



INVASIVE ALIEN SPECIES • ESPÈCES EXOTIQUES ENV

# Canadian Invasive Plant Framework

*A Collaborative Approach to Addressing  
Invasive Plants in Canada*



## Preface

The Canadian Invasive Plant Framework (CIPF) provides the basis for a nationally coordinated, multi-jurisdictional response to invasive plants using both regulatory and non-regulatory tools. The development of the Framework was coordinated by a federal government steering committee consisting of Agriculture and Agri-Food Canada, Environment Canada, Fisheries and Oceans Canada, Natural Resources Canada, Parks Canada and the Canadian Food Inspection Agency. This Framework is a response to the 2005 *Action Plan for Invasive Alien Terrestrial Plants and Plant Pests* that called for an Invasive Alien Plants Strategy for Canada.

The Canadian Invasive Plant Framework was developed based on a series of federal, provincial and territorial workshops completed in 2007 (Phase I), from input and feedback received from all levels of government in consultations completed in 2009 (Phase II), and from input and feedback from a broad range of stakeholders including industry, academia, and other non-government groups completed in 2011 (Phase III).

### **For more information on this project contact:**

#### **English Spokesperson:**

Cory Lindgren  
Canadian Food Inspection Agency  
Invasive Alien Plant Section  
613-269 Main Street, Winnipeg, Manitoba R3C 1B2  
Phone: 204-983-2212  
Email: [Cory.Lindgren@inspection.gc.ca](mailto:Cory.Lindgren@inspection.gc.ca)

#### **French Spokesperson:**

Melanie Gauthier  
Canadian Food Inspection Agency  
Invasive Alien Plant Section  
Phone: 613-773-2130  
Email: [Melanie.Gauthier@inspection.gc.ca](mailto:Melanie.Gauthier@inspection.gc.ca)

## Contents

<b>PREFACE</b> .....	<b>2</b>
<b>EXECUTIVE SUMMARY</b> .....	<b>4</b>
<b>1.0 INTRODUCTION</b> .....	<b>5</b>
<b>2.0 IMPACTS OF INVASIVE PLANTS</b> .....	<b>7</b>
2.1 ECONOMIC IMPACTS .....	7
2.2 ENVIRONMENTAL IMPACTS .....	8
2.3 SOCIAL, CULTURAL AND HUMAN HEALTH IMPACTS .....	9
2.4 IMPACTS ON INTERNATIONAL TRADE .....	9
<b>3.0 THE FRAMEWORK</b> .....	<b>10</b>
3.1 THE VISION.....	10
3.2 THE SCOPE.....	10
3.3 THE OBJECTIVE .....	10
3.4 STRATEGIC GOALS .....	10
3.5 GUIDING PRINCIPLES .....	12
3.6 IMPLEMENTATION.....	12
3.7 NATIONAL INVASIVE PLANT FORUM .....	12
<b>4.0 ROLES AND RESPONSIBILITIES</b> .....	<b>15</b>
4.1 ROLES OF THE GOVERNMENT OF CANADA.....	16
4.2 ROLES OF THE PROVINCIAL, TERRITORIAL, AND LOCAL GOVERNMENTS .....	21
4.3 ROLES OF NON-GOVERNMENT ORGANIZATIONS .....	22
4.4 ROLES OF ABORIGINAL ORGANIZATIONS .....	23
<b>5.0 LITERATURE CITED</b> .....	<b>25</b>
<b>6.0 GLOSSARY</b> .....	<b>27</b>
<b>APPENDIX I: STAKEHOLDER RECOMMENDATIONS</b> .....	<b>28</b>

## Executive Summary

Invasive plants have gained international, national, and local attention as globalization, climate change, and increases in international trade have elevated the risks of invasive plant introductions. It is widely recognized that responding to invasive plants is a shared responsibility and the active involvement of all levels of government, non-government organizations, and stakeholders is essential. Invasive plants have significant environmental, economic, societal, and trade impacts in Canada. They affect our agricultural and forestry sectors as well as unmanaged lands. The Canadian Invasive Plant Framework (CIPF) has been developed to respond to these impacts and risks. It emphasizes multi-jurisdictional partnerships and identifies the roles and responsibilities of all stakeholders in addressing invasive plants in Canada.

- **The vision** is to establish strong active partnerships, and to clearly articulate the roles and responsibilities of all levels of government and Canadians in the prevention, early detection, response, and management of invasive plants. The CIPF envisions minimizing the impacts of invasive plants by encouraging partners to use a blend of regulatory and non-regulatory tools, and by developing consistent, coordinated policies and programs.
- **The scope** is broad and includes all invasive plants that present a risk to Canada's ecosystems, human health, forestry and agricultural sectors, biological diversity, domestic plants and animals, primary industries, and import and export trade markets. The Framework addresses invasive plants not yet present in Canada and those which are present but have not reached their full potential range.
- **The objective** is to prevent introduction, and minimize and manage the risks invasive plants pose to Canada's economy, environment, and society. To achieve this objective a National Invasive Plant Forum is proposed that will provide opportunities to develop and deliver collaborative action.

This Framework emphasizes the importance of preventing and managing introductions through partnerships fostered by stakeholder participation in meetings of a National Invasive Plant Forum (NIPF). A NIPF will strive to strengthen national collaboration and communication by ensuring that national and regional efforts are coordinated, effective, broadly communicated, and resources are used efficiently and effectively.

The CIPF is built upon and consistent with the goals and objectives of the *An Invasive Alien Species Strategy for Canada*.

## 1.0 Introduction

In response to the clear and immediate need for Canada to address the threat of invasive alien species, the Government of Canada developed *An Invasive Alien Species Strategy for Canada* in 2004. The Terrestrial Plants and Plant Pests Working Group<sup>1</sup> further developed an *Action Plan for Invasive Alien Terrestrial Plants and Plant Pests*. The *Action Plan* called for a coordinated national response to minimize incursions and impacts of invasive plants by building on the strengths and capacities of partner organizations. The Canadian Invasive Plant Framework is a response to that call to action.

The Canadian Invasive Plant Framework also fits into a hierarchy of international and domestic conventions and strategies. Canada is party to the [International Plant Protection Convention \(IPPC\)](#) which provides a Framework for international cooperation to prevent the spread and introduction of pests<sup>2</sup>. Canada is also party to the [United Nations Convention of Biological Diversity \(CBD\)](#) which recognizes that invasive alien species are a major contributing factor to world-wide loss of biological diversity. The [Canadian Biodiversity Strategy](#) (1996) further recognizes the need to conserve biological diversity and promote the sustainable use of biological resources. Within this strategy, federal, provincial, and territorial governments expressed a commitment to take all necessary steps to prevent the introduction of harmful alien organisms and eliminate or reduce their adverse effects to acceptable levels by identifying and monitoring, determining priorities based upon impacts on biodiversity, eliminating unintentional introductions, developing national and international databases, ensuring adequate legislation and enforcement, and enhancing public education and awareness.

There are an estimated 1,229 alien vascular plant species in Canada and 486 of these are considered invasive (Canadian Food Inspection Agency 2008) (Figure 1). The number of invasive plant species varies widely by province and territory and many species occur in more than one area. Ontario, Quebec, and British Columbia have the highest numbers of invasive plants while Nunavut has the fewest. Of these, about 58% of the invasive plant species have arrived in Canada through intentional introductions from other countries with 80% arriving from Europe, western Russia, and the Mediterranean (Canadian Food Inspection Agency 2008).

There are an estimated 1,229 alien vascular plant species in Canada contributing to about 24% of the national flora (Canadian Food Inspection Agency 2008).

