PLANT *and* ANIMAL

HEALTH STRATEGY *for* CANADA

July 2017

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Acknowledgements

Effective protection of plant and animal health depends on the combined and coordinated actions of numerous partners. The **Plant and Animal Health Strategy for Canada,** which charts a path for working better together to safeguard plant and animal health, was developed by partners, including:

- Industry associations and producers;
- Processors;
- Suppliers to the plant and animal sectors;
- The distribution industry;
- Provincial and federal governments;
- Non-governmental organizations;
- Academics and professionals in agricultural fields; and,
- Other stakeholders.

1. Introduction

Protecting the health of plants and animals helps safeguard the food supply, the health of Canadians and the environment, and contributes to economic growth and prosperity. Canada's current approach to the protection of plant and animal health relies on the efforts of partners from all levels of government, industry, academia and others, who undertake activities individually and together. The approach includes a diverse set of activities such as assessing and managing risks to plants and animal health; setting, implementing and enforcing standards and rules; controlling imports; detecting and monitoring emerging and endemic pests, diseases and other health risks; preparing for emergencies; and taking action to minimize impacts and promote resilience when emergencies do occur.

While Canada's current approach has a strong foundation, it also has vulnerabilities, increasing challenges, and opportunities for improvement.

Recent experiences show that although Canada can respond to, and recover from, plant and animal health emergencies, this comes at a substantial cost and involves significant loss of productivity, income, and market access. These experiences strongly support the need for increasing the emphasis on preventing targeted risks where feasible, as a more desirable and sustainable approach, while maintaining a strong capacity to respond to emergencies when they occur.

Plant and animal health emergencies can entail substantial costs: two examples

A 2002 study* for the Canadian Animal Health Coalition estimated impacts to the Canadian economy of an outbreak of foot and mouth disease as high as $46 billion, depending on the location and severity of the outbreak. The $46 billion figure included disease control costs, primary and processing sector impacts, tourism and non-agriculture-related impacts, and trade-loss opportunity impacts. In 2017 dollars, these estimated costs would have grown to more than $60 billion.

A 2009 report** for the Canadian Council of Forest Ministers conservatively estimated potential avoided costs of $165 million per year by preventing the introduction and establishment in Canada of four invasive forest insects and diseases, based on case studies of Asian longhorn beetle, emerald ash borer, Sirex wood wasp and sudden oak death disease. The report estimated that every dollar spent on coordinated multi-jurisdictional prevention activities for a given pest could avoid three dollars of spending on mitigation, regulatory and depletion costs.

* Serecon Management Consulting Inc. (2002). *Economic Impacts of a Potential Outbreak of Foot and Mouth Disease in Canada*

**Nelson, Harry et al (2009). *Estimating the Potential Returns from Developing a National Forest Pest Strategy: the benefits of developing a proactive approach to managing risk*

In addition, although the current approach does provide a level of protection from risks, changes in the external context have become more frequent and varied such that partners' activities must constantly evolve to keep pace. If it is to ensure protection of plant and animal health across all regions of the country, ongoing public trust, and sustained support to economic growth and international trade, Canada's approach will need to better integrate partners' efforts and be more proactive in adjusting to a range of increasingly complex and evolving challenges, for example:

- Increased volumes and changing patterns of movement of people and goods across borders;
- Industry consolidation, technology changes, and globalization of supply chains; and
- Impacts of climate change on plant and animal health.

There are also inherent challenges with Canada's current approach, for example:

- The large number of partners and diversity of activities, without overall coordinating structures, makes it difficult to integrate and coordinate efforts across all partners;
- The pressure to react quickly to address needs, which predisposes partners to act independently and miss out on the potential benefits of collaboration; and
- Unequal access to information, knowledge and effective practices across partners.

To address these present-day challenges and those of the future, Canada's approach must become more agile and forward-looking, and better structured and coordinated.

1.1 Context and Purpose of Developing the Plant and Animal Health Strategy

As a key deliverable under the Emergency Management Framework for Agriculture in Canada that was established in July 2016, federal, provincial, and territorial (FPT) ministers of agriculture asked partners to work collaboratively to develop an integrated strategy to prevent and mitigate risks to plant and animal resources[1].

In developing this strategy (the Plant and Animal Health Strategy for Canada), partners set out a collective vision, guiding principles, and objectives for improving Canada's ability to respond to changing needs, challenges and opportunities. The vision for plant and animal health is consistent with the One Health concept, in that it recognizes that safeguarding plant and animal health contributes to protecting the health of humans and the environment. The Strategy also provides direction and prospective actions for the near term that build towards prospective activities for the longer term, as well as a mechanism for ongoing dialogue among partners to continuously adjust the activities under the Strategy when necessary to adapt to risks, needs and capacities. When elaborating activities and a plan for implementing the Strategy, partners built upon ongoing activities and identified new ones to contribute towards the three desired outcomes of the Emergency Management Framework for Agriculture in Canada, specifically:

- Enhanced prevention and mitigation—Risks are prevented or mitigated through a culture of proactivity, responsible action, policies and programming
- Collaborative action—Emergency management partners place collaboration at the forefront and maximize the use of each other's strengths, capacities and expertise for predictable, seamless, coordinated and sustainable emergency management activities
- Building sector resilience—A sector that is prepared to address risk, adapts to changing conditions, and is able to withstand and recover from emergencies.

The purpose of developing the **Plant and Animal Health Strategy for Canada** is to:

- Galvanize partners around a shared vision and objectives for an integrated approach to safeguarding plant and animal health in Canada;
- Set the direction for essential sustained improvements to Canada's approach, through structures, processes and activities;
- Build upon and coordinate the efforts of all partners to achieve cohesion, maximize synergies, and minimize duplication, overlaps and gaps;
- Identify priorities and concrete actions for the near term, and directions for the longer term;
- Position partners' efforts to continuously improve and evolve in step with their changing risks, needs, and capacities.

[1] Federal, provincial, and territorial ministers of agriculture at their annual conference in July 2017 endorsed the Plant and Animal Health Strategy for Canada (sections 1 to 6); the foundational activities to implement the Strategy (table 1 of appendix 3); and the ongoing, collaborative approach that partners will take through two implementation coordinating councils for planning, prioritizing and agreeing upon all future implementation activities under the Strategy.

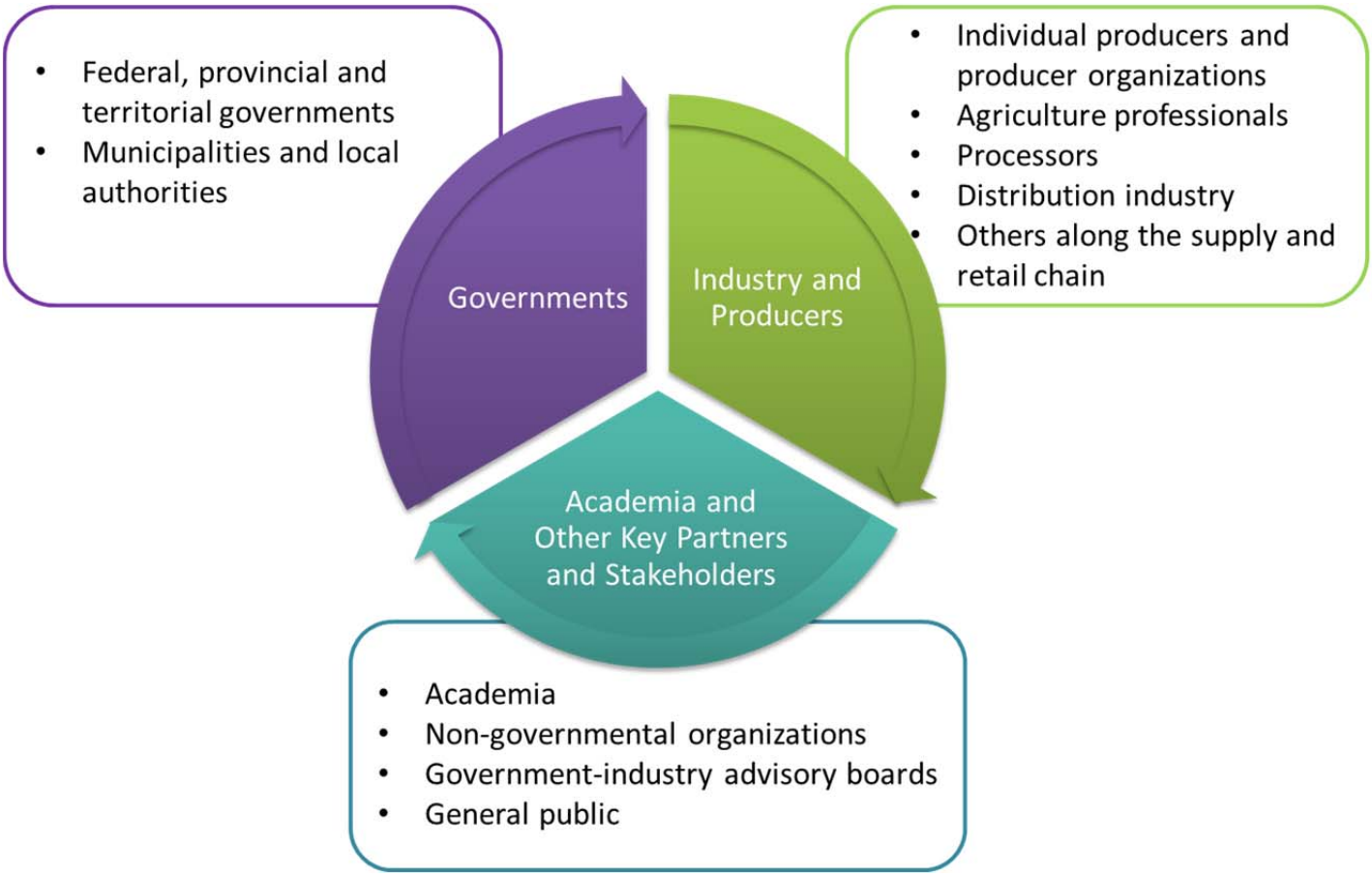
A description of how the Strategy was developed, and other FPT frameworks and strategies to consider during the Strategy's ongoing implementation, is provided in Appendix 2.

