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# Invasive Alien Species Partnership Program

2005-2010 Report



Canada

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# Invasive Alien Species Partnership Program

2005-2010 Report



## Executive Summary

According to the International Union for Conservation of Nature (IUCN), invasive alien species (IAS) are the second most significant threat to biodiversity, after habitat loss. The impact of IAS on native ecosystems, habitats and species can be severe and often irreversible. IAS cause billions of dollars in direct losses, costs of containment and control, production losses, and lost market access each year.

As a result of the national concern over IAS, an Invasive Alien Species Strategy for Canada was developed and approved by federal, provincial and territorial resource ministers in 2004. The 2005 federal budget provided \$85 million over five years to support actions that focused on enhanced preventative measures, including \$5 million over five years for the Invasive Alien Species Partnership Program (IASPP).

Between 2005 and 2010, 141 projects targeting 277 identified IAS have been funded by the IASPP. Most of these projects aimed to increase stakeholder engagement, understanding and awareness of IAS to minimize the risk of IAS introductions and spread. Other key activities included species inventories and monitoring to detect the presence of new IAS infestations and the development of management activities to reduce the impact of established IAS. Each year the requests for funding from the IASPP significantly exceeded the \$1 million available. Over the five years, the IASPP received almost 800 project proposals requesting a total of almost \$40 million, indicating a great interest from all stakeholders to develop initiatives addressing IAS. Total IASPP expenditures of \$4.6 million were matched by almost \$8.3 million provided by recipients and their partners supporting implementation of the approved projects.

This report provides information on the establishment of the IASPP, project implementation and program achievements. Examples are provided to illustrate the results of select projects. The information covers the initial five-year commitment (2005 to 2010) by the Government of Canada to address the threat of IAS.

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## Introduction

Species that become established in areas outside their natural range are known as alien species. Generally, alien species do not pose a significant risk and many are even beneficial. In comparison, invasive alien species (IAS) are those species introduced by human activities outside their natural past or present distribution that threaten the environment, economy or society, including human health. According to the International Union for Conservation of Nature (IUCN), after habitat loss, IAS are the second most significant threat to biodiversity. In their new ecosystems IAS may become predators, competitors, parasites, hybridizers or diseases of native and domesticated plants and animals. The impact of IAS on native ecosystems, habitats and species can often be severe and irreversible. IAS cause billions of dollars in direct losses, including costs of containment and control, production losses and lost market access each year. In Canada, the annual cost of IAS is estimated to be as much as \$20 billion to the forest sector, \$7 billion for aquatic invasive species in the Great Lakes and \$2.2 billion for invasive plants alone in the agricultural sector.

In December of 1992, Canada was the first industrialized country to ratify the United Nations Convention on Biological Diversity developed at the Rio Earth Summit. Under Article 8(h) of the Convention, all signatories are required to “prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species”. It also called on signatory countries to develop a national biodiversity strategy; Canada released its strategy in 1995. The Canadian Biodiversity Strategy recognized that Canadian ecosystems and habitats have been negatively impacted by the establishment of IAS. In addition, the strategy calls for the development and implementation of policies, plans, legislation and programs to prevent IAS from adversely affecting biodiversity.

In line with both the United Nations Convention on Biological Diversity and the Canadian Biodiversity Strategy, the Joint Council meeting of federal, provincial and territorial ministers for wildlife, forests, fisheries and aquaculture called for the development of a national plan on IAS. An Invasive Alien Species Strategy for Canada (IASSC) was developed and approved by federal, provincial and territorial resource ministers in September 2004. The IASSC seeks to minimize the risk of IAS to the environment, economy and society through a hierarchical approach that prioritizes prevention, early detection, rapid response and management.

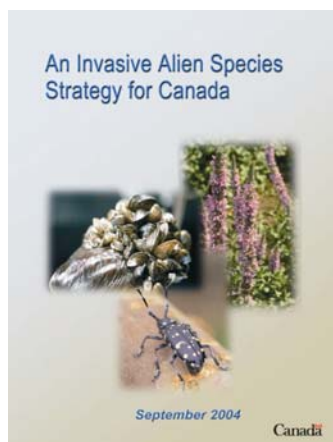
To promote effective management of IAS, the Government of Canada committed \$85 million over five years (2005–2010) to initiate the implementation of the IASSC, especially actions that focused on enhanced prevention measures. As part of this initiative, the Invasive Alien Species Partnership Program (IASPP) received \$5 million over five years to provide funding to projects that engage Canadians in actions that support the key priorities of the IASSC.





# 1. Invasive Alien Species Strategy for Canada

Canada's strategic approach to addressing IAS focuses on pathways of introduction. Pathways are the routes by which IAS are introduced or spread: they can be intentional (purposeful) or unintentional (accidental); authorized (legal) or unauthorized (illegal). There are many pathways of introduction including recreational boating, aquarium/aquaculture trade, bait trade, pet trade, horticultural trade, hitchhikers on commodities and packaging, stowaways in various modes of transportation (e.g. ballast water in ships) and as disease in wildlife.



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The IASSC responds to the IAS challenge through a hierarchical approach that prioritizes:

- 1) prevention of new invasions;
- 2) early detection of new invaders;
- 3) rapid response to new invaders; and
- 4) management of established and spreading invaders (containment, eradication and control).

## Prevention

Prevention is widely accepted as the most effective and least expensive means of avoiding or minimizing the risk posed by IAS. Investments in prevention are cost effective, employing preventative practices leading to the avoidance of significant long-term economic, environmental and social costs.

Tools available under the label "prevention" include increasing risk assessment capacity, conducting scientific research to better predict the invasiveness of a potential IAS and developing public education programs with stakeholders. Meanwhile, surveillance strategies, such as pre-border and border inspections and interceptions are also essential.

In the case of intentional introductions, such as species introduced for stocking (hunting, food, etc.), prevention focuses on the application of risk analysis and prior approval of proposed introductions by the responsible departments. An integrated approach should be used that incorporates environmental, socio-economic and human health considerations, and is consistent nationally and internationally across sectors.

Measures to reduce unintentional introductions likewise involve the use of risk analysis as well as technical measures to minimize the risk of introductions through pathways

such as commodities and transportation vectors. Management plans are needed for high risk pathways of introduction.

### **Early Detection**

Moving through the hierarchical response, early detection is important to address IAS that have made it to the border.

Public education, outreach and surveillance remain important tools in effectively detecting IAS. A coordinated program of site-specific and general monitoring around critical points of entry, protected or sensitive areas, and urban and agricultural ecosystems is essential for early detection. A key aspect of early detection is a core capacity of expertise with the ability to identify IAS and distinguish them from native or long-established species.

### **Rapid Response**

When IAS manage to elude prevention measures and enter Canada, and as soon as they have been detected, it is essential to respond rapidly before they become widely established. Like prevention and early detection approaches, rapid response approaches address the front end of the risk and engage proactive tools to limit the impact of newly arrived IAS.

Integrated rapid response networks are necessary while contingency plans and emergency funds for quarantine and eradication measures are essential to eradicate, contain or control IAS immediately upon entry. Rapid response efforts require the ability to coordinate activities among departments to mobilize resources quickly, with mutual reliance between partner groups.



## **Early Detection and Rapid Response to New Invasive Alien Species: the Asian Long-horned Beetle**

The Asian long-horned beetle (*Anoplophora glabripennis*) is a forest pest native to several Asian countries that attacks and kills a wide range of hardwood trees, including maple. Also known as the starry sky beetle, this destructive wood boring insect was found in an industrial park bordering Toronto and the City of Vaughan in 2003. It is a serious threat to the forests of Ontario.

The beetle is no stranger to North America. It was first found in New York in 1996, in Chicago in 1998, and in New Jersey in 2002 and again in 2004. A native of China, it was likely introduced into North America by way of wooden pallets, crates, or packaging materials used in shipping. Millions of dollars has been spent to eradicate the insect. Though these programs have been successful to date, any new sightings require immediate action.

Immediately upon the discovery of the beetle, a joint task force was created to eradicate the insect from Canada. As the lead agency responsible for preventing the entry and spread of invasive insect species, the eradication effort is led by the Canadian Food Inspection Agency (CFIA), and includes the Ontario Ministry of Natural Resources (OMNR), the Canadian Forest Service (CFS), City of Toronto, City of Vaughan, York Region, Toronto and Region Conservation Authority, and the U.S. Department of Agriculture.

All discoveries of the Asian Long-horned beetle in North America were made by alert, observant citizens who informed the appropriate agencies to manage and control invasive pests. Early detection is crucial to stop this beetle from becoming established and spreading.

Ontario Ministry of Natural Resources:

[www.mnr.gov.on.ca/en/Business/Forests/2ColumnSubPage/STEL02\\_166979.html](http://www.mnr.gov.on.ca/en/Business/Forests/2ColumnSubPage/STEL02_166979.html)

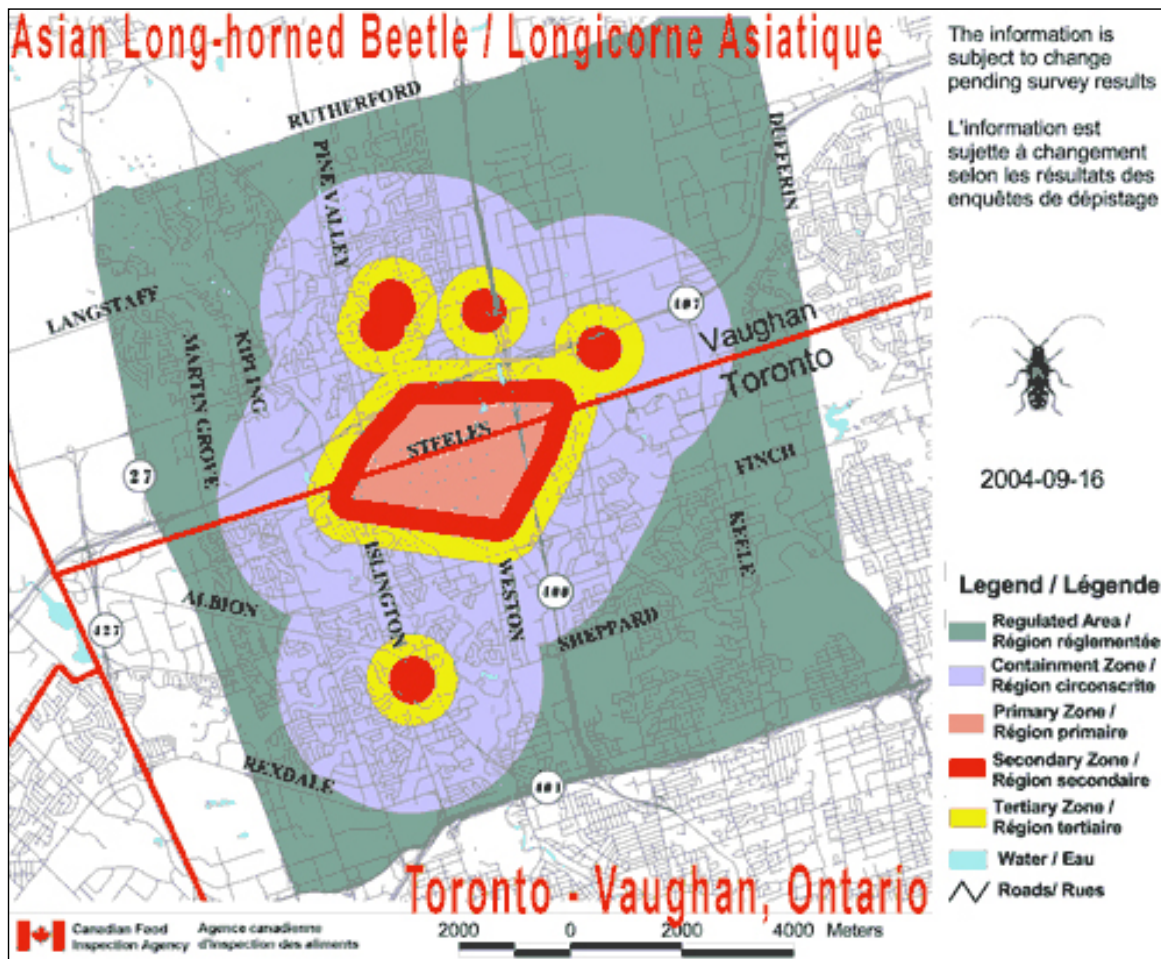
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The CFIA creates regulated areas where invasive pests are found. In these areas, they set up and enforce measures to restrict the movement of potentially infested wood. This helps prevent the pest from spreading into other areas. A regulated area has been established in parts of Toronto and Vaughan in order to prevent the spread of the Asian Long-horned beetle. This is necessary to prevent the spread of the Asian Long-horned beetle throughout Toronto, the rest of Ontario and Canada.

The CFIA is also asking for the public's help in spotting the beetle and reporting it to their local CFIA office.