Invasive species and climate change are the two most significant variables contributing to global environmental change (Rahel and Olden 2008). In an [Intergovernmental Panel on Climate Change \(IPCC\)](#) report, it is projected that climate change will extend the geographic ranges of species northward and upward in altitude (IPCC 2002). Subsequent increases in

---

<sup>1</sup> The Terrestrial Plants and Plant Pests Working Group was one of four thematic groups created by the Government of Canada to advance the Strategy. It is no longer active. Working groups were also created for aquatic invasive species, terrestrial animals, and leadership and coordination.

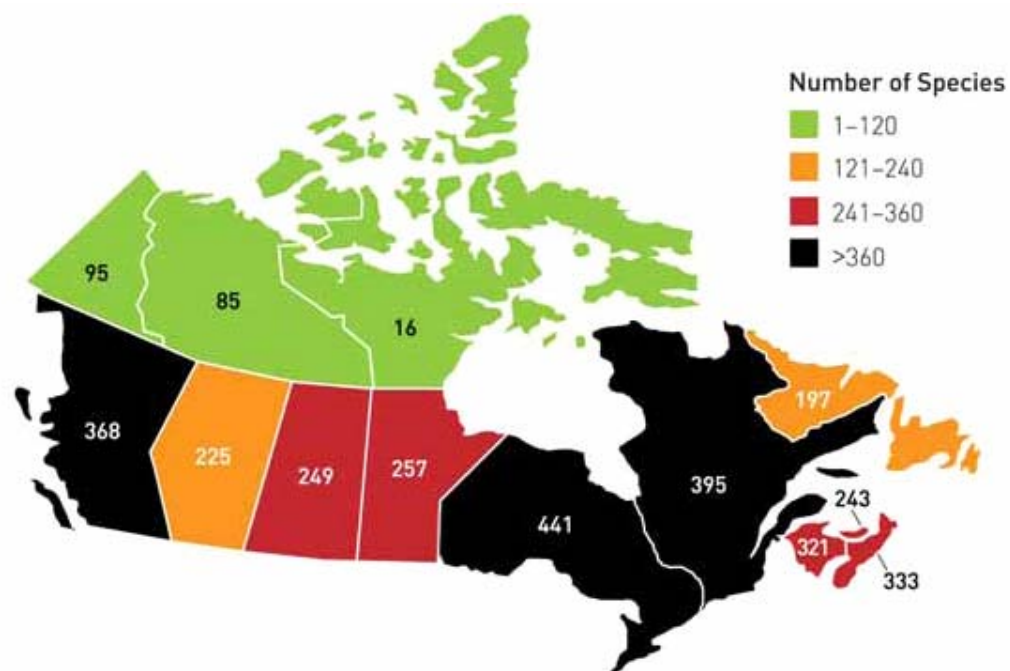
<sup>2</sup> More information on international agreements and obligations, as well as federal and provincial legislation pertinent to invasive plants, can be found in the Appendices of Phase 2 of the *Action Plan for Invasive Terrestrial Plants and Plant Pests*.

atmospheric CO<sub>2</sub> will favour invasive plants allowing them to capitalize on global warming and hence, we can expect increases in their numbers and range expansions (IPCC 2002).

**As a result of climate change, Canada can expect:**

- new invasive plants to establish and spread into new regions of Canada where they previously were unable to survive
- once benign species to become invasive
- pathways of introduction and international travel to be altered
- an increased demand for new garden plants based on changing plant hardiness zones
- the requirement for managers and policy makers to find new strategies to control species that were not traditionally problematic increasing the overall economic costs to Canada (see Hellmann et al. 2008, McKenney et al. 2007, Rahel and Olden 2008, and Van der Veken et al. 2008 for the above).

In response to climate change there is also motivation to produce “green” energy through plant biomass, and some of these new plant species proposed for introduction are known to be invasive in other areas of the world.



**Figure 1.** There are 486 invasive alien plant species in Canada. The number of invasive plant species in Canada varies between provinces and territories and many species occur in more than one area (Canadian Food Inspection Agency 2008).

Many of the barriers that have traditionally restricted the introduction and spread of invasive plants have been removed. The number of new plant incursions and their impacts has increased rapidly over the past 30 years due to exponential increases in travel, tourism and trade, the speed at which commodities and people traverse the globe, increased numbers of ports of entry, expanded exports and imports into new international markets, increased interest in the use of new and exotic plants by gardeners, and increased access to foreign ecosystems with new species (Mullin et al. 2000). As the volume and diversity of our international trade increases, we can expect more introductions of invasive plants (Westphal et al. 2008).

## 2.0 Impacts of Invasive Plants

Invasive plants threaten Canada's environment, economy, and society, including the health and well being of Canadians. They affect the biological diversity and productivity of our agriculture and non-agricultural systems including rangelands, aquatic areas, and natural areas. They impact all Canadian ecosystems.

### 2.1 Economic Impacts

The economic costs of invasive plants in Canada are significant and increasing. In the agricultural sector, invasive plants result in significant losses in crop yields, increased costs associated with weed control, and potential devaluation and export market losses from commodity contamination. For example, Dawson (2002) estimated the annual cost of invasive species to Canada's agricultural and forest land base to be \$7.3 billion dollars, with weeds in crops and pastures accounting for \$2.2 billion dollars. More recently, Thomas and Leeson (2007) estimated the economic yield loss, including the costs of herbicides, attributed to alien invasive weeds in spring wheat, barley, and canola production in the Canadian Prairie Provinces at over \$1.0 billion annually. Weed survey data for arable fields in Canada has indicated that alien invasive weeds account for 52% of the weeds recorded (Thomas and Leeson 2007).



**Figure 2.** A leafy spurge infestation near Winnipeg, Manitoba.

A single invasive plant species can cost Canadians millions of dollars annually. For example, the impact of Canada thistle (*Cirsium arvense*) in canola crops in prairie Canada was estimated at \$320 million dollars annually (RNT Consulting Inc. 2002). The loss of cattle forage to spotted knapweed (*Centaurea maculosa*) and diffuse knapweed (*Centaurea diffusa*) is conservatively estimated to cost British Columbia ranchers as much as \$13 million dollars

annually (C. Rankin & Associates 2004). In Manitoba, the economic costs of leafy spurge (*Euphorbia esula*) (Figure 2) were estimated at \$19 million annually, comprised of \$16 million in impacts on grazing land, \$2.5 million on public lands, and \$0.4 million along rights of way (Leafy Spurge Stakeholders Group 1999).

## 2.2 Environmental Impacts

The environmental impacts of invasive plants, although more difficult to quantify, are broad and in some cases potentially irreversible. Invasive plants are for example, recognized as a leading factor in the extinction of native species second only to habitat destruction (Wilcove 1998).

### **Invasive Plants are known to:**

- out-compete native flora and fauna, including species at risk (see Figure 3),
- alter and destroy natural habitats and ecosystems,
- change water chemistry and hydrological regimes
- introduce new pest species,
- hybridize with native species forming superweeds,
- reduce biological diversity and result in loss of genetic diversity,
- reduce agricultural production and increase weed control costs.



**Figure 3.** First known incursion of kudzu in Canada along Lake Erie, near Leamington, Ontario. Photo by Diana Mooij, CFIA.

Invasive plants impact many aspects of our ecosystems including the biological diversity, structure, and function. By competing with and in some cases, displacing native plant species, they change the composition and function of our ecosystems altering primary productivity and nutrient cycling, hydrology, erosion, and fire regimes. Purple loosestrife (*Lythrum salicaria*), an escaped garden ornamental, is a well known example of an invasive plant that has altered ecosystem function and reduced biological diversity (Thompson et al. 1987).

