère des Forêts, de la Faune et des Parcs are also members.<sup>53</sup> The ACRCC released its Asian Carp Control Action Plan in 2016. Formerly called the Asian Carp Control Strategy Framework, the document outlines the strategic and coordinated actions federal, provincial, state and local partners are taking to stop the introduction, spread and establishment of Asian Carp into the Great Lakes.<sup>54</sup>

Canada has also been involved in bi-national risk assessments of Asian Carp: a bi-national Ecological Risk Assessment of Bigheaded Carp for the Great Lakes basin, between Canada and the United States, was completed in 2012; and as of 2016, DFO and the Great Lakes Fishery Commission had co-led bi-national ecological risk assessments of Grass Carp and Black Carp, in partnership with the United States Geological Survey and the United States Fish and Wildlife Service.<sup>55</sup>

Despite extensive prevention efforts, Asian Carp have been caught in a few isolated instances in Canada. In these instances, DFO has invoked rapid response measures and tested the sexual maturity of any captured Asian Carp. In each case, no additional carps were found in the area and captured carps were sterile, immature, or fertile but lacking breeding grounds. As of 2016, Asian Carp was not considered to be established in Canada.

### ***AIS funding is unevenly distributed***

The majority of AIS funding has historically been directed to AIS threats to the Great Lakes area, i.e., to Sea Lamprey control, and more recently to Sea Lamprey control and the Asian Carp Initiative. More than 80% of AIS funds were directed towards the Asian Carp Initiative and Sea Lamprey control; while the remainder was distributed among all Regions and NHQ, for all other AIS work. As a result, the majority of AIS activities are undertaken by DFO's Central and Arctic region employees, who counter these two AIS threats. Table 3 demonstrates how AIS expenditures were distributed between the six DFO regions and NHQ in 2014-15.

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<sup>53</sup> [HTTP://WWW.ASIANCARP.US/ABOUTUS.HTM](http://www.asiancarp.us/aboutus.htm); and

<http://asiancarp.ca/Portals/0/Documents/Action%20Plan%20Press%20Release.pdf>

<sup>54</sup> <http://asiancarp.us/documents/2016AsianCarpActionPlan.pdf> - DFO is one of 26 members that form the Asian Carp Regional Coordinating Committee which is composed of eight States, eight US Departments, two provinces and other organizations. The Committee, with support from federal, state, and local agencies, and other private stakeholder entities, will create a sustainable Asian Carp control program to prevent introduction and implement actions to protect and maintain the integrity and safety of the Great Lakes ecosystem from an Asian Carp invasion via all viable pathways.

<sup>55</sup> [HTTP://WWW.DFO-MPO.GC.CA/CSAS-SCCS/PUBLICATIONS/SAR-AS/2011/2011\\_071-ENG.PDF](http://www.dfo-mpo.gc.ca/csas-sccs/publications/sar-as/2011/2011_071-eng.pdf)

Table 3: Regional Distribution of Aquatic Invasive Species Expenditures, in Dollars, 2014-15

Regions	2014-15
<b>Central and Arctic</b>	11,493,000*
<b>Quebec</b>	596,000
<b>National Headquarters</b>	405,000
<b>Gulf</b>	371,000
<b>Maritimes</b>	317,000
<b>Pacific</b>	293,000
<b>Newfoundland and Labrador</b>	157,000
<b>Total</b>	<b>13,632,000</b>

\*Includes funding for both the Asian Carp Initiative and Sea Lamprey control as well as regional funding for other AIS work in the Central and Arctic Region.

Preventing the introduction and establishment of Asian Carp and controlling Sea Lamprey in the Great Lakes meets a demonstrated need. At the same time, risk analyses and the presence of other AIS, including Green Crab, Zebra Mussel, tunicates, and Rainbow Trout, demonstrate that freshwater and marine waters across Canada are also threatened.

While the majority of AIS funds have been directed towards two AIS in the Great Lakes, there is an opportunity to address AIS-related issues on a broader scale across Canada.

#### **4.1.2 Alignment with Federal roles and responsibilities, and Government of Canada and DFO priorities**

Fisheries and Oceans Canada is the federal department responsible for conserving and protecting fish and fish habitat in Canada. The Fisheries Protection Program is responsible for the administration of the fisheries protection provisions of the *Fisheries Act*. The Program also has a role to play with respect to the *Canadian Environmental Assessment Act (2012)*, *Species at Risk Act*, many regulations (e.g., *Aquatic Invasive Species Regulations* and *Aquaculture Activities Regulations*) and other regulatory regimes (e.g., the *Mackenzie Valley Resource Management Act* and the *Yukon Environmental and Socio-economic Assessment Act*).

The Fisheries Protection Program is aligned with the federal government outcome: *A Clean and Healthy Environment*, in the Economic Affairs spending area of the Whole of Government Framework. This outcome aims to restore and protect the environment, and to ensure that natural resources are sustainably used.<sup>56</sup> Since 2010-11, various federal budgets and Speeches from the Throne have emphasized the importance of conserving fish habitat and protecting Canada against invasive species.

The Recreational Fisheries Conservation Partnerships Program was launched by the federal government under Budget 2013, received more funding under Budget 2014 and was extended

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<sup>56</sup> <http://www.tbs-sct.gc.ca/PPG-CPR/FRAME-CADRE-ENG.ASPX>

until 2019-20 under Budget 2015.<sup>57</sup> The RFCPP is aligned with the National Conservation Plan, because it supports stewardship activities for fisheries habitat restoration.<sup>58</sup> The RFCPP is the only federal funding source for recreational fisheries habitat restoration that does not require that funding be directed toward projects addressing species-at-risk. Furthermore, the RFCPP does not duplicate provincial programs: while some provinces have available funding for habitat restoration, the RFCPP's partnership requirement allows RFCPP funding opportunities to be complementary to provincial ones, which enables project proponents to undertake larger projects.

Activities undertaken by both the Fisheries Protection Program and its AIS component contribute to two of DFO's strategic outcomes: *Sustainable Aquatic Ecosystems* and *Economically Prosperous Maritime Sectors and Fisheries*. Regulatory review processes, the Recreational Fisheries Conservation Partnerships Program, and AIS-related activities, are all geared toward protecting and restoring fish and fish habitat, and the fisheries that depend on the sustainable use of these resources.

These priorities were reiterated in the ministerial mandate letter of 2015, where the Minister of Fisheries, Oceans and the Canadian Coast Guard was given the "...overarching goal to protect our three oceans, coasts, waterways and fisheries and ensure that they remain healthy for future generations..."<sup>59</sup> In this letter, the minister was tasked to work with his colleagues to review the previous government's changes to the *Fisheries and Navigable Waters Protection Acts*, restore lost protections, and incorporate modern safeguards; and review Canada's environmental assessment processes and introduce new, fair processes. The letter also renewed DFO's commitment to protect freshwater bodies – the Great Lakes, the St. Lawrence River Basin, and the Lake Winnipeg Basin. These freshwater areas are integral to commercial, recreational and Aboriginal fisheries, and received increased federal funding in 2010 through the Action Plan on Clean Water, led by Environment and Climate Change Canada.<sup>60</sup>

AIS-related work is also aligned with federal priorities and a broader strategy against invasive species, which include invasive land-based animals, insects, and plants. While AIS research and prevention is a federal priority, several players are involved in countering the threat of invasive species (e.g., all levels of government, non-governmental organizations and Aboriginal groups) as invasive species issues span jurisdictions.

The federal government has prioritized research into the introduction and spread of AIS since the early 2000s. Environment Canada led the development of the *Invasive Alien Species Strategy for Canada*, for which DFO led the aquatic invasive species portion. In 2004, the Department co-chaired the Canadian Council of Fisheries and Aquaculture Ministers' Aquatic Invasive Species Task Group, alongside the province of Ontario. This task force developed the Canadian Action

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<sup>57</sup> The RFCPP was initially granted \$4M in 2013-14 and \$6M in 2014-15; the Economic Action Plan 2014 extended the program for one year with \$15M (an additional \$5M in 2014-15 and \$10M in 2015-16). The RFCPP was last extended by Economic Action Plan 2015 with \$30M over three years, ending in 2019-20.

<sup>58</sup> <http://www.dfo-mpo.gc.ca/MEDIA/INFOCUS-ALAUNE/2014/RFCPP-PPCPR/INDEX-ENG.HTM>

<sup>59</sup> <http://pm.gc.ca/eng/minister-fisheries-oceans-and-canadian-coast-guard-mandate-letter>

<sup>60</sup> <https://www.ec.gc.ca/EAU-WATER/DEFAULT.ASP?LANG=EN&N=B1128A3D-1>

Plan to Address the Threat of AIS. In the 2005 Budget, the government allocated \$85 million over five years to address terrestrial and aquatic invasive species, \$20 million of which was for AIS. Of this \$20 million, \$10 million was allocated to Sea Lamprey control. Budget 2010 allocated \$19 million per year to Environment Canada, DFO, Natural Resources Canada and the Canadian Food Inspection Agency, to continue to implement the AIS Strategy. Budget 2012 allocated \$17.5 million over five years to prevent the introduction and spread of Asian Carp into the Great Lakes. In April 2013, a report of the Standing Committee on Fisheries and Oceans, entitled, “Invasive species that pose a threat to the Great Lakes system,” noted the importance of pursuing efforts to control AIS.

DFO’s AIS-related work is also aligned with international agreements, particularly bi-national efforts between Canada and the United States. DFO has been involved in countering AIS since 1955, when Canada and the United States entered into the Great Lakes Fishery Commission Agreement to coordinate efforts for the control of Sea Lamprey in the Great Lakes. Canada officially recognized AIS as a priority in its Canadian Biodiversity Strategy (1995); and confirmed its goal of preventing the introduction of AIS in its *Invasive Alien Species Strategy for Canada* (2004). DFO is a member in several bi-national agreements, including the Internal Joint Commission’s Great Lakes Water Quality Agreement, which contains clauses related to AIS.

## 4.2 Governance

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**Key Finding:** The governance structure of the Fisheries Protection Program’s two ‘arms’ functions well, but there is an opportunity for closer collaboration in some instances. There are challenges related to the integration of the AIS component within the Fisheries Protection Program, i.e., reporting challenges and a need to clarify roles and responsibilities of both the Ecosystems and Fisheries Management Sector and the Ecosystems and Oceans Science Sector, as they relate to aquatic invasive species work.

There was limited national direction for the AIS component and the establishment of priorities and activities related to aquatic invasive species was at the discretion of each region. For example, the regions monitor known AIS, but have no dedicated management capacity to prevent or manage the spread of AIS outside of the Great Lakes area. The AIS component’s lack of clear national objectives has perpetuated this regionally-driven operational reality. This finding is consistent with the previous evaluation and audits, as far back as 2002.

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### *Fisheries Protection Program two ‘arms’*

The Fisheries Protection Program has an office at National Headquarters in Ottawa; and 16 service delivery points across the country with regional headquarters in each of the six DFO regions. Employees work for the Ecosystems and Fisheries Management Sector at DFO.

Fisheries Protection Program employees working at NHQ are responsible for coordinating the delivery of the FPP (including the RFCPP); providing national policy direction; providing strategic advice; and liaising with other DFO sectors, federal departments, national industry and non-governmental organizations, on behalf of FPP.

The Triage, Planning & Regulatory Review ‘arm’ of the FPP consists of regulatory review assessors in the six DFO regions who are divided into specialized sector-based units including: Mining, Oil and Gas; Linear Development; Marine and Coastal; and Hydro and Flows.

Employees working in the Client Liaison, Partnerships, Standards & Guidelines ‘arm’ are responsible for developing partnership arrangements, and standards and guidelines. These staff members also deliver the Recreational Fisheries Conservation Partnerships Program.

Overall, the corporate governance structure of FPP’s two ‘arms’ functions well. The National Ecosystem Management Oversight (NEMO) committee provides leadership and direction to staff at the regional headquarters offices and staff at NHQ. In 2013, NEMO played a crucial role in supporting Habitat Management Program’s transition to the Fisheries Protection Program. However, FPP’s two ‘arms’ tend to operate in silos and there are opportunities for more collaboration between the two FPP ‘arms.’ For example, a closer working relationship between staff responsible for developing standards and guidelines and staff working on regulatory review would help to ensure that standards and guidelines developed respond to the needs of regulatory reviewers.

### *Aquatic Invasive Species component*

The Ecosystems and Fisheries Management Sector is responsible for both FPP ‘arms’ and the AIS component, including corporate reporting; however, EFM has limited knowledge on many activities related to the AIS component, because it is delivered primarily by the EOS Sector.

There are only two EFM staff members at National Headquarters who work on AIS component activities. Their responsibilities have included preparing the *Aquatic Invasive Species Regulations*, providing a secretariat function for the National Aquatic Invasive Species Committee at the Canadian Council of Fisheries and Aquaculture Ministers, and providing support for corporate reporting and briefings.

All other work for the AIS component (e.g., research, monitoring, detection of new species, and response and management of established species) is delivered by the Ecosystems and Oceans Science Sector in the regions, where EFM employees are not involved in AIS activities. Furthermore, AIS funding is allocated directly to EOS and then distributed to EFM and the regions; with the Central and Arctic region receiving more than 80% of total AIS funds.

Geographical and working division between the two sectors and NHQ and the regions led to communication challenges. For example, performance information did not flow smoothly from EOS in the regions to EFM at National Headquarters. This, in turn, had exacerbated reporting challenges for the EFM Sector, which was already removed from much of the AIS on-the-ground work.

