

# PLANT HEALTH EMERGENCY MANUAL

Second Edition  
December, 2014



Regional Emergency Action & Containment Tool

**British Columbia Plant Protection Advisory  
Council**

(Transcribed into electronic format March, 2010)

# Table of Contents

|  |    |
|--|----|
| Foreword .....   | i  |
| Endorsement .....  | ii |
| 1.0 Steps to deal with a Plant Emergency.....  | 1  |
| 1.1.1 Checklist for an Agricultural Emergency Response .....   | 1  |
| 1.1.2 Checklist for a Forestry Emergency Response .....  | 2  |
| 2.0 Introduction and Overview .....  | 1  |
| 2.1 Introduction .....   | 1  |
| 2.1.1 Definition of Plant Health Emergency .....   | 2  |
| 2.1.2 Principles of Emergency Response Management .....  | 2  |
| 2.1.3 The Emergency Response Plan .....  | 3  |
| 2.1.4 Principles for Interagency Cooperation.....  | 3  |
| 2.2 Operational Collaboration.....   | 4  |
| 2.3 Agricultural Scenarios .....   | 4  |
| 2.4 Forestry Scenarios .....   | 4  |
| 2.5 On Risk, Hazard and Danger .....   | 5  |
| 2.6 Current Realities .....  | 6  |
| 2.7 Use of this Manual .....   | 6  |
| 3.0 Roles and Responsibilities.....  | 8  |
| 3.1 British Columbia Plant Protection Advisory Council (BCPPAC) and the Critical Plant Pest<br>Management Committee (CPPMC)..... | 8  |
| 3.1.1 Organization.....  | 8  |
| 3.1.2 Terms of Reference, BCPPAC.....  | 8  |
| 3.1.3 Participants, BCPPAC .....   | 9  |
| 3.1.4 Voting Members .....   | 10 |
| 3.1.5 Executive Committee .....  | 10 |
| 3.1.6 Active Technical Advisory Committees .....   | 11 |
| 3.1.7 Inactive Technical Advisory Committees .....   | 11 |
| 3.2 Enabling Statutes and Regulations.....   | 12 |
| 3.2.1 Federal Acts and Regulations.....  | 12 |
| 3.2.2 Provincial Acts and Regulations .....  | 17 |
| 3.3 Roles and Responsibilities of Participants .....   | 21 |
| 3.3.1 Introduction.....  | 21 |
| 3.3.2 Roles of Participants .....  | 22 |
| 3.3.3 Responsibilities of Participants .....   | 22 |
| 3.3.4 A Matrix for Roles and Responsibilities .....  | 23 |
| 3.3.5 Dealing with Change.....   | 24 |
| 3.3.6 Afterword — On the Framework of Interagency Cooperation .....  | 27 |
| 4.0 Emergency Response Procedures .....  | 29 |
| 4.1 Danger Analysis: Determining the Nature of a Threat .....  | 29 |
| 4.1.1 Introduction.....  | 29 |
| 4.1.2 Procedure Flow .....   | 31 |
| 4.1.3 Danger Analysis.....   | 34 |
| 4.1.4 Risk Rating.....   | 34 |
| 4.2 Monitoring and Surveillance .....  | 36 |
| 4.2.1 Trapping or Systematic Sampling .....  | 36 |
| 4.3 Basic Treatment Options .....  | 37 |
| 4.3.1 Legislative Control.....   | 37 |
| 4.3.2 Trapping.....  | 37 |
| 4.3.3 Containment.....   | 37 |
| 4.3.4 Eradication.....   | 38 |