### **2.3 Social, Cultural and Human Health Impacts**

Invasive plants can have diverse social, cultural, and human health impacts. These impacts are difficult to quantify in monetary terms. For example, they cause allergies and dermatitis in humans, interfere with traditional lifestyles, reduce tourism, employment, aesthetic values, and property values, and reduce the overall enjoyment of natural and recreational areas (Canadian Food Inspection Agency 2008). Invasive plants such as giant hogweed (*Heracleum mantegazzianum*), an escaped garden ornamental, cause serious skin inflammation due to ultraviolet photo-activation of furanocoumarins present in the sap (Morton 1975). Carpet burweed (*Soliva sessilis*) originated from South America and is now found on British Columbia's golf courses, parks and lawns. Its sharply pointed spines pierce the skin and in the absence of competition it will cover the ground like a carpet (C. Rankin & Associates 2004).

Hundreds of rural Canadians and Aboriginal communities remain dependent upon agricultural and natural resources including crops, livestock, fisheries, forestry, and wildlife for their livelihoods, and these resources can be degraded or lost with the introduction of an invasive plant.

### **2.4 Impacts on International Trade**

Invasive plants impact our international trade relationships. When an invasive species is found in a region, commercial trade may be restricted or prohibited to prevent these pests from spreading to other areas. There may also be additional costs to control the pest or to treat products to make them safe to move. Countries are recognizing the impacts and costs associated with invasive plant introductions and have started to regulate species of invasive plants as quarantine pests in order to prevent their intentional and unintentional introductions. To maintain access to export markets producers and governments must adhere to foreign country import requirements that protect against introductions of weeds or invasive plants.

## 3.0 The Framework

### What is an Invasive Plant?

The below definition has been adapted from *An Invasive Alien Species Strategy for Canada*.

**Invasive plants** are those harmful plant species whose introduction or spread threatens the environment, the economy, or society, including human health.

**Plants** are living plants and parts thereof, including seeds and germplasm.

### 3.1 The Vision

**The vision** is to establish strong active partnerships, and to clearly articulate the roles and responsibilities of all levels of government and Canadians in the prevention, early detection, response, and management of invasive plants. The CIPF envisions minimizing the impacts of invasive plants by encouraging partners to use a blend of regulatory and non-regulatory tools, and by developing consistent, coordinated policies and programs.

### 3.2 The Scope

**The scope** is broad and includes all invasive plants that present a risk to Canada's ecosystems, human health, forestry and agricultural sectors, biological diversity, domestic plants and animals, primary industries, and import and export trade markets. The Framework addresses invasive plants not yet present in Canada and those which are present but have not reached their full potential range.

### 3.3 The Objective

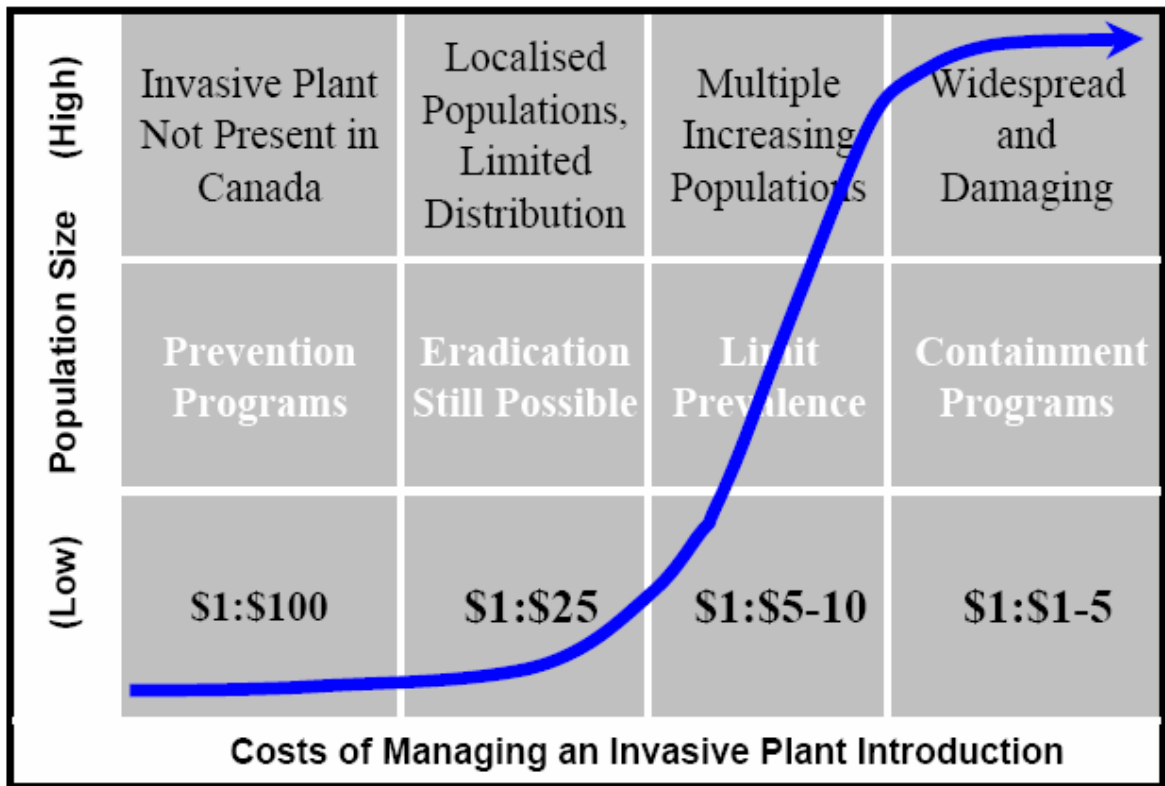
**The objective** is to prevent introduction, and minimize and manage the risks invasive plants pose to Canada's economy, environment, and society. To achieve this objective a National Invasive Plant Forum is proposed that will provide opportunities to develop and deliver collaborative approaches.

### 3.4 Strategic Goals

This Framework adheres to the below four strategic goals, which are consistent with *An Invasive Alien Species Strategy for Canada*:

- 1) prevention of new invasive plants,
- 2) early detection of new invasive plants,
- 3) effective and efficient response to new invasive plants, and
- 4) the management of established and spreading invasive plants.

The Framework's priority will be to establish partnerships that will prevent new incursions of invasive plants into Canada or into new regions of Canada. Prevention is recognized as the most effective and cost efficient strategy for mitigating the risks associated with invasive plants. Figure 4 illustrates the value of prevention. As an invasive plant population increases in size, the management costs increase exponentially. For every dollar invested in prevention economic returns are estimated at \$100 dollars. Conversely, once an invasive plant has established and containment becomes the management option, for every dollar invested, economic returns are significantly reduced and estimated at between \$1 and \$5 dollars.



**Figure 4.** Cost benefit ratios for various responses to invasive plants (Figure adapted from the Weed Alert Plan Victoria 2007 and Williams 1997). Prevention programs are the most effective and cost efficient response to invasive plants.

### **3.5 Guiding Principles**

The Canadian Invasive Plant Framework:

1. works within, and is compatible with existing international agreements including the International Plant Protection Convention and the Convention on Biological Diversity;
2. is consistent with *An Invasive Alien Species Strategy for Canada (2004)* and addresses recommendations outlined within the *Action Plan for Invasive Alien Terrestrial Plants and Plant Pests (2005)*;
3. emphasizes using science-based approaches and utilizing current knowledge and technology;
4. emphasizes partnerships across all levels of government, non-governmental organizations, industry, academia, Aboriginal groups and the public by defining the roles and responsibilities of stakeholders;
5. integrates programs, expertise and resources, in an effort to maximize benefits;
6. promotes an adaptive management approach that incorporates best practices and continuous improvement by learning from the outcomes of operational programs;
7. engages Canadians and encourages universal stewardship; and
8. respects the rights of Aboriginal peoples and all Canadians, and integrates traditional knowledge with other sources of knowledge to address the threats of invasive plants.