2. The Need for Modernizing Canada's Current Approach to Safeguarding Plant and Animal Health

2.1 Partners and their Activities

Under Canada's current approach, multiple partners undertake activities to safeguard plant and animal health, including animal welfare.

Public and private sector organizations and individuals all have roles and responsibilities for safeguarding the health of plant and animal resources. Among the many partners that have a stake in plant and animal health are industry associations and producers; processors; the distribution industry; suppliers and service providers to the plant and animal sectors; various departments from federal, provincial, territorial and municipal governments; non-governmental organizations; academics and professionals in agricultural fields; and the general public.



Whether working independently or in coordination with others, these partners undertake a broad range of activities that contribute to the overall level of protection for plant and animal health. Although specific activities focus on aspects of plant health or animal health, or both, the following four broad categories of activities are carried out within the current approach:

- Legislative control, legal tools, and preventive control programs;
- Data collection, research, and analysis;
- Preparedness, mitigation, response, and recovery; and
- Communication, engagement, and collaboration.

While no complete inventory exists, the following table summarizes some of the types of activities partners currently undertake across the four categories.

Examples of Current Activities Undertaken by Partners

Categories	Types of activities
Legislative control, legal tools, and preventive control programs	o Regulating imports o Conducting preclearance activities o Instituting risk mitigation at origin o Conducting audits of foreign countries o Interprovincial movement restrictions o Certifying establishments o Giving permissions (e.g., issuing certificates) and conducting inspections for import, export and domestic movement o Implementing compliance measures and fees o Instituting on-farm biosecurity
Data collection, research, and analysis	o Providing surveillance and diagnostic laboratory services o Conducting comprehensive environmental scans o Monitoring the marketplace o Conducting research, e.g., developing pest-resistant varieties o Transferring knowledge and technology o Conducting risk assessments and analyses o Collecting data from import inspections/monitoring
Preparedness, mitigation, response, and recovery	o Planning emergency response o Implementing traceability and identification systems o Conducting emergency exercises o Managing endemic pests and diseases o Providing compensation
Communication, engagement, and collaboration	o Establishing and maintaining national and international relationships o Contributing to international standards and bilateral and multilateral agreements for animal and plant-related risks, e.g., zoning arrangements o Providing training and educational resources o Delivering awareness campaigns, exhibits, and publications

2.2 Challenges and Opportunities

A persistent challenge for partners in safeguarding plant and animal health, which intensifies all other challenges described below, is that they must balance their limited resources across numerous activities related to the prevention and mitigation of risks, preparedness, response and recovery. In order to strengthen the overall approach and make it sustainable, partners must embrace opportunities to use their collective resources more efficiently and effectively.

At the same time, Canada's approach must be adaptive so that it can anticipate and continuously adjust to changes in context that challenge its effectiveness. This section describes the key challenges, vulnerabilities and opportunities for improvement that are targeted by the Plant and Animal Health Strategy.

2.2.1 An increasingly complex and ever-changing external context

Canada's approach to protecting plant and animal health operates in a context of increasingly complex and continuously changing risks and challenges. The approach must therefore be readily adjustable so that Canada can contend with challenges stemming from, for example:

- Increasing movement of people across our borders—citizens, tourists and workers—who may bring in plant pests and animal diseases;
- Growing trade volumes, changing trade patterns and emerging markets, and changing consumer demand for international goods from new sources—which increase known risks or introduce unknown risks of pests and diseases entering Canada;
- International integration of supply chains—which increases the complexity of risks as plants, animals and products may traverse or be modified in multiple countries on their way to market;
- Changing production methods and consolidation of producers—which may increase known risks or introduce new risks;
- Public and consumer perceptions of some agricultural practices—which may discourage some producers from adopting beneficial, science-based practices for protecting plant and animal health;
- Changing climate—which may result in expanded ranges or populations of existing pests and diseases, and result in new biological and physiological risks; and,
- Technological changes and advancements—which may present opportunities to increase the ability to predict, detect and monitor risks, but may also challenge the ability of governments to revise regulations quickly enough to address potential new risks associated with these technologies.

2.2.2 A need to optimize the effectiveness of Canada's approach through prevention

In recent years, as recognized in the Emergency Management Framework for Agriculture in Canada, emergency events have grown in frequency and impact. In turn, Canada's approach to plant and animal health has often focused more on response and recovery than on prevention, mitigation and preparedness. While responding to emergencies is critical to a comprehensive approach for protecting plant and animal health, there is wide recognition that preventive actions and mitigation of targeted risks generally provide the greatest returns on investment. Accordingly, partners acknowledge that in order to improve the overall approach there is a general need to rebalance their efforts to emphasize prevention and preparedness, when the benefits of these efforts outweigh the costs and disadvantages. Therefore, to optimize Canada's risk management approach, there is the need to target risks for preventive actions not only according to their likelihood and potential impact, but also according to the expected benefits and return on investment from those actions.

2.2.3 A need to increase collaboration and coordination among partners

Challenges to the effectiveness of Canada's approach also originate from the large number and diversity of partners, and their needs and activities. Partners currently have no jointly defined vision and objectives for safeguarding plant and animal health, nor are there overall needs analyses, comprehensive and systematic approaches to program design and delivery, or assessments of the performance of combined stakeholder activities to help unify partner efforts. As in any complex multi-partner approach, even when partners have common or complementary goals, coordination across all partners is unlikely to occur without structures and processes designed to achieve this. Some partners work independently on activities when synergies could be realized by working together with other partners. Furthermore, a

scan of partners' collective efforts shows a lack of cohesion across activities, with some overlap and duplication of effort, as well as gaps. Although some partners have established governance mechanisms to align their efforts, limited coordination across all partners has diminished the overall effectiveness of Canada's approach to safeguarding plant and animal health.

The collection, analysis, and sharing of data—for example, surveillance data on pests and diseases—represents a specific and important example of limited coordination. Although some information sharing initiatives exist, individual organizations typically collect data according to their own needs and capacity, not sharing it among other partners who may spend resources collecting the same or similar data. A further example is the lack of means and opportunities for partners to share knowledge and effective practices and tools for enabling desired stakeholder behaviours.

3. The Basis for the Plant and Animal Health Strategy: Objectives, Guiding Principles and Scope

Partners developed the Plant and Animal Health Strategy to set the direction for advancing Canada's current approach to the safeguarding of plant and animal health towards an integrated system of partners and activities; to embed continuous improvements in how the system operates and evolves; to build upon and coordinate the efforts of all partners to maximize synergies while minimizing overlaps and gaps; to adapt in step with changing risks, needs, and capacities of partners; and to identify priorities and concrete actions.

As a starting point, partners identified the following three objectives of the Strategy:

Objective 1

Canada has the necessary information and awareness needed to support forward-looking risk management and evidence-based decisions.

Objective 2

Canada has a comprehensive, effective and integrated system that prevents and proactively addresses plant and animal health risks.

Objective 3

Canada has a robust and responsive plant and animal health system that supports economic growth and market competitiveness for Canadian products.

To complement these objectives, partners agreed on the value of a series of principles to guide the development of the Strategy, and ultimately its implementation. The guiding principles include the following:

Guiding Principles

Prevention-Focused

Efficiency and Continuous Improvement

Adaptive, Evidence- and Risk-Based Approach

Shared Accountability

Collaboration, Sharing, and Transparency

Early in the development of the Strategy, partners were consulted about the types of risks, sectors, and activities that it should include. As a result of the consultations, the Strategy focuses on prevention in high-risk areas, including plant pests and animal diseases, and risks to plant and animal health that originate from agricultural inputs (such as contaminated feed or seed). Because risks from plant pests and animal diseases are not limited to one or several sectors, the Strategy includes a wide breadth of managed sectors. It also considers pests and diseases of unmanaged plant and animal populations, but only in situations in which they may impact managed populations.[2] It also considers how pests and diseases of managed populations impact the environment. Four categories of activities are considered in the Strategy, including prevention and mitigation, preparedness, response and recovery.

The scope of the Strategy recognizes that, for some areas of risk, there is little potential for control over pathways, and that preparedness and response capacity for such risks will remain vital.

The Strategy aims to complement, not duplicate, the efforts of other existing strategies or policies. For example, this Strategy recognizes the value of a range of existing strategies and initiatives (Appendix 2), and is intended to build on their successes and strengths and help bring about a cohesive approach. In addition, the Strategy is intended to build on the strengths of existing related federal and provincial programs relating to crop and animal production inputs such as fertilizer safety, seed standards and integrity, feeds, veterinary biologics, plant and animal treatments, and plant biosafety. As the Strategy is implemented and its activities evolve with the changing needs of the plant and animal health system, it will be important to ensure ongoing consistency with other strategies and support to complementary activities. Appendix 2 provides information on related frameworks and strategies to consider during the ongoing implementation of the Plant and Animal Health Strategy.

[2] This limitation recognizes the broader scope of "An Invasive Alien Species Strategy for Canada" for unmanaged populations of plants and animals.