Canadian Food Inspection Agency:

[www.inspection.gc.ca/english/plaveg/pestrava/anogla/questionse.shtml](http://www.inspection.gc.ca/english/plaveg/pestrava/anogla/questionse.shtml)



Canadian Food Inspection Agency

[www.inspection.gc.ca/english/plaveg/pestrava/anogla/mc/mapcar031208e.shtml](http://www.inspection.gc.ca/english/plaveg/pestrava/anogla/mc/mapcar031208e.shtml)

## Management

Once established, IAS should be targeted for management activities, research and innovative responses to minimize their long-term impacts and costs. Risk analysis, benefit-cost analysis and other tools can be used to identify and prioritize the most appropriate and cost-effective mitigation measures to be undertaken, including containment, control and eradication.

Unlike the prior three approaches, management approaches to established IAS tend to be costly and are reactive in nature. Eradication, containment and control of identified priority IAS can involve physical, chemical, biological or integrated strategies. Scientific research on methods and technologies for priority IAS are critical to effectively assign resource use and maximize effectiveness. For example, Sea Lampreys were a significant factor in the collapse of the Lake Trout and Whitefish fisheries in the Great Lakes in the 1940s and 1950s. The Sea Lamprey Control Program, initiated in 1955, resulted in a 90% reduction in Sea Lamprey populations. The annual costs of the program are over \$21 million and are shared by Canada and the United States.

## 1.1. Partners

The IASSC emphasizes the importance of key actions aimed at prevention, rapid response, early detection and management of IAS. Dedicated federal, provincial and territorial governments leadership is imperative for a successful response to the challenge of IAS, and coordination is important not only among jurisdictions but also among non-governmental organizations and private sector.

At the federal level, the coordination for the implementation of the IASSC is led by Environment Canada (EC), and core responsibilities for implementing the IASSC are shared among three departments and one agency:

- Canadian Food Inspection Agency (CFIA) for terrestrial invasive plants and agricultural pests;
- EC for terrestrial invasive animals and wildlife diseases;
- Fisheries and Oceans Canada (DFO) for aquatic invasive species; and
- Natural Resources Canada (NRCan) for forest pests.

The agency and departments are committed to an ongoing collaboration on IAS issues.

The IASSC identifies stakeholders as all levels of government, industry, non-governmental organizations (NGOs), academic researchers, Aboriginal groups and the general public. All of these stakeholders contribute to addressing the challenge of IAS in their own right; for example, engaging the public can increase awareness of how to prevent the introduction and spread of IAS, while academic researchers conduct important research that enhances the capacity to predict the likelihood of a species being introduced and the level at which that species may invade.



## 2. Invasive Alien Species Partnership Program

The IASPP, which began in 2005, is only one part of the Government of Canada's larger initiative on IAS. The Program is a federal funding program with an annual budget of \$1 million available to partners.

The IASPP encourages partnerships and coordination among a wide range of stakeholders on IAS initiatives considered high priority under the IASSC. The contributions of many stakeholders, both regional and local, are important in addressing the challenges of IAS.

The Program is managed jointly by EC, the CFIA and DFO and administered by EC. Other federal departments have been engaged in the Program through the Interdepartmental Technical Review Committee that evaluates project proposals. Committee members include NRCan, the Canada Border Services Agency, Agriculture and Agri-Food Canada and the Parks Canada Agency. These federal departments and agencies work with stakeholders to effectively implement the IASPP and to ensure achievement of objectives related to the Program's priorities.

Eligible recipients for funding include non-governmental and not-for-profit organizations, Aboriginal groups and organizations, educational or research institutions, private individuals and companies, as well as provincial, territorial and municipal governments, agencies or Crown corporations.

Recipients are eligible for up to \$50,000 in funding per year. All projects are evaluated by the Interdepartmental Technical Review Committee according to the following criteria: public education value, risk reduction value, significance of target species or pathways, value of contributions from other sources, sustainability of the initiative, technical feasibility, appropriateness of budget and work plan, and evaluation and performance framework. The Technical Review Committee submits its project recommendations to an Interdepartmental Directors General Steering Committee; the Steering Committee subsequently presents its recommendations to the Assistant Deputy Minister of EC for final approval.

### 2.1. Goals, Objectives and Results

The IASPP provides funding in support of the implementation of the IASSC. The goal of the IASPP is to engage Canadians in actions to prevent, detect and manage IAS in order to minimize the risk the species pose to Canada's natural capital. The three specific objectives of the IASPP are to:

- reduce the introduction and spread of IAS and address their pathways of invasion through prevention, detection and management (containment, eradication and control) activities;
- enable Canadians to become actively involved in projects that address the threat of IAS; and

- improve Canadians' understanding and awareness of IAS and the individual actions and choices that contribute to their introduction and spread.

Projects funded by the IASPP support the key activities of the Program identified as being high priorities for taking action on IAS in Canada and include: Extension, Outreach, Education and Communication; Inventories, Monitoring and Science Development; and Eradication, Containment and Control. The results of projects completed under the IASPP support the priorities identified in the IASSC. They fall into three main areas:

- active engagement of Canadians in minimizing the risk of IAS introductions;
- development of products and tools to reduce the potential for unintentional introductions through specific pathways of invasion; and
- development of products and tools to increase general public awareness and understanding of IAS issues.

## 2.2. Program Achievements

The first five years of the Program showed significant interest from Canadians in working to address IAS with almost 800 applications submitted with a total value of almost \$40 million. During the first five years of the Program, 141 different projects were funded for a total IASPP contribution of \$4.6 million. Many of the projects were multi-year and approved for two or three years to allow for more concrete results. Due to delays in implementing the Program, the \$1 million in funding that was originally allocated for fiscal year 2005-2006 was carried forward to fiscal years 2006-2007 and 2007-2008 through a combined call for proposals with most of the approved projects during the first round being multi-year. Therefore the Program actually provided funding from 2006-2007 to 2009-2010.

### IASPP Funding

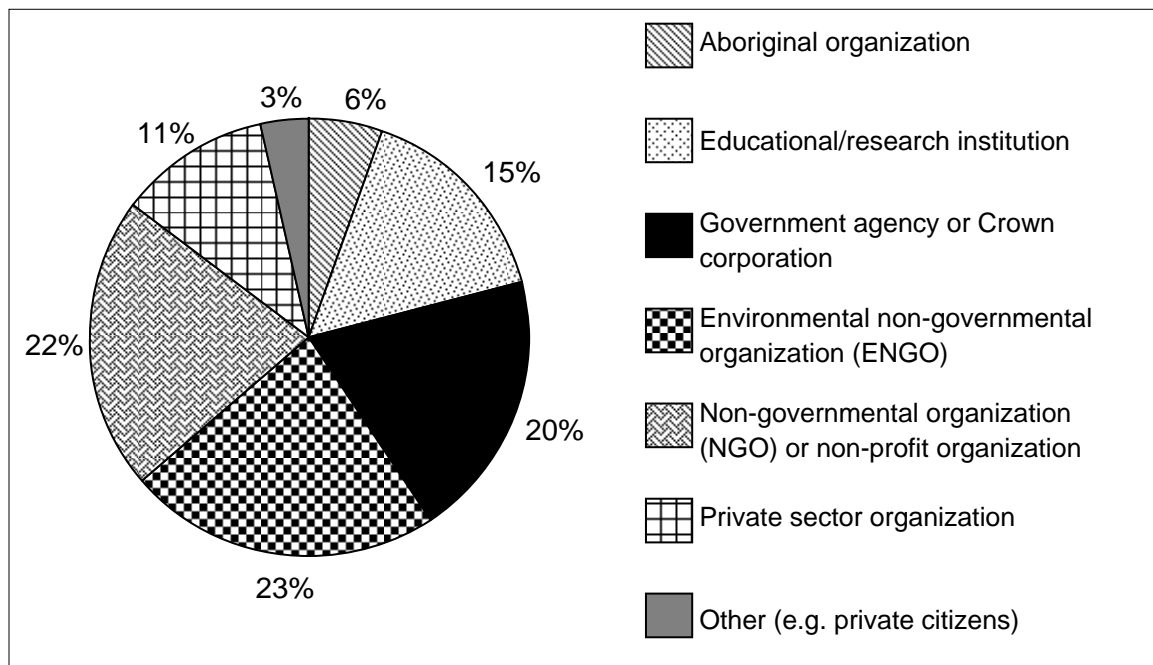
Year	Number of Applications	Total Funding Request (\$ million)	Number of Approved Projects	IASPP Funding (\$ million)	Additional Funding (\$ million)		Total Value (\$ million)
					In-kind	Cash	
2006/2007	310	19.0	44	0.629	3.081	1.044	6.709
2007/2008	123	7.0	30	1.982			
2008/2009	192	7.35	32	0.994	1.655	0.487	3.125
2009/2010	173	6.04	35	1.000	1.648	0.374	3.022
<b>Total</b>	<b>798</b>	<b>39.39</b>	<b>141</b>	<b>4.605</b>	<b>6.384</b>	<b>1.905</b>	<b>12.857</b>

Contributions from other sources of funding are encouraged in project proposals. Between 2006 and 2010, an estimated \$8.289 million was contributed to IASPP projects by the proponents and their partners. This represents \$1.80 for each dollar awarded by the IASPP. Of these contributions, a portion was in cash (\$1.905 million) and the remainder was in-kind (\$6.384 million), including volunteer labour; since 2006 approximately 4543 volunteers have participated directly in the 141 IASPP projects.

These projects have targeted 277 IAS (Appendix A) including species originating from outside of Canada, and those native to Canada but invasive to particular regions. Some high-profile invasive species that have been targeted by IASPP projects include Purple Loosestrife (*Lythrum salicaria*), Club Tunicate (*Styela clava*), Asian Long-horned Beetle (*Anoplophora glabripennis*), Round Goby (*Neogobius melanostomus*), Red-eared Slider (*Trachemys scripta elegans*) and Butternut Canker (*Sirococcus clavignenti-juglandacearum*).

The IASPP has funded 85 different organizations (Appendix B) including the Ontario Federation of Anglers and Hunters, McGill University, Cape Breton University, Vancouver Island University, Ministère des Ressources naturelles et de la Faune [Quebec Ministry of Natural Resources and Wildlife], British Columbia Ministry of Environment, Congress of Aboriginal Peoples and Environmental Dynamics Inc.

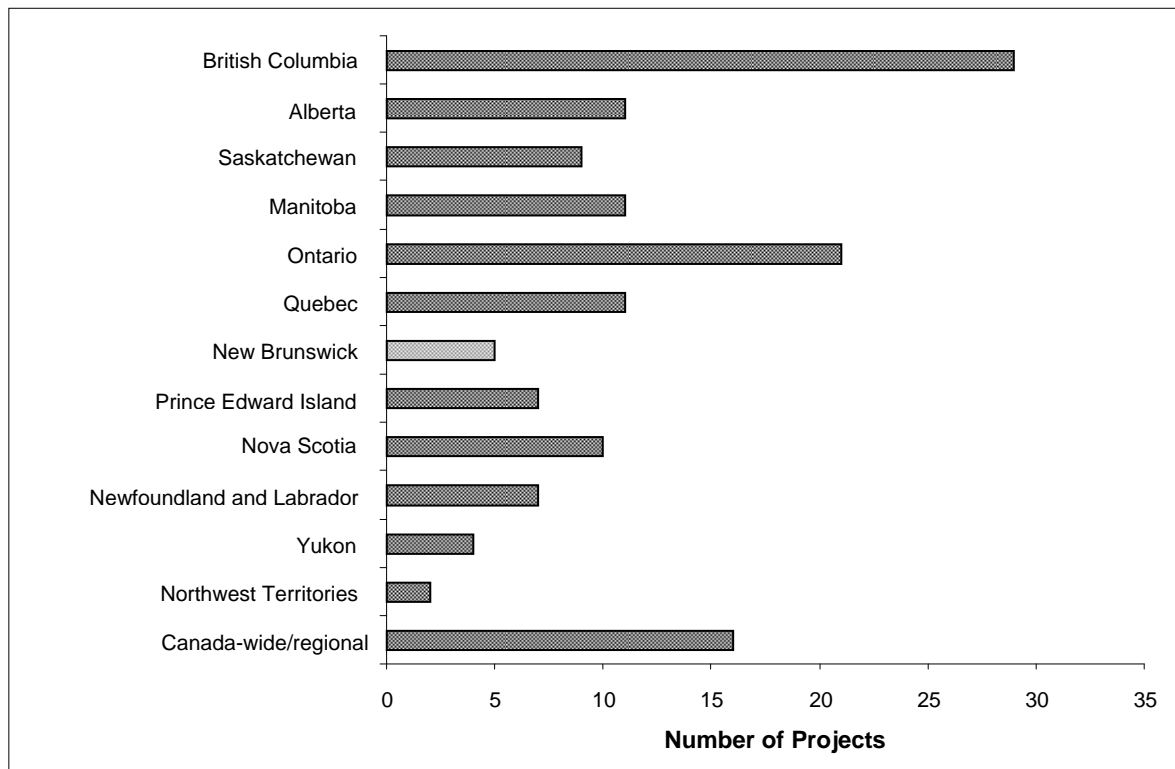
### Types of Organizations, by Number of Projects, Funded by the IASPP



In order to achieve a balanced national program, the distribution of projects in all provinces and territories was taken into consideration during the project review process. However, final decisions depended on the number of applications from each jurisdiction and the quality of the applications. In some cases, funded projects were regional in nature (covering two or more provinces or territories) or occurred at a national level.