|        |   |    |
|--------|---|----|
| 4.3.5  | Integrated Pest Management .....  | 38 |
| 4.3.6  | Model Flowchart for Consideration of Options and Development of a Treatment Program ..... | 38 |
| 4.4    | Initial Response Enabling Memorandum of Understanding .....                               | 42 |
| 4.5    | Preparing an Agreement on Emergency Treatment .....                                       | 42 |
| 4.6    | Preparing for an Emergency Response .....   | 43 |
| 4.6.1  | Initial Response.....   | 43 |
| 4.7    | Model Organization Charts.....  | 45 |
| 4.7.1  | BCPPAC and its Relationship with Member Agencies .....                                    | 45 |
| 4.7.2  | Initial Response / Verification and Survey .....  | 46 |
| 4.7.3  | Project Steering Committee .....  | 46 |
| 4.7.4  | Emergency Operations Team.....  | 47 |
| 4.8    | Guidelines for Agricultural Emergency Response Procedures .....                           | 48 |
| 4.8.1  | Introduction.....   | 48 |
| 4.8.2  | Emergency Process .....   | 49 |
| 4.9    | Forestry Emergency Response Procedures .....  | 52 |
| 4.9.1  | Introduction.....   | 52 |
| 4.9.2  | Emergency Process .....   | 53 |
| 5.0    | Communications.....   | 57 |
| 5.1    | Basic Communications Network for a Plant Health Emergency .....                           | 57 |
| 5.1.1  | Purpose.....  | 57 |
| 5.1.2  | Objectives .....  | 57 |
| 5.2    | Crisis Communication .....  | 57 |
| 5.2.1  | Principles of Effective Communication .....   | 57 |
| 5.2.2  | Assessing Information Needs.....  | 59 |
| 6.0    | Appendices and References.....  | 60 |
| 6.1    | Lists of Non-indigenous Species of Concern to British Columbia .....                      | 60 |
| 6.1.1  | Introduction.....   | 60 |
| 6.2    | Sample Submission and Identification.....   | 61 |
| 6.2.1  | Introduction.....   | 61 |
| 6.2.2  | Sample Handling Procedures .....  | 61 |
| 6.2.3  | Shipment of Samples .....   | 63 |
| 6.2.4  | CFIA Pest Identification .....  | 63 |
| 6.3    | Danger Analysis Worksheet .....   | 63 |
| 6.3.1  | Danger Analysis.....  | 63 |
| 6.4    | Case Study: 1992 Asian Gypsy Moth Eradication Program .....                               | 71 |
| 6.4.1  | Introduction.....   | 71 |
| 6.4.2  | Background.....   | 71 |
| 6.4.3  | Detection and Initial Response.....   | 72 |
| 6.4.4  | Response Planning .....   | 74 |
| 6.4.5  | Communications .....  | 78 |
| 6.4.6  | Legislative Authority .....   | 78 |
| 6.4.7  | Operations.....   | 80 |
| 6.4.8  | Follow Up .....   | 80 |
| 6.4.9  | Lessons Learned.....  | 81 |
| 6.4.10 | Afterword.....  | 81 |
| 6.4.11 | Annotated References .....  | 82 |
| 6.5    | Project Evaluation Checklist.....   | 83 |
| 6.5.1  | Introduction.....   | 83 |
| 6.6    | Literature References.....  | 84 |

## List of Figures

|   |    |
|---|----|
| Figure 1. Emergency response roles and responsibilities matrix* .....   | 23 |
| <b>Figure 2. Three phases of a plant health emergency based on number of specimens detected</b> .....                                     | 24 |
| Figure 3. Hypothetical Example: Emergency Response: Roles & Responsibilities – Phase I. ....  | 25 |
| Figure 4. Hypothetical Example: Emergency Response: Roles & Responsibilities – Phase II ....  | 26 |
| Figure 5. Hypothetical Example: Emergency Response: Roles & Responsibilities – Phase III ....   | 26 |
| <b>Figure 6. Procedural guidelines to evaluate a pest threat</b> .....  | 33 |
| Figure 7. Risk factor descriptions .....  | 35 |
| Figure 8. Pathway and eradication flowchart.....  | 40 |
| Figure 9. Summary of some basic treatment options.....  | 41 |
| Figure 10. Relationships .....  | 46 |
| Figure 11. Initial Response Team .....  | 46 |
| Figure 12. Project steering committee.....  | 47 |
| Figure 13. Relationship of Emergency Operations Team.....   | 48 |
| Figure 14. Danger Analysis Worksheet ( <i>for use, remove and photocopy</i> ). ....   | 65 |
| Figure 15. Danger Analysis Worksheet (SAMPLE 1) .....   | 67 |
| Figure 16. Danger Analysis Worksheet (SAMPLE 2) .....   | 69 |
| Figure 17. Map of British Columbia and Greater Vancouver District.....  | 73 |
| Figure 18. Distribution of male Gypsy Moth trap captures within the area of concern and possible treatment, Greater Vancouver, 1991 ..... | 73 |
| Figure 19. The Asian Gypsy Moth Eradication Program: Treatment Area, 1992 .....   | 76 |