### **3.6 Implementation**

The CFIA is the lead Government of Canada agency responsible for implementing the CIPF. A national coordinating body is proposed to implement the CIPF and to ensure broad communication, collaboration and consultation. It is proposed that a national coordinating body would take the form of a secretariat situated within the CFIA's Plant Health and Biosecurity Directorate. The secretariat would be responsible for the overall delivery of the Framework providing coordination, and day to day interface (Figure 5). The secretariat would also provide administrative support for the National Invasive Plant Forum (NIPF).

### **3.7 National Invasive Plant Forum**

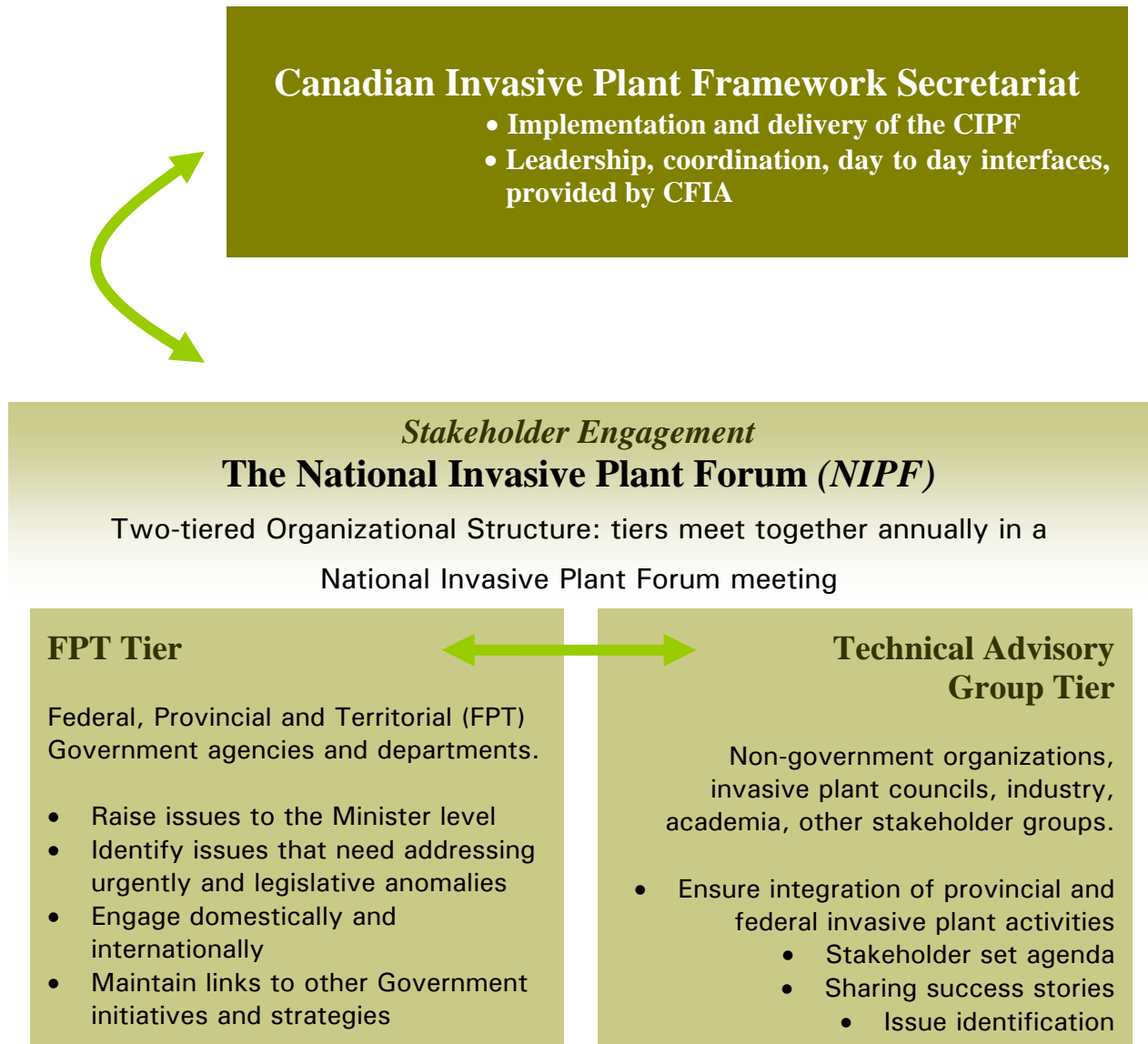
The diverse nature of the impacts of invasive plants in Canada necessitates the need for a comprehensive and inclusive stakeholder forum. A NIPF would strive to facilitate partnerships and engagement and provide linkages to complementary frameworks and strategies. The NIPF will strengthen national collaboration and communication by ensuring national and regional efforts are coordinated, effective, broadly communication and resources are used efficiently

and effectively. It will emphasize a collaborative approach to ensure the strategic goals of this Framework - prevention, early detection, rapid response, and management - are achieved.

The success of the NIPF will be dependent on the active participation of its members. Forum membership will be inclusive engaging all levels of government, non-government organizations, industry, and other stakeholders including provincial invasive plant or species councils, conservation groups, scientists, and academia. The NIPF would be a two-tiered structure with a federal, provincial and territorial (FPT) tier, and a technical advisory tier that works with a FPT tier (Figure 5). The two tiers would meet collaboratively in annual meetings of NIPF.

The roles and responsibilities of the National Invasive Plant Forum will be to:

- identify and move forward national and regional priorities,
- provide an inclusive venue to engage stakeholders on invasive plant issues,
- facilitate cooperation and coordination between partners,
- when appropriate, establish and facilitate working groups to investigate and provide advice on specific invasive plant issues,
- address municipal, provincial/territorial and national issues by drawing on the expertise of its members and other resources,
- build capacity and collaboration between all stakeholders including government,
- ensure that regional and local efforts are coordinated with national initiatives and strategies.



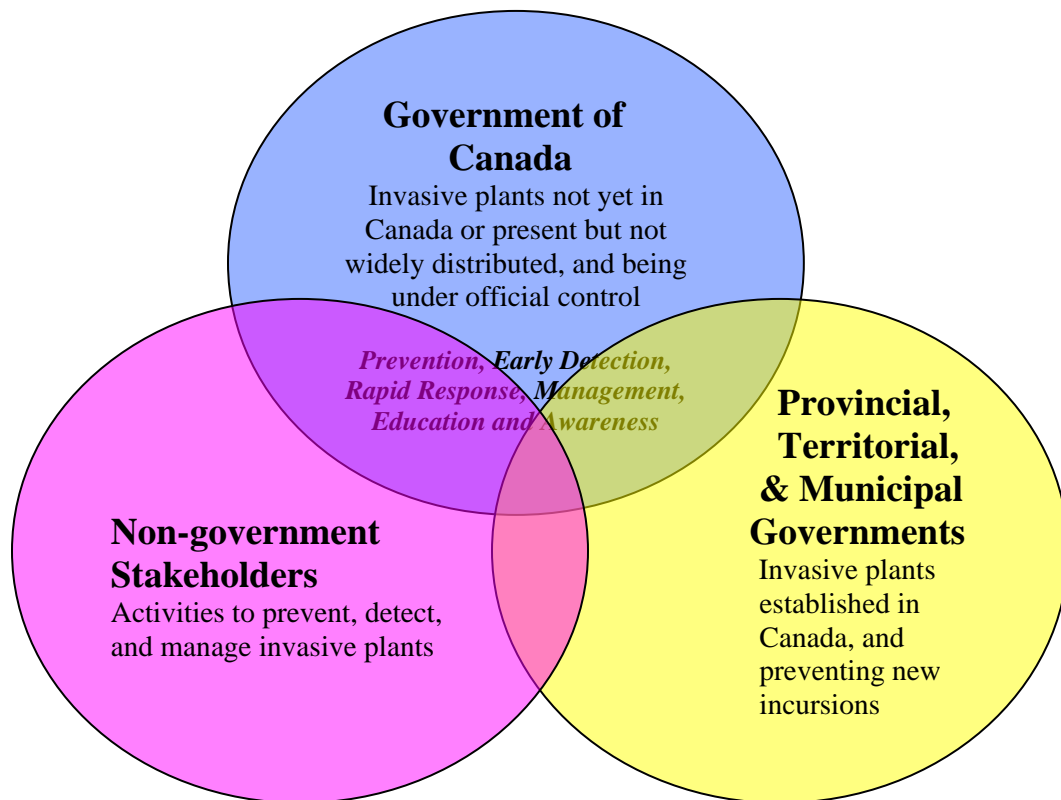
**Figure 5.** National Invasive Plant Forum stakeholder engagement model.