## IASPP Project Distribution Across Provinces and Territories



The results of the projects carried out under the IASPP are a series of prevention, detection and management-related initiatives addressing the primary objective of preventing the introduction and managing the spread of IAS into and throughout Canada.

Projects funded through the IASPP respond to three priorities in the IASSC: Prevention, Detection and Management. Overall, 75% of the projects addressed two or all three priorities.

### Strategic IASSC Priorities Addressed by IASPP Projects

Priority Activity	Number of Projects	Percent of Total (%)
Prevention	16	11%
Detection	8	6%
Management	11	8%
Detection and management	6	4%
Prevention and detection	12	8%
Prevention and management	11	8%
Prevention, detection and management	77	55%
<b>Total</b>	<b>141</b>	<b>100%</b>

Projects funded through the IASPP addressed both aquatic (freshwater and marine) and terrestrial invasive species, with 64 (45%) projects targeting terrestrial species and 47 (34%) projects targeting aquatic species. The remaining 30 (21%) projects targeted both terrestrial and aquatic species. The program objective was to achieve a 40% to 60% aquatic to terrestrial split.



## 3. Project Activities

The funded projects support the key activities of the Program as agreed upon by the responsible departments and agency as being high priorities for taking action on IAS in Canada and include: Outreach, Education and Communication; Inventories, Monitoring and Science Development; and Eradication, Containment and Control. These key activities align with the hierarchical approach of the IASCC that prioritizes prevention, early detection, rapid response and management.

The following examples highlight some of the projects that achieved one or more of the Program's key activities. Appendix B provides a list of all recipients funded under the IASPP, including the title(s) of their funded project(s), the year the project was funded and the amount awarded. Also, summaries of all projects funded under the IASPP are available on the Program's website ([www.ec.gc.ca/eee-ias](http://www.ec.gc.ca/eee-ias)).

### 3.1. Outreach, Education and Communication

As highlighted in the IASCC, prevention is the first step in the approach to addressing IAS. High-priority activities include extension activities such as the development and implementation of a national public education campaign and targeted outreach initiatives (including codes of conduct) in partnership with stakeholders.

Central to education and outreach activities is the need to provide data and information on IAS to the public (particularly travellers who may intentionally or unintentionally introduce IAS) in accessible formats and through readily available portals or networks.

#### ***Invasive Species Councils***

Invasive species councils are multi-stakeholder bodies that play an important role in working with their partners to address the IASCC's priorities, specifically in developing regional priorities, providing information on IAS and leveraging local action to address IAS. In 2005, only one invasive species council was established in Canada, the Invasive Plant Council of British Columbia. Five years later, with the support of the IASPP, eight councils now exist. This represents a significant outcome of the IASPP.

##### **Alberta Invasive Plant Council**

[www.invasiveplants.ab.ca](http://www.invasiveplants.ab.ca)

##### **Invasive Plant Council of British Columbia**

[www.invasiveplantcouncilbc.ca](http://www.invasiveplantcouncilbc.ca)

##### **Invasive Species Alliance of Nova Scotia**

[www.invasivespeciesns.ca](http://www.invasivespeciesns.ca)

##### **Invasive Species Council of Manitoba**

[www.invasivespeciesmanitoba.com](http://www.invasivespeciesmanitoba.com)

##### **New Brunswick Invasive Species Council**

[www.nbisc.ca](http://www.nbisc.ca)

##### **Ontario Invasive Plant Council**

[www.ontarioinvasiveplants.ca](http://www.ontarioinvasiveplants.ca)

##### **Saskatchewan Invasive Species Council**

[www.saskinvasives.ca](http://www.saskinvasives.ca)

##### **Yukon Invasive Species Council**

[www.yukoninvasives.com](http://www.yukoninvasives.com)

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## **The Native Plant Society of Saskatchewan, Inc.**

### **Formation of the Saskatchewan Invasive Species Council**



© Native Plant Society of Saskatchewan, Inc.

The Saskatchewan Invasive Species Council (SISC) was formed to address the current and future threats in Saskatchewan from IAS and also to coordinate efforts against invasive species within the province and among other provinces and territories. The main objective was to bring all stakeholders

together and have them collaborate to form a functioning provincial authority on IAS. The council was formally incorporated, developed guiding documents and launched a website. Incorporating the council allowed it to apply for funding and gave it a more reputable standing, while the guiding documents outlined procedures for conducting the business of the council and outlined goals for future years. The website serves as an information clearinghouse for the public and announces all events related to IAS in Saskatchewan.

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## **The Ontario Federation of Anglers and Hunters**

### **Development of the Ontario Invasive Plant Council**



© Ontario Federation of Anglers and Hunters

The Ontario Invasive Plant Council (OIPC) is a non-profit, multi-agency organization that was founded in 2007 to increase the coordinated provincial response to the growing threat of terrestrial and aquatic invasive plants. The OIPC is comprised of conservation authorities, academic institutions, Aboriginal organizations, stewardship networks, private consultants, industry and

environmental non-governmental organizations as well as all levels of government.

With funding from the IASPP, the development of the OIPC has been successful in creating a greater awareness of the problems posed by invasive plants throughout the province of Ontario. The OIPC has created a provincial network of over 600 individuals who receive and distribute information on invasive plants. The OIPC has held three annual general meetings/invasive plant symposiums and has developed three council committees in order to increase strategic planning and better address the issues that deal with communication, policy and research/control of invasive plants.

Before the OIPC's inception, there was no coordinated provincial response to invasive plants in Ontario. The OIPC is working on increasing awareness across the province and reviewing legislation in order to make needed changes.

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## Yukon Government – Highways and Public Works

### Yukon Invasive Species Forum and Early Detection and Rapid Response Framework



© Yukon Invasive Species Committee

In most places in Canada with a history of agriculture and weed management, weed councils have been in place since well before invasive species became an issue. As a consequence of there being no significant agricultural sector in the Yukon, there are no weed councils. Consequently, weeds and invasive species are only dealt with

marginally, by a few farmers and engaged individuals. However, IAS management is becoming increasingly important because some species have shown explosive growth over the past 10 years. This has resulted in increased costs for farmers and highway vegetation management as well as damage to natural ecosystems.

In 2004, the Yukon Invasive Species Committee (YISC) was established: an ad-hoc group comprised of key members of the Yukon Government, the Parks Canada Agency and one member of the public. Using IASPP funds, the YISC organized a regional forum on IAS; this included presentations from neighbouring jurisdictions (Alaska and British Columbia), and the YISC provided examples of ecological and economic damage that IAS had caused in Yukon. Over 70 people registered for the forum, which helped raise awareness of IAS issues in the territory at several governmental levels and within the general public. In addition, a draft Early Detection and Rapid Response Framework was developed to identify the key components that would be essential for IAS management in Yukon.

## ***Outreach and Education***

As outlined in the IASSC, outreach and education activities should facilitate on-the-ground action through stewardship programs that involve communities directly in the management of IAS. Federal, provincial and territorial governments are working together to identify their common interests and concerns in dealing with the challenges of IAS. Outside of the government, many stakeholders are increasingly stepping forward to manage IAS of concern to their own activities.

Continued and enhanced collaboration among key stakeholders is essential in meeting the current and future challenges of responding rapidly to new invaders and pathways of invasion. The IASPP has supported many groups in developing initiatives targeting specific stakeholders who may contribute to the spread of IAS. Several recipients have offered training courses on IAS to community members and stakeholders. To date, through IASPP funded projects, over 12,000 people have received training to detect and respond to IAS. Through a variety of other public outreach initiatives (e.g. television, newspaper articles, Internet) successful recipients have reached an average of over 500,000 people annually.



© Manitoba Conservation



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## Prince Edward Island Aquaculture Alliance

Educating Resource Users About Invasive Aquatic Alien Species in Prince Edward Island Estuarine Waters



© Prince Edward Island (PEI)  
Aquaculture Alliance

The objective of this initiative by the Prince Edward Island (PEI) Aquaculture Alliance was to build awareness of aquatic invasive species (AIS) among people who derive their livelihoods from PEI's aquatic environments (e.g. aquaculture and fisheries) and those who use it for recreation and leisure (e.g. recreational boaters and the general public). Educational materials, such as

the waterproof "Stop the Spread" booklet, were produced to provide pertinent information to all stakeholders. This information included AIS identification, protocols for reporting suspect material and tips to prevent the accidental introduction or spread of AIS. Materials were distributed by the Alliance's partners via mail-outs and in person via public information events including five workshops held at yacht clubs and marinas. Signs have been displayed at every harbour and many of the significant launch points on the Island. The Alliance has conducted numerous presentations at Harbour Authorities, the Small Craft and Harbours Annual General Meeting, Mt. Stewart Consolidated School, the Moncton Boat Show and the L'Nu Fisheries Annual Meeting.

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## Science Enterprise Algoma

Forest and Aquatic Invasives – Building Stakeholder Capacity for Early Detection



© science enterprise Algoma

With Ontario being the final destination for the majority of Canadian imports, it is at high risk for the introduction of IAS accompanying imported goods or in ships' ballast water. A public outreach program has been established by science enterprise Algoma (seA) with intentions of educating the public as well as stakeholders and educators about IAS. An online course was developed involving nine modules that provide detailed information about IAS, focusing on their introduction and

identification, jurisdictional responsibilities for their management and current research involved in controlling their populations.

The organization has also built a database of course participants and has obtained participant feedback in order to monitor the effectiveness of the online course and, ultimately, the success of knowledge transfer in improving awareness of this issue.

This project has also provided opportunities for education and outreach among key stakeholders through workshops, special events, computer-based and printed information directories and Web-based information. For example, the theme for International Biodiversity Day 2009 was IAS. In keeping with this theme, a local day of action in collaboration with the Biodiversity Education and Awareness Network (BEAN) and the East Algoma Stewardship Council was held for 45 elementary school students. With the help of 25 high school volunteers, the students were taken through three different activities that involved education on IAS; a tour of the Kensington wetlands in East Algoma showing how they have been negatively impacted by these species, a demonstration on GPS units explaining how they can be used to track IAS and a monitoring activity in Sucker Creek for Rusty Crayfish, an invasive crustacean.

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## **The Native Plant Society of Saskatchewan**

### **Voluntary Codes of Conduct**

Many invasive plant species in Saskatchewan are ornamental plants that are still legally bought, sold and traded through the horticulture industry. While recent provincial legislation has partially addressed this problem, there are still many species that are not covered under this legislation. In order to prevent the introduction of new invasive horticultural plants and to mitigate the impact of those that have already been introduced, the Native Plant Society of Saskatchewan has initiated the Voluntary Codes of Conduct (VCC) program. Through the VCC, program consumers, distributors and producers of known and potentially invasive plant species have been contacted and introduced to the program. The VCC program educates participants and encourages them to stop using, producing and distributing invasive ornamental plants so that they do not spread from greenhouses or ornamental flower beds and propagate in the wild.



**Native Plant Society  
of Saskatchewan**

### **Voluntary Codes of Conduct**

Thank you for your interest and participation in the Voluntary Codes of Conduct program! This is an important step to you, your clients and to the environment.

Your willingness to be a part of this provincial program will go a long way in helping to establish a successful method in reducing invasions by aggressive horticultural plants.

Voluntary Codes of Conduct Instructions  
([www.npss.sk.ca/docs/5\\_worddocuments/VCC\\_Instructions.doc](http://www.npss.sk.ca/docs/5_worddocuments/VCC_Instructions.doc))

© Native Plant Society of Saskatchewan

The program works by diminishing both the supply and demand for invasive ornamental plants and connects like-minded consumers, distributors and producers, creating a positive feedback loop.

Suppliers such as greenhouses and nurseries are asked to voluntarily stop selling any horticultural plant deemed invasive and, in return, they are allowed to brand themselves as an environmentally friendly supplier using Native Plant Society of Saskatchewan materials and will have VCC participants directed to their businesses. VCC participants such as landscape architects, landscapers, park and land managers, horticulture societies and home gardeners voluntarily agree not to use or buy any plant deemed invasive and, in

return, receive a certificate recognizing their efforts and a list of participating retailers to ensure that the plants they purchase are not invasive.