# Foreword

The first edition of the REACT Manual was compiled in 1997. This original Foreword follows:

This first edition of the Plant Health Emergency Manual stems from the realization that British Columbia is situated as a gateway on the Pacific Rim, that the province has extensive interactions (e.g. trade, travel) with the United States and the eastern Provinces, and that the best organization to deal with threatening non-indigenous species is the B.C. Plant Protection Advisory Council (BCPPAC). Working together, members of BCPPAC have achieved first rank status and peer recognition during an active and vigilant history of interagency collaboration. Critical to its success have been BCPPAC's standing Technical Committees, where specialists contribute freely to Executive decisions.

The Regional Emergency Action and Communications Team (REACT), one of these committees, is charged with the collection of information which might be useful as a basic reference for operational response, preparation and planning. REACT itself was formed in 1985 as a result of a symposium on the European gypsy moth, a recurring threat to B.C. which has required interagency collaboration and cooperation at the highest level since 1978.

The Manual is a summary of experience and procedures as compiled by REACT members in consultation with staff of the B.C. Provincial Emergency Program. It has been written by resident staff specialists for B.C. situations requiring close interagency liaison. It is not intended as a replacement of existing procedural guidelines or policy of BCPPAC member agencies. Instead, it should be viewed as the first reference off the shelf to facilitate and augment relationships within BCPPAC, and to supplement existing procedures for prompt and effective action.

As a first edition, members of REACT recognize some obvious deficiencies and limitations, but the committee expects to receive constructive criticism and helpful comments to improve the content of the Manual. It is REACT's primary responsibility to maintain and fine-tune each section of each section as quickly as possible.

This project has been a unique and rewarding experience, and I am indebted to the following contributors for their commitment and personal support: Bryan Frazer (retired), Kingsley Chong (retired), Al Oliver and Gaye Le Page of Agriculture & Agri- Food Canada; Lee Humble of the Canadian Forest Service; Tony Kluge and Denise Mason of the B.C. Ministry of Agriculture, Fisheries and Food; John Muir of the B.C. Forest Service; and Nancy Argyle and Gerry Hirter of the B.C. Provincial Emergency Program. Special mention goes to Lee Humble and Tony Kluge who served with me as members of the "REACT Editorial Board" working many evenings and weekends for over two years to complete the first edition of the Plant Health Emergency Manual.

Robert F. DeBoo  
Chairman, REACT

*Victoria*  
*March 31, 1997*

## Foreword, 2<sup>nd</sup> edition

The Plant Protection Advisory Council of British Columbia (BCPPAC) has provided an intergovernmental and interagency forum for discussing the implications of and responses to non-indigenous introductions that could threaten the agricultural, horticultural and forestry resources in the province for more than forty years. It was first conceptualized at a meeting of the Canadian Phytopathology Society held in Vancouver, B.C. in 1972 and founded in 1973. The early history of the council is briefly summarized in Sect.2.1 . The council provides a forum for communication between federal and provincial agencies, regional and municipal governments, universities and industry for both newly discovered introduced pests and historically introductions under active management in British Columbia. A wide range of pest or commodity specific Technical Advisory Committees provide recommendations to the council on issues related to the status of non-indigenous introductions or their management in British Columbia.