Summary Table of the Strategy's Scope

Scope Category	What's Included		Examples
Risks to the Health of Plant and Animal Resources	• Plant pests and diseases • Animal diseases • Animal welfare • Vectors	• Inputs to the sectors • Impacts of climate change on the ability of pests, diseases and vectors to establish and spread	• Pests includes pathogens, insects, and weeds • Endemic and emerging pests and diseases • Contamination of inputs (e.g., feed, seed)
Sectors	• Agriculture • Aquaculture • Interface between managed and unmanaged populations	• Forestry • Apiculture • Technologies used for pest and disease control • Services provided to primary producers	• Crops, horticulture, traditional livestock • Managed and unmanaged forests • Vaccines • Transporters
Activities	• Prevention and mitigation • Preparedness	• Response • Recovery	• Surveillance • Research • Foresighting • Awareness and outreach • Emergency exercises

4. Envisioning an Integrated System for Plant and Animal Health

For the purposes of the Plant and Animal Health Strategy, a "system" is defined as a regularly interacting or interdependent group of elements that forms a unified whole. This section envisions a single Plant and Animal Health System that brings together the partners who undertake activities to safeguard plant and animal health.

Articulating a shared vision for safeguarding plant and animal health in Canada provides an important foundation to ensure partners have a common understanding of what the System aims to achieve. Throughout the implementation of the Strategy, the vision statement and results chain described below can be used to judge the level of success in improving the System.

4.1 Vision for Plant and Animal Health

Partners agreed upon the following vision for the Plant and Animal Health System:

Canada's plant and animal resources are safeguarded, contributing to economic growth and the protection of human health and the environment

4.2 Expected Results of the Plant and Animal Health System

The activities carried out through the Plant and Animal Health System aim to achieve a cascade of results, as presented in the Results Chain Model in section 4.3. In the current System, however, not all partner activities are fully integrated, not all expected results are fully realized, and costs are not always sustainable for partners.

Expected results of the ideal System include:

- Risks are controlled at critical points.
- Access to accurate and timely information to inform action.
- Preparedness to respond to and recover from plant- and animal-related emergencies.
- Actions are carried out in a coordinated and timely manner by all partners.

Leading to:

- Risks to Canada's plant and animal resource base are prevented, reduced, and/or managed.
- Canada's ability to safeguard plant and animal health is trusted and respected.

Leading to:

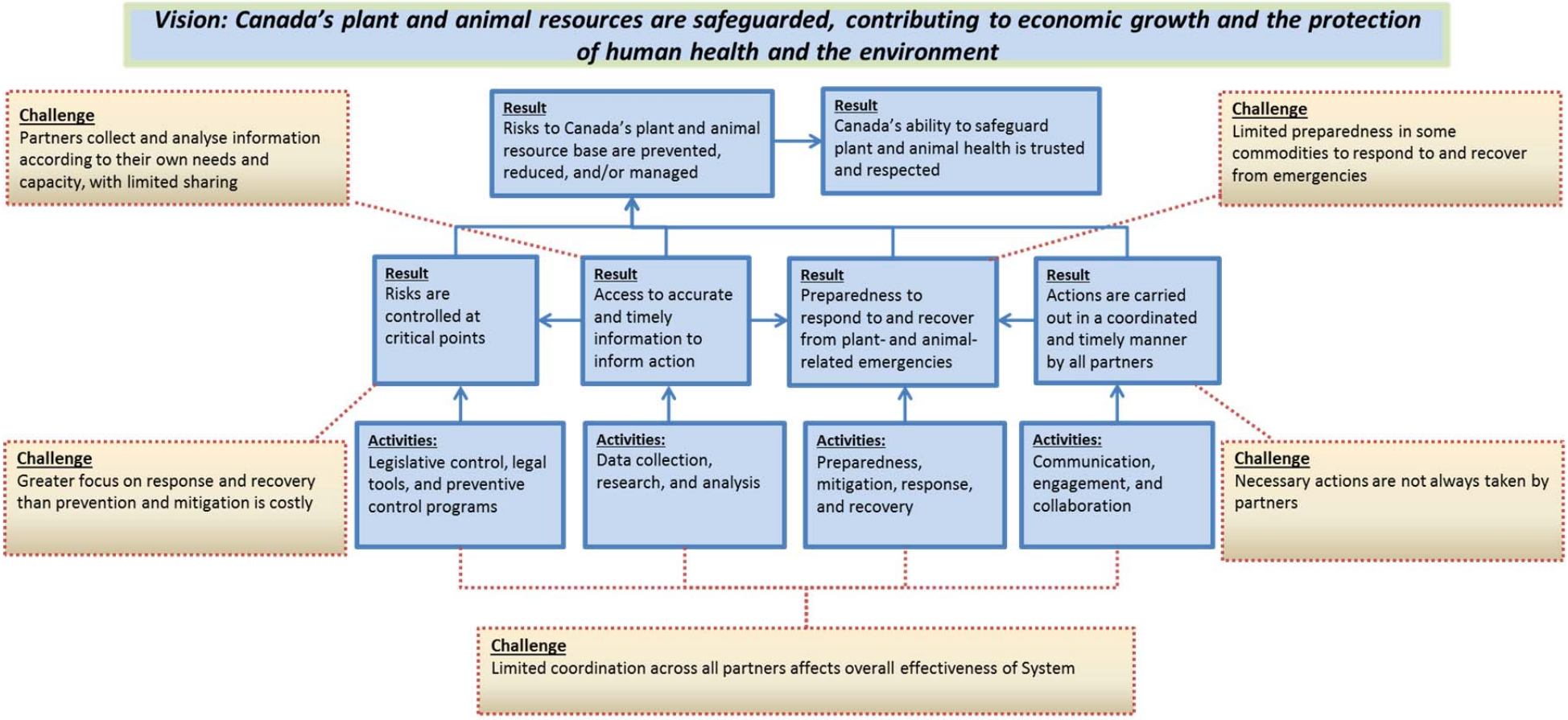
- Canada's plant and animal resources are safeguarded, contributing to economic growth and the protection of human health and the environment.

Economic growth in the agricultural sector relies upon continued public trust in Canada's ability to safeguard plant and animal health

In its February 2017 report titled "Unleashing the Growth Potential of Key Sectors," the Advisory Council on Economic Growth identified the agriculture and agri-food sector as a key sector with growth potential. The 2017 federal budget set a target to grow Canada's annual agri-food exports to $75 billion by 2025, an increase of about 50 per cent over the current level, and confirmed that the agri-food sector was a target for innovation and growth. The 2016 Calgary Statement issued by ministers of agriculture also highlights several goals related to risk management and economic growth. The Strategy supports these agendas and will be an important factor in the expansion of market access for Canada's plant and animal resources by increasing prevention-based approaches to safeguarding Canada's plant and animal health, and strengthening public trust and domestic and international confidence in our plant and animal health system.

4.3 Results Chain of the Plant and Animal Health System and its Current Challenges

The model below depicts the connections between the activities undertaken by partners and the expected results of the System. However, current partner activities are not fully integrated and expected results are not fully realized. The challenges that were highlighted in section 2 are shown impacting the System, weakening its effectiveness or producing other negative impacts (e.g., unsustainable costs).



5. Strategy Components: Areas for Action to Achieve System Results

In the face of the challenges described in section 2, the Plant and Animal Health Strategy introduces actions that aim to improve the System's activities, and ultimately their effectiveness in achieving the expected results of the System. Based on the extensive consultation-based input from partners and stakeholders, four priority areas for action emerged under the Strategy, which establish the foundation for a new and lasting partner engagement in the Strategy.

The Strategy provides direction and prospective actions for the near term that build towards prospective activities for the longer term. At the same time, by creating a mechanism for partners to regularly discuss progress and potential adjustments to the Strategy, there is a built-in expectation for its activities to be evergreen and to evolve in tune with risks, needs and capacities.

Sections 5.1 through 5.4 describe the four areas of action. Detailed activities are proposed more concretely over the first five years of the Strategy's implementation, while longer-term activities represent prospective future needs for achieving the ultimate expected results. In adopting the Strategy, partners recognize that further work will need to be done to refine the activities and to ensure implementation will be flexible so that partners can adapt them to suit their specific needs, realities and capacities (for example, when regional variations are needed).

Each of the areas for action was developed by a dedicated multi-partner working group that articulated a set of expected results for the Strategy to achieve. Subsequently, each group proposed possible activities to achieve the expected results. Activities were selected after assessing their strategic fit with the vision for plant and animal health; their feasibility to implement; their affordability, acceptability and adaptability across partners; and potential impacts.

The expected results and activities for each of the four areas for action, along with considerations for their implementation, are presented below. In particular, the implementation of activities or their timing will depend on the capacities of partners. Some activities may require an assessment of existing capacities across all partners and the need for supplemental resources.

5.1 Coordination through Partnerships

Given its many partners and diverse range of activities, Canada's Plant and Animal Health System reflects the complexity of the risks to plant and animal health. By coordinating their various efforts to improve the effectiveness of the System, partners can make the most efficient use of their limited resources. Building partners' collective awareness of best practices and lessons learned from past experiences enhances their ability to deliver effective interventions.

In exploring effective partnerships, approaches should be considered that will lead to clear roles and responsibilities that can be adapted to emerging needs when necessary; collaborative priority setting and open communication; and foundations for transparent decision making that reflect the interests of all partners. These elements are critical for developing the trust needed for successful partnerships and ultimately for achieving partners' common objectives. They are also the basis for consideration of the concept of shared accountability among partners. There are several potential ways to enable shared accountability, long-term commitment and continuity of efforts—one example is by establishing formal agreements. Through open discussions and agreement among partners, shared accountability for Strategy implementation may eventually be defined. It is important to note that the Strategy is not intended as a vehicle for transferring current responsibilities or costs from one partner to another; rather, it is intended as a mechanism to promote synergies and reduce duplication of effort among partners.