The VCC program has a positive benefit on local communities by encouraging collaboration among different stakeholder groups and generating a sense of ownership in keeping invasive and potentially invasive ornamental plants from being planted. The program also encourages a sense of pride in stakeholders' accomplishments and their communities. Participants have gained new knowledge regarding IAS, alternative native plant species and the environment. They have also learned how to be better environmental stewards and have gained a new ecological awareness of the impact of their decisions and actions and what they can do to benefit their local environment.

## 3.2. Inventories, Monitoring and Science Development

### **Surveillance Networks**

When IAS manage to elude prevention measures and enter Canada, it is essential to detect and identify them before they become established or immediately after. Site-specific and general monitoring around critical points of entry, protected areas as well as natural, urban and agricultural ecosystems is critical to detection. Detection efforts must be complemented by the ability to identify new invaders. Examples of detection and monitoring activities include surveillance activities in geographic areas at high risk from IAS and establishing a coordinated public monitoring network to detect and report IAS sightings. Established monitoring networks can enhance coordination and cooperation among key stakeholders to protect ecosystems from IAS and help ensure rapid and effective response to new invasions and pathways of invasion. This section presents some examples of detection and monitoring activities that have received IASPP funding.

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#### **Cape Breton University**

**Project U.F.O.: A Monitoring and Public Education Program About Invasive Alien Aquatic Species**



"Aliens on the Beach" event photo  
© Katherine Jones, Project U.F.O.



© Project U.F.O.

Project U.F.O. (Unidentified Foreign Organisms) is a collaborative initiative involving faculty and students at Cape Breton University, members of the Atlantic Coastal Action Program and community volunteers with the objective of increasing public awareness of IAS threatening aquatic ecosystems in eastern Canada.

Project U.F.O. is currently the only public outreach initiative in Nova Scotia that is focused solely on IAS. Project U.F.O. conducts two monitoring programs: "Aliens on the Beach" and "Sea Squirt Surveys."

In the "Aliens on the Beach" surveys, community volunteers are trained to help identify native and alien species found on local beaches. In partnership with DFO's "Atlantic Zone Biofouling Monitoring Project," Project U.F.O. has also been conducting "Sea Squirt Surveys" at 20 harbours in Cape Breton involving the deployment and subsequent collection and analysis of settlement plates that primarily collect sea squirts (native and alien) and often other IAS.

Since its inception in 2008, Project U.F.O. has received an incredible number of requests for public speaking engagements and for participation in workshops, classroom activities, day camps and open houses. There is clearly a need for such an initiative throughout the province. First and foremost, this organization's effective public education and outreach programs are bringing the impact of IAS to the forefront for all aquatic stakeholders in Cape Breton and even further afield.

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## **Department of Natural Resources and Wildlife Quebec**

### **Early Detection and Prevention Network for Aquatic Invasive Species in the St. Lawrence River**

The main goal of this project is to detect, at an early stage, any new aquatic invasive species (AIS) introduced into the St. Lawrence River in order to react quickly to limit their expansion and mitigate the damage they may cause.

A monitoring network has been developed by the Department of Natural Resources and Wildlife of Quebec consisting of 150 commercial fishers who work 475 km of the St. Lawrence River downstream of Lake St. Pierre. Any specimen found in fishing gear that is unknown to the fisher is collected and later identified in a ministry or partner laboratory. It was found that out of 250 suspect specimens captured by the network, five species were identified as non-natives of the St. Lawrence River: Round Goby (*Neogobius melanostomus*), Gizzard Shad (*Dorosoma cepedianum*), Blueback Herring (*Alosa aestivalis*), Chinese Mitten Crab (*Eriocheir sinensis*) and Butterfish (*Peprilus triacanthus*).

Early detection allows a constant update of new AIS that could become established in the St. Lawrence River and cause significant ecological damage.

In addition to the detection of new AIS, the network also helps to monitor the occurrence of certain diseases such as Viral Hemorrhagic Septicaemia (VHS), a deadly infectious disease in fish; observe any change in behavioural patterns (distribution, competition, food, etc.) of native aquatic species; and monitor the populations of species of special concern including reintroduced native species; e.g. Striped Bass (*Morone saxatilis*), which was reintroduced into the river in 2002.

Commercial fishers know the importance of maintaining healthy populations of native aquatic species in the St. Lawrence River, and they are most likely to make the first discovery of any changes that may occur in the system, in particular the presence of unknown fish species. Although the AIS detected by the network may not already be established in the river, early detection can help define the actions to be taken in order to control their possible invasion and spread.



## ***Monitoring and Inventories: Understanding Pathways of Invasion***

Canada's strategic approach to addressing IAS focuses on pathways of introduction. Below are a few examples of projects aimed at reducing the introduction and spread of IAS by addressing their pathways of invasion.



Ship deballasting  
© Donald M. Reid

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### **University of British Columbia – Earth and Ocean Sciences**

#### **Introduction and Spread of Invasive Species by the Transient and International Recreational Boating Community**

Hull fouling refers to the way organisms attach themselves to the hull of a ship or boat and hitchhike long distances, often bypassing natural barriers to invasion. Invasive alien organisms that attach to recreational boats are a major transportation pathway for aquatic IAS. British Columbia has the largest recreational boating community in Canada and one of the highest levels of temperate marine diversity in the world. This combination suggests that British Columbia is quite susceptible to invasion by IAS transported by hull fouling, which is a substantial and mostly unregulated transport pathway for IAS. The goal of this project was to characterize and quantify the recreational boating pathway of introduction into British Columbia and thereby facilitate prevention of the spread of IAS, both by increasing public awareness and informing management decision makers.

In the first year of this study (2008), the team determined that British Columbia's recreational boats do indeed serve as a pathway of introduction for IAS. Eight IAS were identified on the hulls of recreational boats during an extensive scuba diving survey of 314 boats from 14 marinas undertaken in the summer of 2008, including the Club



Tunicate (*Styela clava*), the Golden Star Tunicate (*Botryllus schlosseri*), the Violet Tunicate (*Botrylloides violaceus*), Sea Grapes (*Molgula manhattensis*; also a tunicate), the Single-horned Bryozoan (*Schizoporella unicornis*), the Yellow Sponge (*Halichondria bowerbankii*), Wireweed (*Sargassum muticum*) and the Japanese Skeleton Shrimp (*Caprella mutica*).

During the first year of the study, a survey of over 500 boaters indicated that 17% had travelled to the United States in the preceding 12 months. Therefore, in the second year of the study the team narrowed their focus and surveyed transient boats (those that move frequently and long distances) only. It was found that while the degree of fouling is much less on transient boats compared to international boats, hull fouling IAS organisms are still present on transient boats. This leads to the conclusion that transient boats may indeed serve as a pathway of introduction for IAS, both as new introductions from the United States and by spreading existing IAS within British Columbia.



© Cathryn Murray  
Earth and Ocean Sciences

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### Manitoba Conservation Forestry Branch Forest Health and Renewal Invasive Forest Pests Monitoring and Awareness Program



Brown Spruce Longhorn Beetle;  
*Tetropium fuscum*  
© Georgette Smith,  
Canadian Forest Service,  
Bugwood.org

IAS such as the Emerald Ash Borer (*Agrilus planipennis*) are on the doorstep of Manitoba. Other species of concern include the Asian Long-horned Beetle (*Anoplophora glabripennis*), Banded Elm Bark Beetle (*Scolytus schevyrewi*), Brown Spruce Longhorn Beetle (*Tetropium fuscum*), European Woodwasp (*Sirex noctilio*), Gypsy Moth (*Lymantria dispar*) and the Mountain Pine Beetle (*Dendroctonus ponderosae*).

Bonfires are a camping treat, but buying firewood can be expensive so travelers often bring their own. Firewood is one pathway that has been widely identified as a common portal for forest IAS to enter new territory.

The three components of this project were education and public awareness through participation at various tradeshow; monitoring four firewood drop-off bins and inspecting the wood for evidence of insects or disease; and placing advertisements and articles into known reading materials of the target audience including cottagers' magazines, newsletters and guidebooks.

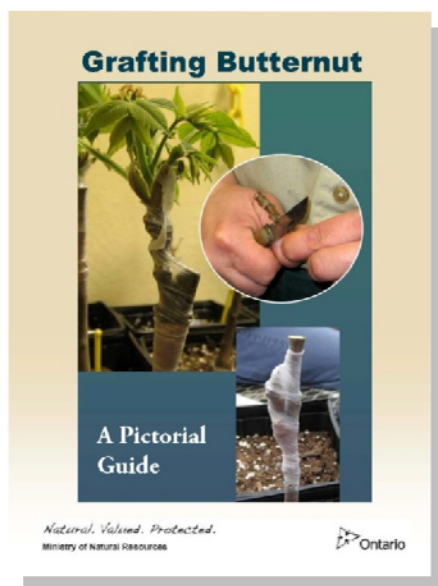
One of the main results of this project was communicating the message of preventing accidental introductions of forest IAS, specifically through firewood transport. Another result from the firewood bin inspections was that while no insects or diseases were found, the origins of the wood could occasionally be traced via wrapping materials discarded with the wood. Some of the firewood was found to come from areas significantly far away, such as southwestern Ontario.



© Manitoba Conservation

## Ontario Ministry of Natural Resources – The Ontario Forest Research Institute

Screening Butternut for Resistance to Butternut Canker Disease, an Invasive Alien Fungal Pathogen in Canada



© Ontario Forest Research Institute

Over the past 40 years Butternut (*Juglans cinerea*) populations have undergone a dramatic decline, primarily due to an IAS fungal pathogen that causes a fatal stem and branch disease known as Butternut Canker. Recovery strategy efforts to preserve this endangered tree species have been undertaken collaboratively by governmental and non-governmental organizations and universities. These efforts include identifying, grafting and maintaining grafted individuals putatively resistant to the Butternut Canker pathogen in order to establish a breeding program and ultimately a species recovery program. In order to determine actual resistance, these putatively resistant individuals need to be experimentally challenged with the disease in a controlled way.

This project, led by the Ontario Forest Research Institute, involved testing three inoculation methods to determine their ability to infect Butternut seedlings or grafts, and to determine which method best answers the questions “does the seedling or graft exhibit resistance, and to what degree?” Two methods were successful, and ultimately these tests will be used to determine the actual resistance of individual Butternut trees with observed/putative resistance to the Butternut Canker fungus. The Ontario Forest Research Institute also developed a butternut grafting pictorial guide, which has been used by various partners throughout the province to aid in their grafting efforts.

### 3.3. Eradication, Containment and Control

IAS that become established in Canada should be managed through eradication, containment and control efforts in order to minimize their environmental and economic impacts and prevent their spread. Eradication, containment and control measures can involve physical, chemical, biological and integrated strategies. Examples of projects where management interventions have a high probability of success include biological control, weed pulling and integrated pest management. The following projects are just a few examples of those funded through the IASPP that used targeted management activities, research and innovation to minimize the long-term impacts and costs of IAS. Since the inception of the IASPP, more than 37,000 hectares of land have been managed using eradication, containment or control, removing plant IAS and restoring the land to its natural state before the establishment of invasive plant species.

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#### The Frenchman-Wood River Weed Management Area

##### Frenchman-Wood River Weed Management Area



© Julie Mackenzie,  
Frenchman-Wood River Weed Management Area

The purpose of the Frenchman-Wood River Management Area in Saskatchewan is to provide a unified, coordinated approach to fighting invasive weed species within its boundaries and to make strategic use of resources across the area through the cooperation of its rural members, Grasslands National Park and local conservation groups.

Key activities of the project include: identification, prioritization and implementation of management practices for existing invasive weed species in the area; refinement and maintenance of effective survey, mapping and monitoring systems; decreasing the density and distribution of Leafy Spurge (*Euphorbia esula*); and identification of the locations of emerging weeds of concern including Scentless Chamomile (*Matricaria maritima*), Field Bindweed (*Convolvulus arvensis*), Russian Knapweed (*Centaurea repens*) and Spotted Knapweed (*Centaurea maculosa*).

Like many programs, involving landowners has proven to be a successful approach. In working with over 40 producers, 80% of known infestations of invasive weed species have been mapped. As well, producers have identified 20 previously unknown infestations, and 90% of infestations that could be treated with herbicides have been.

There was also additional on-the-ground education and training for maintenance personnel and producers throughout the province to address the issue of invasive weed species. This resulted in the development of strong partnerships with the Prairie Conservation Action Plan, Saskatchewan Association of Rural Municipalities, Saskatchewan Forage Council, Saskatchewan Forage Seed Development Fund,

Agriculture and Agri-Food Canada, Saskatchewan Watershed Authority, Saskatchewan Ministry of Agriculture, University of Saskatchewan, DuPont, Dow Agro Sciences, other rural municipalities and producer organizations. This project was successful in expanding the existing WMA program and taking the organization to a whole new level in invasive weed awareness, detection and management.

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### **Vancouver Island University**

#### **Grey Squirrels on Vancouver Island – Monitoring Their Range Expansion and Evaluating Hormonal Sterilization as a Potential Control Method**

Eastern Grey Squirrels (*Sciurus carolinensis*) are native to Eastern Canada but were introduced to mainland British Columbia in 1914 and Vancouver Island in 1966. Since these initial introductions, both the mainland and island grey squirrel populations have continued to grow and spread.