Following the large scale treatment for and successful eradication of Asian Gypsy Moth in Vancouver in 1992 (see Section 6.4 for a history of this program) the council recognized a need for an emergency response manual that captured the best practices from the AGM eradication to guide any future efforts against other non-indigenous introductions. The BCPPAC executive charged the Regional Emergency Action and Communications Team (REACT) with collecting information which might be useful as a basic reference for operational response, preparation and planning for plant health emergencies. The first edition of the REACT manual was completed in March of 1997. The first edition included a statement that confirmed continuing support of BCPPAC and its role in preserving plant health in British Columbia. It noted that “*The involvement of BCPPAC is essential for the protection of the agriculture and forest resources of British Columbia, especially for formulating contingency plans and response procedures for plant health emergencies threatening these sectors. By providing a forum of expertise from government, industry and universities in this province, BCPPAC is the most effective vehicle for interagency cooperation and collaboration.*” and was signed by the Assistant Deputy Minister, Food Production and Inspection, Agriculture & Agri-Food Canada; the Assistant Deputy Minister, Canadian Forest Service, Natural Resources Canada; the Deputy Minister, BC Ministry of Agriculture, Fisheries and Food; the Deputy Minister, BC Ministry of Forests; the President, BC Federation of Agriculture; and the President of the Council of Forest Industries.

In recognition of the changing of roles and responsibilities for non-indigenous introductions in British Columbia, BCPPAC recognized the need to update the REACT manual to better reflect the current roles of the member agencies, universities and private sector with respect to non-indigenous introductions that threaten plant health. The second edition of the REACT Manual was completed by the REACT Revisions Committee in 2012, with much of the same vision of the original Manual. It draws heavily on the concepts included in the first edition and includes a detailed update of the roles and responsibilities of BCPPAC (Section 3.1 ) and adds a new section (Section 3.2 ) outlining the Federal and Provincial enabling statutes and regulations of relevance to non-indigenous introductions and plant health emergencies. In June of 2009, a Memorandum of Understanding for Critical Plant Pest Response in British Columbia between senior regional officials of the Canadian Food Inspection Agency, Agriculture and Agri-Food Canada, Natural Resources Canada, the Canadian Forest Service, the BC Ministry of Agriculture and Lands, the BC Ministry of Forests and Range, and the BC Ministry of the Environment led to the creation of the Critical Plant Pest Management Committee (CPPMC). The roles of the CPPMC and BCPPAC during a plant health emergency in BC are outlined in Sect.6.0 . This MOU

is in force for five years (through to 25 June 2014), and then automatically renewed for successive periods of five years unless terminated.

The REACT Revisions Committee concurs with the statement from the foreword of the first edition that acknowledges that the manual is not intended “as a replacement of existing procedural guidelines or policy of BCPPAC member agencies. Instead, it should be viewed as the first reference off the shelf to facilitate and augment relationships within BCPPAC, and to supplement existing procedures for prompt and effective action.”

REACT Revisions Committee:

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*2<sup>nd</sup> Edition Completed December 2014*

# Plant Health Emergency Manual

|                |   |           |
|----------------|---|-----------|
| Section<br>1.0 | Steps to deal with a Plant<br>Emergency | Page<br>1 |
|                | DATE<br>4 December 2014                 | AMENDED   |

## 1.0 Steps to deal with a Plant Emergency

### 1.1.1 Checklist for an Agricultural Emergency Response

In the case of an agricultural emergency, it is expected that roles and responsibilities will break into three categories: lead, supporting and monitoring. Usually the lead agency is responsible for most of the actions below. Many of the activities listed will happen concurrently and not necessarily sequentially.