Collaboration of partners is needed across the overall System. Furthermore, individual elements of the System can be improved by increasing coordination among partners, such as through forming networks for knowledge sharing and collective risk management. To maximize the effectiveness of partnerships, partners across the entire supply chain must be engaged, including academia and other key stakeholders.

In addition, Canada's risk prevention can be strengthened through deeper international collaboration. Maintaining and enhancing international relationships can improve sharing of information and resources for addressing outbreaks and for training, and can also enable joint and/or international efforts on risk mitigation to reduce risks on a global scale (for example, by establishing and promoting effective international standards). Recognizing equivalent international systems for safeguarding plant and animal health and encouraging greater coordination and harmonization of related strategic approaches and standards among international partners, when feasible, can also lead to a more predictable trading environment.

Link to the Emergency Management Framework for Agriculture in Canada

Establishing clear roles and responsibilities is critical for successful partnerships. For example, testing roles and responsibilities and identifying gaps is an established practice for emergency exercises. As part of the **Emergency Management Framework for Agriculture in Canada**, there are ongoing efforts to coordinate emergency exercises nationally. There is an opportunity for the Strategy to feed into and build on these ongoing efforts by informing and validating roles and responsibilities for plant and animal health.

Considerations

A number of challenges will need to be addressed for partners to successfully work together to coordinate design and delivery, maximize efficiency, and collaborate with other countries to address global risks:

- To ensure their commitment, partners must see the value of partnerships.
- There are many different initiatives, structures and strategies already in place as well as differences in the systems, approaches and standards of regions and sectors. Gaining a complete understanding of these will be a complex undertaking, but is critical for developing an efficient overall System and achieving commitment by partners.
- If formal partnership agreements are established, this may require legislative changes and involve legal considerations. The establishment of roles and responsibilities within these agreements would likely be a significant undertaking requiring lengthy negotiations.
- Partnerships are important, but leadership is still required within the partnerships.
- International partnerships for risk management should carefully consider issues such as capacity, resources, predictability and control, as well as potential legal limitations and trade implications.

Expected Results

Through partners working together to coordinate design and delivery of the System, and to collaborate with other countries to address global risks, the following results are expected:

- Roles, responsibilities and accountabilities across the Plant and Animal Health System are inclusive, predictable and adaptable and align with public/private benefits.
- Partner efforts across the System are coordinated, harmonized, and transparent.
- Canada's interests are reflected in global risk reduction efforts.

Activities

In order to achieve these results, the following activities are proposed:

- Establish processes, agreements, tools, communications plans and governance to support coordination within the System.
- Pursue opportunities to engage internationally to collaborate on risk reduction.
- Develop a collaborative process for prioritizing Canada's participation and increasing Canada's influence in international standard setting.

Possible Future Activities

Partners will further discuss future opportunities for the development of partnership models that allow for joint priority setting, shared accountability and decision making in relation to responses to pests and diseases. This could possibly be through formalized agreements that pre-determine actions and hold partners accountable.

5.2 A System Founded on Prevention and Defended through Effective Response and Recovery

Partners recognize that preventive and proactive actions provide the greatest return on investment for plant and animal health. The Plant and Animal Health Strategy will reorient Canada's Plant and Animal Health System so that preventive and proactive actions are prioritized.

This can only be achieved if partners jointly determine program priorities using an integrated risk management process and by considering the whole risk continuum, including emerging diseases and pests.

Link to the Emergency Management Framework for Agriculture in Canada

Work on integrated risk management has already begun under the **Emergency Management Framework for Agriculture in Canada** (Risk Analysis Sub-Group). The Strategy builds on these efforts.

Partners may have different interests, but prioritization should be seen through a One Health lens, where applicable, and consider economic, social, and environmental concerns.

While prevention of targeted risks is ideal, not all can be prevented, and emergency events will continue to occur. Canada's ability to respond to and recover from such emergencies must be sustained even as we shift our focus to prevention. The impacts of emergency events can be minimized by continuing to improve and coordinate early detection and rapid response.

Considerations

A number of challenges will need to be addressed to reorient the System such that preventive and proactive actions are prioritized, including:

- Partners may vary in their capacities to implement joint priorities.
- Regional/geographical differences need to be recognized (e.g., weather, commodities, industries, pests).
- Balancing efforts between protecting our resource base and accessing foreign markets for Canadian products.
- It is difficult to assess the effectiveness of preventive measures in reducing risks.

Expected Results

By taking an approach that reorients the System so that preventive and proactive actions are prioritized, the following results are expected:

- Program priority setting is integrated across the interests of partners and across disciplines.
- Partners have a common understanding of each other's contribution to managing risk across the biosecurity continuum.
- System activities are carried out with a view to capitalizing on the various strengths of partners.
- Risks, including emerging threats, are rapidly identified and analyzed.
- An agile System that reacts to evolving and emerging risks.
- Partners are ready and able to respond rapidly to emergencies.

Activities

In order to achieve these results, the following activities are proposed:

- Develop and maintain an integrated risk management process for determining priorities.
- Evaluate and address capacity of partners to mitigate biosecurity risks at critical points (e.g., pre-border, border, on-farm, processing facilities).
- Establish a collaborative and coordinated process for planning, prioritizing and implementing surveillance activities, including diagnostic laboratory testing.
- Develop a research strategy for plant and animal health that supports prevention and mitigation.
- Develop and/or regularly update plans and processes for responding to and recovering from emergencies.

Possible Future Activities

Future opportunities include implementation of a dedicated national centre for preventive science activities, including epidemiology, disease modelling, economic modelling, risk identification, and risk assessment.

5.3 Collection, Analysis, and Sharing of Information

Timely access to accurate information is essential for making rapid, evidence-based decisions, developing and delivering robust programs, and communicating effectively. Information is generated throughout the plant and animal health System, from activities such as surveillance and monitoring, diagnostics, traceability and identification programs, intelligence gathering, and research. This information needs to be collected, analyzed and shared by partners across the System. Information on endemic risks must be prioritized alongside the identification of emerging risks.

Link to the Emergency Management Framework for Agriculture in Canada

Work on information sharing has already begun under the **Emergency Management Framework for Agriculture in Canada**. An inventory of existing agreements among federal, provincial, and territorial governments is being developed. Through the Strategy, we will continue to build on these efforts.

The above requires coordinated information collection efforts, that are built on a clear understanding of information needs across the System. Quality controls and data standardization can ensure accuracy and enable sharing. The availability of common analysis methods will support partner communications and lead to more transparent decision making.

Advancements in information technologies provide an opportunity to facilitate and accelerate the collection, analysis, and sharing of information, freeing up valuable resources for other important work. Solutions that are automated, open

source and scalable will increase the adaptability and transparency of the System. Similarly, innovative collection and analysis methods can provide access to a wealth of information that will position Canada to meet emerging challenges.

To measure the effectiveness of the System and support risk-based decision making, economic data is needed to quantify the risks to plant and animal resources and the extent to which Canada's Plant and Animal Health System reduces those risks.

Considerations

A number of challenges will need to be addressed to successfully take a systematic approach to the collection, analysis, and sharing of information, including:

- Partners must be willing to share information, which means building trust and demonstrating the value of their participation.
- Formal information-sharing agreements may be difficult and time-consuming to establish.
- Integration of data will have to overcome many hurdles, including system compatibility, standardization and oversight of data quality.
- Available expertise in Canada to undertake complex analyses is limited.
- Confidentiality must be respected. The extent to which information is shared must be considered in view of legal and legislative boundaries. The System should be designed such that appropriate levels of access to the information are provided.

Expected Results

By taking a systematic approach to the collection, analysis, and sharing of information, the following results are expected:

- All partners contribute to the collection and sharing of information.
- Comprehensive, accurate, and timely information is available.
- Information is accessible and amenable to analysis and interpretation by all partners.

Activities

In order to achieve these results, the following activities are proposed:

- Develop and deliver an approach to coordinate the collection and sharing of information across the System.
- Incorporate innovative methods developed globally for information collection and analysis.
- Develop automated information technology (IT) solutions to support collection, analysis, and sharing of information.
- Expand national capacity for analysis.
- Establish processes for reporting.

Possible Future Activities

Future plans could include implementation of a single, standardized information collection system, supported by a fully integrated, scalable, open source and automated IT solution with built-in analysis and reporting tools.

5.4 Enabling Desired Behaviours

The behaviours of all partners can have an impact on the health of plant and animal resources. "Behaviours" refers to actions taken by any of the partners or stakeholders, for example the practices of producers and processors and the behaviours of companies and individual travellers when transporting plants and animals or goods across borders. Desired behaviours support the effectiveness of the overall Plant and Animal Health System—for example, promoting the health of plants and animals, supporting biosecurity efforts, and helping to prevent disease—whereas undesired behaviours hamper the effectiveness of the System.

Many partners already practice a variety of desired behaviours and strive for continuous improvement in this regard. However, while various partners possess knowledge and science-based evidence regarding the importance and impacts of various behaviours on plant and animal health, as well as expertise and tools for influencing behaviours, this knowledge and expertise may not extend to all partners. Further, knowledge of desired behaviours does not always translate into action, as there may be barriers to adoption of these behaviours for some partners, such as resource constraints, or a lack of tools to assist with adoption. There may also be disincentives to the adoption of some desired behaviours. For example, in cases where the public or consumers hold negative perceptions of a desired behaviour, such as treating animals with certain veterinary drug products, industry partners may be discouraged from adopting the behaviour even though it is science-based and protects animal health.