In British Columbia, Grey Squirrels have their greatest negative impact on the native tree squirrels, which include the Douglas Squirrel (*Tamiasciurus douglasii*) and the Red Squirrel (*Tamiasciurus hudsonicus*). In addition to their impact on native fauna, on Vancouver Island the grey squirrel may pose a risk to the endangered Garry Oak Ecosystem as they frequently bite out the tips of the acorns of oaks, negatively affecting oak propagation. They can also damage and kill trees, especially young oaks, by stripping the bark.

Despite the potential negative impact this IAS may have on the environment, little has been done to document or control the spread of this species. Indeed, many animal rehabilitation facilities in B.C. will accept, rehabilitate and release Grey Squirrels. In addition, many homeowners live trap pest Grey Squirrels and relocate them despite the fact that it is illegal to do so under the B.C. *Wildlife Act*.

This project promoted better education on the risks posed by this mammal IAS by establishing a spatially explicit database to map and document the current distribution and spread of Grey Squirrels on Vancouver Island. In doing so, Grey Squirrels could be monitored in order to evaluate the effectiveness of the hormonal contraceptive Suprelorin in suppressing reproduction and thereby reducing population growth.

Increased public awareness and education about the impacts of Grey Squirrels has been achieved through the creation and distribution of posters and brochures, production of material for electronic media and meetings with local naturalist groups. The public can now also directly input their Grey Squirrel sightings online ([web.viu.ca/eaqillis/Squirrel%20Pages/squirrel\\_report.htm](http://web.viu.ca/eaqillis/Squirrel%20Pages/squirrel_report.htm)) and, also as part of the project, a network of volunteers has been established to ensure the long-term continuation of Grey Squirrel monitoring.

A one-year field experiment involving 40 Grey Squirrels (20 implanted with the hormonal contraceptive and 20 experimental controls) was conducted in 2009/2010 to determine if a contraceptive originally used to control fox populations in Australia is effective in Grey Squirrels. This study determined that hormonal implants can reduce population growth and

is a feasible method for wildlife rehabilitation centres to sterilize rehabilitated Grey Squirrels prior to release if they continue to accept them.

By raising awareness of the negative impacts of translocating Grey Squirrels, providing the framework for long-term monitoring of the distribution and spread of Grey Squirrels, and continuing the contraception program, it is expected that the project will soon be able to document a reduction of the rate of spread of Grey Squirrels on Vancouver Island.





## 4. Key Accomplishments and Successes

Overall, the IASPP complements other programs conducted under the IASSC by engaging stakeholders beyond the federal government and by targeting community-level and grassroots organizations. In particular, the IASPP has contributed to building regional relationships among stakeholders and promoting the engagement of Canadians to undertake priority actions that have addressed IAS in Canada. The Program is unique in that it is the only contribution program that provides funding to organizations to take action related specifically to IAS.

There is a great interest from all stakeholders to develop initiatives to fight IAS. Phase 1 of the IASPP ended on March 31, 2010, and led to the successful renewal of the Program for Phase 2. The IASPP received project proposals requesting a total of almost \$40 million during the five-year period of Phase 1. A total of 141 projects were funded, targeting 277 IAS with a total investment of \$4.6 million by the IASPP. For each dollar invested by the IASPP, almost two dollars were provided by the projects' proponents and their partners, in cash and/or in-kind.

The funded projects have achieved results in priority areas outlined in the IASSC; prevention, early detection, rapid response and management. A major result of the first five years of operation has been the enhancement of existing partnerships and the building of new collaborative relationships among federal, provincial and territorial partners and many other key stakeholders to effectively manage and prevent the introduction and spread of IAS.

The establishment of IAS councils made possible by IASPP funding is important in that they facilitate partnerships among various key stakeholders and provide a vital contribution to the development of regional priorities related to IAS. Only one IAS council was in place prior to the inception of the IASPP, and the Program has since fostered the development of seven new councils. With funding from the IASPP, the IAS councils have increased cooperation and coordination at the local, provincial and regional levels by increasing awareness and understanding of IAS and their impacts while enhancing the management of IAS issues within their jurisdictions. Consequently, there has been a higher level of participation by government, stakeholders and the public in addressing the introduction and spread of IAS. The councils play an important role in working with their partners to address the IASSC's priorities, specifically in leveraging local action to address IAS issues, e.g. equipping local residents with the necessary training and tools to identify new and existing IAS infestations, and facilitating the establishment of a community monitoring network.

The IASPP has been successful in funding projects for multiple years supporting activities that have produced significant long-term results. In fact, the Program has provided momentum and stimulus for a significant amount of high-quality work completed at the grassroots level.

Other key accomplishments include the funding of actions, on a local or regional scale, geared towards understanding and addressing the key pathways of introduction and spread of IAS that were identified in the IASSC; for example, the accidental transportation of IAS on the hulls of recreational boats, the trade and utilization of IAS in horticulture, and firewood transport by campers.

Finally, the Program has been successful in increasing the availability of IAS information through project awareness and outreach activities. Hundreds of thousands of people have been reached through the various campaigns and dissemination of quality communication products. Education and outreach initiatives have also facilitated on-the-ground action that involved communities directly in the management of IAS. During the first phase of the IASPP, more than 4500 volunteers participated directly in the 141 projects. In addition, Section 5.2 (see below) describes the first IAS National Forum that was held in 2009 and enabled information sharing and outreach between governments and the IAS councils.



## 5. Going Forward

Phase 1 of the IASPP ended in March 2010. The 2010 federal budget announced the renewal of funding (\$19 million/year) to continue the implementation of the IASSC, including funding of \$1 million per year for Phase 2 of the IASPP, with a review of the Program's accomplishments every five years. A renewed IASPP will be implemented based on the lessons learned from Phase 1, particularly the Program evaluation done in 2009 (see below), and on consultations with key partners.

### 5.1. IASPP Evaluation

In 2009, EC's Audit and Evaluation Branch conducted an evaluation of the IASPP. The evaluation noted that there was a continued need for a contribution program in Canada to address IAS issues at the grassroots level within the context of the national strategy.

The evaluation raised issues with respect to more focused program priorities in relation to program funding that is limited compared to the challenges of IAS. In addition, although the individual projects funded by the Program were found to be generally successful in achieving their respective objectives, these results were often at the local/community level. As a result, it was difficult for the Program to have major impacts at the national level, with the exception of the establishment of seven IAS councils.

Information collected during the evaluation indicates that the Program was being delivered in a cost-efficient manner through its low administrative costs, as well as its ability to leverage significant matching funds.

Regarding the design and delivery of the Program, the evaluation noted that the Program was making continuous operational improvements; e.g. the creation of a website ([www.ec.gc.ca/eee-ias/default.asp?lang=EN&n=A49893BC-1](http://www.ec.gc.ca/eee-ias/default.asp?lang=EN&n=A49893BC-1)) and the addition of an online application process to disseminate information and streamline the administrative process for both applicants and the review committee.

Timelines for the distribution of funding to successful proponents is a key element of the program delivery. Applications for funding are received from proponents in December for funding during the following fiscal year. Many projects that propose on-the-ground work begin in the spring; as such, delays in the distribution of funding have sometimes had a negative impact on the capacity of proponents to effectively reach their expected goals. However, some projects have been funded for multiple years, allowing work that has produced significant long-term results.

Key recommendations of the evaluation included the need to determine an appropriate role for IASPP within the context of both the IASSC and EC departmental priorities, to re-examine the Program's objectives with an aim to developing a concise and more focused set of priorities and to re-examine the current performance measurement strategy with the objective of developing and implementing a set of intended project-level outcomes and performance indicators.

## 5.2. IAS National Forums

The IASSC states that cooperation and collaboration are key principles in the fight against IAS and recognizes the importance of building awareness through action by individual Canadians and national, regional and local partners to prevent, detect and manage IAS.

In June 2009, a national IAS forum with 40 participants representing a variety of federal, provincial and territorial departments and IAS councils from across Canada was convened. The objective of this forum was to enhance collaboration among all stakeholders and sectors with IAS responsibilities. The participants highlighted the work of the IAS councils and their role in increasing regional coordination as one of the key successes of the Program. Another important achievement of the IASPP indicated by participants was that the Program provided momentum and stimulus for a significant amount of work completed at the grassroots level. Forum participants identified that "Priority Setting and Good Governance," along with "Funding," as the most important issues facing the current and future effective implementation of the IASSC. In particular, participants felt that a new national coordinating or governance structure is needed and that long-term funding through the IASPP is essential.

Following on the June 2009 forum recommendations, a second national forum was organized in March 2010 in order to continue to encourage partners to work collaboratively to review, develop and obtain support for a revised governance mechanism under the IASSC and to further reflect on priorities and existing operational gaps. Fifty-nine participants representing a variety of federal, provincial and territorial departments, Aboriginal organizations and IAS councils from across Canada attended the 2010 forum. Similar to the 2009 forum, participants supported the idea of enhancing the federal-provincial-territorial coordination with a close alignment or linkage with the councils, Aboriginal interests and municipalities. Also, long-term funding and support to the IAS councils were identified as key needs.

## 5.3. The Renewed IASPP: Phase 2

Taking into consideration the lessons learned, including the recommendations of the program evaluation and results of the two national forums, as well as discussions with the other responsible federal departments and key stakeholders, EC refocused the IASPP for Phase 2. The main consideration implemented in updating the IASPP was the development of a concise and more focused set of priorities and outcomes aligned with the IASSC goals and commensurate with the available funding. Another key point (agreed to by participants during the 2010 forum) taken into consideration during the process of revising the IASPP direction for Phase 2 was to further explore the possibilities for long-term funding and to provide stronger support to the IAS councils.

It is anticipated that a more targeted program will have a greater impact in specific areas and that it will be better able to demonstrate its results in line with its priority objectives.

The expected program results are:

- Increased targeted awareness of key stakeholders in priority pathways of introduction;
- Improved ability to detect and respond early to IAS introduction and spread in Canada; and
- Maintained jurisdictional partnership for coordination and communications of on-the-ground activities.

In the future, the IASPP will encourage multi-year projects and will operate under two approaches. The first one is a targeted and directed approach to reinforce coordination of IAS activities and communication at the provincial or territorial level through regional multi-stakeholder IAS councils. The second approach is a competitive process open to all eligible stakeholders involved in undertaking IAS activities to increase awareness or improve early detection of IAS and enable rapid response to new invasions.

EC has developed an IASPP performance measurement strategy that presents a logic model which graphically identifies linkages between the Program's activities and intended key program and project-level outcomes and performance indicators that would allow the IASPP to demonstrate its progress toward the key anticipated results. This evolving performance measurement will be used to make adjustments to the Program in order to improve its effectiveness and efficiency. The regular collection and interpretation of information regarding IASPP results will be an important way to learn what is working and what improvements can be made to the Program to ensure greater success.



## Conclusion

IAS are those species introduced by human activities to locations outside of their natural past or present distributions and that threaten the environment, economy and society, including human health. With the rapid expansion of global trade, the development of worldwide supply chains and the faster and more efficient international movement of goods, the risk of IAS entering Canada continues to increase. Canada's natural resource base is thereby threatened by IAS and their potential to cause billions of dollars in annual direct losses. As a result of the increasing number of issues related to IAS, both in Canada and worldwide, along with the increased media attention resulting in heightened public awareness and involvement, it is expected that IAS will remain an issue of great interest and concern in the future. The IASSC developed in 2004 seeks to protect Canada's aquatic and terrestrial ecosystems and their native biological diversity, as well as domestic plants and animals, from the negative impacts of IAS. It is expected that the IASSC will continue to play a vital role in developing a more coordinated approach for taking action on IAS to ensure the protection of Canada's ecosystems and resource-based economy.

The IASPP was created as part of the Government of Canada's initiative to implement the IASSC, especially actions that focus on enhanced preventative measures. A funding program such as the IASPP offers financial support to a wide variety of public and private organizations that wish to contribute to the prevention of the introduction and spread of IAS in Canada. On-the-ground activities are key to tackling the challenges posed by IAS, and the necessity for stable financial support has been recognized. Funding provided by the IASPP to support the implementation of the IASSC has resulted in the enhancement of existing partnerships and the building of new collaborative relationships among all partners, with a goal to effectively manage IAS.

During the five-year period from 2005–2010, the IASPP awarded almost \$5 million in funding to projects that engaged Canadians in actions supporting the key priorities of the IASSC: prevention, early detection, rapid response and management. Funded projects under the IASPP support the priorities of the IASSC; for example, the critical identification of new IAS infestations through inventories and the engagement of Canadians through targeted outreach activities. The IASPP is unique in that it is the only contribution program that provides funding to organizations to take action to specifically address IAS and the potential negative impacts caused by IAS. Discussions with partners within and outside of the Canadian federal government indicate that the IASPP significantly contributes to the coordination of IAS-related activities across Canada. Without this coordination, dissemination of information, reduction of duplication of efforts and many other activities, effective response would be more challenging, resulting in potentially significantly higher costs and reduced ability to prevent the introduction and spread of IAS in Canada.