As soon as a non-indigenous pest has been reported, BCPPAC and CPPMC notified, and tentative identification has been made, the following actions should be undertaken within the BCPPAC framework:

- Executive convenes pest-specific Technical Advisory Committee (TAC) and identifies chair, lead agency, and other members.
- TAC completes Danger Analysis to determine threat posed by the situation.
- Executive, on recommendation of TAC, may request preparation of formal "Pest Risk Assessment" by CFIA PRA Unit at Ottawa.
- Executive forms and deploys Initial Response Team to confirm and assess the situation in more detail. Concurrently and independently, the lead agency will initiate early eradication and containment activity, if possible.
- Executive advises stakeholders, as appropriate.
- Executive, based on results of Danger Analysis and the evaluation of treatment options by TAC and the field report from Initial Response Team, obtains member agency approval for immediate actions to prevent establishment and spread.
- CPPMC convenes Project Steering Committee and Emergency Operations Team, i.e. for operations, survey, communications, and administration, as required.
- Emergency Operations Team establishes and maintains project information file(s).
- Emergency Operations Team, with advice from Steering Committee and CPPMC approval, determines and requisitions any funds required. Support agencies and/or stakeholders may be requested to contribute resources.
- Lead agency, in consultation with TAC and/or Steering Committee applies for Pesticide Use Permit, if required.
- Lead agency, after communication with Steering Committee, completes environmental assessment, if required.
- Emergency Operations Team holds stakeholder consultations, as appropriate.
- Emergency Operations Team establishes communications network with media and stakeholders to advise them of project status; prepares public information packages, as necessary.
- Emergency Operations Team arranges facilities and transportation for field operations.
- Emergency Operations Team, on the advice of the Steering Committee, prepares contracts with outside operators, e.g. pesticide applicators, including all technical aspects of a treatment program, e.g. calibration of equipment, etc.

# Plant Health Emergency Manual

|                |   |           |
|----------------|---|-----------|
| Section<br>1.0 | Steps to deal with a Plant<br>Emergency | Page<br>2 |
|                | DATE<br>4 December 2014                 | AMENDED   |

- Emergency Operations Team orders materials and supplies, and arranges secure storage, as required.
- Emergency Operations Team conducts treatment to contain or eradicate pest population.
- Emergency Operations Team surveys and monitors pest population to determine efficacy of treatment.
- Emergency Operations Team, in consultation with the CPPMC, BCPPAC Executive and Steering Committee, coordinates or conducts debriefing and audits after completion of the program.
- CPPMC disbands Emergency Operations Team and Steering Committee, requests final report and continued monitoring of the situation by the BCPPAC Technical Advisory Committee.

It is expected throughout that the representative from each involved agency will keep the CPPMC and other senior management fully informed. It is also expected that concerns or advice from stakeholders will be shared by each member agency with the cooperating members.

## ***1.1.2 Checklist for a Forestry Emergency Response***

In the case of a forestry emergency, it is expected that roles and responsibilities will break into three categories: lead, supporting and monitoring. Usually the lead agency is responsible for most of the actions below. Many of the activities below will happen concurrently, not necessarily sequentially.

British Columbia is fortunate in having many strategically-located offices of MFLNRO. Many of the professional and technical specialists have pest management responsibilities as a routine function of their duties. This experience should be recognized and utilized in the organization and implementation of the Emergency Response to protect the forest.

As soon as a non-indigenous pest has been reported, BCPPAC and CPPMC notified, and tentative identification has been made, the following actions should be undertaken within the BCPPAC framework:

- Executive convenes pest-specific Technical Advisory Committee (TAC), and identifies lead agency.
- TAC completes Danger Analysis to determine threat posed by the situation.
- Executive advises CPPMC and stakeholders, including MFLNRO Regional and District Managers, as appropriate.
- Executive, on recommendation of TAC, may request through the CPPMC preparation of formal "Pest Risk Assessment" by CFIA Pest Risk Assessment Unit at Ottawa.
- Executive forms and deploys Initial Response Team to confirm and assess the situation in more detail. Involvement of local BCMFR staff should be an early consideration. Concurrently and independently, the lead agency will initiate early eradication and containment activity, if possible.
- CPPMC, based on results of Danger Analysis and the evaluation of treatment options by TAC and the field report from Initial Response Team, obtains member agency approval for immediate actions to prevent establishment and spread.
- CPPMC convenes Project Steering Committee and Emergency Action Team, i.e. operations, survey, communications, and administration, as required.