## 4.0 Roles and Responsibilities

Responding to invasive plants is a shared responsibility and the actions of all levels of government, non-government organizations, and industry is required. Often the assigned responsibility for responding to an invasive plant depends upon if the plant is present or absent from an area, or its distribution in an area.

The effectiveness of the CIPF will depend upon active participation by all levels of government, non-government organizations, industry, academia, aboriginal groups and the Canadian public.

While some stakeholders have specific roles, many of the regulatory and non-regulatory roles are multi-jurisdictional providing opportunities for partnerships. Stakeholders have identified that the primary role of the Government of Canada is prevention while provincial and territorial Governments have a primary role in managing invasive plants established in Canada (Figure 6). All levels of government and stakeholders can respond by developing programs to achieve the Framework's four strategic goals of prevention, early detection, rapid response and management. The implementation of the Framework relies on clearly articulating the roles and responsibilities of all levels of government and non-government stakeholders in the prevention, early detection, rapid response and management of invasive plants.



**Figure 6.** Responding to invasive plants is a shared responsibility and all parties have a role in prevention, early detection, rapid response, management, and education and awareness.

## 4.1 Roles of the Government of Canada

The Government of Canada has a commitment to responding to invasive alien species as identified in *An Invasive Alien Species Strategy for Canada* which provides an institutional and legislative framework, and identified measures to help prevent new introductions. Stakeholders have identified that the primary role of the Government of Canada is prevention. With respect to invasive plants, the roles and responsibilities of the Government of Canada require clarification.

**The Canadian Invasive Plant Framework recognizes the roles the Government of Canada as follows:**

### **Agriculture and Agri-Food Canada (AAFC)**

Agriculture and Agri-Food Canada is a science-based department with a broad mandate for matters under federal jurisdiction that relate to agriculture, products derived from agriculture, and research related to agriculture and agricultural products. Invasive alien species is one of the key issues facing Canadian agriculture that are identified in the “*Agriculture and Agri-Food Canada’s Action Plan for Biodiversity in Canada*”. As well, addressing the risks to agricultural interests posed by invasive alien species is included in one of the key results under the biodiversity/bioresources priority of the AAFC “*Science and Innovation Strategy*”. Within AAFC, the Research Branch, the Agri-Environmental Services Branch, and the Programs Branch, through its Pest Management Centre, are most involved in addressing invasive plants in Canada.

The Research Branch of AAFC provides scientific expertise necessary for the identification, characterization and management of invasive plants; develops and maintains a reference collection of plants (i.e., AAFC Vascular Plant Herbarium in Ottawa); implements a Canadian biological control research program; provides spatial modeling capabilities (e.g., to determine climate change impacts); provides national quarantine importation clearance facilities in Ottawa, and provides quarantine research facilities in Lethbridge, Saskatoon, and Ottawa. Research Branch also coordinates review of submissions for the release of classical biological control agents. These activities support regulatory decision making by the CFIA relative to invasive plants and the CFIA mandate for plant health protection.

The Agri-Environmental Services Branch (AESB) conducts prairie weed surveys detecting invasive plants in agricultural crops; conducts field trials of weed control methodologies (i.e., mechanical, chemical), as well as the ecology, genetics, and herbicide resistance of weeds; monitors and manages invasive plants on federal lands that are community pastures; and provides extension services on integrated weed management and grazing practices on rangelands and pastures in Western Canada. The AESB Branch uses the science base for the control of invasive plants, provided primarily by the Research Branch, to develop, test and promote management strategies for farmers. Through the Pest Management Centre, the AAFC Programs Branch facilitates the implementation of biological control approaches for invasive plant management, and generates data to support registrations of herbicides to combat priority weeds, some of which are invasive alien species.

### **Canadian Food Inspection Agency (CFIA)**

The Canadian Food Inspection Agency is the primary agency charged with preventing invasive plants from entering Canada. Under the IPPC framework the CFIA as Canada's National Plant Protection Organization and in this role it has responsibility for prescribing phytosanitary measures necessary for the safe import, export, and domestic movement of plants and plant products in Canada. The International Standards for Phytosanitary Measures (ISPMs) developed under the IPPC provide guidance to member countries for implementation of the Convention at a national level. The CFIA is responsible for international border protection under the *Plant Protection Act* and *Regulations* as well as under the *Seeds Act* and *Regulations*. Specifically, the CFIA regulates the intentional introduction of new invasive plants known to be invasive in other regions of the world but not yet present in Canada<sup>3</sup>. The CFIA can also regulate those plants present in Canada but which have a limited distribution and where an official control<sup>4</sup> program will be implemented. Official control programs can be implemented by the Government of Canada or in partnership with provincial and territorial governments.

The CFIA encourages partnerships where capacity can be increased to respond to pest incursions proactively; addresses the introduction of invasive plants not yet present in Canada and those present but not yet widely distributed and where an official control program can and will be implemented in partnership with other stakeholders; regulates the environmental release of plants which may cause harm to the environment under Part V of the *Seeds Act and Regulations*; address the potential spread of invasive plants through the sale of seed using the *Weed Seeds Order*; uses risk analyses (i.e., risk assessment, risk management, risk communication) to determine the risk of new potentially invasive plants to Canada; conducts surveys, monitors, manages, and controls regulated invasive plants in partnership with other stakeholders; promotes and develops education and awareness programs; and engages in international discussions (i.e., IPPC) and projects aimed at controlling the introduction and spread of invasive plants.

### **Canada Border Services Agency (CBSA)**

The Canada Border Services Agency (CBSA) is responsible for providing integrated border services that support national security and public safety priorities and facilitate the free flow of persons and goods, including animals and plants that meet all requirements under the program legislation. The CBSA operates at about 1,200 service points across Canada and 39 locations abroad. Over 12 million commercial releases and 95 million travelers are processed each year.

---

<sup>3</sup> This represents a “quarantine pest” which is a pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled as defined by the IPPC.

<sup>4</sup> Official control is the active enforcement of mandatory phytosanitary regulations and the application of mandatory phytosanitary procedures with the objective of eradication or containment of quarantine pests or for the management of regulated non-quarantine pests as defined by the IPPC.

The CBSA's role is to manage the nation's border by administering and enforcing any Act of Parliament that governs trade and travel, as well as international agreements and conventions. Specifically, the CBSA is authorized to enforce the Plant Protection Act and Regulations and the Seeds Act and Regulations at Canadian border points to assist the Canadian Food Inspection Agency (CFIA) with the prevention of the introduction into Canada of invasive plants. The CBSA performs traveler and commercial inspection functions on plants and plant products on behalf of the CFIA at all ports of entry into Canada.