In order to assist with the alignment of the AIS component under the FPP and to help clarify the roles and responsibilities of each sector with respect to the AIS component, the Central and Arctic Region created a temporary assignment for one worker who was coordinating regional AIS activities for the Asian Carp Initiative to switch sectors within the region. The employee, who worked for the EOS Sector in the C&A region, was transferred temporarily to the EFM

Sector in the same region. At the time of the evaluation, this pilot assignment was ongoing and no lessons learned were yet available.

Discussions and some actions (e.g., the assignment within the C&A Region) have been undertaken to facilitate the integration of the AIS component's activities within the Fisheries Protection Program; however reporting challenges remained at the time of the evaluation. Moreover, there remained a need to clarify roles and responsibilities of each sector with respect to the AIS component.

The evaluation also found that there was limited national direction for the AIS component; and the establishment of priorities and activities related to AIS was at the discretion of each region. For example, the regions monitor known AIS, but there is little dedicated management capacity to prevent or manage the spread of AIS outside of the Great Lakes area. Interviewees explained that this situation had evolved because the AIS component is not a 'program,' *per se* and because most of the funding allocated to AIS annually is directed toward Sea Lamprey control and the Asian Carp Initiative.

The need for a "coordinated national response to aquatic invasive species" was noted as early as 2002 and again in 2008 by the March Status Report of the Commissioner of the Environment and Sustainable Development, Office of the Auditor General. The 2008-09 DFO evaluation also noted several areas in which the AIS funding model was problematic. Recommendations made in the 2008-09 evaluation, to strengthen the effectiveness of the AIS component, centered on its need for national, long-term strategic direction.

Most issues conveyed by the previous evaluation and audits continued to be a challenge for the AIS component in the current evaluation. The AIS component is regionally-driven; the current funding model is more reactive than proactive; AIS are addressed on a species-by-species basis; most AIS funding is dedicated to two species of AIS in the Great Lakes; and there is no dedicated AIS management capacity other than the implementation of Sea Lamprey control and the Asian Carp Initiative. There is a need to identify clear national objectives for the AIS component and to reassess the governance structure.

### **4.3 Performance**

This section examines the performance of the Fisheries Protection Program's two 'arms' and its AIS component, in terms of their effectiveness (achievement of results); efficiency and economy (resource utilization). Key Findings are presented at the beginning of each sub-section.

#### **4.3.1 Effectiveness**

As discussed in section 3.3, Methodological Limitations and Mitigation Strategies, measuring program outcomes was challenging due to the significant restructuring of the Fisheries Protection Program during the course of the evaluation period. In particular, there was a breakpoint in terms of performance data collection before and after November 2013, which meant that data from these two periods could not be compared. Furthermore, the FPP modified its expected results and indicators in the Departmental Performance Report of 2013-14, making comparison with previous years not possible.



The evaluation's assessment and findings for the period of 2010-11 to pre-November 2013, for both FPP 'arms' pertain to the former Habitat Management Program's achievement of results. Activities performed after 2013 for both 'arms' are discussed in terms of challenges, key achievements and developments of the Fisheries Protection Program. The AIS component's performance is also presented in terms of its challenges, strengths and achievements.

#### 4.3.1.1 Triage, Planning and Regulatory Review 'arm' of the Fisheries Protection Program

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**Key Finding:** The former Habitat Management Program demonstrated success in providing advice and regulatory direction to proponents, which contributed to the prevention of harmful alteration, disruption or destruction of fish habitat. However, the Habitat Management Program experienced a continued challenge in monitoring and measuring success in preventing harm to fish habitat. The implementation of a self-assessment tool in 2014 exacerbated these challenges. The lack of oversight and monitoring combined with the introduction of this tool has increased the risk that the Department is not adequately safeguarding fish and fish habitat.

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The Triage and Planning Unit is responsible for reviewing proponent projects and determining whether they have to be assigned to the Regulatory Review Unit for further review. The Regulatory Review Unit reviews the projects, confirms whether or not they need authorization, establishes the conditions for an authorization, and issues the authorization, as appropriate. Where necessary, the Conservation and Protection (C&P) Directorate's fishery officers working in the regions enforce the fisheries protection provisions of the *Fisheries Act*.<sup>61</sup>

Over the 2010-11 to pre-November 2013 period, the former Habitat Management Program (HMP) supported the conservation and protection of fish and fish habitat by providing advice to project proponents (i.e., those who submitted projects to DFO for review) for activities and projects in or near Canadian waters. Among the projects reviewed by DFO, between 2011-12 and 2012-13, the HMP was successful in providing influential advice to proponents, which in turn, mitigated risks to fish habitat. The influence of HMP advice was measured by the percentage of proposals (that would have negatively affected fish habitat) that were modified after their proponents received HMP advice. In 2011-12, HMP advice resulted in the modification of approximately 85% of project proposals that would have negatively affected fish habitat; this exceeded the HMP's target of 45%. And in 2012-13, the impact from 79% of proposed works was mitigated by their modification due to advice by the HMP, again greatly exceeding the target of 45%.

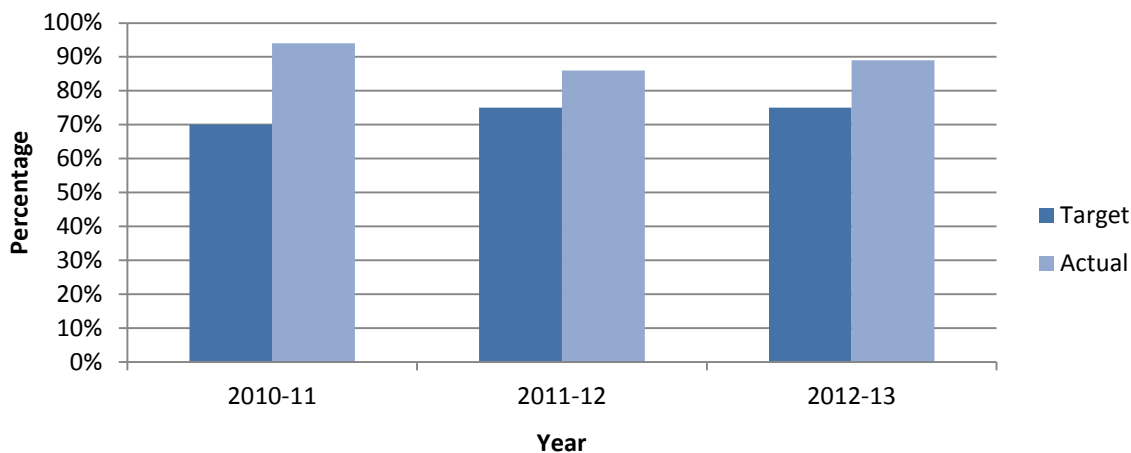
The Habitat Management Program also supported the conservation and protection of fish and fish habitat by monitoring project proponents' compliance with HMP advice or regulatory direction. In 2011-12 and 2012-13, HMP advice was effective in preventing harmful alteration, disruption or destruction of fish habitat in about 85% of cases monitored by the Habitat Management Program, compared to the target of 80%.

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<sup>61</sup> Fishery officers conduct at-sea patrols in coastal and inshore areas, monitor catches, conduct forensic investigations and audits, conduct inland patrols and provide information to fishers regarding government policies and regulations. The compliance and enforcement monitoring activities of fishery officers contribute to protecting Canada's fish and fish habitat.

Graph 3 demonstrates that between 2010-11 and 2012-13, the majority of proponents conformed to HMP advice or regulatory direction (e.g., Authorizations, Letters of Advice, and Operational Statements), in activities and projects that were monitored by the HMP. The targets were exceeded by approximately 20% in 2010-11, and 10% in each of 2011-12 and 2012-13.

Graph 3 – Percentage of Monitored Projects that Conformed to DFO Advice or Regulatory Direction, 2010-11 to 2012-13



Source: DFO Departmental Performance Reports

During the scope of the evaluation, monitoring and enforcement capacity steadily decreased. These challenges were the result of a number of factors, including a significant reduction in full-time equivalent (FTE) employees (HMP staff, FPP staff and C&P fishery officers); the reorganisation and centralization of offices; and the introduction of a new self-assessment tool to replace triaging of lower-risk proposals by FPP regulatory reviewers.

The HMP and FPP experienced annual reductions in its number of FTEs in the regions during the evaluation period. The FPP’s workforce in the regions was reduced by half, from 490 FTEs in 2010-11 to 245 FTEs in 2014-15 (Table 4).

Table 4 – Number of Fisheries Protection Program FTEs in all Regions\*, 2010-11 to 2014-15

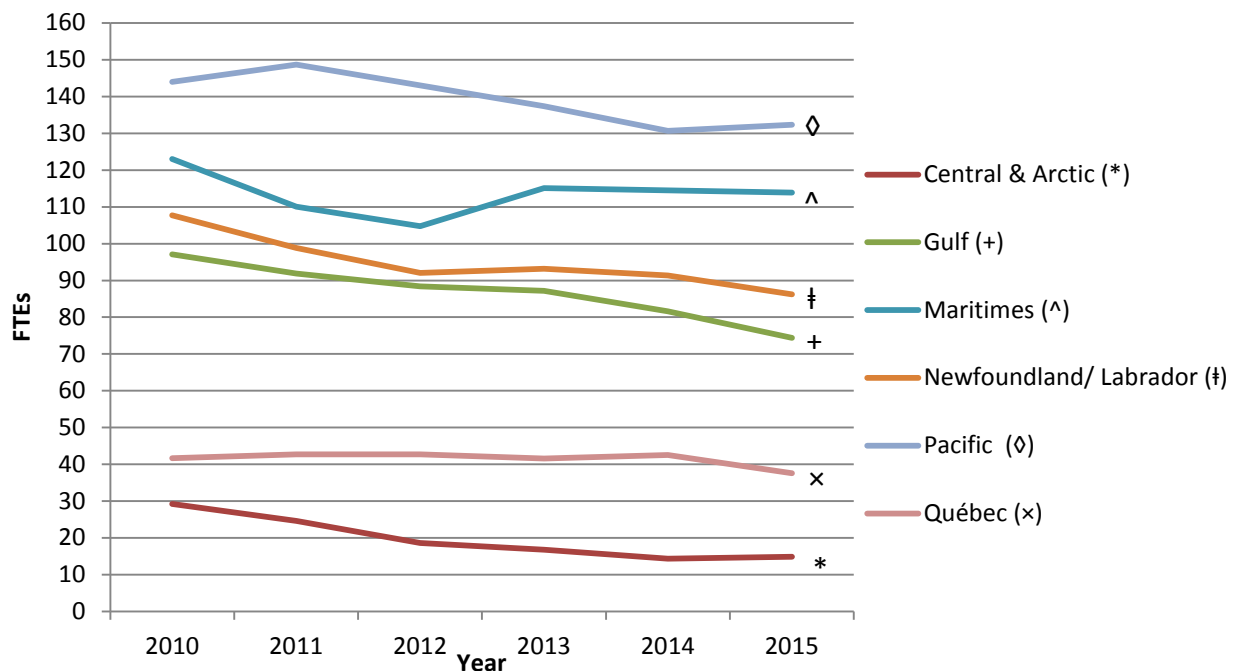
Fiscal Year	FTEs
2010-11	490
2011-12	468
2012-13	409
2013-14	282
2014-15	245

\*Excludes Full-Time Equivalents working at NHQ and all FTEs working for the AIS component.

Source: Cognos Financial System, DFO

DFO’s C&P Directorate also experienced a reduction in fishery officers during the evaluation period. C&P fishery officers perform work for FPP to enforce compliance with legislation that protects fish and fish habitat.<sup>62</sup> Between 2010 and 2015, the number of fishery officers across Canada was reduced, from 543 FTEs to 467 FTEs. All regions experienced reductions except at National Headquarters, where previously no full-time equivalent fishery officers worked, had 8 fishery officers by 2015. For example, in the Pacific region, FTE fishery officers were reduced from 144 FTEs in 2010 to 132 in 2015; and in the Gulf region were reduced from 97 FTEs in 2010 to 74 in 2015. Some regions experienced greater reductions than others. The Central and Arctic region experienced a reduction of almost 50% of its fishery officers, from approximately 29 FTEs in 2010 to 15 FTEs in 2015 (Graph 4).

Graph 4 – Number of Conservation & Protection Fishery Officers in all Regions\*, 2010 to 2015



Excludes National Headquarters FTEs  
 Source: C&P Directorate database, DFO

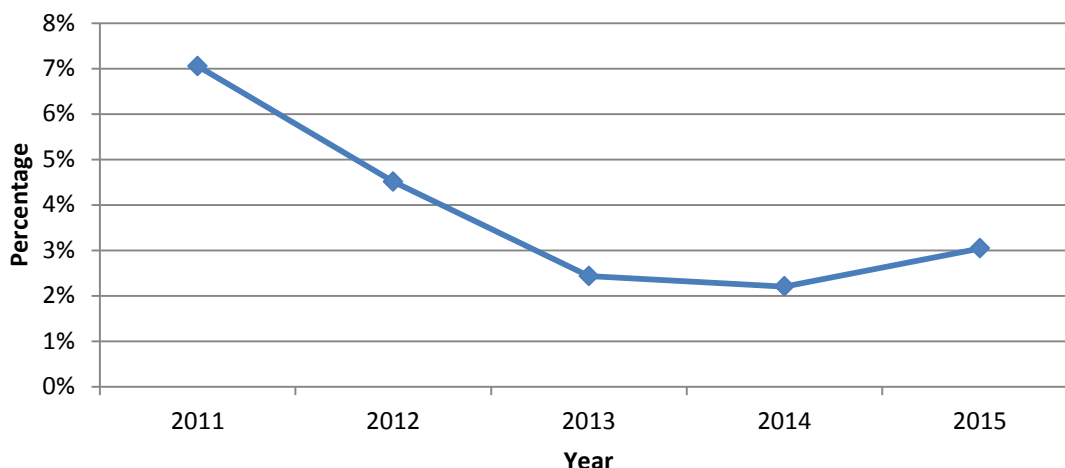
The reduction in the number of C&P fishery officers in all regions affected the Fishery Protection Program’s habitat enforcement-related efforts. Furthermore, because fishery officers are engaged in many other activities that are not related to the FPP, the decrease in their numbers resulted in an even smaller percentage of FPP-related work being carried out by the leaner staff at C&P.