# Plant Health Emergency Manual

|                |   |           |
|----------------|---|-----------|
| Section<br>1.0 | Steps to deal with a Plant<br>Emergency | Page<br>3 |
|                | DATE<br>4 December 2014                 | AMENDED   |

- Emergency Operations Team establishes and maintains project information file(s).
- Emergency Operations Team, with advice from Steering Committee and Executive approval, determines and requisitions any funds required. Support agencies and/or stakeholders may be requested to contribute resources.
- Lead agency, in consultation with TAC and/or Steering Committee applies for Pesticide Use Permit, if required.
- Lead agency, after communication with Steering Committee, completes environmental assessment, if required.
- Emergency Operations Team holds stakeholder consultations, as appropriate.
- Emergency Operations Team establishes communications network with media and stakeholders to advise them of project status; prepares public information packages, as necessary.
- Emergency Operations Team, in consultation with MFLNRO administrators, arranges facilities and transportation for field operations.
- Emergency Operations Team, on the advice of the Steering Committee, prepares contracts with outside operators, e.g., pesticide applicators, including all technical aspects of a treatment program, e.g., calibration of equipment, etc.
- Emergency Operations Team, in consultation with local MFLNRO office, orders materials and supplies and arranges secure storage, as required.
- Emergency Operations Team conducts treatment to suppress or eradicate pest population.
- Emergency Operations Team surveys and monitors pest population to determine efficacy of treatment.
- Emergency Operations Team, in consultation with CPPMC, BCPPAC Executive, Steering Committee and local MFLNRO managers, conducts debriefing and audits after completion the program.
- CPPMC disbands Emergency Operations Team and Steering Committee, requests final report and continued monitoring of the situation by the standing BCPPAC TAC.

It is expected throughout that each involved agency will keep senior management fully informed. It is also expected that concerns or advice from stakeholders will be shared by each agency with the other cooperating agencies

# Plant Health Emergency Manual

|                |                           |           |
|----------------|---------------------------|-----------|
| Section<br>2.0 | Introduction and Overview | Page<br>1 |
|                | DATE<br>4 December 2014   | AMENDED   |

## 2.0 Introduction and Overview

### 2.1 Introduction

Pacific British Columbia, or British Columbia Region, is a particularly vulnerable area. That is, it is vulnerable to natural catastrophes or disasters resulting from events such as floods, earthquakes and forest fires. Emergency measures are in place for floods and forest fires, for example, and B.C. is considered to be particularly experienced and able in dealing with these agents of damage and destruction. Coordination of response is through designated key organizations such as the B.C. Provincial Emergency Program (BCPEP) or the B.C. Ministry of Forests, Lands and Natural Resource Operations.

Procedures are also in place to deal with other emergencies such as an outbreak of animal disease (e.g., foot and mouth disease). Here, some 35 agencies could be involved under the leadership of Canadian Food Inspection Agency. The members would use operational guidelines contained in their Foreign Animal and Disease Emergency Support Plan ("FADES" Plan).

Other jurisdictions in North America have developed and signed interagency memoranda of understanding (or intent) to enable rapid emergency response following the identification of the emergency, the allocation and the deployment of resources and the maintenance of 24-hour emergency response centres similar to the BCPEP Emergency Coordination Centre (ECC) at Victoria and the Canadian Interagency Fire Centre Winnipeg. In the United States, all federal forest emergencies concerning fire, insect outbreaks or foreign disease occurrences are now dealt with using the Incident Command System (ICS). This is an emergency management system developed to facilitate the inter-operability and cooperation between different agencies in the pursuit of a common goal.