### **Department of National Defence and Canadian Forces (DND)**

The Department of National Defence and Canadian Forces manage large amounts of land in Canada and is committed to practicing sound environmental stewardship. The Department of National Defence and Canadian Forces will work in coordination with stakeholders to determine appropriate plans of action as may be required to assess and address invasive species to ensure the protection of environmental integrity on its lands. This may include developing specific pest response strategies for invasive plants; surveying and monitoring invasive plants; controlling and managing invasive plants; and exploring opportunities for building partnerships with internal and external organizations in order to profit from their expertise in managing invasive plants. For example, invasive plants are a concern to the Department at Canadian Forces Base Suffield which is comprised of 260,900 hectares of biologically diverse native prairie, a portion of which is designated as a National Wildlife Area. As well, National Defence has established policies and procedures to clean military equipment and material arriving into Canada from overseas operations to prevent introductions of invasive plants.

### **Environment Canada**

Environment Canada is committed to providing leadership and coordination in the implementation of *An Invasive Alien Species Strategy for Canada*. Environment Canada led the development of *An Invasive Alien Species Strategy for Canada* and continues to coordinate issues of shared interest. The department also manages the Invasive Alien Species Partnership Program, which provides funding to provinces, municipalities, non-government organizations and groups that are working in support of the goals of the national strategy. Environment Canada works with all relevant federal stakeholders to ensure a cohesive federal approach on invasive alien species as well as collaborating with international agencies working on invasive alien species.

### **Fisheries and Oceans Canada (DFO)**

Aquatic invasive species have already been responsible for significant impacts on some native fish species, aquaculture, and fishery industries in Canada. On behalf of the Government of Canada, Fisheries and Oceans Canada is responsible for developing and implementing laws, regulations, policies and programs in support of Canada's scientific, ecological, social and economic interests in oceans and fresh waters. The Department's guiding legislation includes the *Oceans Act*, which charges the Minister with leading oceans management and providing coast guard and hydrographic services on behalf of the Government of Canada, and the *Fisheries Act*, which confers responsibility to the Minister for the management of commercial fisheries, fish habitat and aquaculture. The Department is also one of the three responsible

authorities under the *Species at Risk Act*. The Department will advise the government on issues related to aquatic invasive species under its responsibility and work to implement [The Canadian Action Plan to Address the Threat of Aquatic Invasive Species](#) which outlines a national approach for managing aquatic invasive species.

DFO will advise the government on issues related to aquatic invasive species; work to implement [The Canadian Action Plan to Address the Threat of Aquatic Invasive Species](#) which outlines a national approach for managing aquatic invasive species; conduct research to support the development of a regulatory framework and guide the development and implementation of management measures, including prevention, rapid response, mitigation, and control activities for invasive species; conduct research towards refining predictive modelling of future invaders; conduct research determining the best methods leading to the early detection of new invaders and monitoring the spread existing ones; develop rapid response and ongoing mitigation and control methods; refine risk assessment methods so that they can be best utilized to determine the risk of aquatic invasive species to Canada's aquatic ecosystems.

### **Health Canada**

Health Canada's Pest Management Regulatory Agency (PMRA) administers the *Pest Control Products Act* the Act on behalf of the Minister of Health, and is responsible for the regulation of pest control products in Canada. The PMRA's primary objective is to prevent unacceptable risks to people and the environment from the use of pesticides. All pesticides, including those herbicides to be used in the control or suppression of invasive plants are thoroughly assessed for health and environmental risks as well as efficacy and value, which includes efficacy, before they are registered for use.

The PMRA will continue to develop pest management policies and guidelines which promote sustainable pest management, improve the efficiency of the regulatory process, provide access to pest control products, develop strategies and distribute pest management information to the general public and key stakeholders.

### **Indian and Northern Affairs Canada (INAC)**

Indian and Northern Affairs Canada is the federal government department responsible for administration of the *Indian Act*, a piece of federal legislation primarily responsible for status Indians, First Nation governance and reserve lands in Canada, its amendments, and enabling treaties. INAC is the lead federal department managing two-fifths of Canada's land mass under the *Indian Act* and develops legislative frameworks empowering Aboriginal Canadians to make decisions on how to manage their resources and promote sound community development. This includes the development of comprehensive community plans and frameworks which address land use, natural resource management and protection of sensitive species. Protection of native flora is an issue of keen interest to First Nation groups as this links to a variety of economic,

cultural and spiritual traditions. Section 91 (24) of the Constitution Act, 1867, gives the federal government as a whole exclusive jurisdiction to enact legislation respecting ‘Indians and lands reserved for Indians’. Therefore, INAC is involved collectively with other departments in responding to the fiduciary responsibilities of the Federal Crown as a whole. In relation to invasive plant species, INAC will work in coordination with stakeholders to determine appropriate plans of action as may be required to assess and address the issue and ensure the protection of environmental integrity on reserve lands.

### **Natural Resources Canada (NRCan)**

The Canadian Forest Service (CFS) is a science-based policy organization within Natural Resources Canada, a Government of Canada department that helps shape the important contributions of the natural resources sector to the Canadian economy, society and environment. The CFS promotes the responsible and sustainable development of Canada's forests and recognizes that invasive plants present potential direct and indirect risks to forests, specifically as vectors for plant pathogens and plant pests which are of fundamental interest to CFS forest science and technology research nationally. Natural Resources Canada is participating in the implementation of the *National Forest Pest Strategy*<sup>5</sup> and *An Invasive Alien Species Strategy for Canada*.

### **Parks Canada**

Parks Canada Agency is responsible for the management of invasive species in Protected Heritage Areas under its custody as per the *Parks Canada Agency Act*. The Agency must contend with the broad issue of alien species compromising ecological integrity and representative ecosystems, and potentially becoming invasive. Parks Canada also must address those species that currently exhibit a significant degree of invasiveness, recognizing that eradicating or controlling these species contributes to achieving the overarching goal of conservation of ecological integrity and biological diversity in Canada's Protected heritage Areas. The Ecological Integrity Branch of Parks Canada serves a national coordination role with regard to invasive alien species including invasive plants.

Parks Canada's ecosystem management approach for invasive species is consistent with both the *Invasive Alien Species Strategy for Canada* and the *Principles and Guidelines for Ecological Restoration in Canada's Protected Natural Areas* (Parks Canada and the Canadian Parks Council 2008). This approach builds on broad, cross-jurisdictional partnerships and aims for efficient, effective and engaging action plans for invasive species that threaten ecological integrity at the landscape and regional levels. Accordingly, the Agency's on-the-ground ecosystem management activities help minimize the risk for re-invasion and provide opportunities for public understanding, appreciation and engagement (Parks Canada 2008).

---

<sup>5</sup> In 2006, the Canadian Council of Forest Ministers (CCFM) endorsed the idea of a National Forest Pest Strategy to cover the management of both native and alien forest pests. Built on the success of the *Invasive Alien Species Strategy for Canada*, it is based on a risk analysis framework that takes the same preventative, evidence-based approach to pest management as the invasive species strategy.

## 4.2 Roles of the Provincial, Territorial, and Local Governments

The primary responsibility for managing established and widely distributed invasive plants in Canada rests with the provinces and territories. However, the regulatory mandates of provincial and territorial governments also allow for provisions to prevent introductions. With respect to invasive plants, the roles and responsibilities of the provinces, territories, and local government requires clarification.