During this period, the proportion of effort dedicated by fishery officers to habitat-related work also fell. The number of hours dedicated by fishery officers to habitat-related work, across all

<sup>62</sup> The Conservation and Protection Directorate promotes and maintains compliance with legislation, regulations and management measures implemented to achieve the conservation and sustainable use of Canada’s aquatic resources, and the protection of species at risk, fish habitat and oceans.

regions, fell steadily until 2014. Graph 5 demonstrates that in 2011, habitat-related work performed by C&P fishery officers comprised seven per cent of their activities; whereas in 2014, it comprised only two per cent of their activities, with a one per cent increase in 2015.

Graph 5 – Percentage of Time Dedicated to Habitat-related Work by Conservation and Protection Fishery Officers, 2011 to 2015



Source: DFO, Fisheries Enforcement Activities Tracking System (FEATS) Database

Table 5 demonstrates the extent to which the number of habitat enforcement activities carried out by C&P fishery officers declined over the period evaluated. Total enforcement activities peaked in 2011-12, and rose again in 2013-14; but overall, they declined from a total of 84 activities in all regions in 2010-11 to just nine activities in 2014-15, with three regions reporting zero enforcement activities in the last year (2015).

Table 5 – Number of Habitat Enforcement Activities, by Region, 2010-11 to 2014-15

Region	2010-11	2011-12	2012-13	2013-14	2014-15
Newfoundland and Labrador	3	1	2	6	0
Gulf	4	10	2	0	1
Maritimes	10	31	13	14	3
Central & Arctic	21	4	3	2	0
Quebec	4	2	0	2	0
Pacific	42	75	31	50	5
<b>TOTAL</b>	<b>84</b>	<b>123</b>	<b>51</b>	<b>74</b>	<b>9</b>

Source: C&P Directorate database, DFO

In addition to the strain experienced by a decrease in staff involved in monitoring and enforcement, interviewees indicated that the relationship between FPP and Conservation and Protection fishery officers had been disrupted by the centralization of Fisheries Protection Program offices. In June 2016, an updated protocol between the FPP and the C&P Directorate was finalized to assist in re-establishing the lines of communication between the FPP and C&P regional offices.

### ***Monitoring as a continued challenge***

The *Fisheries Act* requires that projects/activities undertaken in and near freshwater and marine fisheries waters avoid causing serious harm to fish unless authorized by DFO's minister. Under the former Habitat Management Program, monitoring issues were noted in the 2009 Spring Report of the Commissioner of the Environment and Sustainable Development, Chapter 1: Protecting Fish Habitat, Office of the Auditor General.<sup>63</sup>

In 2014, the FPP made a new self-assessment tool available on its internet site for low-risk projects, and supplemented this site with information concerning measures to avoid harm to fish and fish habitat and advice for remediation.<sup>64</sup> The self-assessment tool helps project proponents to determine whether or not their project requires a DFO review. If the proponent determines that the project does not require a review, then there is no further examination by DFO. It is the proponent's responsibility to comply with the *Fisheries Act*, and to avoid causing serious harm to fish.

While the former HMP was able to track some low-risk projects (which have always been contingent upon proponents' sending their project to DFO), the FPP's self-assessment tool has no data capture requirement, which means that the FPP can no longer report on low-risk projects at all.

The tool's effectiveness was questioned by internal and external interviewees, particularly because data collection was not built into the tool. These interviewees were concerned that no records were kept on the use of the tool, making it difficult to know whether all projects were being self-assessed, where they took place and when they were completed. Some interviewees voiced concern that the lack of available data from the self-assessment tool might result in many small projects (being assessed individually as within regulatory guidelines) occurring in the same area, having a negative cumulative effect upon fish and fish habitat.

Since 2013, the Fisheries Protection Program has faced challenges including a reduction in the number of FPP staff and a reduction in the number of C&P fishery officers, along with fewer hours devoted by C&P to enforcement activities. According to some DFO staff and FPP partners, the reduction of staff and the centralization of offices have notably decreased the Department's visibility in the field. This diminished regulatory presence may have a negative effect on proponents' compliance to regulations, particularly when the self-assessment tool relies upon proponents' own triaging of their projects and compliance with advice available on the FPP's website. The risks introduced by the self-assessment tool are compounded by the fact that no information can be gathered from it, so the FPP cannot demonstrate whether the self-assessment tool is efficient or achieves its expected results. It is also possible that not all proponents are using the self-assessment tool properly or at all.

In 2015, the FPP recognized the absence of monitoring to be a risk, and addressed this risk by developing region-specific monitoring plans in all regions. The implementation of the regional

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<sup>63</sup> [http://www.oag-bvg.gc.ca/internet/English/parl\\_cesd\\_200905\\_01\\_e\\_32511.html](http://www.oag-bvg.gc.ca/internet/English/parl_cesd_200905_01_e_32511.html)

<sup>64</sup> 'Projects near Water' <http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>

plans varied from one to three years. It was too early for this evaluation to assess the impact of these monitoring plans.

#### 4.3.1.2 Client Liaison, Partnerships, Standards & Guidelines ‘arm’ of the FPP

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**Key Finding:** Additional standards and guidelines are needed to continue to harmonize regulatory review across the country and to make it more efficient; more collaboration between the two FPP ‘arms’, for the development of these key documents, would be advantageous. The Client Liaison, Partnerships, Standards and Guidelines ‘arm’ was not as productive as anticipated due to the implementation of the Recreational Fisheries Conservation Partnerships Program, for which it provided resources. The RFCPP achieved all its expected results in its first two years, but continues to be funded without allotments for operations and maintenance or salary dollars.

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Staff working within the Fisheries Protection Program’s Client Liaison, Partnerships, Standards & Guidelines ‘arm’ perform activities that include developing and maintaining regulatory arrangements with partners; implementing the Recreational Fisheries Conservation Partnerships Program; and the development of policy tools required by the Triage, Planning and Regulatory Review ‘arm’ of FPP.

The former Habitat Management Program successfully developed and established partnering arrangements with some federal agencies and provinces. These arrangements enabled HMP partners to conduct initial reviews of projects and to determine whether they required advice or review by HMP under the *Fisheries Act*. Some partnering arrangements have continued under the Fisheries Protection Program.

However, the Fisheries Protection Program’s relationships with its partners and stakeholders were no longer as strong as they had been prior to 2013, under the HMP. External interviewees believed that FPP’s relationships had been negatively impacted by circumstances surrounding the amendments to the *Fisheries Act*: namely, the limited consultations that were conducted prior to the amendments; and the lack of an effective communication strategy to explain how the amendments would impact FPP’s partners and stakeholders. Evidence showed that FPP had made efforts in 2015 and 2016 to improve communication between the regions and FPP’s partners and stakeholders. For example, the Central and Arctic Region co-chairs industry groups and provides training related to the amended *Fisheries Act* to Environmental Consultants.

With respect to the development of guidelines and standards, FPP staff and partners confirmed that many documents, frameworks, protocols, guidelines and standards were developed in-house; however, additional guidelines and standards are needed to continue to harmonize regulatory review across the regions, and increase its efficiency. In 2016, the FPP was developing new documents, such as the Framework for Referral Review; Fish Mortality Standard for Large and Medium Water Intakes; and Sediment Standard for Transportation Crossing, with the assistance of a working group composed of representatives from each region and NHQ. The finalization of these documents will facilitate interpretation and coherence by DFO regulatory review assessors across regions. Appendix D provides the list of the standards or guidelines under development.

### ***Recreational Fisheries Conservation Partnerships Program***

The assessment of the Recreational Fisheries Conservation Partnerships Program's effectiveness was limited to examining its immediate and intermediate outcomes. This was because the RFCPP was initially a two-year program, and no indicator was set, nor was any data tracked to enable reporting on its final outcome.<sup>65</sup>

In its first two years (2013 to 2015), the RFCPP was successful in supporting many restoration projects, which benefitted fisheries and fish habitat. In this period, the RFCPP restored 5,336 km and 7,838,960 m<sup>2</sup> of recreational fisheries and fish habitat.

With respect to its immediate and intermediate outcomes, the RFCPP surpassed the targets it had set over its first two years. It increased community participation, partnerships, and community awareness surrounding the importance of protecting and conserving fisheries, fish and fish habitat. The RFCPP was also successful in meeting its targets for funding leveraged and leverage ratio. The target for the amount of funding leveraged for the initial \$10 million was \$20 million, based on a funding leverage ratio target of 2.0. Based on actual expenditures, the RFCPP expended \$11.1 million over its first two years and leveraged \$22.5 million over that same period, for a leverage ratio of 2.02.

While the RFCPP achieved its results, the evaluation heard from interviewees that it appropriated FTEs from the Client Liaison, Partnerships, Standards & Guidelines' 'arm' because RFCPP was created with no dedicated funding for O&M or salaries. According to FPP staff, this shift in resources impacted the capacity of the Client Liaison, Partnerships, Standards & Guidelines 'arm' to undertake other activities. During its first two fiscal years in operation, RFCPP required 13 and 16 FTEs from the FPP Client Liaison, Partnerships, Standards and Guidelines 'arm.' In 2014-15, about 20% of all FTEs dedicated to the Client Liaison, Partnerships, Standards and Guidelines 'arm' were engaged in RFCPP activities, which reduced the time and efforts these staff dedicated to other activities, like client liaison and the development of standards and guidelines.

#### **4.3.1.3 Aquatic Invasive Species**

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**Key Finding:** A key challenge for the AIS component is its ability to report on its achievements, because its success is measured by the *absence* of AIS. The AIS component has contributed to undertaking and/or facilitating research related to risk assessment, pathways of AIS introduction and spread, species biology and establishment, and in a few cases, control measures. It has been successful in controlling Sea Lamprey, while keeping Asian Carp from establishing in the country, to date. However, there is a disparity between what the AIS component aims to achieve and its current capacity: outside of the Great Lakes, AIS work has been limited by its governance structure and funding model.

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<sup>65</sup> The RFCPP's immediate and intermediate outcomes were: "Number of partners; amount of funding leveraged and leverage ratio; number of projects funded; number of short-term jobs created; number of volunteers; and targeted recreational fisheries habitat restored." The RFCPP's final outcome is "Sustainability and ongoing productivity of Canada's recreational fisheries are enhanced."

A key challenge for the AIS component is that its success is measured by the *absence* of AIS, in other words, maintaining *status quo*. The evaluation considered the AIS component's strengths, achievements and challenges in light of the ongoing need for preventative action and AIS research (discussed in the Relevance section 4.1.1). The evaluation suggests that in determining the value of the component, the cost of AIS activities, the importance of maintaining the current health of Canadian fish and fish habitat, and the overall contribution to the Canadian economy made by the fisheries industries, be considered in combination.

### ***Strengths and Achievements***

One of the most significant achievements for the AIS component of FPP, and one that has had application nation-wide, was the development of the *Aquatic Invasive Species Regulations*, which came into force in 2015. The Regulations strengthened the authority of federal departments and agencies (e.g., DFO, Canada Border Services Agency, and the Canadian Food Inspection Agency) to enforce rules to prevent the entry and establishment of AIS in Canadian waters. The Regulations have addressed a significant gap by authorizing the enforcement of import prohibitions at the Canadian border.

The Canadian Aquatic Invasive Species Network (CAISN), composed of scientists at six DFO laboratories and researchers from partner universities, contributed for a decade to AIS-related research. However, its funding ended in 2016 and the Network is not eligible for renewed Natural Sciences and Engineering Research Council of Canada (NSERC) leveraged funds<sup>66</sup>. Funding received through CAISN by NSERC for AIS research was received in two phases: 2006 to 2011, and 2012 to 2016. CAISN's objectives were met, and included the development of risk assessment models for potential and existing AIS; the identification of pathways by which AIS enter Canada; and determination of factors that affect AIS colonization success. An example of a substantial deliverable was the development of a three-tiered risk assessment methodology, which included a Rapid Assessment Protocol, Screening-Level Risk Assessment, and a Detailed-Level Risk Assessment.<sup>67</sup>

Other examples of achievements for the AIS component include the development of environmental DNA techniques for early detection and monitoring of AIS; and the use of genomics to study the dispersal and connectivity of AIS, like the green crab.<sup>68</sup> The science-based Rapid Response Framework was also an important achievement. The Framework will facilitate effective response to an aquatic invader once it has been detected.