After these first five years, the IASPP has made an important contribution to the increased coordination of IAS activities among a variety of stakeholders as well as to the



prevention, detection and management of IAS in Canada. Overall, the Program is an important source of support for stakeholders pursuing actions against IAS that support the Government of Canada's priorities in preventing the introduction and spread of IAS. Lessons learned in the first five years of the Program will be used to continue delivery of a strong, well-rounded program in support of the IASSC.

## Appendix A. Invasive Alien Species Targeted by IASPP Projects



European Buckthorn;  
*Rhamnus cathartica*

© Mark Richardson,  
Eastern Ontario Model Forest

### Plants (142)

- Absinthe Wormwood (*Artemisia absinthium*)
- Alder/Glossy Buckthorn (*Frangula alnus*)
- Alfalfa (*Medicago sativa*)
- American / Canadian Waterweed (*Elodea canadensis*)
- Annual Sow-thistle (*Sonchus oleraceus*)
- Autumn Olive (*Elaeagnus umbellata*)
- Baby's Breath (*Gypsophila paniculata*)
- Bird Vetch (*Vicia cracca*)
- Black Henbane (*Hyoscyamus niger*)
- Black Knapweed (*Centaurea nigra*)
- Black Locust (*Robinia pseudoacacia*)
- Black Medick (*Medicago lupulina*)
- Bladder Campion (*Silene vulgaris*)
- Blueweed (*Echium vulgare*)
- Brazilian Waterweed (*Egeria densa*)
- Bull Thistle (*Cirsium vulgare*)
- Carpet Burweed (*Soliva sessilis*)
- Catnip (*Nepeta cataria*)
- Chicory (*Cichorium intybus*)
- Coltsfoot (*Tussilago farfara*)
- Columbus Grass (*Sorghum alnum*)
- Common Bugloss (*Anchusa officinalis*)
- Common Cattail / Bulrush (*Typha latifolia*)
- Common Reed (*Phragmites australis*)
- Common Tansy (*Tanacetum vulgare*)
- Cow Cockle (*Vaccaria hispanica*)
- Creeping Bellflower (*Campanula rapunculoides*)
- Creeping / Canadian Thistle (*Cirsium arvense*)
- Crested Wheatgrass (*Agropyron cristatum*)
- Curly-leaf Pondweed (*Potamogeton crispus*)
- Cypress Spurge (*Euphorbia cyparissias*)
- Dalmatian Toadflax (*Linaria dalmatica*)
- Dame's Rocket (*Hesperis matronalis*)
- Dense-flowered Cordgrass (*Spartina densiflora*)
- Diffuse Knapweed (*Centaurea diffusa*)
- Dog-strangling Vine / Pale Swallowwort (*Cynanchum rossicum*)
- Downy Brome / Cheatgrass (*Bromus tectorum*)
- Didymo / Rock Snot (*Didymosphenia geminata*)
- English Cordgrass (*Spartina anglica*)
- English Holly (*Ilex aquifolium*)
- English Ivy (*Hedera helix*)
- Eurasian Watermilfoil (*Myriophyllum spicatum*)



Garlic Mustard;  
*Alliaria petiolata*

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- European Buckthorn (*Rhamnus cathartica*)
- European Frog-bit / Frogbit (*Hydrocharis morsus-ranae*)
- Evergreen Blackberry (*Rubus laciniatus*)
- Fanwort / Green Cabomba (*Cabomba caroliniana*)
- Field Bindweed (*Convolvulus arvensis*)
- Field Scabious (*Knautia arvensis*)
- Flowering Rush (*Butomus umbellatus*)
- Foxtail Barley (*Hordeum jubatum*)
- Garlic Mustard (*Alliaria petiolata*)
- German Chamomile (*Matricaria recutita*)
- Giant Hogweed (*Heracleum mantegazzianum*)
- Giant Salvinia (*Salvinia molesta*)
- Goat's Beard (*Tragopogon dubius*)
- Gorse (*Ulex europaeus*)
- Goutweed (*Aegopodium podagraria*)
- Great Burdock (*Arctium lappa*)
- Hedge Morning Glory / Bindweed (*Calystegia sepium*)
- Himalayan Balsam / Policemen's Helmet (*Impatiens glandulifera*)
- Himalayan Blackberry (*Rubus discolor*)
- Hoary Alyssum (*Berteroa incana*)
- Hoary Cress (*Cardaria* spp.)
- Hound's Tongue (*Cynoglossum officinale*)
- Hybrid Cattail (*Typha x glauca*)
- Hydrilla (*Hydrilla verticillata*)
- Japanese Brome (*Bromus japonicus*)
- Japanese / Giant Knotweed (*Polygonum* spp.)
- Jointed Goatgrass (*Aegilops cylindrica*)
- Kentucky Bluegrass (*Poa pratensis*)
- Kochia (*Kochia scoparia*)
- Kudzu Vine / Mile-a-minute (*Polygonum perfoliatum*)
- Leafy Spurge (*Euphorbia esula*)
- Marsh Thistle (*Cirsium palustre*)
- Meadow Knapweed (*Centaurea pratensis*)
- Musk Thistle / Nodding Thistle (*Carduus nutans*)
- Narrow-leaved Lyme Grass (*Leymus angustus*)
- Norway Maple (*Acer platanoides*)
- Orange Hawkweed (*Hieracium aurantiacum*)
- Oriental Bittersweet (*Celastrus orbiculatus*)
- Ornamental Honeysuckle (*Lonicera* spp.)
- Oxeye Daisy (*Chrysanthemum leucanthemum*)
- Oyster Thief / Dead Man's Fingers (*Codium fragile* ssp. *tomentosoides*)
- Parrotfeather / Parrot's Feather (*Myriophyllum aquaticum*)
- Perennial Pepperweed (*Lepidium latifolium*)
- Perennial Sow-thistle (*Sonchus arvensis*)
- Periwinkle (*Vinca minor*)
- Persian Darnel (*Lolium persicum*)
- Plumeless Thistle (*Carduus acanthoides*)



Watercress;  
*Rorippa nasturtium-aquaticum*  
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- Puncturevine (*Tribulus terrestris*)
- Purple Loosestrife (*Lythrum salicaria*)
- Quackgrass (*Agropyron repens*)
- Red Bartsia (*Odontites vernus*)
- Red Clover (*Trifolium pratense*)
- Reed Canary Grass (*Phalaris arundinacea*)
- Russian Knapweed (*Centaurea repens*)
- Russian Olive Tree (*Elaeagnus angustifolia*)
- Russian Thistle (*Salsola kali*)
- Salt Cedar (*Tamarix* spp.)
- Saltmeadow Cordgrass (*Spartina patens*)
- Scentless Chamomile (*Matricaria maritima*)
- Scotch / Common Broom (*Cytisus scoparius*)
- Sea Buckthorn (*Hippophae rhamnoides*)
- Siberian elm (*Ulmus pumila*)
- Siberian Peashrub (*Caragana arborescens*)
- Silver Nettle / Yellow Archangel (*Lamiastrum galeobdolon*)
- Smooth Brome / Bromegrass (*Bromus inermis*)
- Smooth Cordgrass (*Spartina alterniflora*)
- Spiny Sow-thistle (*Sonchus asper*)
- Spotted Knapweed (*Centaurea maculosa*)
- Spurge Laurel (*Daphne laureola*)
- St. John's Wort (*Hypericum perforatum*)
- Sulphur Cinquefoil (*Potentilla recta*)
- Tall Tumble Mustard (*Sisymbrium altissimum*)
- Tansy Ragwort (*Senecio jacobaea*)
- Tartarian Honeysuckle (*Lonicera tatarica*)
- Teasel (*Dipsacus* spp.)
- Timothy (*Phleum pratense*)
- Velvetleaf (*Abutilon theophrasti*)
- Water Chestnut (*Trapa natans*)
- Water Hyacinth (*Eichhornia crassipes*)
- Water Lettuce (*Pistia stratiotes*)
- Water Soldier (*Stratiotes aloides*)
- Watercress (*Rorippa nasturtium-aquaticum*)
- White Cockle (*Lychnis alba*)
- White Mulberry (*Morus alba*)
- White Poplar (*Populus alba*)
- White Sweet Clover (*Melilotus alba*)
- Wild Angelica (*Angelica sylvestris*)
- Wild Caraway (*Carum carvi*)
- Wild Carrot (*Daucus carota*)
- Wild Chervil (*Anthriscus sylvestris*)
- Wild Four O'clock (*Mirabilis nyctaginea*)
- Wild Parsnip (*Pastinaca sativa*)
- Wireweed / Sargassum (*Sargassum muticum*)
- Woolly Burdock (*Arctium tomentosum*)
- Yellow Flag Iris (*Iris pseudacorus*)
- Yellow Floating Heart (*Nymphoides peltata*)



- Yellow Hawkweed (*Hieracium pratense*)
- Yellow Starthistle (*Centaurea solstitialis*)
- Yellow Sweet Clover (*Melilotus officinalis*)
- Yellow Toadflaxes (*Linaria vulgaris*)

### Aquatic Invertebrates (28)

- Allegheny Crayfish (*Orconectes obscurus*)
- Asian Shore Crab (*Hemigrapsus sanguineus*)
- Atlantic Bay Scallop (*Argopecten irradians*)
- Banded Mystery Snail (*Viviparus georgianus*)
- Bloody-red Mysid Shrimp (*Hemimysis anomala*)
- Channelled Apple Snail (*Pomacea canaliculata*)
- Chinese Mitten Crab (*Eriocheir sinensis*)
- Chinese Mystery Snail (*Cipangopaludina chinensis*)
- Club Tunicate (*Styela clava*)
- Colonial / Macaroni / Carpet Tunicate (*Didemnum vexillum*)
- Fishhook Water Flea (*Cercopagis pengoi*)
- Golden Star Tunicate (*Botryllus schlosseri*)
- Green Crab (*Carcinus maenas*)
- Japanese Skeleton Shrimp (*Caprella mutica*)
- Lacy Crust Bryozoan (*Membranipora membranacea*)
- Mediterranean Mussel (*Mytilus galloprovincialis*)
- New Zealand Mud Snail (*Potamopyrgus antipodarum*)
- Oyster Drill (*Urosalpinx cinerea*)
- Robust Crayfish (*Cambarus robustus*)
- Rusty Crayfish (*Orconectes rusticus*)
- Sea Grapes (*Molgula manhattensis*)
- Single Horn Bryozoan (*Schizoporella unicornis*)
- Spiny Water Flea (*Bythotrephes longimanus*)
- Spinycheek crayfish (*Orconectes limosus*)
- Vase tunicate (*Ciona intestinalis*)
- Violet tunicate (*Botrylloides violaceus*)
- Yellow Sponge (*Halichondria bowerbankii*)
- Zebra Mussel (*Dreissena polymorpha*)

### Insects (43)

- Asian Multicoloured Lady Beetle (*Harmonia axyridis*)
- Altai Larch Longhorn / Long-horned Beetle (*Xylotrechus altaicus*)
- Ash Bark Beetle (*Hylesinus varius*)
- Asian Long-horned Beetle (*Anoplophora glabripennis*)
- Balsam Woolly Adelgid (*Adelges piceae*)
- Banded Elm Bark Beetle (*Scolytus schevyrewi*)
- Birch Bark Beetle (*Scolytus ratzeburgi*)
- Black Fir Sawyer / Beetle (*Monochamus urusovi*)
- Black Pine Bark Beetle (*Hylastes ater*)



Chinese Mitten Crab;  
*Eriocheir sinensis*

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and Wildlife



Asian Long-horned Beetle;  
*Anoplophora glabripennis*

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Emerald Ash Borer;  
*Agrilus planipennis*  
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Michigan State University, Bugwood.org