**The Canadian Invasive Plant Framework recognizes the roles the provinces, territories, and local governments of Canada as follows:**

### Provinces and Territorial Governments

Provinces and territories are supporting the implementation of the *Invasive Alien Species Strategy for Canada* in accordance with their policies, plans, priorities and fiscal capabilities, and actively partnering with other federal departments and agencies, provincial and territorial governments, municipal governments, First Nations, non-government organizations and industries to address invasive plants in Canada. Provincial and territorial governments have significant roles and responsibilities in addressing invasive plants in Canada. Some provinces provide leadership and technical expertise to other agencies, non-government partners, including regional weed committees and related groups. Provincial and territorial governments should consider revising noxious weed acts or similar regulatory tools, and work to harmonize existing legislation where more than one act or regulation exists that provide authority for regulating invasive plants. In partnership with regional and local governments, some provinces and territories deliver operational invasive plant programs, have developed education and outreach programs aimed at preventing new incursions, developed early detection systems, conduct surveillance activities, developed and implement response and management plans (e.g., classical biological control programs, herbicide programs, integrated vegetation (or pest) management programs and educational programs) for invasive plants established in a region . Some provinces have developed and operate provincial online databases to record survey and inventory data, track invasive plant distributions, and facilitate coordination of management efforts. Provinces have and are developing memorandums of understanding with other levels of government so that effective and efficient response plans are in place prior to incursions.

Provincial and territorial governments can also play a role in prevention activities through their existing legislation (e.g., noxious weed acts, environmental acts, forestry acts, etc.) where available. Provinces and territories can also use various other regulatory tools such as Parks Acts, Land Acts, Biodiversity Acts, Forestry Acts, Mining Acts, and Fisheries Acts to regulate invasive plants or enable action that prevents introductions of invasive plants. However, in some cases provincial and territorial acts are limited and do not provide the necessary authority to regulate invasive plants. Some provinces have not developed noxious weed acts, and many existing noxious weed acts only address weeds that impact agricultural areas.

## **Local and Municipal Governments**

Local and municipal governments, both rural and urban, also play a key regulatory and non-regulatory role in managing invasive plants. In some provinces and territories, the responsibility for weed control has been delegated to local governments. In Southern Canada, much of the land infested by invasive plants is under municipal jurisdiction. This includes parkland, community forests, and roadsides (especially in rural or semi-rural areas). In many cases, municipal powers with respect to the control of invasive plants on private property is restricted to agricultural “weeds” as specified in provincial enabling legislation. Many local governments in Canada have created by-laws that prohibit the sale and planting of invasive plants. In some cases, local governments have staff (e.g., weed inspectors and supervisors) that responds to invasive plants directly through biological, chemical, mechanical and integrated pest management programs.

## **4.3 Roles of Non-Government Organizations**

The roles and responsibilities of non-government stakeholders are varied with many provinces and territories establishing multi-jurisdictional invasive plant councils, and community based groups initiating programs that target specific invasive plants. With respect to invasive plants, the roles and responsibilities of the non-government organizations require clarification.

### **Industry**

As international trade of ornamental plants increases and new and exotic varieties of plants are discovered, the horticulture, garden and landscape industries and its customers can be expected to play a larger role in managing invasive plants. Also important is the increased interest in producing “green energy” and bio-products using plant species not currently present in Canada, or not cultivated extensively but found in the natural environment or garden trade.

Industry has already begun to produce educational and outreach materials and some garden centers and greenhouses have delivered trade-in programs where environmentally safe native plants are traded for invasive plants. However, forming accords or cooperative agreements (i.e., that prevent the sale, propagation or distribution of invasive plants locally or regionally) between various groups including the nursery and garden industry, the landscape architecture profession, regional invasive plant councils, government departments and agencies, and non-governmental organizations, would be valuable in preventing local or regional spread.

### **Invasive Plant Councils**

Invasive plant councils (IPCs) and invasive species councils play a significant role in addressing invasive plants in Canada as well as in sharing and coordinating information needs. In most provinces and territories, partnerships have been formed and continue to evolve resulting in the formation of societies and councils that are dynamic in nature. Invasive plant

councils may develop strategic plans and form smaller regional committees to address local incursions. Invasive plant councils will encourage actions to help detect, prevent and manage invasive plants. By building collaboration on key actions, they will raise the profile of invasive plants across diverse interests including governments, influence and encourage required regulatory measures, and engage the public at large in identification and detection activities that lead to early detection and prevention. Councils will promote coordinated research, develop and distribute educational and outreach materials, and assist in the development of regional and provincial databases that support early detection.

Invasive plant councils play a significant role in networking with other provincial, regional and federal councils, as well as with provincial and federal governments. Invasive plant councils will work in cooperation with other stakeholder groups to inform policy decision makers and assist in prioritizing issues for action. Ensuring collaboration and networking between councils, across provincial borders, is recognized as a key role of IPCs. By building linkages across Canada, IPCs will work to share expertise, network on common issues, and help ensure a coordinated national response to invasive plants that transcends borders.

### **Land trusts, Conservancies and Stewardship Groups**

Land trusts, conservancies, and stewardship groups such as the Nature Conservancy of Canada that own fee simple properties or hold conservation easements and covenants to protect and manage significant ecological values have a significant role in land management that includes preventing and managing invasive plants.

### **Community Groups and Individuals**

There are hundreds of community-based groups and individuals in Canada that are actively involved in invasive plant management. These take many forms including coalitions, task forces, provincial projects, and “friends of” projects. Communities and individuals undertake non-regulatory activities to address priority local issues. In addition, many community institutions, corporations, foundations, banks, utilities, and private individuals also fund programs and projects addressing invasive plants. Ensuring collaboration and networking between non-government groups and individuals, and adequate funding to support their efforts to management invasive plants is recognized as a key to building and supporting long-term capacity at this level.

## **4.4 Roles of Aboriginal Organizations**

### **Aboriginal Peoples of Canada**

Invasive Species directly impact our life, and our recognized Treaty and Aboriginal Rights as the Aboriginal Peoples of Canada. There are seventy-three (73) distinct nations of Aboriginal Peoples throughout the 23 Eco Regions of Canada, speaking fifty (53) Aboriginal Languages from eleven language families. The present day political map of Canada is the result of more

than a dozen pre-confederation treaties, number treaties, two Royal Proclamations, modern day land claims agreements, and settlements. The Aboriginal Peoples of Canada have a continuum in some instance of ten thousand years in specific areas, with a formidable repository of traditional ecological knowledge.

As a rule, the Aboriginal Peoples of Canada also have extensive knowledge about invasive species, from experience - we and our ancestors have witnessed and lived through the introduction of many types of foreign biodiversity onto and into our lands and waters. Each in time displacing what the Creator had first placed, plants, animals, birds, fishes - the bounty promised for our continuum of generations to come. This promise is core to our world view, embodied in our history, culture, traditions, architecture, innovations, practices, languages and that much more as Aboriginal Peoples of Nations of Aboriginal Peoples. A fundamental first step is to work for the reconciliation of our world views as the many Peoples of the Federation of the Peoples of Canada. As the Mi'Kmaq would say in the Mi'Kmaq language, mawqatmuti'kw (maw haad moo teek) "we all live together"

Regional organizations like the Maritime Aboriginal Peoples Council and the National Aboriginal Peoples Organizations can play a role by participating in advisory councils that encourage Aboriginal Peoples involvement and partnerships in addressing invasive plants. The work will be on going and will require strong minds, hearts, hands and tenacity - the promise that has made Canada.

## 5.0 Literature Cited

Canadian Food Inspection Agency. 2008. Invasive Alien Plants in Canada. CFIA. Ottawa, Ontario.

Convention on Biological Diversity. 2002. Decision VI/23 and Guiding Principles. IUCN's "Guidelines for the prevention of biodiversity loss caused by alien invasive species".

C. Rankin & Associates. 2004. Invasive Alien Species Framework for BC: identifying and addressing threats to biodiversity. Report prepared for the Biodiversity Branch Ministry of Water, Land & Air Protection. May 2004. British Columbia, Canada. 96 pages.