Extensive research into AIS risk associated with ballast waters has contributed to DFO's capacity to support the *Ballast Water Control and Management Regulations (2011)*, led by Transport Canada. Ballast water is one of the primary pathways by which AIS can be brought from one country or area of water to another and Canada's Regulations play an important role in countering the introduction of AIS.<sup>69</sup> AIS component research into ballast water also supports

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<sup>66</sup> CAISN was funded partially by NSERC and partially by DFO.

<sup>67</sup> <http://www.caisn.ca/en/index.php>

<sup>68</sup> These projects were led by the Biotechnology and Genomics program within DFO, and completed by the Genomics Research and Development Initiative (GRDI).

<sup>69</sup> <http://laws-lois.justice.gc.ca/eng/regulations/SOR-2011-237/page-1.html#h-1>



Canada's international commitments: the BWM Convention, which was adopted in 2004 by the International Maritime Organization, will enter into force on September 8, 2017, and joint research is being undertaken by DFO and Transport Canada to support Canada's implementation of the Convention's standards, which will "...provide a global level playing field for international shipping."<sup>70</sup>

The AIS component was also involved in some response operations, including Sea Lamprey control in the Great Lakes; preventing Asian Carp from establishing in Canada; and reducing AIS like Small Mouth Bass. Over a period of five years, the AIS component's eradication response succeeded in drastically reducing the number of Small Mouth Bass in Lake Miramichi: in 2010, 2,584 Small Mouth Bass were removed; whereas by 2015, only 183 were removed from the lake.

These response operations – although successful – responded to an *ongoing* need, due to the resilient nature of AIS and their ability to reproduce and spread quickly in favourable conditions. Even with successful management and control measures that minimize the threats of AIS, these threats persist and new ones will emerge. In some cases, threats posed by AIS increase, resulting in a need for increased investment in AIS-related research, prevention and/or control activities. Sea Lamprey and Asian Carp are two examples of species that the AIS component has been successful in controlling and preventing; but which continue to present a serious threat. These species will continue to require investment to prevent, control and manage for the foreseeable future; while the search for more efficient means of eradication or control continues.

### ***Outreach and Education***

Through the Asian Carp Initiative, the AIS component was involved in preventing the spread of AIS in freshwater by coordinating outreach and education for the public. Outreach and education activities in the Great Lakes region were primarily managed by two non-governmental organizations: the Invasive Species Centre and the Ontario Federation of Anglers and Hunters.

The Invasive Species Centre (ISC), a Canadian non-profit organization, is headquartered in Sault Sainte Marie, Ontario with operations across Canada and jointly funded by DFO, Natural Resources Canada's Canadian Forest Service, the Canadian Food Inspection Agency and the Government of Ontario. The ISC builds partnerships and supports collaborative projects in natural and applied science, policy research, outreach and education to protect Canada's forests, fields, gardens, waterways and cities from the damaging effects of invasive species.

The Ontario Federation of Anglers and Hunters (OFAH) delivered outreach, education and monitoring activities in Ontario on behalf of the AIS component. OFAH used various outreach methods such as the internet, television, published educational material, and billboards, to improve public awareness of invasive terrestrial and aquatic plants, invasive fish and

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<sup>70</sup> The BWM Convention or the International Convention for the Control and Management of Ships' Ballast Water and Sediments, was triggered when Finland entered and the combined tonnage of contracting parties represented at least 35% of the world merchant shipping tonnage. <http://www.imo.org/en/MediaCentre/PressBriefings/Pages/22-BWM-.aspx>

invertebrates, including Asian Carp. OFAH's contribution to monitoring invasive species in Ontario included providing a cell phone application and a toll-free number to the public so that people could report sightings of invasive species to the authorities. Monitoring activities generated a total of 115 confirmed reports of the presence of aquatic invasive species in 2014-15 and 156 confirmed reports in 2015-16.

### *Sea Lamprey Control in the Great Lakes*

As of 2015, Sea Lamprey was the only aquatic invasive species subject to control measures in the Great Lakes. According to the Great Lakes Fishery Commission, in the 1930s and 1940s, the Great Lakes fisheries were destroyed by the invasion of Sea Lamprey. An example of the damage caused to the Great Lakes by Sea Lamprey was discussed above in the Relevance section (4.1). Sea Lamprey control began in 1955, when the Great Lakes Fishery Commission (GLFC) was established by the Canadian/US Convention on Great Lakes Fisheries. The GLFC coordinates the Sea Lamprey Control Program within the Great Lakes basin. Under the direction of the GLFC, Fisheries and Oceans Canada delivers the program in Canada and the US Fish and Wildlife Service delivers the program in the United States. The GLFC also coordinates fisheries research and facilitates cooperative fishery management among state, provincial, tribal, and federal management agencies.

Several techniques are used to control the Sea Lamprey population at different stages of its life cycle. The two most successful means of Sea Lamprey control are: highly-selective lampricides,<sup>71</sup> applied to more than 300 rivers and streams to extinguish sea lamprey larvae; and barriers (purpose-made, low head barriers and multi-purpose dams), which block adult Sea Lamprey from migrating up river to spawn.



DFO and US Fish and Wildlife Service Staff engaged in Sea Lamprey control.

Photo source: DFO<sup>72</sup>

<sup>71</sup> Lampricides (TFM) are registered with Health Canada and pose no harm to humans. <http://www.dfo-mpo.gc.ca/species-especes/lamprey-lamproie-eng.htm>

<sup>72</sup> [HTTP://WWW.DFO-MPO.GC.CA/SPECIES-ESPECES/LAMPREY-LAMPROIE-ENG.HTM](http://www.dfo-mpo.gc.ca/species-especes/lamprey-lamproie-eng.htm)

The GLFC is funded by a bi-national agreement between the US and Canada. Under the agreement, the US funds 69% of Sea Lamprey control and Canada funds 31%. This funding ratio reflects the percentage of the Great Lakes within each country as well as the proportional “value of the historical fish harvest prior to the Sea Lamprey invasion” in each country.<sup>73</sup> In addition to funding Sea Lamprey control, each country funds research, fisheries management coordination and administration of the GLFC at a ratio of 50:50.

During the last two decades, between 1995 and 2016, Canada contributed \$154.8 million and the US contributed \$324.8 million to the GLFC. Since 2005, Canada’s total contribution has remained static at \$8.1 million annually, while the US contribution has increased from \$13 million in 2005 to \$21.5 million in 2016.

In 2015-16, the GLFC requested an additional \$4.7 million per year from Canada to increase the annual Canadian contribution to \$12.8 million. Moreover, the GLFC has also requested \$4 million per year for three years to address failing infrastructure (barriers) used to block the spring migration of Sea Lamprey to spawning grounds. In 2015-16, Canada provided \$4 million from the Infrastructure Fund for Sea Lamprey barrier refurbishment and an additional \$4 million for fiscal year 2016-17; however, no additional funding was identified to increase Canada’s annual contribution to the GLFC.

US and Canadian federal funding is the only source of funding for the Great Lakes Fishery Commission; however, rehabilitation of the Great Lakes fisheries is also supported by states and the province of Ontario, which have made investments in the fisheries through stocking programs (fish hatcheries), stock assessment and other fisheries management actions.

Sea Lamprey control work undertaken by the GLFC and its American and Canadian federal partners since 1955 has contributed significantly to the rehabilitation of the fisheries in the Great Lakes. In 2013-14, the GLFC successfully met Sea Lamprey population reduction targets in three out of the five Great Lakes; and in 2014-15, it met targets in four of out the five Great Lakes. Since its establishment, the GLFC has reduced the overall population of Sea Lampreys by 90%, which has allowed populations of native fish such as lake trout and whitefish to recover from the Sea Lamprey invasion in the 1930s and 1940s.<sup>74</sup>

The control of Sea Lampreys in the Great Lakes basin is the only successful international example of a control program at the level of an ecosystem.<sup>75</sup> However, Sea Lamprey control must remain proactive, because Sea Lamprey is very resilient and multiplies rapidly. In future, ongoing investments in Sea Lamprey control will be required to keep this AIS from damaging the Great Lakes fisheries, and to maintain a healthy aquatic ecosystem in the Great Lakes basin.

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<sup>73</sup> [HTTP://WWW.GLFC.ORG/PRESSREL/FUNDPR.HTM](http://www.glfc.org/pressrel/fundpr.htm)

<sup>74</sup> <https://www.ontario.ca/page/how-government-combats-invasive-species>

<sup>75</sup> <http://www.glfc.org/sealamp/index.php>

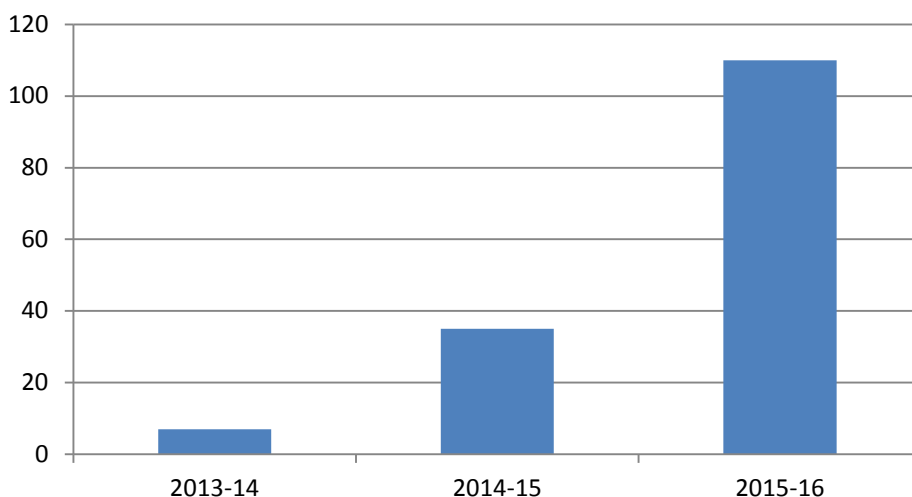
### *The Asian Carp Initiative*

As was discussed in the Relevance section (4.1), Asian Carp is currently the greatest threat to indigenous fish and fish habitat in the Great Lakes. Asian Carp is the subject of extensive control activities by the United States, including three electrified dams to prevent the carps from reaching the Great Lakes basin.

The Asian Carp Initiative is implemented by staff in the Central and Arctic Region in collaboration with partners and stakeholders. These collaborations have encouraged the expansion of already-established scientific advice, education and outreach efforts to prevent the introduction and establishment of Asian Carp into Canadian waters.

The Asian Carp Initiative worked toward its goal of increasing awareness of the threat posed by Asian Carp by engaging inhabitants and organizations as partners in the large-scale effort to prevent the introduction and establishment of Asian Carp in the Great Lakes. The Invasive Species Centre and the Ontario Federation of Anglers and Hunters provided outreach and education to people living in the vicinity of the Great Lakes on behalf of the Initiative. The Invasive Species Centre launched the Asian Carp Canada website in 2014 and has offered webinars about Asian Carp, hosted by leading researchers and professionals.<sup>76</sup> The Ontario Federation of Anglers and Hunters has provided the Asian Carp Initiative with educational material and hosted monitoring services, such as email inboxes and telephone numbers for the public to report sightings of fish believed to be Asian Carp. Graph 6 shows an increase in the use of public reporting mechanisms such as email, toll free numbers and cellphone applications, for sightings of fish that may be Asian Carp.<sup>77</sup>

Graph 6 – Number of Potential Asian Carp Sightings Reported by the Public, 2013-14 to 2015-16



Source: Ontario Federation of Anglers and Hungers Data, Recorded in EDDMaps.

<sup>76</sup> <http://asiancarp.ca/>

<sup>77</sup> The increase in the use of public reporting mechanisms may indicate a greater public awareness of Asian carp; however, the extent of the Asian Carp Initiative’s contribution to this increase was not assessed.

The Asian Carp Initiative worked toward its short-, -medium- and long-term outcomes. The public has become informed about the risk posed by Asian Carp; and organizations and people have begun to work collaboratively towards preventing the introduction of Asian Carp into the Great Lakes, which in turn protects ecosystems and fisheries in the Great Lakes.

A few adult Asian Carp were found in the Great Lakes; they were removed and their sexual maturity tested. Captured carps were sterile, immature, or fertile but lacking breeding grounds. As of 2016, Asian Carp was not considered to be established in the Great Lakes.

Several best practices were identified throughout the Asian Carp Initiative's implementation, which may inform the prevention and management of other aquatic invasive species. These practices include the Asian Carp Regional Coordinating Committee, which was instrumental in facilitating the collaboration between the United States, the federal, provincial governments and other organizations; the Initiative's outreach and education component, which involved DFO, the Ontario provincial government and non-governmental organizations; and the Environmental DNA techniques, which can be used for early detection of AIS. In addition, the Asian Carp Initiative's response tools, i.e., the "rapid response" protocol and Incident Command Structure, may be adaptable for use in other initiatives related to the response and prevention of AIS.

### *The AIS Component – Looking Ahead*

Overall, the AIS component of the Fisheries Protection Program has contributed to undertaking and/or facilitating research related to risk assessment, pathways of AIS introduction and spread, species biology and establishment, and in a few cases, control measures. It has coordinated outreach and education about the threats posed by Asian Carp; and it has succeeded in controlling Sea Lamprey, while keeping Asian Carp from establishing in the country, to date. However, these are not finite projects; investments will be required to continue to maintain the current levels of Sea Lamprey and to keep Asian Carp out of Canada in order to protect fish and fish habitat and the fishery industry. Just as the threat of AIS introduction will continue to grow, with the continued increase in international trade and travel, so too will the need for continued AIS work, including research and prevention efforts into other species and pathways. If DFO's AIS work is to move beyond the Great Lakes region and become more proactive, there is a need to identify clear national objectives for the AIS component and changes will need to be made to DFO's AIS approach, particularly related to the governance and funding of the AIS component.