A systematic approach is needed for consolidating and sharing knowledge, expertise and tools that help influence behaviours, and for enabling desired behaviours across all partners, including the general public.

Considerations

A number of challenges will need to be addressed to establish a systematic approach to enabling desired behaviours, including:

- Capacity and specialized skills will be needed to integrate existing information and tools, and to develop new approaches for promoting desired behaviours and discouraging undesired ones.
- Capacity and engagement will be needed to build relationships and processes for sharing information and tools among partners.
- Partners must be willing to share knowledge and expertise about enabling desired behaviours and discouraging undesired behaviours, which means building trust among partners and demonstrating the value of their participation.

Expected Results

By taking a systematic approach to identifying desired behaviours, and by consolidating knowledge, expertise and tools for performing, enabling, and promoting desired behaviours, the following results are expected:

- Partners know the desired behaviours and how to perform them.
- Partners adopt desired behaviours and avoid undesired behaviours.
- Partners know how to promote and enable the adoption of desired behaviours by others.

Possible Future Activities

Future implementation of a national centre of expertise in knowledge translation to assess, proactively share, and maintain a repository of best practices and tools for motivating positive behavioural change would strengthen the preventive approach for plant and animal health in Canada.

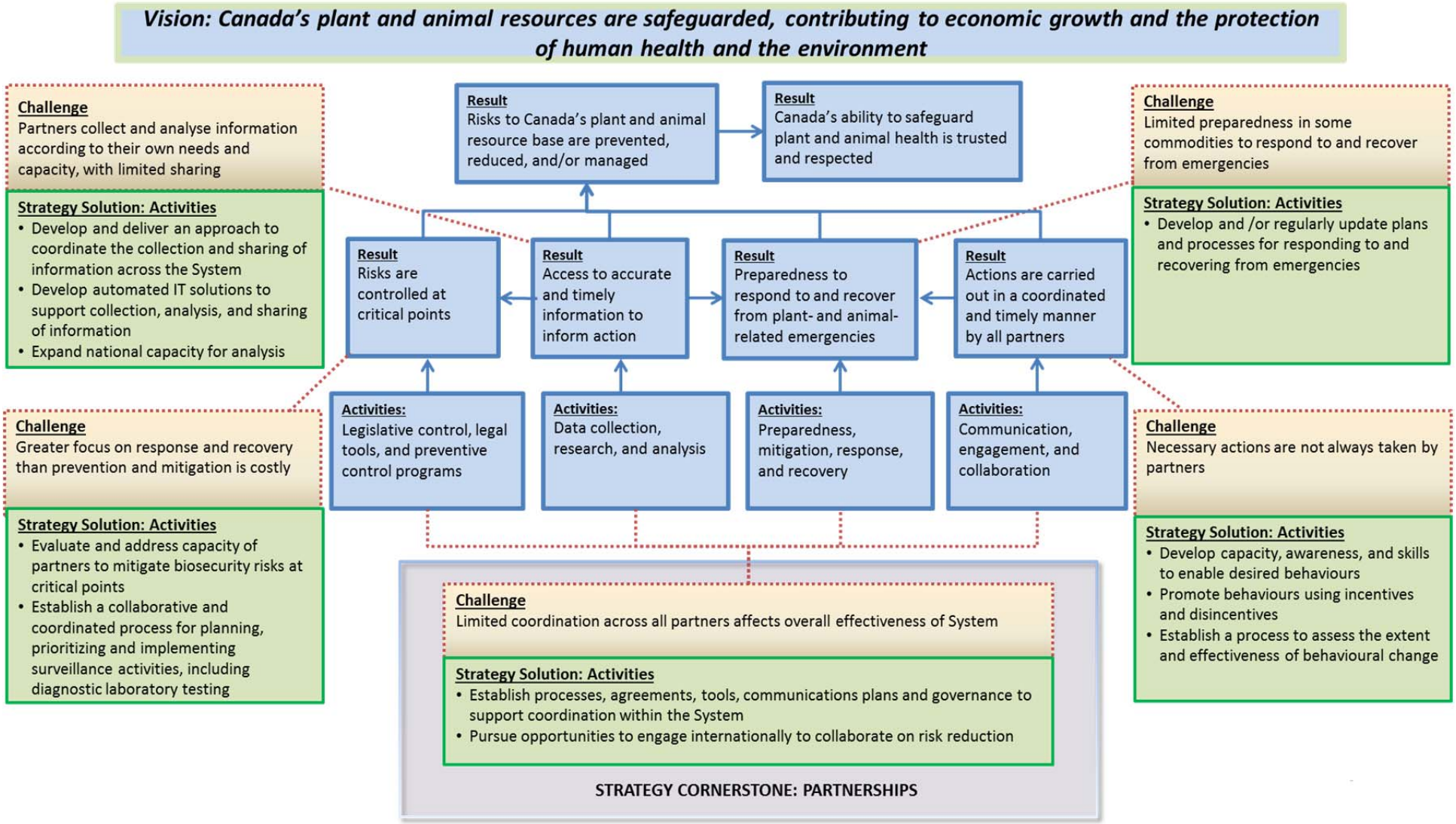
Activities

In order to achieve these results, the following activities are proposed:

- Develop capacity, awareness, and skills to enable desired behaviours.
- Promote behaviours using incentives and disincentives.
- Establish a process to assess approaches to motivating desired behaviour.
- Establish a process to assess the extent and effectiveness of behavioural change.

5.5 Illustrating How the Strategy Addresses Challenges to the System

The illustration below provides an overview of how the activities of the Plant and Animal Health Strategy (as described in sections 5.1 to 5.4) address the challenges being faced by the current Plant and Animal Health System. The illustration underscores the primacy of effective partnerships to coordinate and enable partners' activities across the System, and also provides a basis for performance measurement.



6. Implementing the Strategy and Measuring Results

Implementing the Strategy is a shared responsibility and commitment among partners. Partners will need to reflect on their required level of investment and work together to target their investments towards activities that will have the most benefit.

Successful implementation requires strong collaboration and coordination among all partners. In order to track and communicate progress, partners will measure and regularly report on the results of the Strategy throughout its implementation.

Reflecting on the Investments Needed

All partners will need to consider their respective levels of contribution and potential new investment to implement the foundational activities and other detailed activities that are proposed in the Implementation Plan outlined in Appendix 3.

The expected results and activities outlined under the four areas of action of the Strategy are further defined in the Implementation Plan (Appendix 3). As several of the activities are foundational, in that other activities build upon them, implementation of the Strategy is intended to be progressive. The Implementation Plan focuses on the first five years of implementation and shows a preliminary list of proposed activities and supporting sub-activities that partners will need to refine and prioritize over time.

As specific activities are further developed, focused analysis and consultation may be needed prior to their implementation. These consultations could be broad in scope, or limited to specific groups, such as individual industry sectors, regional stakeholders or indigenous communities.

In keeping with the need for implementation of the Strategy to evolve in step with the System's changing needs, increasing complexity of risks, and the capacities of partners to carry out activities, the Implementation Plan will remain evergreen. An essential aspect of the Strategy is establishing a means to ensure that activities are revisited periodically (for example, annually) and when required. Accordingly, an early implementation step will be to establish an ongoing systematic means for partners to assess and consider whether activities should be adjusted to achieve better results, and to plan activities on an ongoing, phased approach.

Recognizing that the optimal timing of collaborative activities differs between the plant and animal sectors, partners plan to establish two collaborative bodies (Appendix 4)—one dedicated to plant health and the other to animal health—that will further develop implementation plans and coordinate activities to respond to sector-specific needs, priorities and capacities on an ongoing basis, and will pursue continuous improvement.

Among the important functions that these two collaborative bodies will perform are the advancement of discussions among all partners to define their roles and responsibilities; further development of the concept of shared accountability under the Strategy; and development of expectations around public performance reporting. The Strategy is not intended to be a vehicle to move existing responsibilities or costs from one partner to another; rather, it is intended as a mechanism to promote synergies and reduce duplication of effort among partners. To help formulate an effective approach to shared accountability for the safeguarding of plant and animal health among Canadian partners, several existing initiatives and approaches in various countries will be analyzed. These analyses and discussions are intended to identify possible approaches and options that reflect Canada's unique attributes, which can then be further considered for implementation in Canada, reflecting a "Made in Canada" solution.