- Brown Spruce Longhorn / Long-horned Beetle (*Tetropium fuscum*)
- Common Eastern Bumblebee (*Bombus impatiens*)
- Cottony Ash Psyllid (*Psyllopsis discrepans*)
- Emerald Ash Borer (*Agrilus planipennis*)
- European Fire Ant (*Myrmica rubra*)
- European Oak Bark Beetle (*Scolytus intricatus*)
- European / Eight-toothed Spruce Bark Beetle (*Ips typographus*)
- European / Black Spruce Longhorn / Long-horned Beetle (*Tetropium castaneum*)
- European / Sirex Woodwasp / Horntail (*Sirex noctilio*)
- Eyed / Twin Spot Longhorn / Long-horned Beetle (*Oberea oculata*)
- Fourteen-spotted Lady Beetle (*Propylaea quatuordecimpunctata*)
- Great Capricorn Beetle (*Cerambyx cerdo*)
- Great Spruce Bark Beetle (*Dendroctonus micans*)
- Gypsy Moth (*Lymantria dispar*)
- Hauser's / Mountain Kyrgyz Engraver / Bark Beetle (*Ips hauseri*)
- Hazelnut Long-horned Beetle / Hazlenut and Walnut Twig Borer (*Oberea linearis*)
- Japanese Beetle (*Popillia japonica*)
- Larch Bark Beetle (*Ips subelongatus*)
- Large Pitch Tube Bark Beetle (*Dendroctonus armandi*)
- Long-horned / Sawyer Beetle (*Monochamus sartor*)
- Long-horned Beetle (*Plagionotus arcuatus*)
- Long-horned Beetle (*Xylotrechus rufilius*)
- Mountain Pine Beetle (*Dendroctonus ponderosae*)
- Morawitz's Bark Beetle (*Scolytus morawitzi*)
- Pine Shoot Beetle (*Tomicus piniperda*)
- Red-bodied Horntail / Woodwasp (*Sirex rufiabdominis*)
- Red-haired Pine Bark Beetle (*Hylurgus ligniperda*)
- Sevenspotted Ladybug (*Coccinella septempunctata*)
- Six-spined / Six-toothed Engraver / Bark Beetle (*Ips sexdentatus*)
- Six-spined Spruce Bark Beetle (*Pityogenes chalcographus*)
- Smaller Japanese Cedar Long-horned Beetle (*Callidiellum rufipenne*)
- Thin-antenna Spruce Borer (*Tetropium gracilicorne*)
- Two-spotted Oak Borer (*Agrilus biguttatus*)
- Variegated Lady Beetle (*Hippodamia variegata*)

### Amphibians (1)

- American Bullfrog (*Rana catesbeiana*)





Round Goby; *Neogobius melanostomus*  
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## Aquatic Vertebrates (49)

- Bighead (Asian) Carp (*Hypophthalmichthys nobilis*)
- Black (Asian) Carp (*Mylopharyngodon piceus*)
- Black Sea Silverside (*Aphanius boyeri*)
- Blueback Herring (*Alosa aestivalis*)
- Bluespotted Sunfish (*Enneacanthus gloriosus*)
- Brown Trout (*Salmo trutta*)
- Caspian Tyulka (*Clupeonella caspia*)
- Chain Pickerel (*Esox niger*)
- Chinook Salmon (*Oncorhynchus tshawytscha*)
- Coho Salmon (*Oncorhynchus kisutch*)
- Common Carp (*Cyprinus carpio*)
- Common Red Fish / Goldfish (Carp) (*Carassius auratus*)
- Common Rudd (*Scardinius erythrophthalmus*)
- Cutthroat Trout (*Oncorhynchus clarki*)
- Eastern Mosquitofish (*Gambusia holbrooki*)
- Eurasian minnow (*Phoxinus phoxinus*)
- European perch (*Perca fluviatilis*)
- Fallfish (*Semotilus corporalis*)
- Ghost Shiner (*Notropis buchanani*)
- Gizzard Shad (*Dorosoma cepedianum*)
- Golden / Silver Orfe / Ide (*Leuciscus idus*)
- Grass (Asian) Carp (*Ctenopharyngodon idella*)
- Largemouth Bass (*Micropterus salmoides*)
- Monkey Goby (*Neogobius fluviatilis*)
- Muskellunge (*Esox masquinongy*)
- Northern Snakehead (*Channa argus*)
- Orangespotted Sunfish (*Lepomis humilis*)
- Oriental Weatherfish (*Misgurnus anguillicaudatus*)
- Pingi Logsucker (*Garra pingi pingi*)
- Rainbow Smelt (*Osmerus mordax*)
- Rainbow Trout (*Oncorhynchus mykiss*)
- Red-bellied Pacu (*Piaractus brachypomus*)
- Redear Sunfish (*Lepomis microlophus*)
- Round Goby (*Neogobius melanostomus*)
- Ruffe (*Gymnocephalus cernuus*)
- Sea Lamprey (*Petromyzon marinus*)
- Shortnose Gar (*Lepisosteus platostomus*)
- Silver (Asian) Carp (*Hypophthalmichthys molitrix*)
- Smallmouth Bass (*Micropterus dolomieu*)
- Sockeye Salmon (*Oncorhynchus nerka*)
- Starry Goby (*Asterropteryx semipunctatus*)
- Suckermouth Minnow (*Phenacobius mirabilis*)
- Tench / Doctor-fish (*Tinca tinca*)
- Tubenose Goby (*Proterorhinus semilunaris*)
- Walking Catfish (*Clarias batrachus*)
- Weatherfish (*Misgurnus fossilis*)
- White Bass (*Morone chrysops*)

- White Sucker (*Catostomus commersoni*)
- Yellow Perch (*Perca flavescens*)

### Terrestrial Vertebrates (6)

- American Mink (*Mustela vison*)
- Eastern Grey Squirrel (*Sciurus carolinensis*)
- Raccoon (*Procyon lotor*)
- Red-eared Slider (*Trachemys scripta elegans*)
- Southern Red-backed Vole (*Clethrionomys gapperi*)
- Wild Boar (*Sus scrofa*)



### Pathogens / Parasites (8)

- Beech Bark Disease (*Nectria coccinea*)
- Butternut Canker (*Sirococcus clavigignenti-juglandacearum*)
- Dutch Elm Disease (*Ophiostoma* spp.)
- Lung Fluke (*Paragonimus westermani*)
- Oyster Parasite MSX (Multinucleate Sphere Unknown / MSX Disease) (*Haplosporidium nelsoni*)
- Sudden Oak Death (*Phytophthora ramorum*)
- Viral Haemorrhagic Septicaemia (VHS) (*Novirhabdovirus* sp.)
- White Pine Blister Rust (*Cronartium ribicola*)

Butternut Canker;  
*Sirococcus clavigignenti-juglandacearum*  
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## Appendix B. List of Recipients and Projects Funded by the IASPP

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### **Acadia University, Acadia Centre for Estuarine Research**

- Stepping up – Towards the formation of a provincial invasive alien species body for Nova Scotia (2008/09: \$40,000)
- Starting up – First-year development of a provincial invasive alien species coordinating body for Nova Scotia (2009/10: \$55,100)

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### **Alberta Community Development**

- Integrated invasive alien species management program, SW Alberta Parks (2007/08: \$30,000)

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### **Alberta Invasive Plant Council**

- Alberta Invasive Plant Council strategic initiative (2006/07: \$20,000; 2007/08: \$62,000; 2008/09: \$60,000)
- Helping Albertans become “weed-wise” (2009/10: \$37,100)

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### **Alberta Parks, SE Management Area**

- Integrated invasive alien species management program, SE Alberta Parks (2007/08: \$30,000)
- Integrated invasive alien species management program, SE Alberta Parks – Phase II (2008/09: \$20,000)

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### **Alberta Parks, SW Management Area**

- Integrated invasive alien species management program, SW Alberta Parks (2008/09: \$25,000)

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### **Association régionale des gestionnaires de ZECs de la Mauricie**

- Increasing awareness of the use of live baits for recreational fishing aimed at resort vacationers (2007/08: \$45,000)

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### **Blood Tribe Land Management**

- Blood Tribe invasive alien species integrated management plan and community awareness (2009/10: \$22,000)

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### **Boundary Weed Management Committee**

- Weeds Cross Borders Project – Cooperation with neighbours to keep new invaders out (2006/07: \$10,150; 2007/08: \$17,980)
- Cooperative project to produce tools for regional invasive plant committees to educate people participating in recreational activities about invasive plants in British Columbia (2006/07: \$35,980; 2007/08: \$9,020)

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### **Brandon University, Rural Development Institute**

- On the ground: Leafy spurge surveillance and management and towards the establishment of an invasive plant council for the province of Manitoba (2007/08: \$45,000)

- Establishment of the prairie region invasive noxious weed survey and mapping system (2006/07: \$29,500; 2007/08: \$60,500)

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#### **British Columbia Ministry of Agriculture and Lands**

- Field guide and video to address invasive alien plant pest and disease threats to British Columbia (2007/08: \$45,000)

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#### **British Columbia Ministry of Environment**

- Assessment and control of invasive Smallmouth Bass in Beaver Creek and Quesnel River Watersheds (2007/08: \$32,000)
- Reducing the risks of schools, science curricula and biological supply houses as potential pathways for spreading aquatic invasive species (2009/10: \$20,000)
- Stop the spread before it begins: Early detection and rapid response to alien invasive plants in British Columbia's Parks and Protected Areas (2009/10: \$30,000)

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#### **British Columbia Shellfish Growers Association**

- Preparing the British Columbia shellfish culture industry for monitoring marine invasive species (2006/07: \$15,000; 2007/08: \$28,900)

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#### **Canadian Weed Science Society**

- Invasive plants – Inventories, strategies and action, CWSS-SCM 2006 Symposium, Victoria, British Columbia (2006/07: \$23,500; 2007/08: \$16,000)

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#### **Cap-Pelé Watershed Group**

- Aquatic invasive species strategic plan in the Northumberland Strait (2007/08: \$45,000)

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#### **Cape Breton University**

- Project U.F.O. (Unidentified Foreign Organisms): Establishing a monitoring and public education program about invasive alien aquatic species (2007/08: \$25,000)
- Project U.F.O. (Unidentified Foreign Organisms): Phase 2 – Implementing monitoring efforts for early detection of invasive alien aquatic species in Cape Breton (2008/09: \$35,000)
- Project U.F.O. (Unidentified Foreign Organisms): Phase 3 – Strengthening partnerships to investigate aliens in coastal space: The final frontier (2009/10: \$35,000)

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#### **Central Kootenay Invasive Plant Committee**

- Central Kootenay Invasive Plant Committee – Regional initiative (2006/07: \$9,700; 2007/08: \$35,300)

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#### **Centre d'interprétation du milieu écologique du Haut-Richelieu**

- Integrated management of water chestnut (2006/07: \$4,450; 2007/08: \$43,525)
- Monitoring and eradication of water chestnut in Southern Quebec (2009/10: \$20,000)

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#### **City of Charlottetown**

- Eradication of Glossy buckthorn (*Frangula alnus*) in Victoria Park combined with educational outreach to increase public awareness about invasive alien species (2008/09: \$7,955)

- Eradication of Purple loosestrife (*Lythrum salicaria*) along the Charlottetown Confederation Trail combined with educational outreach about invasive alien plant species (2009/10: \$6,500)

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### **City of Saskatoon**

- Protecting prairie forests from invasive alien species: a seminar series and workshop (2009/10: \$1,700)

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### **Clean Annapolis River Project**

- Community action on invasive ealien plants in Nova Scotia's Anapolis valley (2006/07: \$20,800; 2007-/08: \$24,200)
- Weedy whereabouts – Tracking invasive alien plants in Nova Scotia (2007/08: \$35,000)
- Garlic Mustard eradication at Grand Pré, Nova Scotia (2008/09: \$19,000)

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### **Community Stewardship Council of Lanark County**

- Alien invaders – An innovative, new media educational resource on aquatic invasive species (2008/09: \$35,000)
- Alien invaders – An innovative, new media educational resource on aquatic invasive species Phase 2 (2009/10: \$10,000)

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### **Congress of Aboriginal Peoples**

- National Aboriginal awareness and outreach initiative on invasive alien species (2009/10: \$20,000)

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### **Eastern Ontario Model Forest**

- Course-in-a-box – Managing forests under the threat of invasive alien species (2006/07: \$10,800; 2007/08: \$28,525; 2008/09: \$5,675)

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### **Environmental Dynamics**

- Yukon Invasive Species Program coordinator (2009/10: \$35,000)

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### **Eskasoni Fish and Wildlife Commission**

- Building awareness about aquatic invaders, especially tunicates in Cape Breton, Nova Scotia (2006/07: \$24,590; 2007/08: \$20,410)

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### **Federation of Ontario Cottagers' Association**

- Motivating action by recreational property owners to prevent the spread of alien invasive species (2006/07: \$10,000; 2007/08: \$15,000)

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### **Frenchman-Wood River Weed Management Area**

- Continuation of the Frenchman-Wood River invasive weed management areas (2009/10: \$26,700)

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### **Friends of Fish Creek Provincial Park Society**

- Restoring the balance in Fish Creek Provincial Park, Canada's largest urban provincial park (2006/07: \$15,000; 2007/08: \$30,000)

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### **Friends of Wye Marsh**

- Invasive alien species management and education project at Wye Marsh Provincial Wildlife Area (2006/07: \$9,000; 2007/08: \$9,200)

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### **Fundy Model Forest**

- Development of outreach, extension and hazard rating tools for the balsam woolly adelgid – *Adelges piceae* (Ratz.) (2006/07: \$12,000; 2007/08: \$20,000)

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### **Government of Northwest Territories**

- Risk analysis and management options for invasive alien species in the Northwest Territories (2007/08: \$35,000)
- Risk analysis and management options for invasive alien species in the Northwest Territories – Part 2 (2008/09: \$15,807)