### **4.3.2 Resource Utilization**

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**Key Finding:** The Fisheries Protection Program (excluding its AIS component) would benefit from a reassessment of its allocation of human resources and its operational structure to ensure that the workload is balanced within and across regions. In 2014-15, close to 20% of all FPP employees were funded through two initiatives, which use B-base funding; this reliance upon temporary funding represents a risk to FPP. The Recreational Fisheries Conservation Partnerships Program's administrative overhead is approximately 14%, which is commensurate with many start-up programs.

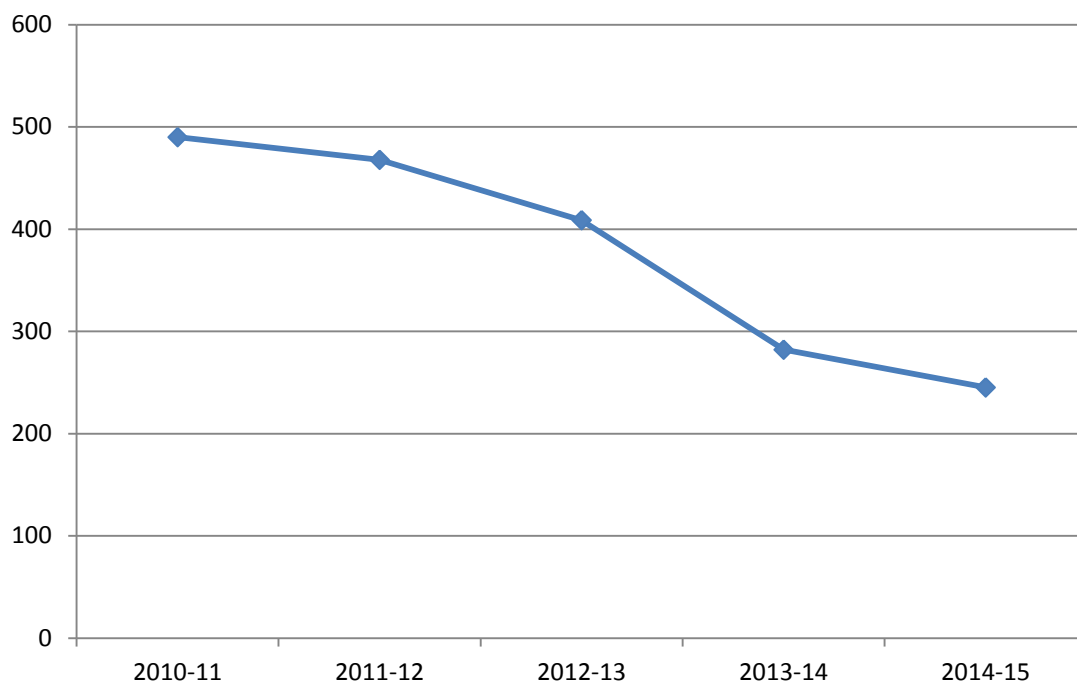
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Before presenting the evaluation’s resource utilization findings for the two ‘arms’ of the FPP, a presentation of the impacts that the reduction in workforce and the consolidation of offices had upon the FPP, followed by the reduction of projects sent to FPP, to give context to the findings.

***Impact of reduction in staff and office consolidation upon regional workload***

The FPP’s human resources (excluding the AIS component) have declined significantly since 2010-11. Between 2010-11 and 2014-15, the total number of employees in all regions, excluding NHQ, fell from 490 FTEs to 245 FTEs. Graph 7 demonstrates that between 2010-11 and 2014-15, the number of employees in the regions, excluding aquatic invasive species staff, was reduced by half.

Graph 7 – Number of Fisheries Protection Program Full Time Equivalentents in all Regions\*, 2010-11 to 2014-15



\*Number of FTEs excludes those working at National Headquarters and those working for the AIS component.  
Source: DFO’s CFO Cognos Financial System

The combination of reduction in staff and centralization of 63 offices into 16 offices resulted in several challenges for the FPP’s two ‘arms,’ during the evaluation period. First, these measures led to a loss of corporate knowledge, particularly for those regions that experienced the greatest reduction in FTEs: the Central and Arctic, Maritimes and Pacific regions. In each of these regions, staff was reduced by more than 50% since 2010-11. Interviewees mentioned that this situation have been further compounded when new hires replaced experienced employees.

Second, consolidating offices in the regions resulted in diminished capacity within the remaining offices, with respect to local knowledge of fish and fish habitat; and increased the breadth of knowledge required for regulatory review in some regions. This process was particularly

challenging for the Central and Arctic region, whose geographical area is so large (see Figure 5 below – Central and Arctic region is identified in purple) and its centralized offices are spread out across several provinces. Regulatory reviewers working in consolidated C&A offices are now often located at a significant distance from projects under review, and do not necessarily have local knowledge of fish and fish habitat in each project-specific area. An added challenge for employees in this region is that they need to be familiar with legislation and regulations of four provinces and two territories as the projects that they review now span four provinces and two territories.

Third, internal and external interviewees both raised concerns that the centralization of offices and reductions in staff had reduced the FPP's visibility in the field. These respondents worried that the reduction in staff increased the risk that proponents may not follow regulations, due to a reduced presence in the field.

Figure 5 – The Six Fisheries and Oceans Canada Regions



Source: DFO Science Advisory Report (2005).<sup>78</sup>

### ***Reduction in the number of projects sent to the FPP***

Over the last ten years, there have been concerted efforts to streamline the triage and regulatory review processes. In 2004, the former Habitat Management Program began to use a risk management matrix in order to prioritize project 'referrals' sent in by proponents.<sup>79</sup> The matrix enabled staff to classify proposed projects as high, medium or low risk. High-risk projects received site-specific review, conditions for authorization and authorization, as appropriate; medium-risk projects were subjected to streamlined authorization processes, as appropriate; and low-risk projects were subject only to FPP advice.

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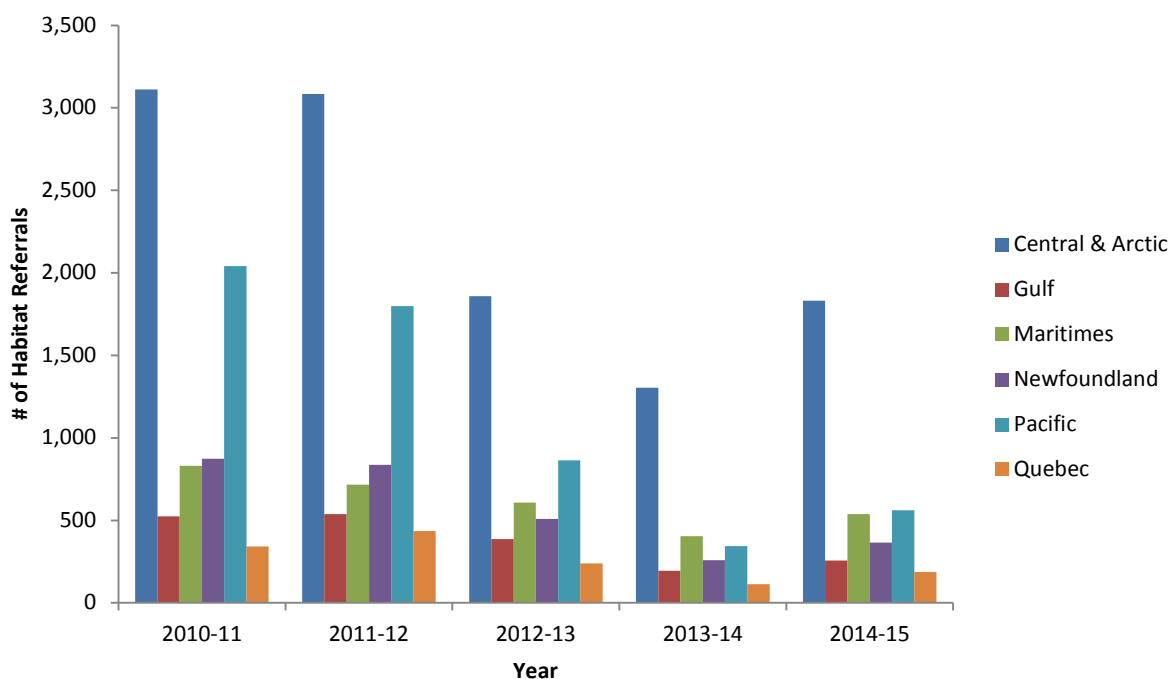
<sup>78</sup> [http://www.dfo-mpo.gc.ca/csas/Csas/status/2005/SAR-AS2005\\_001\\_e.pdf](http://www.dfo-mpo.gc.ca/csas/Csas/status/2005/SAR-AS2005_001_e.pdf)

<sup>79</sup> 'Referrals' are proposed projects, sent to the FPP by project initiators ('proponents'), for regulatory advice.

In 2014-15, the FPP introduced a self-assessment tool that allowed project proponents to triage projects themselves instead of referring all of them to the FPP. The FPP also added more information on its website, including measures that proponents could take to mitigate risks to fish and fish habitat, by project type. It was hoped that by making information available to the public, proponents would be better able to prepare and modify their projects, mitigate potential threats to fish and fish habitat, and thereby eventually reduce the number of projects requiring DFO advice or authorization.

Between 2010-11 and 2014-15, the number of projects (“referrals”) sent to the FPP decreased by about 50% (Graph 8). Between 2010-11 and 2013-14, before the self-assessment tool was introduced, every region except Quebec experienced a steady decline in the number of proposals referred to the FPP, and all regions experienced a slight resurgence in the number of referrals in 2014-15. The upswing in 2014-15 may be a result of the transition to the self-assessment tool and/or a lack of confidence in the new tool; however, without data from the self-assessment tool, the evaluation was not able to ascribe any decrease or increase in referrals to the tool’s use.

Graph 8 – Regional Distribution of Referrals to Fisheries Protection Program, 2010-11 to 2014-15

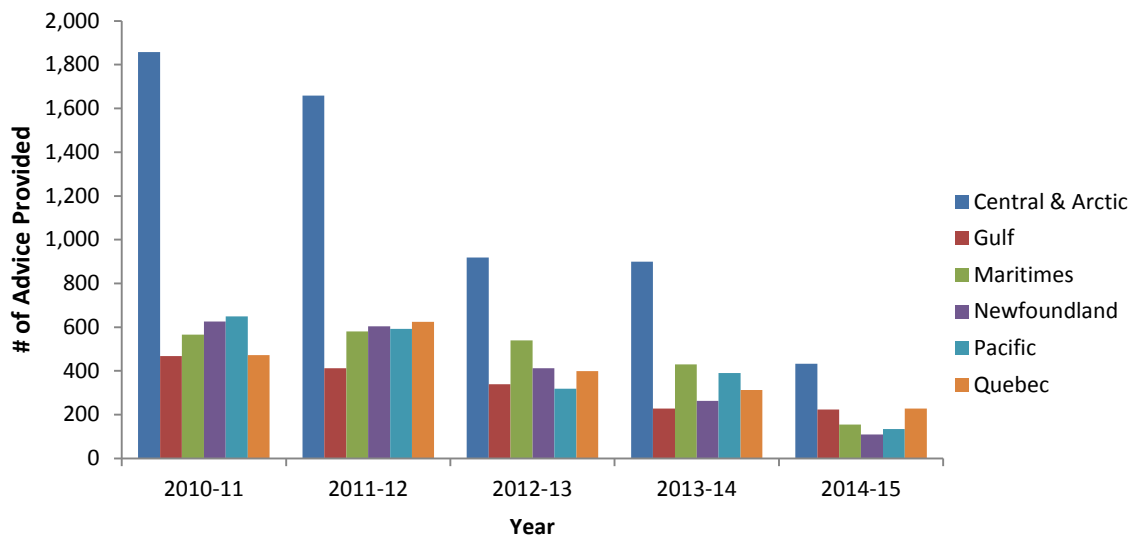


Source: FPP Annual Reports

According to the Habitat Management Program risk matrix, low-risk project proposals received advice. Graph 9 demonstrates that the number of low-risk project proposals received requiring advice, steadily declined over the five-year period. On a national level, the number of times advices were provided fell by 72% between 2010-11 and 2014-15.