Appendix 1: Glossary of Terms

Animal (terrestrial)	A mammal, reptile, bird or bee. **(World Organisation for Animal Health [OIE], Terrestrial Animal Health Code, 2016)**
Animal (aquatic)	All life stages (including eggs and gametes) of fish, molluscs, crustaceans and amphibians originating from aquaculture establishments or removed from the wild, for farming purposes, for release into the environment, for human consumption or for ornamental purposes. **(OIE, Aquatic Animal Health Code, 2016)**
Animal Welfare	How an animal is coping with the conditions in which it lives. An animal is in a good state of welfare if (as indicated by scientific evidence) it is healthy, comfortable, well nourished, safe, able to express innate behaviour, and if it is not suffering from unpleasant states such as pain, fear and distress. Good animal welfare requires disease prevention and veterinary treatment, appropriate shelter, management, nutrition, humane handling and humane slaughter/killing. Animal welfare refers to the state of the animal; the treatment that an animal receives is covered by other terms such as animal care, animal husbandry, and humane treatment. **(OIE, Terrestrial Animal Health Code, 2016)**
Apiculture	The keeping of bees. **(adapted from Merriam Webster)**
Aquaculture	The breeding, rearing, and harvesting of plants and animals in all types of water environments including ponds, rivers, lakes, and the ocean. **(SOR, Aquaculture Activities Regulations, 2015)**
Biosecurity	A set of practices used to minimize the transmission of pathogens and pests in animal and plant populations including their introduction (bioexclusion), spread within the populations (bio-management), and release (biocontainment). **(CFIA)**
Climate Change	Change in the state of the climate that can be identified by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer. **(IEHIAS, Integrated Environmental Health Impact Assessment System)**
Data	Factual information used as a basis for reasoning, discussion, or calculation.
Disease (Animal)	Clinical or pathological manifestation of infection or infestation. **(OIE, Terrestrial Animal Health Code, 2016)**
Ecosystem	A dynamic complex of plant, animal and micro-organism communities and their abiotic environment interacting as a functional unit. **(International Plant Protection Convention [IPPC], Glossary of Phytosanitary Terms, 2016)**

Eradication	The elimination of a pathogenic agent from a country or zone. **(OIE, Terrestrial Animal Health Code, 2016)**
Hazard	A biological, chemical or physical agent in, or a condition of, an animal (terrestrial or aquatic) or animal product with the potential to cause an adverse health effect. **(OIE, Terrestrial Animal Health Code, 2016)**
Infection	The entry and development or multiplication of an infectious agent in the body of humans or animals. **(OIE, Terrestrial Animal Health Code, 2016)**
Information	Knowledge obtained from investigation, study, or instruction and the communication of that knowledge or intelligence. **(Adapted from Merriam Webster)**
Infestation	Presence in a commodity of a living pest of the plant or plant product concerned. Infestation includes infection **(IPPC, Glossary of Phytosanitary Terms, 2016)**; the external invasion or colonisation of animals or their immediate surroundings by arthropods, which may cause disease or are potential vectors of infectious agents. **(OIE, Terrestrial Animal Health Code, 2016)**
Integrated Risk Management	Integrated risk management is a continuous, proactive and systematic process for understanding, managing and communicating risk from a system-wide perspective.
Integration	The incorporation and development of an instance or program into an organization.
Invasive Species	Invasive species are plants, animals and micro-organisms in an area where they have never been before. They can adapt, spread quickly, and don't have natural predators in the new environment. **(CFIA)**
Laboratory Capacity	The capacity of laboratory operations based on equipment availability, workspace availability, and available laboratory personnel.
One Health	Human health and animal health are interdependent and bound to the health of the ecosystems in which they exist. **(Adapted from OIE, 2016)**
Outbreak	A recently detected pest population, including an incursion **(IPPC, Glossary of Phytosanitary Terms, 2016);** an occurrence of one or more cases in an epidemiological unit. **(OIE, Terrestrial Animal Health Code, 2016)**
Partnership	A collaborative relationship between entities to work toward shared objectives. **(Adapted from World Bank Partnerships Group, 1998)**
Pathogen	A micro-organism that causes disease. **(IPPC, Glossary of Phytosanitary Terms, 2016)**
Pest	Any species, strain, plant biotype, animal, or pathogenic agent injurious to plants or plant products. Note: In the IPPC, plant pest is sometimes used for the term "pest". **(IPPC, Glossary of Phytosanitary Terms, 2016)**
Response Capacity	The ability to effectively manage risks and their consequences.

Risk	The likelihood of the occurrence and the likely magnitude of the biological and economic consequences of an adverse event or effect to animal or human health. **(OIE, Terrestrial Animal Health Code, 2016)**
Risk Analysis	The process composed of hazard identification , risk assessment, risk management and risk communication. **(OIE, Terrestrial Animal Health Code, 2016)**
Risk Assessment	The evaluation of the likelihood and the biological and economic consequences of entry, establishment and spread of a hazard. **(OIE, Terrestrial Animal Health Code, 2016)**
Shared Accountability	*An existing definition is:* The condition of being mutually accountable for the implementation and/or governance of a specific activity. *Shared accountability will be further explored and defined as part of implementation work under the Strategy.*
Stakeholders	System Partners with a stake in the development of the Plant and Animal Health Strategy; federal, provincial, and territorial governments, municipalities, local authorities, producers, processors, suppliers, the distribution industry, non-governmental organizations, agriculture professionals, academia, government-industry advisory boards, and the general public.
Standardization	To bring into conformity with a standard or norm. To normalize a certain practice or system.
Surveillance	Systematic ongoing collection, collation, and analysis of information related to plant and animal health and the timely dissemination of information so that action can be taken. **(Adapted from OIE, Terrestrial Animal Health Code, 2016)**
Systems Approach	A pest risk management option that integrates different measures, at least two of which act independently, with cumulative effect. **(IPPC, Glossary of Phytosanitary Terms, 2016)**
Vector	An insect or any living carrier that transports an infectious agent from an infected individual to a susceptible individual or its food or immediate surroundings. The organism may or may not pass through a development cycle within the vector **(OIE, Terrestrial Animal Health Code, 2016)**; any living organism that transports a pathogenic agent to a susceptible aquatic animal or its food or immediate surroundings. The pathogenic agent may or may not pass through a development cycle within the vector. **(OIE, Aquatic Animal Health Code, 2016)**
Zoonosis / Zoonotic	Any disease or infection which is naturally transmissible from animals to humans. **(OIE, Terrestrial Animal Health Code, 2016)**

Appendix 2: How the Strategy was Developed and Related Strategies

The Plant and Animal Health Strategy is one of the deliverables under the Emergency Management Framework for Agriculture in Canada that was endorsed by federal, provincial, and territorial (FPT) ministers of agriculture in July 2016. FPT ministers called for partners to jointly develop the Strategy to achieve an integrated approach to the prevention and mitigation of risks to Canada's plant and animal resources. The Strategy and its associated activities and implementation plan aim to build upon ongoing work in some areas and to identify new activities to carry out.

The Strategy is founded on a co-creation approach involving partners and stakeholders, with input collected through a series of consultations and engagements, including:

- Stakeholder consultations on the Emergency Management Framework for Agriculture in Canada (January to March 2016)
- In-person engagement in all provinces (September to November 2016)
- Online consultation on a discussion document regarding the development of the Strategy (September to December 2016)
- In-person Planning Forum[3] in Ottawa (December 6 and 7, 2016)
- Engagement of stakeholders via social media
- Multi-stakeholder working groups, steering committee, and Strategy leaders
- Online consultation on the draft Strategy (April 2017)

In developing the Plant and Animal Health Strategy, and throughout its implementation, partners aim to take into account and leverage the ongoing work under related frameworks and strategies, with a view to maximizing the complementarity of efforts under the Strategy with this ongoing work, and minimizing duplication and overlap. The following table provides a list of frameworks and strategies currently in place or under development; however, it may not be an exhaustive list.

Other Frameworks and Strategies to Consider during Strategy Development and Implementation

Framework or Strategy
Emergency Management Framework for Agriculture in Canada 2016 Federal, Provincial, and Territorial Emergency Management Framework Task Team http://publications.gc.ca/collections/collection_2016/aac-aafc/A22-593-2016-eng.pdf
Livestock Market Interruption Strategy (LMIS): Final Report 2016 Livestock Market Interruption Strategy Steering Committee http://www.agr.gc.ca/resources/prod/doc/pdf/LMIS_final_report-en.pdf

[3] Participants to the Forum included, among others, representatives from 10 federal departments; 9 provincial governments; 33 national and 13 provincial industry associations; 5 universities; and representatives from Australia, the European Union, and the United States

Framework or Strategy
National Farmed Animal Health and Welfare Strategy 2009, 2014 Council of Chief Veterinary Officers / Farmed Animal Industry Joint Working Group http://www.ahwcouncil.ca/pdfs/background-materials/NFAHWSFinalMay2009ENG.pdf http://www.ahwcouncil.ca/pdfs/2020/NFAHW%20Brochure%20trifold%20F2.pdf
An Invasive Alien Species Strategy for Canada 2004 Federal and provincial governments http://publications.gc.ca/collections/collection_2014/ec/CW66-394-2004-eng.pdf Federal-Provincial-Territorial IAS Task Force recommendations to support continued implementation progress (February 2016) http://www.biodivcanada.ca/default.asp?lang=En&n=81BC7F85-1
Antimicrobial Resistance and Use in Canada: A Federal Framework for Action 2014 Government of Canada https://www.canada.ca/en/public-health/services/antibiotic-antimicrobial-resistance/antimicrobial-resistance-use-canada-federal-framework-action.html
National Forest Pest Strategy (NFPS) 2007 Canadian Council of Forest Ministers http://www.nrcan.gc.ca/forests/fire-insects-disturbances/pest-management/13409
Pan-Canadian Framework on Clean Growth and Climate Change 2017 Climate Action Network Canada https://www.canada.ca/content/dam/themes/environment/documents/weather1/20170125-en.pdf
Healthy Animals | Healthy Future 2025 2011 Fore-CAN: Foresight for Canadian Animal Health http://www.star-idaz.net/wp-content/uploads/2013/02/Fore-CAN-Healthy-final-e1.pdf
Canadian Animal Health Surveillance System 2015 National Farmed Animal Health and Welfare Council www.cahss.ca