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### **Great Lakes United**

- « Ouvrez l'oeil! » (Keep your eyes peeled) Community Monitoring Network of invasive alien plants in Quebec (2009/10: \$30,000)

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### **High Park Initiatives**

- Invasive species “Busters” education programs for junior and intermediate grades at the High Park Nature Centre (2008/09: \$10,000)

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### **Horsefly Cattlemen’s Association**

- Horsefly Cattlemen’s Association invasive weeds on range (2006/07: \$8,800)

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### **Invasive Plant Council of British Columbia**

- Sharing best invasive plant practices with plant managers, governments, community groups and people participating in recreational activities (2006/07: \$4,000; 2007/08: \$41,000)
- Program development for the Greater Vancouver Invasive Plant Committee (2007/08: \$6,700)
- Preventing the invasion and spread of invasive alien plants via key pathways (2007/08: \$35,000)
- Collaborating to prevent the introduction and spread of invasive alien plants in British Columbia (2008/09: \$40,000)
- Building responsible actions to stop the spread of invasive plants in British Columbia (2009/10: \$47,200)

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### **Invasive Species Council of Manitoba**

- Invasive Species Council of Manitoba (2007/08: \$30,000)
- Invasive Species Council of Manitoba – Increasing public awareness and developing landscape management plans for invasive species in Manitoba (2008/09: \$35,000)
- Invasive Species Council of Manitoba: A collaborative approach to early detection and rapid response (EDRR) in Manitoba (2009/10: \$47,100)



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### **Island Conservation Canada**

- Restoring biodiversity of the Scott Islands Provincial Park through the eradication of invasive alien species (2009/10: \$35,000)

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### **Island Nature Trust**

- Assessment and eradication of garlic mustard from Prince Edward Island (2006/07: \$3,050; 2007/08: \$5,950)

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### **Lake Huron Centre for Coastal Conservation**

- Control of the *Phragmites australis* threat to Lake Huron coastal dune ecosystems (2006/07: \$16,500; 2007/08: \$12,650)
- Communicating threats of *Phragmites australis* on Lake Huron coastal ecosystems (2008/09: \$25,000)
- Combating the threat of *Phragmites australis* on Lake Huron's beaches (2009/10: \$20,200)

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### **Landscape Ontario Horticultural Trades Association**

- Development of monitoring and certification programs for invasive alien species (2006/07: \$8,750; 2007/08: \$36,250)

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### **Lower Nicola Indian Band**

- Lower Nicola Indian Band – Invasive plant management strategy, British Columbia (2006/07: \$8,250; 2007/08: \$16,750)

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### **Magdalen Islands ZIP Committee**

- Implementation of the Action Plan on Aquatic Invasive Species in Magdalen Islands (2008/09: \$40,000)
- Implementation of the Action Plan on Aquatic Invasive Species in Magdalen Islands – Phase 2 (2009/10: \$33,000)

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### **Manitoba Conservation, Forestry Branch**

- Prevention of the introduction of invasive pests of woody plants into Manitoba (2007/08: \$15,000)
- Invasive forest pests monitoring and public awareness program (2009/10: \$12,000)

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### **Manitoba Purple Loosestrife Project**

- Invasive plant pocket guide – Supporting early detection and prevention activities (2007/08: \$11,300)
- Manitoba early detection and prevention strategy for invasive aquatic and wetland plants (2007/08: \$5,200)
- Enhancements to the Manitoba Purple Loosestrife Project (2008/09: \$12,000)

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### **Manitoba Water Stewardship**

- Public education and awareness campaign of aquatic invasive species in Manitoba (2007/08: \$14,878)

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**McGill University**

- Detection of an invasive freshwater shrimp (*Hemimysis anomala*) in the St. Lawrence River (2009/10: \$25,000)

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**Memorial University of Newfoundland Botanical Garden**

- Newfoundland and Labrador's invasive plants – Creating awareness, implementing change (2006/07: \$18,808; 2007/08: \$26,189)
- Invasive alien species: profiles and procedures (2007/08: \$33,773)
- Newfoundland and Labrador's invasive plants: Creating awareness, implementing change (Part 3) (2008/09: \$15,000)

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**Mersey Tobeatic Research Institute**

- Prevention of invasive alien fish in the Southwest Nova Biosphere Reserve (2006/07: \$18,000; 2007/08: \$27,000)

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**Musqueam Ecosystem Conservation Society**

- Musqueam ecosystem English Ivy eradication project (2008/09: \$20,000)

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**Native Plant Society of Saskatchewan**

- Invasive alien plant detection, surveillance and control – Capacity building in Saskatchewan, phase 2 (2006/07: \$30,000; 2007/08: \$15,000)
- 8th Prairie Conservation and Endangered Species Conference and Workshop – 2007 (2006/07: \$8,454)
- Saskatchewan Invasive Alien Plant Program (2007/08: \$32,000)
- Formation of the Saskatchewan Invasive Alien Plant Council (2008/09: \$50,000)
- Voluntary codes of conduct for the prevention of invasive alien species (2009/10: \$47,000)

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**Nature-Action Québec**

- Regional outreach campaign aimed at invasive alien plants in the horticultural industry (2006/07: \$12,971; 2007/08: \$32,049)
- Horticulturists in action (2007/08: \$37,700)

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**NatureServe Canada**

- CanTrack, a Web-based invasive species reporting, assessment and mapping application (2007/08: \$45,000)

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**NatureServe Yukon**

- Inventory of invasive plant species along Yukon highways (2006/07: \$19,500)
- Building maps of Yukon invasive plant distributions and increasing public awareness (2007/08: \$18,850)

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**New Brunswick Department of Natural Resources**

- New Brunswick freshwater aquatic alien invasive species public education plan (2008/09: \$30,000)

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### **Newfoundland and Labrador Department of Environment and Conservation**

- Exotic species education coordination and policy development project (2007/08: \$27,000)

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### **Newfoundland Aquaculture Industry Association**

- Strengthening our nation – Addressing pathways and communication initiatives for aquatic invasive species in Newfoundland and Labrador (2006/07: \$2,500; 2007/08: 42,500)
- Communication initiatives for the management of aquatic invasive species in Newfoundland and Labrador (2008/09: \$18,000)
- Communication and shellfish aquaculture biosecurity initiatives for the management of aquatic invasive species in Newfoundland and Labrador (2009/10: \$9,900)

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### **Ontario Federation of Anglers and Hunters**

- Stopping the spread by spreading the word – Partnerships to address invasive species pathways within the aquarium and water garden industries (2006/07: \$38,468; 2007/08: \$42,532)
- Keeping our lakes great! Partnerships within the boating and angling community to prevent alien invasive species (2006/07: \$11,363; 2007/08: \$78,599; 2008/09: \$45,005)
- Making waves! Educational curricula highlighting the impacts and preventing the spread of invasive species (2007/08: \$45,000)
- Building capacity to manage invasive plants through the Ontario Invasive Plant Council (2008/09: \$40,000)
- The Ontario Invasive Plant Council (2009-2010: \$46,000)

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### **Ontario Ministry of Natural Resources**

- Development of capacity for early detection and rapid response to invasions of aquatic plants (2006/07: \$15,000; 2007/08: \$30,000)

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### **Ontario Ministry of Natural Resources, Ontario Forest Research Institute**

- Screening butternut for resistance to butternut canker disease, an invasive alien fungal pathogen in Canada (2008/09: \$7,873)

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### **Ontario Streams**

- Rouge River watershed aquatic alien species program (2006/07: \$8,000)
- Aquatic invasive species outreach within the aquarium and water garden trades (2009/10: \$11,000)

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### **Osoyoos Desert Society**

- South Okanagan native seed mix development (2007/08: \$3,174)

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### **Pet Industry Joint Advisory Council**

- Canadian “Habitattitude” website – A website dedicated to invasive alien species in Canada (2006/07: \$16,740; 2007/08: \$1,260)

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**Plenty Canada**

- Aboriginal perspective on alien invasive species action; Eastern Ontario (2007/08: \$30,000)
- Strategies on Invasives – South-Eastern Ontario Aboriginal partners build capacity (2008/09: \$25,000)

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**Prairie Learning Centre**

- The Prairie persists – High school workshop on invasive alien plants and restoration of natural grassland (2006/07: \$4,500)

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**Prince Edward Island Aquaculture Alliance**

- Communication program – Educating resource users about invasive aquatic alien species in Prince Edward Island estuarine waters (2006/07: \$18,000; 2007/08: \$27,000)
- Aquatic invasive species workshops on Prince Edward Island for boat owners and harbour authorities (2008/09: \$35,000)
- Development of interactive and targeted educational resources to help control the spread of aquatic invasive species in Atlantic Canada (2009/10: \$30,000)

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**Quebec Ministry of Natural Resources and Wildlife**

- Early detection network for aquatic invasive species (2006/07: \$11,500; 2007/08: \$41,000)
- Early detection network for aquatic invasive species (2008/09: \$45,000)
- Early detection network for aquatic invasive species (2009/10: \$45,000)

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**RNT Consulting Inc.**

- Recreational boater information/education package to prevent the spread of aquatic invasive species throughout Canada (2006/07: \$45,000)

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**Royal British Columbia Museum Corporation**

- Survey of alien plants from ports of entry on southern Vancouver Island (2007/08: \$6,276)

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**Science Enterprise Algoma**

- Forest and aquatic invasives – Building stakeholder capacity for early detection (2007/08: \$15,000)
- Terrestrial and aquatic invasives – Building stakeholder capacity for early detection (2008/09: \$10,000)

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**Secwepemc Fisheries Commission**

- Detection of invasive Yellow Perch through inventory and monitoring in the South Thompson River Watershed (2009/10: \$35,000)

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**Severn Sound Environmental Association**

- Invasive alien species monitoring and awareness program for Severn Sound (2007/08: \$20,000)

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**Society to Prevent Dutch Elm Disease**

- Monitoring invasive alien wood-boring insects in Alberta (2008/09: \$45,000)
- Monitoring invasive alien wood-boring insects in Alberta (2009/10: \$35,000)

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**Southeast Environmental Association Ltd.**

- ISPOT – Invasive Species Presence Observation Teams (2006/07: \$5,300; 2007/08: \$39,700)
- Helping harbour authorities control the spread of aquatic invasive species (2009/10: \$30,000)

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**Southern Alberta Land Trust Society**

- Native fescue grassland and invasive plant species – Phase 2, action (2006/07: \$7,200; 2007/08: \$37,800)

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**The Nature Conservancy of Canada**

- Invasive species early detection and management on conservation lands in the Atlantic provinces (2009/10: \$15,000)

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**Tree Canada Foundation**

- The tree killers – An invasive species interactive website (2006/07: \$9,685; 2007/08: \$25,315)

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**University of British Columbia, Earth and Ocean Sciences**

- Transport of marine invasive species by recreational boating (2008/09: \$35,000)
- Introduction and spread of invasive species by the transient and international recreational boating community (2009/10: \$35,000)

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**University of New Brunswick, Connell Memorial Herbarium**

- New Brunswick invasive plant workshop (2008/09: \$15,300)
- Increasing invasive alien species communication, awareness, networking and engagement in New Brunswick (2009/10: \$45,000)

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**University of Victoria, School of Environmental Studies**

- Mitigating impacts of introduced bullfrogs on native amphibians on Vancouver Island (2006/07: \$3,500; 2007/08: \$41,500)

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**University of Windsor, Great Lakes Institute for Environmental Research**

- Activating spaces for public awareness: invasive species exhibits and educational programs (2007/08: \$45,000)
- Taking it national: Phase two of the aquatic invasive species exhibits for public awareness and education (2008/09: \$30,000)
- The aquatic invasive species exhibit: coast to coast (2009/10: \$30,000)

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**Vancouver Aquarium Marine Science Centre**

- *Spartina* management project in coastal southwestern British Columbia (2006/07: \$15,625; 2007/08: \$29,375)
- *Spartina* management project in coastal southwestern British Columbia: Outreach and education (2008/09: \$37,000)

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**Vancouver Island University**

- Grey squirrels on Vancouver Island – Monitoring their range expansion and evaluating hormonal sterilization as a potential control method (2008/09: \$5,385)
- Grey squirrels on Vancouver Island – Monitoring their range expansion and evaluating hormonal sterilization as a potential control method (2009/10: \$17,500)

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**Western Newfoundland Model Forest**

- Limit and prevent the introduction of alien exotics to Newfoundland and Labrador (2006/07: \$13,000)

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**Wood River District No. 3**

- Establishment of the Frenchman-Wood River invasive weed management areas (2006/07: \$13,000; 2007/08: \$45,000; 2008/09: \$45,000)

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**Yukon Government, Highways and Public Works**

- Yukon Invasive Species Forum and early Detection and Rapid Response Framework (2008/09: \$15,000)





**www.ec.gc.ca**

Additional information can be obtained at:

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