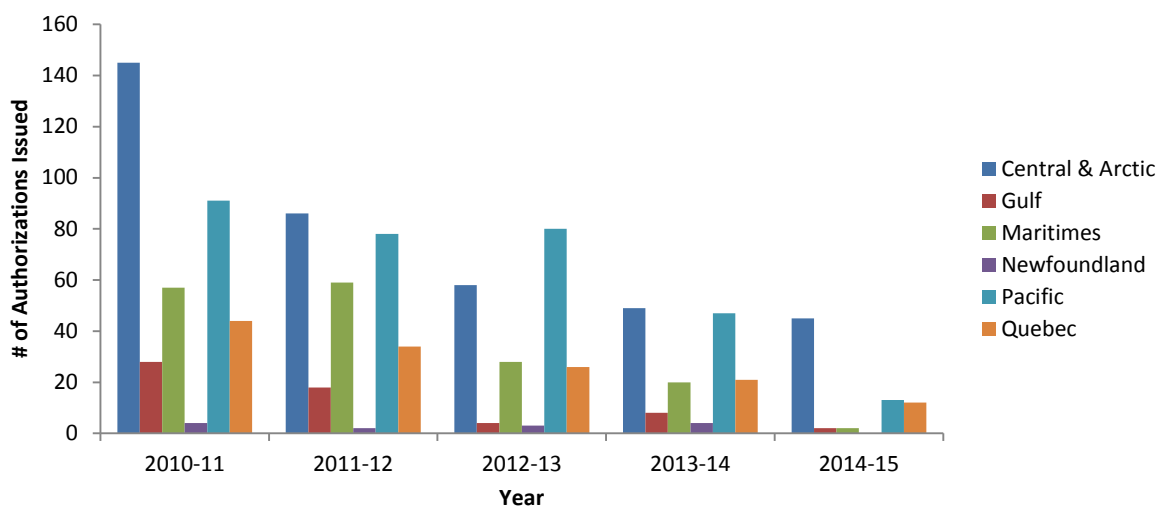
Graph 9 – Number of Times the Program Provided Advice to Proponents, by Region, 2010-11 to 2014-15



Source: FPP Annual Reports

Graph 10 demonstrates that between 2010-11 and 2014-15, the total number of authorizations issued by DFO fell by 80%. Many circumstances may have caused this decrease in authorizations, including the decrease in the price for certain commodities, which may have reduced the total number of project proponents interested in the development of natural resources.<sup>80</sup>

Graph 10 – Number of Authorizations Issued, by Region, 2010-11 to 2014-15

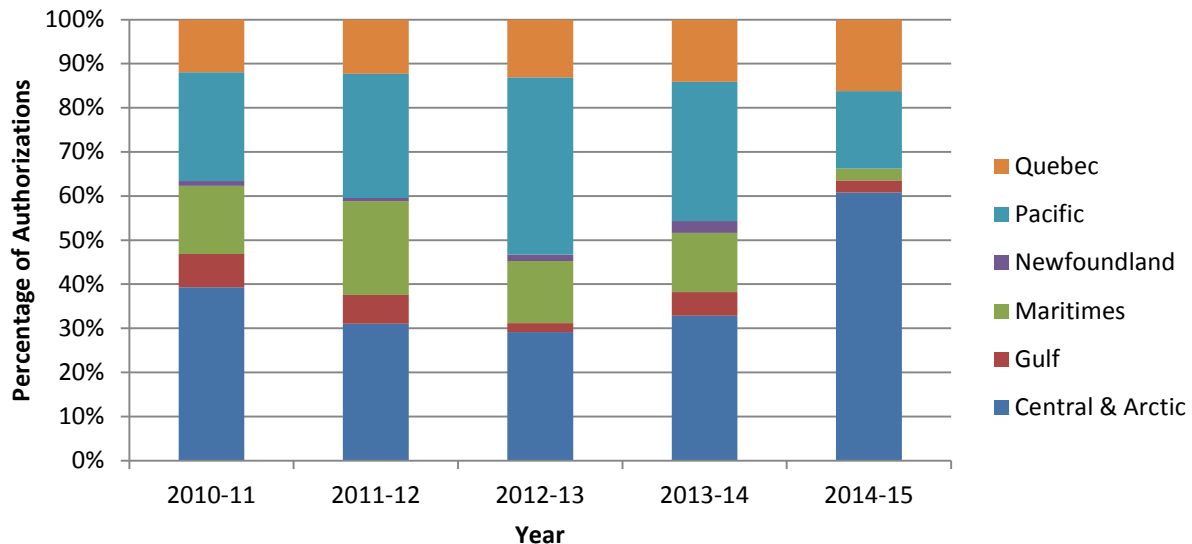


Source: FPP Annual Reports

<sup>80</sup> Development projects concerned with natural resources are frequently medium- to high-risk and require authorization.

There was also annual variation in the volume of authorizations issued by each region (Graph 11). For example, in 2014-15, the Central and Arctic region issued approximately 60% of all authorizations (a much higher percentage compared to previous years).

Graph 11 – Percentage of Authorizations, by Region, 2010-11 to 2014-15



Source: FPP Annual Reports

#### 4.3.2.1 Resource utilization findings

It was expected that there would be reduction in workload for FPP as a result of the changes in the *Canadian Environmental Assessment Act (2012)*. However, the reduction was less than anticipated because the Canadian Environmental Assessment Agency took on a coordination role and the expertise for advice related to the *Fisheries Act* for environmental assessments continued to reside within DFO.

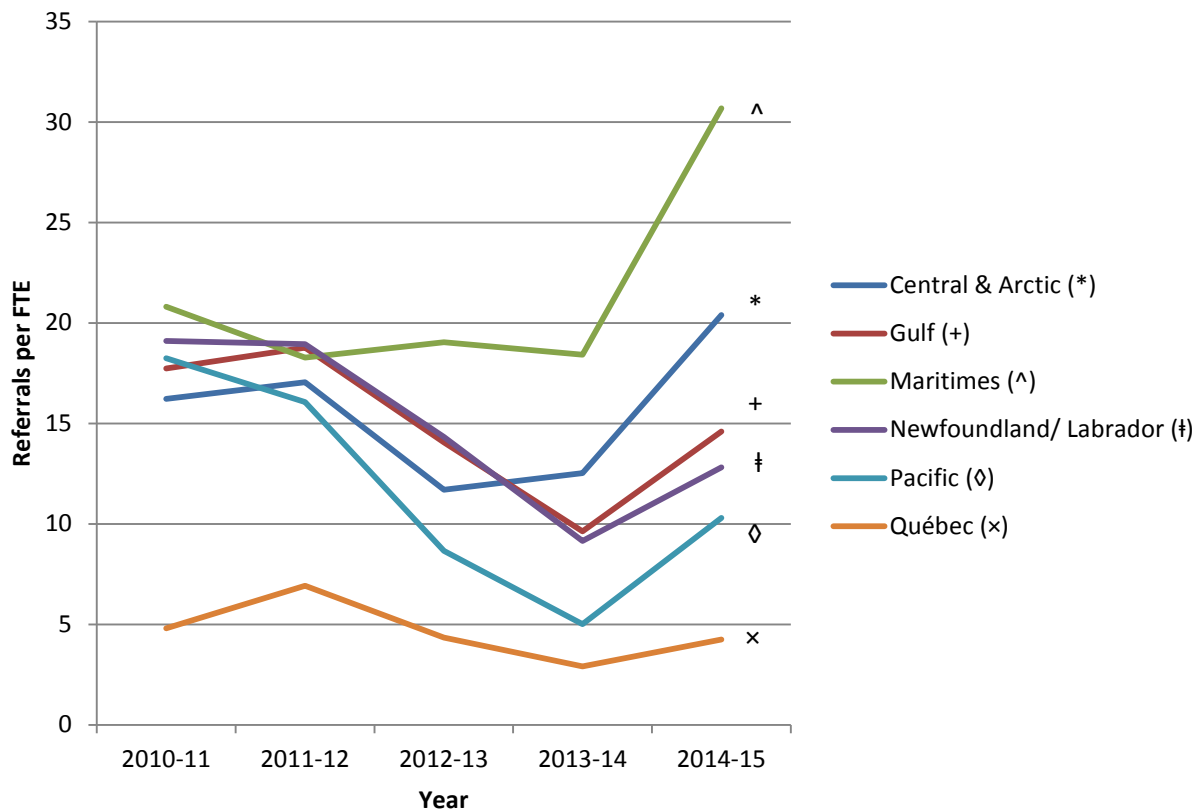
By 2014-15, 19.6% of all FPP employees were funded through two initiatives, which use B-base funding: the Major Projects Management Office (MPMO) initiative, which is led by Natural Resources Canada to undertake core program activities related to regulatory reviews; and the Federal Contaminated Sites Action Plan (FSCAP), which is led by Environment and Climate Change Canada. Considering the 50% reduction in FPP staff in the regions over the period evaluated, this reliance upon temporary funding represents a risk to FPP. In 2014-15, 42 FTEs were funded by the MPMO initiative and 12 FTEs were funded through FSCAP, a total of 19.6% of the Fisheries Protection Program’s staff.

The reorganization and centralization of offices in the regions also had an impact upon workload and FPP capacity. These changes created an imbalance in resource allocation between regions, with respect to regulatory review, which is measured by number of referrals per year.

Before the reorganization in 2013, FTEs in most regions performed a similar number of referrals per fiscal year: approximately 15 referrals per FTE, with the exception of Quebec region, where

the average was five referrals per FTE. By 2014-15, these numbers varied significantly across the regions (Graph 12). In the Central and Arctic Region and the Maritimes Region, the number of referrals per FTE increased in 2014-15. These regions also experienced the greatest reduction in number of FTEs after 2013.

Graph 12 – Number of Referrals per Full Time Equivalent, by Region, 2010-11 to 2014-15



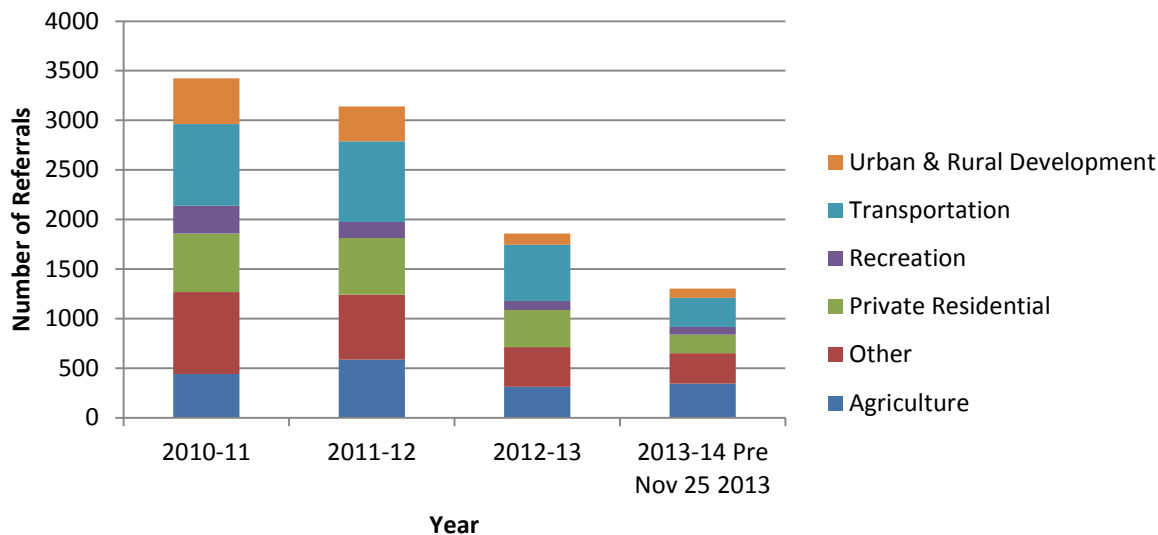
Source: Cognos Financial System, DFO and FPP Annual Reports

Note that the comparison in the number of referrals per region does not take into account the size, complexity or other factors related to referrals.

The evaluation also noted that the workload of regulatory reviewers who are assigned to review proposals by industry type, becoming specialists in their assigned industries, varied between industries and across regions. Both the number of referrals by type of industry in each region varied; and the number of referrals within the same industry type varied across regions year over year.

Graph 13 illustrates the variation in workload that exists across industries, within a given region (Central and Arctic), between 2010-11 and 2013-14. For example, in 2010-11 and 2011-12, there were a proportionately large number of referrals for the Transportation industry (second bar from the top – blue); whereas, by 2013-14, it had less.

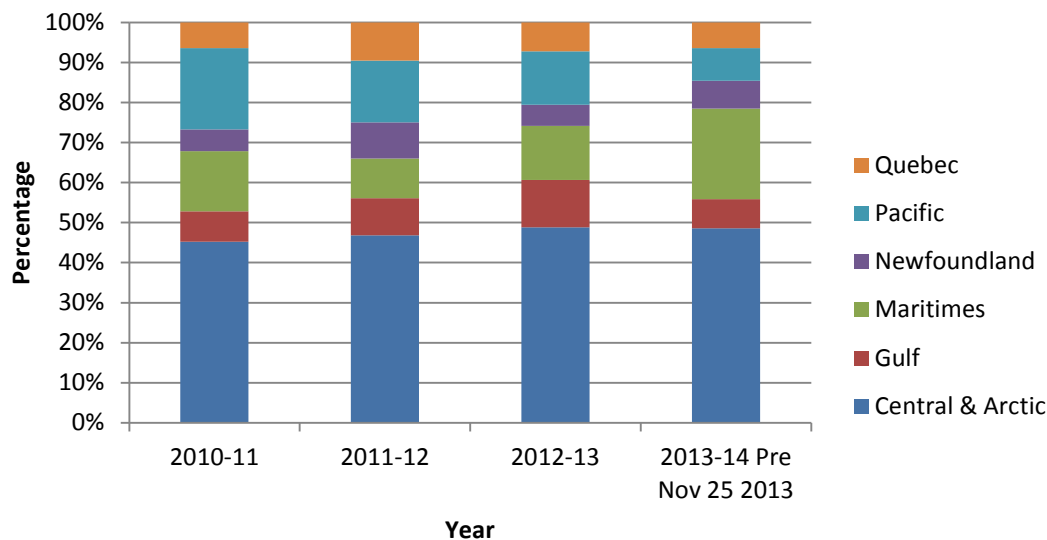
Graph 13 – Number of Referrals by Industry Type, 2010-11 to 2013-14, in Central and Arctic Region



Source: PATH Database

Graph 14 illustrates the variation in workload that exists across regions, by industry (Transportation). Note that the number of Transportation industry-related referrals reviewed by the Pacific and Maritimes regions fluctuated between 2010-11 and 2013-14.