Framework or Strategy
North American Plant Protection Organization Strategic Plan 2016-2020 2016 North American Plant Protection Organization http://nappo.org/files/3214/7337/2283/EC_3_2_NAPPO_Strategic_Plan_2016-2020-e.pdf
Plant Pest Response Project 2012 Potato and Greenhouse Working Groups, Canadian Horticultural Council http://www.hortcouncil.ca/wp-content/uploads/2016/01/2012_AGM_Annual-Report_FINAL_ENGLISH_Updated_April.pdf
British Columbia Plant Health Strategy for Agriculture 2013-2018 Plant Health Unit, Plant and Animal Health Branch, Ministry of Agriculture http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/animal-and-crops/plant-health/phstrategy.pdf
Invasive Plant Strategy for British Columbia 2003 Invasive Plant Council of British Columbia http://bcinvasives.ca/documents/invasive-plant-strategy.pdf
Ontario Invasive Species Strategic Plan 2012 Government of Ontario https://dr6j45jk9xcmk.cloudfront.net/documents/2679/stdprod-097634.pdf
Ontario's Climate Change Strategy 2015 Government of Ontario https://dr6j45jk9xcmk.cloudfront.net/documents/4928/climate-change-strategy-en.pdf
Quebec Animal Health and Welfare Strategy (Stratégie Québécoise de santé et de bien-être des animaux) 2010 Government of Quebec, Ministry of Agriculture, Fisheries and Food http://www.mapaq.gouv.qc.ca/fr/Publications/MAG1002_brochure_web.pdf

Framework or Strategy
Industry government Advisory Committee (IGAC) on National Agriculture and Food Traceability System (NAFTS) 2006 Government of Canada http://www.agr.gc.ca/eng/industry-markets-and-trade/traceability/fact-sheets/national-agriculture-and-food-traceability-system-nafts/?id=1382985011063
IPPC Strategic Framework for 2020-2030 2016 International Plant Protection Convention https://www.ippc.int/en/publications/82913/
The Sixth Strategic Plan (2016 – 2020) 2015 World Organisation for Animal Health http://www.oie.int/en/about-us/director-general-office/strategic-plan/
One Health Initiative http://www.onehealthinitiative.com/
Agriculture and Agri-Food Canada Science and Technology Branch Sector Science Strategies Agriculture and Agri-Food Canada http://www.agr.gc.ca/eng/about-us/planning-and-reporting/overview-of-science-and-technology-branch-sector-science-strategies/?id=1405554689843
Seizing Canada's Moment: Moving Forward in Science, Technology and Innovation 2014 2014 Innovation, Science and Economic Development Canada https://www.ic.gc.ca/eic/site/icgc.nsf/eng/h_07472.html#supporting
Perimeter Security and Economic Competitiveness Action Plan 2011 Canada-United States Regulatory Cooperation Council http://publications.gc.ca/collections/collection_2011/aecic-faitc/FR5-61-2011-eng.pdf
Wildlife Health Strategy (under development; title to be confirmed) Canadian Wildlife Health Cooperative

Appendix 3: Implementation Plan

For each of the areas for action, the multi-partner working groups conducted preliminary work to further elaborate the activities that could be carried out through the Strategy. Several prospective longer term activities were identified by the working groups, representing current expectations of future needs and extending potentially as far as 20—25 years into the future. However, as activities are intended to be prioritized and planned on an ongoing basis as the Strategy is implemented, the preliminary list of activities only includes those likely to be considered in the first five years. Partners may agree to pursue some activities and not others.

Among the list of activities, those that need to be implemented to lay the foundation for a collaborative approach to safeguarding plant and animal health are presented in Table 1.

A preliminary list of prospective additional activities is provided in Table 2. Upon endorsement of the Strategy, a key task for partners will be to further elaborate the preliminary list of additional activities by validating, refining and prioritizing them and any others that may be identified. This task also involves weighing the potential costs, benefits, and unintended consequences of these additional activities. This elaboration will also require scanning partners' existing activities to identify overlaps and gaps; to take into account work conducted under related frameworks and strategies and leverage it as appropriate; and to ensure that incremental activities under the Strategy are complementary, with minimum overlap. In addition, scanning and analyzing successful activities in other jurisdictions will help to elaborate the preliminary implementation plan.

It is recognized that implementation will depend, in most cases, on resource reallocation or investment. Therefore, the implementation plan will require review and adjustment based on resources, and ultimately the implementation of activities will require agreement from partners.

Based on input received from partners during development of the Strategy, the majority of activities that make up the preliminary list are proposed for both the plant and animal sectors (unless otherwise indicated by the description within the table). However, it is envisaged that activities would be separately implemented for plant health and animal health, under the leadership and oversight of their respective independent implementation coordinating council. Therefore, the specific activities and time frames for implementation may differ between the plant and animal sectors, as a result of further consultations regarding partners' needs, priorities and capacities, led by each implementation coordinating council.

Table 1: Preliminary List of Foundational Activities Identified by Multi-partner Working Groups

	Activities	Plant, Animal or Both
0	**Foundational Activities**	
0.1	**Strategy: Management of Implementation** Establish and maintain implementation coordinating councils to manage collaborative efforts and implementation of the Strategy, including prioritization of activities	Both
0.2	**Strategy: Maintenance of Comprehensive Canadian Context** Further analyze, determine relevancy and catalogue all supporting Canadian strategies and initiatives that currently exist and determine how best to build on their collective strengths	Both
0.3	**Strategy: Communication and Transparency** Create a web platform and accompanying social media strategy to support implementation of the Strategy and engagement of partners; functions can include: • Reporting on implementation progress • Development of a tool to assist in creation of inventories	Both
0.4	**Strategy: Continuous Planning and Review** Hold recurring all-partner forums to review changing external environment, challenges, and performance and to further plan and prioritize Strategy implementation	Both
0.5	**Strategy: Elaborate System Description** Further inventory and analyze elements of the Plant and Animal Health System to assess their effectiveness, characterize gaps and identify involved partners, including: • Networks • Partnership-based arrangements/agreements • Current partner roles and responsibilities • Current partner expertise and capacity • Legislative mandates and operational span • Import/export programs and points of entry processes and procedures • Existing surveillance mechanisms • Data/information collection, analysis, and sharing	Both

	Activities	Plant, Animal or Both
	• Communication channels across the System	

Table 2: Detailed Preliminary List of Activities Proposed by Multi-Partner Working Groups

	Activities	Plant, Animal or Both
1	**Coordination through Partnerships**	
1.1	**Establish processes, agreements, tools, communication plans and governance to support coordination within the System**	
1.1.1	Establish an independent advisory panel for ongoing strategic development	Both
1.1.2	Establish a national plant-based industry representative body, building on experience of the former Canadian Plant Protection Advisory Committee (CPPAC); explore options for establishing a similar body for animal health	Both
1.1.3	Assess other countries' approaches for domestic partnerships for feasibility in the Canadian context	Both
1.1.4	Formalize the plant and animal health strategic collaboration framework through an agreement to ensure commitment and continuity	Both
1.1.5	Develop partnership approaches beyond the core industry-provincial-federal partners, e.g., with academia	Both
1.1.6	Develop a communications strategy for partners that establishes guidelines and procedures and a network diagram for communication pathways; integrate use of the web platform in Table 1 (0.3)	Both
1.1.7	Designate liaison officers to link between the federal, provincial, and territorial governments	Both
1.1.8	Expand partnerships between animal health and public health bodies on zoonotic diseases to include multiple partners	Animal
1.1.9	Foster partnerships for the development of Canadian plant health networks of experts (including clean plant network, surveillance, diagnostics, etc.)	Plant

	Activities	Plant, Animal or Both
1.1.10	Establish a national chief plant health officer network between federal, provincial, and territorial governments	Plant
1.1.11	Develop a process for enabling targeted partnerships for carrying out activities	Both
1.1.12	Establish partnerships to facilitate research and biosecurity approaches to adapt to increased risks stemming from, e.g., climate change, selection pressure, and policy changes made elsewhere	Both
1.1.13	Further develop and improve effectiveness and plant and animal health focus of partnership approach between the Canadian Food Inspection Agency and the Canada Border Services Agency for comprehensive and improved border security	Both
1.2	**Pursue opportunities to engage internationally to collaborate on risk reduction**	
1.2.1	Maintain or enhance cooperative and collaborative approach with the U.S.	Both
1.2.2	Link with similar plant/animal health strategic and/or coordinating bodies internationally to allow for timely information exchange, shared training opportunities, etc.	Both
1.2.3	Establish international partnerships to facilitate activities intended to mitigate risk at point of origin, similar to successful Canada-U.S. model used with Korea, China, Japan and Russia for Asian gypsy moth (AGM)	Both
1.2.4	Work to align the development of networks with similar international initiatives to facilitate information sharing (e.g., OIE World Animal Health Information System (WAHIS), antimicrobial usage monitoring and resistance)	Both
1.3	**Develop a collaborative process for prioritizing Canada's participation and increasing Canada's influence in international standard setting**	
1.3.1	Increase federal government engagement with provincial and territorial governments and industry stakeholders to determine priorities for international standard setting	Both
1.3.2	Promote commodity- and pest-specific international standards that reduce risks on a global scale	Both
2	**A System Founded on Prevention and Defended through Effective Response and Recovery**	
2.1	**Develop and maintain an integrated risk management process for determining priorities**	
2.1.1	Develop an approach for applying the risk-based priority setting tool developed for the Emergency Management Framework for Agriculture in Canada to determine program priorities	Both