Dawson, M. 2002. Plant quarantine: a tool for preventing the introduction and spread of alien species harmful to plants. In: Claudi R., Nantel, P., and Muckle-Jeffs, E. (eds). Alien Invaders in Canada's Waters, Wetlands and Forests, pp 243-251. Canadian Forest Service, Ottawa, Canada.

Government of Canada. 2004. An Invasive Alien Species Strategy for Canada. Ottawa, Ontario.

Hellmann, J., Byers, J., Bierwagen, B. and J. Dukes. 2008. Five potential consequences of climate change for invasive species. *Conservation Biology* 22:534-543.

International Plant Protection Convention. 1997. FAO, Rome.

IPPC. 2003. Climate Change and Biodiversity. Intergovernmental Panel on Climate Change technical paper V. H Gitay, A Suárez, R.T.Watson, D,J Dokken (Eds). IPCC, Geneva, Switzerland.

Leafy Spurge Stakeholders Group. 1999. Leafy Spurge Impact Assessment. Analysis prepared by The Leafy Spurge Stakeholders Group Impact Assessment Working Group. 33pp.

McKenny, D., Pedlar, J., Lawrence, K., Campbell, K. and M. Hutchinson. 2007. Potential impacts of climate on the distribution of North American trees. *BioScience* 57:939-948.

Morton, J. 1975. The giant cow parsnip, *Heracleum mantegazzianum* Umbelliferae, in Canada. *Can. Field-Nat.*, 89:183-184.

Mullin, B., Anderson, L., DiTomaso, J. Eplee, R. and K. Getsinger. 2000. Invasive Plant Species. Issue paper for the Council for Agricultural Science and Technology. Number 13. Ames, Iowa.

Parks Canada and the Canadian Parks Council 2008. Principles and Guidelines for Ecological Restoration in Canada's Protected Natural Areas. Parks Canada Agency, Gatineau (QC) 99 p.

Parks Canada 2008. Action On The Ground II. Working With Canadians to Improve Ecological Integrity in Canada`s National Parks. Parks Canada, Gatineau (QC) 102 p.

Rahel, F. and J. Olden. 2008. Assessing the effects of climate change on aquatic invasive species. *Conservation Biology* 22:521-533.

Reichard, S.H. and P. White. 2001. Horticulture as a pathway of invasive plant introductions in the United States. *Bioscience* 51:103-113.

RNT Consulting Inc. 2002. Environmental and economic costs of alien invasive species in Canada. Report prepared for the Canadian Information System for the Environment. Picton, Ontario.

Thomas, G. and J. Leeson. 2007. Tracking long-term changes in arable weed flora of Canada. Pages 43-70 in D.R. Clements and S.J. Darbyshire, eds. *Invasive Plants: Inventories, strategies and action. Topics in Canadian Weed Science, Vol. 5.* Sainte Anne de Bellevus, Quebec: Canadian Weed Science Society.

Thompson, D.Q., R.L. Stuckey and E.B. Thompson. 1987. Spread, Impact and Control of Purple Loosestrife (*Lythrum salicaria*) in North American Wetlands. U.S. Fish and Wildlife Service, Fish and Wildlife Research 2, 55 pages.

Van der Veken, S., Hermy, M., Vellend, M., Knapen, A. and K. Verheyen 2008. Garden plants get a head start on climate change. *Frontiers in Ecology and Environment* 6:212-216.

Weed Alert Plan Victoria. 2007. Weed Alert Plan Victoria: A surveillance and response plan for potential, new and emerging weeds in Victoria. Department of Sustainable and Environment Department of Primary Industries. The State of Victoria. Victoria, Australia.

Westphal, M.I., Browne, M., MacKinnon, K. and I. Noble. 2008. The link between international trade and the global distribution of invasive alien species. *Biological Invasions* 10:391-398.

Wilcove, D., Rothstein, D., Dubow, J., Phillips, A. and E. Losos. 1998. Quantifying threats to imperiled species in the United States: Assessing the relative importance of habitat destruction, alien species, pollution, overexploitation, and disease.

Williams, P.A. 1997. Ecology and management of invasive weeds. Department of Conservation, Conservation Sciences Publication No. 7. Wellington, New Zealand. 41 pp.

## 6.0 Glossary

**Alien species** — species of plants, animals, and micro-organisms introduced by human action outside their natural past or present distribution (Convention on Biological Diversity Decision VI/23)

**Containment** — application of measures in and around an infested area to prevent spread of a pest (ISPM No. 5, 2005)

**Eradication** — application of measures to eliminate a pest from an area (ISPM No. 5, 2005)

**Incursion** - An isolated population of a pest recently detected in an area, not known to be established, but expected to survive for the immediate future (ISPM No. 5, 2006)

**International Plant Protection Convention** - International Plant Protection Convention, as deposited with the Food and Agricultural Organization in Rome in 1951 and as subsequently amended (ISPM No. 5, 2006)

**Invasive species** — harmful alien organisms whose introduction or spread threatens the environment, the economy, or society (Convention on Biological Diversity Decision VI/23)

**Invasive plants** - are those harmful plant species whose introduction or spread threatens the environment, the economy, or society, including human health.

**Legislation** – Any act, law, regulation, guideline or other administrative order promulgated by a government (ISPM No. 5, 2006)

**Official control** - The active enforcement of mandatory phytosanitary regulations and the application of mandatory phytosanitary procedures with the objective of eradication or containment of quarantine pests or for the management of regulated non-quarantine pests (ISPM No. 5, 2005)

**Pest risk analysis** – The process of evaluating biological or other scientific and economic evidence to determine whether an organism is a pest, whether it should be regulated, and the strength of any phytosanitary measures to be taken against it (ISPM No. 2, 2007)

**Plant** – Living plants and parts thereof, including seeds and germplasm (ISPM No. 5, 2006)

**Quarantine pest** - A pest of potential economic importance to the area endangered thereby and not yet present there, or present but not widely distributed and being officially controlled (ISPM No. 5, 2006).

## **Appendix I: Stakeholder Recommendations**

1. Develop a mechanism that will strengthen national coordination and communications; and provide inter-governmental leadership at a national level ensuring that federal efforts are well coordinated, effective, and broadly communicated.
2. Develop a mechanism to strengthen linkages between government, non-government stakeholders and industry.
3. Develop a program that prevents the further sale, distribution, or propagation of invasive plants already established in Canada, for example a Canadian Invasive Plant Accord.
4. Develop lists to prioritize and target invasive plants. For example, more efficient use of the existing Regulated Pests of Canada list, which identifies invasive plants as quarantine pests in Canada. Consider creating new lists such as (1) a “white list” which identifies plants that can be imported into Canada, (2) a non-regulatory “alert list” which identifies plants that are invasive elsewhere however not yet naturalized in Canada, and (3) a non-regulatory “accord list” and (4) an invasive plants of national significance list. Provinces and Territories should consider modernization of existing noxious weed lists so that they take a preventive approach.
5. Modernize federal regulations by developing a Canadian Invasive Plant Policy. A new policy should be science-based and adhere to the principles of risk analysis.
6. Develop a pre-import risk assessment screening tool to be adopted as part of Canada’s risk analysis framework. A screening tool would allow for more timely assessments of the potential invasiveness of plants for planting prior to import into Canada.
7. Develop a web-based IAS portal to strengthen national communications and coordination, and to act as an education and outreach tool.
8. Develop a Plants of Canada Database which would provide information on the status of plants in Canada, which are invasive, and where they are found in Canada.
9. Develop a National Early Detection Rapid Response (EDRR) framework. The objective would be to prevent the introduction and establishment of new invasive plants into Canada and to clearly outline the roles and responsibilities of all agencies in the event of an incursion.
10. Develop a National Invasive Plant Forum with annually meetings hosted by a provincial Invasive Plant Council. This will serve as an opportunity to share information and discuss local, regional and national priorities.