Graph 14 – Transportation Industry: Percentage of Referrals, by DFO Region, 2010-11 to 2013-14



Source: Path Database

As the Fisheries Protection Program continues to stabilize (after the reorganization, centralization of offices, reduction in staff, and implementation of the RFCPP), there is an opportunity for the FPP to reassess its allocation of human resources; and to investigate how resources are split between the two FPP ‘arms’ (excluding the AIS component). An investigation

of this nature could determine how FPP may best balance the workload of its regulatory review staff either within regions or nationally. For example, perhaps it would be more efficient to reallocate work within each region, and build the versatility of employees who are now subject-matter experts so that they become better versed in reviewing proposals for different industry types. Conversely, perhaps it would be more efficient to assign regional staff members by industry type to perform the same expert work nationally (i.e., to other regions when they require support). Another area of investigation could involve an assessment of how FPP may balance work dedicated to the Recreational Fisheries Conservation Partnerships Program and advance on other activities (e.g., development of standards and guidelines).

Finally, key informants suggested measures that may yield increased efficiency, including:

- Conducting a review of the Delegation of Signing Authorities related to authorizations. As of 2015, all authorizations are signed by the Regional Director General for each region.
- Reviewing and modifying the FPP's self-assessment tool to make it more user-friendly. The objective would be to decrease the number of telephone calls from proponents who need additional advice as to whether a DFO review is required for their project or not.
- Consider working with the Canadian Environmental Assessment Agency (CEAA) to develop checklists, to ensure that CEAA employees are gathering of all the information required by DFO from proponents, in order to avoid further delays in the regulatory review process. DFO regulatory review officers sometimes have to request materials directly from the proponents.

### ***Recreational Fisheries Conservation Partnerships Program***

With respect to the Recreational Fisheries Conservation Partnerships Program, the efficiency of the program had improved since its inception in 2012-13, despite having been launched without any dollars allocated to O&M or salary. It was anticipated that four to five FTEs from the Fisheries Protection Program would be re-assigned to support the delivery of the RFCPP. Instead, 13 and 16 FTEs from FPP were required to deliver the program during its two first fiscal years in operation.

The RFCPP has a large geographic footprint as it covers all regions of the country, including both urban and rural areas. It has launched a call for applications every year, sometimes more than once: in 2013 there were two application rounds (June and October); the third round was launched in September 2014; and the fourth round in the fall of 2015. The average funding per project is \$55,000, which increases the administrative cost to RFCPP. The data provided for the 2014-15 fiscal year, in which rounds 1 to 3 all overlapped, with an average of 241 active files throughout the year, indicate that the RFCPP used 16 FTEs for direct program delivery, regional oversight, national management and coordination, at a cost of \$1.3 million. With \$9.0 million in signed contribution agreements for 2014-15, the administrative overhead was approximately 14% of total program disbursements.

Its administrative overhead rate of 14% is commensurate with many start-up programs; the RFCPP has incurred costs associated with the preliminary work of developing program policies, tools and operational processes; the need for training staff; and for addressing changes in the program. Furthermore, there was a learning curve for the applicants, most notably from smaller

organizations, that required more assistance from DFO staff for the submission of their application in the first years of the RFCPP. Nevertheless, operational efficiency improved recently, from 2013-14 at \$3,415 salary/\$10,000 G&C, to 2014-15 at \$1,532 salary/\$10,000 G&C, based on projects that were completed fully or partially. These rates would decrease if cancelled projects were included, because administration was nonetheless required for such projects.

### ***Aquatic Invasive Species Component***

This report addressed resource-related challenges experienced by the AIS component in the Relevance and Effectiveness sections, above. It was found that the AIS component's aims exceeded its capacity. The majority of AIS funding has been directed to AIS threats to the Great Lakes basin. More than 80% of AIS funds were directed towards the Asian Carp Initiative and Sea Lamprey control while the remainder was distributed among all regions and NHQ, for AIS work. The current governance and funding model has resulted in AIS activities being primarily regionally-driven; and the vast majority of AIS efforts being focused on only two species (i.e., Sea Lamprey and Asian Carp).

There is an opportunity to address AIS-related issues on a broader scale across Canada. However, if DFO's AIS work is to move beyond the Great Lakes region and become more proactive, there is a need to identify clear national objectives for the AIS component and changes will need to be made to DFO's AIS approach as it functions to date.

## **5.0 CONCLUSIONS AND RECOMMENDATIONS**

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### **5.1 Conclusions**

The Fisheries Protection Program and its Aquatic Invasive Species component are both engaged in activities that contribute directly to protecting fish and fish habitat across the country. Accordingly, they are aligned with the Department's mandate and the minister's responsibilities as set out in the *Fisheries Act* and other relevant Acts, including the *Species at Risk Act*.

With respect to the Fisheries Protection Program, the evaluation ascertained that there is an ongoing need to protect fish and fish habitat from projects in or near water; but was concerned about FPP's continued challenge in its monitoring capacity. The lack of oversight and monitoring has increased the risk that the Department is not adequately safeguarding fish and fish habitat.

The performance of the FPP has been impacted by a substantial reduction in its workforce and the consolidation of DFO offices in the regions. Regulatory review workload was found to be imbalanced within and among regions. Additional standards and guidelines are needed to continue to harmonize regulatory review across the country and to make it more efficient; the development of standards and guidelines has not advanced as anticipated due to the implementation of the Recreational Fisheries Conservation Partnerships Program, a contribution program with no associated funding for operations and maintenance or salaries.

With respect to the AIS component, there is an ongoing need to prevent the introduction, establishment and spread of AIS into Canadian waters. While the AIS component has been successful to preventing the introduction and establishment of Asian Carp, and controlling Sea Lamprey in the Great Lakes, less than 20% of all AIS funds are dedicated to other areas of the country. The current governance and funding model, and lack of clear national objectives restrict the AIS component from achieving impact on a national scale.

## 5.2 Recommendations

Based on the findings of the evaluation, three recommendations are being made. The first two recommendations pertain to the Fisheries Protection Program; whereas the third recommendation pertains to the AIS component.

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### Fisheries Protection Program

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**Recommendation 1: It is recommended that the Senior Assistant Deputy Minister, Ecosystems and Fisheries Management Sector, develop a clear plan to ensure that the required standards and guidelines are developed and implemented.**

**Rationale:** FPP's development of required standards and guidelines has been hindered by the strain placed upon its resources to deliver the Recreational Fisheries Conservation Partnerships Program and the reduction in FPP FTEs. As the Fisheries Protection Program continues to stabilize, there is an opportunity to reassess its human resource allocation for an optimal synergy between the two FPP 'arms' and to balance the workload of its regulatory review staff within and across regions.

**Recommendation 2: It is recommended that the Senior Assistant Deputy Minister, Ecosystems and Fisheries Management Sector, ensure that there is adequate oversight and monitoring of projects taking place in or near water, to mitigate potential impacts on fish and fish habitat.**

**Rationale:** Challenges to adequately monitor projects on or in water have been noted since before 2009. In 2014, the introduction of a self-assessment tool (with no data capture requirement) created efficiencies for FPP, but increased the risks that the Department is not adequately safeguarding fish and fish habitat. In 2015, the FPP addressed the risk of insufficient monitoring by developing region-specific monitoring plans in all regions. The implementation of the regional plans varied from one to three years. It was too early for this evaluation to assess the impact of these monitoring plans.

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### Aquatic Invasive Species Component

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**Recommendation 3: It is recommended that the Senior Assistant Deputy Minister, Ecosystems and Fisheries Management Sector, in collaboration with the Assistant Deputy Minister, Ecosystems and Oceans Science Sector, identify clear national objectives for the**

**AIS component, which are achievable based upon resource allocations, and a governance structure that ensures accountability for results.**

**Rationale:** Previous audits by the Office of the Auditor General (2002 and 2008) and the 2008-09 DFO evaluation noted that the AIS component lacks a national, long-term strategic direction. In 2015-16, there remained a lack of clear overall objective(s) to direct AIS efforts across Canada. For years the approach to AIS work has been more reactive than proactive and resulted in most of AIS funds and work focusing on two species in the Great Lakes. The current funding model, whereby over 80% of AIS funds (either B-based or fixed by international agreement) are dedicated to Sea Lamprey control and to preventing the introduction and establishment of Asian Carp. Aquatic Invasive Species was relocated under the Fisheries Protection Program in 2014-15; the AIS component employed 76 employees, all of whom belonged to the Ecosystems and Oceans Science Sector with the exception of two FTEs, who worked at National Headquarters and belonged to the Ecosystems and Fisheries Management Sector. The roles and responsibilities of both the Ecosystems and Fisheries Management Sector and the Ecosystems and Oceans Science Sector should be clarified, as they relate to aquatic invasive species work.



## 6.0 MANAGEMENT ACTION PLAN

RECOMMENDATION 1			
<p><b>Recommendation 1: It is recommended that the Senior Assistant Deputy Minister, Ecosystems and Fisheries Management Sector develop a clear plan to ensure that the required standards and guidelines are developed and implemented.</b></p> <p><b>Rationale:</b> FPP’s development of required standards and guidelines has been hindered by the strain placed upon its resources to deliver the Recreational Fisheries Conservation Partnerships Program and the reduction in FPP FTEs. As the Fisheries Protection Program continues to stabilize, there is an opportunity to reassess its human resource allocation for an optimal synergy between the two FPP ‘arms’ and to balance the workload of its regulatory review staff within and across regions.</p>			
STRATEGY			
<p>As part of the review of the 2012 changes to the <i>Fisheries Act</i>, the use of standards and guidelines, as well as the manner in which the Program is resourced and organized to develop and implement them, will be considered. This review will result in legislative, regulatory, policy and program recommendations that may, among other things, identify new approaches to developing and implementing standards and guidelines for FPP.</p>			
MANAGEMENT ACTIONS	DUE DATE (BY END OF MONTH)	STATUS UPDATE: COMPLETED / ON TARGET / REASON FOR CHANGE IN DUE DATE	OUTPUT
Based on the outcomes of the review of recent changes to the <i>Fisheries Act</i> , assess the use of, and need for, standards and guidelines within FPP	March 2018		Proposed approaches or plans for developing and implementing standards and guidelines for FPP

**RECOMMENDATION 2**

**Recommendation 2: It is recommended that the Senior Assistant Deputy Minister, Ecosystems and Fisheries Management Sector, ensure that there is adequate oversight and monitoring of projects taking place in or near water, to mitigate potential impacts on fish and fish habitat.**

**Rationale:** Challenges to adequately monitor projects on or in water have been noted since before 2009. In 2014, the introduction of a self-assessment tool (with no data capture requirement) created efficiencies for FPP, but increased the risks that the Department is not adequately safeguarding fish and fish habitat. In 2015, the FPP addressed the risk of insufficient monitoring by developing region-specific monitoring plans in all regions. The implementation of the regional plans varied from one to three years. It was too early for this evaluation to assess the impact of these monitoring plans.

**STRATEGY**

As approved by the Government in late spring 2016, FPP will dedicate resources to improve existing processes, and develop new processes, to monitor development projects that affect fish and fish habitat, and report back to the public on how fish and fish habitat are being protected.

MANAGEMENT ACTIONS	DUE DATE (BY END OF MONTH)	STATUS UPDATE: COMPLETED / ON TARGET / REASON FOR CHANGE IN DUE DATE	OUTPUT
Develop approaches and processes to ensure that monitoring data is collected, analyzed and captured in a consistent and standardized way	March 2018		New, modern monitoring plans, tools and protocols for FPP
Report regularly to the public on outcomes for fish and fish habitat achieved through the implementation of the FPP	March 2018		Evidence and outcomes-based FPP public reporting processes

### RECOMMENDATION 3

**Recommendation 3: It is recommended that the Senior Assistant Deputy Minister, Ecosystems and Fisheries Management Sector in collaboration with the Assistant Deputy Minister, Ecosystems and Oceans Science Sector, identify clear national objectives for the AIS component, which are achievable based upon resource allocations, and a governance structure that ensures accountability for results.**

**Rationale:** Previous audits by the Office of the Auditor General (2002 and 2008) and the 2008-09 DFO evaluation noted that the AIS component lacks a national, long-term strategic direction. In 2015-16, there remained a lack of clear overall objective(s) to direct AIS efforts across Canada. For years the approach to AIS work has been more reactive than proactive and resulted in most of AIS funds and work focusing on two species in the Great Lakes. The current funding model, whereby over 80% of AIS funds (either B-based or fixed by international agreement) are dedicated to Sea Lamprey control and to preventing the introduction and establishment of Asian Carp. Aquatic Invasive Species was relocated under the Fisheries Protection Program in 2014-15; the AIS component employed 76 employees, all of whom belonged to the Ecosystems and Oceans Science Sector with the exception of two FTEs, who worked at National Headquarters and belonged to the Ecosystems and Fisheries Management Sector. The roles and responsibilities of both the Ecosystems and Fisheries Management Sector and the Ecosystems and Oceans Science Sector should be clarified, as they relate to aquatic invasive species work.