	Activities	Plant, Animal or Both
2.2	**Establish a collaborative and coordinated process for planning, prioritizing and implementing surveillance activities, including diagnostic laboratory testing**	
2.2.1	Develop and implement an effective national surveillance system(s) that reflects different partner priorities and needs	Both
2.2.2	Create and implement a process for annual planning and prioritizing of surveillance activities	Both
2.3	**Evaluate and address capacity of partners to mitigate biosecurity risks at critical points**	
2.3.1	Evaluate and address federal and provincial regulatory capacity for risk mitigation at critical points and industry's ability to meet regulations	Both
2.3.2	Evaluate and strengthen import/export programs and processes/procedures in countries of origin and at points of entry	Both
2.3.3	Explore options for increasing system efficiency, e.g., alternative service delivery	Both
2.3.4	Analyze value and feasibility of developing a continental, common perimeter-based approach to plant and animal health	Both
2.3.5	Scan existing international options for dedicated national centers for preventive science activities, including epidemiology, disease and pest modelling, economic modelling, risk identification, and risk assessment, and assess feasibility for Canada	Both
2.3.6	Develop biosecurity standards where gaps exist and continue to update existing standards to address current risks	Both
2.4	**Develop and/or regularly update plans and processes for responding to and recovering from emergencies**	
2.4.1	Develop, maintain and exercise plans in case of an emergency or outbreak with a list of experts and organizations to call on for support	Both
2.4.2	Develop a standardized process for conducting and sharing reviews and lessons-learned assessments following events	Both
2.4.3	Incorporate industry as signatory to Foreign Animal Disease Emergency Support Plan (FADES)	Animal
2.4.4	Evaluate and address the capacity nationally to identify and respond effectively to emerging hazards, including vector-borne diseases and pests and changes in risk resulting from climate change	Both
2.4.5	Develop mutual resource-sharing agreements, including those for surge capacity, between key partners	Both
2.5	**Develop a research strategy for plant and animal health that supports prevention and mitigation**	

	Activities	Plant, Animal or Both
2.5.1	Create a process to facilitate collaboration in research	Both
2.5.2	Create a prioritization process for research projects that support prevention and mitigation	Both
2.5.3	Develop a national research strategy that establishes dedicated funding, promotes cooperation, facilitates knowledge transfer and balances research on prevention and mitigation with that for preparedness, response and recovery	Both
2.5.4	Develop expertise and innovative tools to quickly predict, prevent, and control both vector-borne disease outbreaks and the vectors themselves	Both
3	**Collection, Analysis, and Sharing of Information**	
3.1	**Develop and deliver an approach to coordinate the collection and sharing of information across the Plant and Animal Health System**	
3.1.1	Identify data/information requirements for the Plant and Animal Health System; links in part to 2.2.1 and 2.5.3	Both
3.1.2	Develop a conceptual model for the collection, storage, and distribution of data/information	Both
3.1.3	Develop a data/information integration strategy to help ensure the heterogeneous data/information can be consolidated for analysis, along with minimum data standards and data dictionaries to ensure some level of standardization	Both
3.1.4	Develop processes to integrate and coordinate data/information collection based on the model identified in 3.1.2	Both
3.1.5	Consolidate the existing data/information and knowledge to enable analysis	Both
3.1.6	Establish mechanisms for quality assurances and controls	Both
3.1.7	Using the inventory and gap analysis of data/information sharing agreements developed as part of the **Emergency Management Framework for Agriculture in Canada** to determine where there are gaps for plant and animal health; revise existing agreements or develop new agreements as needed	Both
3.1.8	Assess benefits/achievability of multi-stakeholder agreements or a single master agreement	Both
3.1.9	Conduct a privacy impact assessment once the data to be collected has been determined	Both
3.1.10	Evaluate the legislative and regulatory impediments to information sharing; initiate legislative changes to enable the Strategy	Both

	Activities	Plant, Animal or Both
3.2	**Incorporate innovative methods developed globally for information collection and analysis**	
3.2.1	Develop an intelligence generating network similar to the Community for Emerging and Zoonotic Disease (CEZD), for identifying emerging plant health risks; support the implementation of the CEZD for animal and public health risks	Plant
3.2.2	Identify other innovative data/information collection systems being used globally that could be adopted in Canada	Both
3.3	**Develop automated information technology (IT) solutions to support collection, analysis, and sharing of information**	
3.3.1	Analyze existing IT infrastructure to determine whether it is sufficient and develop a plan to increase capacity as needed, including costing estimates; this may include purchasing new infrastructure including storage and backup systems to protect against system failure and information/data loss	Both
3.3.2	Use the conceptual data/information model to identify cross linkages and opportunities where automated data/information collection can be implemented	Both
3.3.3	Develop infrastructure/IT solutions and accompanying software standards to guide development; solution should be open source, scalable, and automated where possible	Both
3.3.4	Develop an international information exchange system that can interface with existing international systems	Both
3.4	**Expand national capacity for analysis**	
3.4.1	Evaluate existing analysis methodologies and analytics and develop new standardized analysis methodologies and analytics where needed	Both
3.4.2	Identify expertise needed to conduct the analyses, and determine where this expertise resides nationally and possibly internationally	Both
3.4.3	Create a new collaborative process and tools to analyze emerging and re-emerging risks at the national level	Both
3.4.4	Identify which types of analysis can be automated and are required by all sectors	Both
3.5	**Establish processes for reporting**	
3.5.1	Develop user-focused outputs that entice partners to share information (e.g., customized dashboards for each user's profile that suits their sector, region, risk intelligence requirements)	Both

	Activities	Plant, Animal or Both
3.5.2	Develop a protocol to guide the reporting process, which includes minimum standards for reporting timelines as well as considerations for ensuring that data/information is reported in a manner that respects confidentiality	Both
3.5.3	Integrate existing reporting structures or build new as required; this will be informed by the communications strategy developed in 1.1.6	Both
4	**Enabling Desired Behaviours**	
4.1	**Develop capacity, awareness, and skills to enable identified desired behaviours**	
4.1.1	Build on and support tools, products, and partnerships that support extension services (government, academia, associations or industry and professional continuing education)	Both
4.1.2	Ensure that supporting resources are consistent, reliable, and sustainable	Both
4.1.3	Build on and support uptake of tools, products, and partnerships for outreach aimed at motivating individuals to adopt specific behaviours	Both
4.1.4	Facilitate the implementation of existing tools (e.g. food safety programs, biosecurity standards, animal welfare codes, etc.)	Both
4.1.5	Develop process to enable assessment and demonstration of economic and epidemiological value of proposed behaviour changes	Both
4.2	**Promote behaviours using incentives and disincentives**	
4.2.1	Leverage existing incentive and disincentive programs while assessing current effectiveness	Both
4.2.2	Support process to enable creation of shared expectations of peers and communities	Both
4.3	**Establish a process to assess approaches to motivating desired behaviour**	
4.3.1	Facilitate regular stakeholder dialogues to identify priority needs and opportunities for change	Both
4.3.2	Deliver targeted communications to areas with greatest risk	Both
4.3.3	Provide communication tools and strategies for multi-directional information sharing	Both

Activities		Plant, Animal or Both
4.3.4	Enable sector-specific communities of practice	Both
4.4	**Establish a process to assess the extent and effectiveness of behavioural change**	
4.4.1	Provide leadership and expertise in evidence-informed knowledge translation (include the mechanisms for providing this leadership)	Both
4.4.2	Develop processes to encourage or ensure that a suite of evidence (social, biological, economic, environmental) is incorporated into planning for influencing desired behaviours	Both
4.4.3	Develop and assess expertise in knowledge translation evaluation	Both
4.4.4	Develop and assess mechanisms and processes to identify , prevent, and mitigate unintended or negative consequences of behaviour change	Both

Appendix 4: Overview of Implementation Coordinating Councils

Purpose and mandate

Two implementation coordinating councils will be established to provide ongoing leadership and oversight for the Plant and Animal Health Strategy's implementation and continuous evolution. One implementation coordinating council will focus on plant aspects of the Strategy and the other on animal aspects.

The implementation coordinating councils will provide advice and recommendations on the implementation of the Strategy and any needed adjustments and improvements required, to the federal, provincial, and territorial regulatory assistant deputy ministers, federal departments, provinces and territories, and industry and non-government stakeholders.

Goals

Promote mutual understanding and respect among partners of their diverse needs, interests, and capacities with respect to safeguarding plant and animal health.

Build and maintain constructive relationships among partners that focus on continuous improvement of Canada's Plant and Animal Health System and on working collaboratively towards the Strategy's vision.

Build upon and coordinate partners' activities to achieve a cohesive implementation with minimal overlaps and gaps, to maximize overall results of the Plant and Animal Health System and optimize the use of partners' resources.

Representation of Partners and Involvement of Stakeholders

Membership of the implementation coordinating councils should include representatives from federal and provincial governments, industry, and academia, and may include other non-government partners.

Mutual responsibilities of the two implementation coordinating councils include:

- Collaborating with the other implementation coordinating council to share information and lessons learned, and, as needed, prepare joint performance reports or briefings on the Strategy for federal, provincial, and territorial ministers of agriculture, federal, provincial, and territorial regulatory assistant deputy ministers, and partners.

Responsibilities of each implementation coordinating council should include:

- Building relationships and facilitating ongoing communication, consultation, constructive dialogue and collaboration among partners, including:
  - establishing procedures and interactions that give all partners a voice
  - facilitating information sharing and transparency among partners

- promoting commitment to the shared vision, objectives and guiding principles of the Strategy
- advancing discussions among all partners on the concept of *shared accountability* under the Strategy

- Coordinating and monitoring partners' implementation of activities under the Strategy, including:
  - taking stock of partners' existing activities and initiatives and analyzing overlaps and potential gaps that weaken the Plant and Animal Health System
  - facilitating agreement on roles, resources and responsibility sharing for individual activities or initiatives under the Strategy
  - facilitating joint planning and priority-setting, through periodic all-partner forums
  - facilitating adjustments to plans and priorities to continuously improve and evolve in step with changing risks, needs, and capacities of partners
  - establishing processes and tools to support coordination of partners
  - establishing working groups of partners as and when required to advance the implementation of activities

- Coordinating partners' performance reporting, including:
  - developing mechanisms for and establishing partner commitment to regular progress reporting, against targets (where relevant)