### STRATEGY

EFM to identify clear national objectives, roles and responsibilities.

- DFO's objective is to protect Canada's fisheries and ecosystems against the threat of AIS and to provide leadership across Canada on AIS issues.
- Senior management assigned the lead to the EFM sector in 2012 (it was previously with EOS), and the AIS program was relocated under EFM in the PAA in 2014-15.
- In August 2016, the Deputy Minister's Policy Committee (DPC) agreed to create an AIS Program that would be led centrally and delivered regionally. The program would focus on delivering policy and operational functions and conducting some science.
- EFM is exploring options for the development of a Program. A decision on options will be communicated in spring 2018.

MANAGEMENT ACTIONS	DUE DATE (BY END OF MONTH)	STATUS UPDATE: COMPLETED / ON TARGET / REASON FOR CHANGE IN DUE DATE	OUTPUT
Ecosystems Management (EM), in collaboration with the AIS DG Steering Committee and the AIS Working Group, develops a recommendation for DPC's Decision	August 2016	Completed	Decision made to create national AIS Program to implement AIS regulations
EFM explores options for the development of a Program, which will include the identification of clear national objectives and governance structure	Spring 2018		Decision has been made on which option to pursue; analysis paper on implications for the department regarding the development of national objectives and a governance structure

## **ANNEX A: PROGRAM ALIGNMENT ARCHITECTURE VERSUS OPERATIONAL STRUCTURE**

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The Fisheries Protection Program underwent many changes within DFO's Program Alignment Architecture (PAA) during the scope of the evaluation. Between 2010-11 and 2012-13 it was called the Habitat Management Program. It became known as the Fisheries Protection Program in 2013-14 after the *Fisheries Act* was amended.

In 2014-15, Aquatic Invasive Species was relocated under the Fisheries Protection Program; and the FPP was re-organized into three sub-programs in the PAA, under the departmental Strategic Outcome of *Sustainable Aquatic Ecosystems*:

1. Regulatory Reviews, Standards and Guidelines;
2. Partnerships and Regulatory Arrangements; and
3. Aquatic Invasive Species<sup>81</sup>

The Evaluation Directorate elected to assess the FPP and its AIS component according to their operational structure as of 2014-15. This operational structure is composed of three administrative 'arms' located under DFO's Ecosystems and Fisheries Management Sector. One of which, the AIS component, is led by EFM but is primarily delivered by the Ecosystems and Oceans Science Sector:

1. Triage and Planning & Regulatory Review
2. Clients Liaison, Partnerships, Standards and Guidelines
3. Aquatic Invasive Species

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<sup>81</sup> Prior to 2014-15, the Aquatic Invasive Species component was located under the Science for Sustainable Fisheries and Aquaculture Program in DFO's PAA 2010-11; and from 2011-12 to 2013-14 it was a stand-alone program.

## **ANNEX B: FISHERIES PROTECTION AND AQUATIC INVASIVE SPECIES PARTNERS AND STAKEHOLDERS**

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### Regulatory Reviews, Partnerships and Regulatory Arrangements

#### Partners

- DFO Conservation and Protection Program
- DFO Ecosystems and Oceans Science Sector
- DFO Species at Risk Management Program
- DFO Integrated Fisheries Management Program
- DFO Sustainable Aquaculture Program
- Environment and Climate Change Canada
- Major Projects Management Office
- Provincial Governments
- Aboriginal Groups

#### Primary Stakeholders

- Agriculture Industry
- Aquaculture Industry
- Forestry Industry
- Hydro Power Corporations
- Industrial/Commercial Industries
- Mining Industries
- Oil/Gas Industry
- Rural/Urban Development Project Proponents
- Transportation Industry
- Recreational Industry
- Commercial, Recreational and Aboriginal Fisheries
- Non-Governmental Organizations

### Aquatic Invasive Species

#### Co-Delivery Partners

- Federal and provincial authorities
- Great Lakes Fishery Commission
- Environment and Climate Change Canada
- Transport Canada
- Canada Border Services Agency
- Universities

### Primary Stakeholders

- Commercial, recreational and aboriginal fisheries
- Non-Governmental Organizations
- International Organizations
- Shipping Industry
- Municipalities
- Hydroelectric Facilities
- Cottage Owners
- Recreational Boaters

**ANNEX C: EVALUATION MATRIX**

<b>NOTE: Fisheries Protection Program (FPP) include Aquatic Invasive Species (AIS) in the Evaluation Matrix</b>		
<b>Issue/Question</b>	<b>Indicators</b>	<b>Data Sources</b>
<b>1. Relevance</b>		
1.1 Is there a continued need for the Fisheries Protection Program?	<ul style="list-style-type: none"> <li>• Key informant respondent views on the importance/need of FPP</li> <li>• Evidence/demonstration that there is continuing need for FPP</li> <li>• Program stakeholders attest to the importance of FPP</li> <li>• How is the program different from other programs? Look for potential duplication of program objectives with other government departments, provinces/territories, municipalities, private sector.</li> </ul>	<ul style="list-style-type: none"> <li>• Document review</li> <li>• Key informant interviews</li> <li>• 2008-09 AIS evaluation</li> </ul>
1.2 Is the Fisheries Protection Program aligned with Government of Canada priorities and DFO strategic outcomes?	<ul style="list-style-type: none"> <li>• Evidence/demonstration that FPP is aligned with Government of Canada priorities and DFO strategic outcomes.</li> <li>• Senior management views on the degree of alignment of program objectives with Government of Canada priorities and DFO priorities/strategic outcomes.</li> </ul>	<ul style="list-style-type: none"> <li>• Document review</li> <li>• Key informant interviews</li> </ul>
1.3 Is the Fisheries Protection Program aligned with federal roles and responsibilities?	<ul style="list-style-type: none"> <li>• Demonstrated link with federal legislation, regulations or policies.</li> <li>• Evidence of exclusive or shared federal jurisdiction for the program.</li> <li>• Key informant respondent views on whether some components of the program could or should be conducted by other organizations or levels of government.</li> </ul>	<ul style="list-style-type: none"> <li>• Document review</li> <li>• Key informant interviews</li> </ul>
<b>2. Performance: Achievement of Expected Outcomes</b>		



<p>2.1 To what extent and in what circumstances has the new FPP organizational structure impacted the program capacity to achieve its results? To what extent and in what circumstances does the program meet its results?</p>	<ul style="list-style-type: none"> <li>• Stakeholder/Partners opinion on the extent to which FPP and AIS achieves its results</li> <li>• Establishment of guidelines and regulations</li> <li>• Provide advice to proponents</li> <li>• Ensure compliance with the <i>Fisheries Act</i> and the <i>Species at Risk Act</i>.</li> <li>• Strengths and weaknesses of the new FPP organizational structure</li> <li>• Effective decision making</li> <li>• clarity of roles and responsibilities</li> <li>• FTEs dedicated to RFCPP projects.</li> <li>• Perception from stakeholder on building partnerships</li> <li>• % of authorizations issues meeting timelines set in regulations</li> <li>• # of referrals reviewed per year</li> <li>• # of advice to proponents or other provided per year</li> <li>• # of authorizations issued by work type and by sector</li> <li>• # of hours dedicated by Conservation and Protection to habitat/fisheries protection issues</li> <li>• RFCPP results</li> <li>• AIS under FPP since 2014-15</li> </ul>	<ul style="list-style-type: none"> <li>• Document review</li> <li>• Key informant interviews</li> </ul>
<p>2.2 Are there any external factors and/or challenges that may have impacted the results of the program? Any unintended results?</p>	<ul style="list-style-type: none"> <li>• Additional funding related to FPP (<i>Major Projects Management Office Initiative and funding from Federal Contaminated Sites Action Plan</i>)</li> <li>• Time spent by FPP staff on RFCPP</li> <li>• Impact of RFCPP on other FPP aspects.</li> <li>• Centralization and reduction of FPP staff</li> <li>• Internal services in support of achieving FPP results</li> <li>• New Acts and Regulations (e.g.; <i>New Fisheries Act, Aquatic Invasive Species regulations, Canadian Environmental Assessment Act</i>, etc.)</li> <li>• Key informant respondents opinions</li> </ul>	<ul style="list-style-type: none"> <li>• Databases</li> <li>• Key informant interviews</li> <li>• Document review</li> </ul>
<p><b>3. Performance</b></p>		

<p>3.1 To what extent are the program’s activities, structures and processes appropriate to support the achievement of results?</p>	<ul style="list-style-type: none"> <li>○ Governance</li> <li>○ Clarity of roles and responsibilities</li> <li>○ Partnerships established</li> <li>○ Provincial collaboration</li> <li>○ Allocation of budget and FTEs between regions</li> <li>○ Communication</li> <li>○ Program coordination with other programs (e.g., C&amp;P)</li> <li>○ Usefulness of G&amp;C and other funding mechanisms</li> <li>○ Design and delivery of the program</li> </ul>	<ul style="list-style-type: none"> <li>● Key informant interviews</li> <li>● Document review</li> </ul>
<p>3.2 Are there best practices and lessons learned from FPP and AIS? From the Asian Carp Initiative, best practices that may be transferred to other AIS.</p>	<ul style="list-style-type: none"> <li>● Example of best practices that may be transferred to other AIS.</li> <li>● Examples from key informants respondents and documents</li> <li>● On-site examination</li> </ul>	<ul style="list-style-type: none"> <li>● Document review</li> <li>● Key informant interviews</li> <li>● Site visit</li> </ul>
<p>3.3 Could the efficiency of FPP activities be improved?</p>	<ul style="list-style-type: none"> <li>● Examples of possible efficiency improvements</li> <li>● On-site examination</li> <li>● Efficiency of RFCPP process related to G&amp;C</li> <li>● Collaboration with external parties (e.g.; Great Lake Fisheries Commission, one window approach with Provinces)</li> <li>● Asian Carp Initiative collaboration with US and other partners</li> <li>● Rapid response plans and protocols in place</li> <li>● Key informant respondents opinions</li> </ul>	<ul style="list-style-type: none"> <li>● Document review</li> <li>● Key informant interviews</li> <li>● Site visit</li> </ul>

## **ANNEX D: STANDARDS AND GUIDELINES UNDER DEVELOPMENT**

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The following standards or guidelines were under development in 2016:

- Framework for Referral Review – Led by National Headquarters
- Sediment Standard for Pipeline Crossing – Led by National Headquarters
- Sediment Standard for Transportation Crossing – Led by Quebec Region
- Fish Passage Standard for Transportation Crossing – Led by Quebec Region
- Footprint Standard for Transportation Crossing – Led by Quebec Region
- Fish Mortality Standard for Large and Medium Water Intakes – Led by Central and Arctic Region
- Footprint Standard for Harbour Infrastructure – Led by Maritimes Region

## **ANNEX E: ESTIMATING THE COMBINED TOTAL (US AND CANADA) ECONOMIC VALUES OF COMMERCIAL AND RECREATIONAL FISHERIES IN THE GREAT LAKES BASIN**

The total economic contribution of commercial and recreational fisheries in the Great Lakes (including the multiplier effect) is estimated at CAD \$9.4 billion (USD \$8.3 billion). The Great Lakes commercial and recreational fisheries contributed CAD \$1.3 billion (USD \$1.2 billion) to the Canadian economy.

These estimates were arrived at using the following methodology:

1. US methodology was used for the estimate, to ensure that the Canadian calculations were consistent with American estimates. This approach was adopted because the dollar value of the US Great Lakes fisheries industry is significantly larger than the dollar value of the Canadian fisheries industry in the Great Lakes.
  - a. For this reason, values for both Canadian and US industries include the multiplier effect and represent the spin-off values generated throughout the economy, as this is the American approach
2. Values were all converted into 2006 values, because data for both countries and categories (commercial and recreational) was collected in different years, but 2006 was the latest year for which US data was available.

The following table provides a detailed breakdown of the values:

	<b>Value (in 2006 Mil. USD)</b>	<b>Total Economic Value (in 2006 Mil. USD)</b>	<b>Total Economic Value (in 2006 Mil. CAD)</b>
<b>The USA</b>			
Commercial	\$17	\$47	\$53
Recreational	\$2,524	\$7,092	\$8,014
<b>Sub-total</b>	<b>\$2,541</b>	<b>\$7,140</b>	<b>\$8,068</b>
<b>Canada</b>			
Commercial	\$34	\$67	\$75
Recreational	\$556	\$1,100	\$1,243
<b>Sub-total</b>	<b>\$589</b>	<b>\$1,167</b>	<b>\$1,319</b>
<b>Total</b>	<b>\$3,130</b>	<b>\$8,307</b>	<b>\$9,386</b>

Data for the USA is taken from the following sources for the year 2006:

- (i) Commercial fishing – Eugene H. B., Harold F. U., Charles V. S., and James E. N. (2010). Asian Carp and the Great Lakes Region. Congressional Research Service, 7-5700, [WWW.CRS.GOV](http://www.crs.gov), R41082
- (ii) Recreational fishing – American Sportfishing Association. (2008). Today’s Angler, *A statistical profile of anglers, their targeted species and expenditures*, [WWW.ASAFISHING.ORG](http://www.asafishing.org)

Data for Canada is taken from the following sources:

- (i) Ontario Ministry of Natural Resources and Forestry for commercial fishing
- (ii) Department of Fisheries and Oceans. (2008). *Survey of Recreational Fishing in Canada 2005. Selected Results for the Great Lakes Fishery*