Similar understandings, agreements; and capabilities for rapid response to both forest and agricultural plant health threats caused by non-indigenous species are required in British Columbia. The organization best able to deal with British Columbia's vulnerability to foreign pests and unusual incidents is the interagency B.C. Plant Protection Advisory Council (BCPPAC). This Council, formed in 1973 to advise governments and industries on such issues, already contains most of the agencies and experience required to deal with a plant health emergency. Its most publicized accomplishment was the 1992 Asian Gypsy Moth Eradication Program where federal, provincial, municipal and private-resources were pooled, a strategic plan developed, a federal-provincial funding formula agreed to and a successful operation conducted to prevent establishment of this serious threat to the agricultural and forestry resources of B.C. (please see section 6.4 )

The 1992 Asian Gypsy Moth eradication, as well as other incidents in this province, have confirmed the need for a BCPPAC reference manual to facilitate the identification of a plant health emergency and coordinate a course of action with the participation of as many mandated agencies as possible. The best source of information for producing an emergency manual for B.C. is clearly BCPPAC itself. Thus, this unique plant health emergency manual has been authored by members of this Council. It incorporates past experiences and operational constraints as set out by statutes, regulations and policies, and the best advice from others. It was conceived by BCPPAC as an important, but not the only, reference to consult when confronted by a potential plant health emergency and to answer the question: "Now, where do I start?"

# Plant Health Emergency Manual

|                |                           |           |
|----------------|---------------------------|-----------|
| Section<br>2.0 | Introduction and Overview | Page<br>2 |
|                | DATE<br>4 December 2014   | AMENDED   |

## ***2.1.1 Definition of Plant Health Emergency***

For purposes of this manual, BCPPAC considers a plant health emergency to be:

“A MAJOR EVENT, OUT OF THE ORDINARY OR BEYOND NORMAL PROCEDURES, WHICH REQUIRES A COORDINATED RESPONSE FROM A NUMBER OF AGENCIES.”

The Canadian Food Inspection Agency, the federal agency responsible for implementation of national plant health phytosanitary policy, has adopted the government of Canada definition which defines an emergency as:

“AN ABNORMAL SITUATION WHICH, TO LIMIT DAMAGE TO PERSONS, PROPERTY, OR THE ENVIRONMENT, REQUIRES PROMPT ACTION BEYOND NORMAL PROCEDURES.”

In the case of a plant health emergency, BCPPAC has determined that one agency will assume the LEAD (KEY) ROLE while others involved will have either SUPPORT or MONITORING roles. These roles will be determined by the agency with the primary responsibility for the specific plant health emergency.

## ***2.1.2 Principles of Emergency Response Management***

Further, BCPPAC endorses the following principles for dealing with a plant health emergency:

- Members of BCPPAC have an obligation to SHARE THE RESPONSIBILITY.
- The responsibility for meeting emergency situations rests with the level of government most directly affected as well as with the most appropriate or senior legislation/regulations.
- There must be maximum use of existing systems and procedures based on past experiences in B.C. and or other equivalent jurisdictions.
- There must be a single set of management arrangements, especially for operational organization and implementation.
- The LEAD (KEY) AGENCY (e.g., a ministry or department of government) can be from the federal, provincial, or municipal level as dictated by the nature of the emergency.
- All plans, organizational documents and project reports must CLEARLY IDENTIFY LEAD, SUPPORT AND MONITORING ROLES OF THE PARTICIPANTS.
- Potentially affected industries (e.g., agricultural producers, forest products firms) are expected to assume SUPPORT roles.
- Prompt, open and continuing public communications are a prerequisite to any action.
- The EMERGENCY RESPONSE PROCEDURE will be the responsibility of the designated BCPPAC Technical Committee and/or a Project Steering Committee as the scale of the operation may determine.
- The PROCEDURE will be determined by the best advice available, common sense, fiscal realities, and technical facts. Moreover, all recommendations, including the response procedure, should be formulated by the Technical Advisory Committee (TAC) or Steering Committee for the consideration and decision of the (likely) participating agencies as described under the MOU. The BCPPAC Executive's role is primarily to assess, advise and coordinate.

# Plant Health Emergency Manual

|                |                           |           |
|----------------|---------------------------|-----------|
| Section<br>2.0 | Introduction and Overview | Page<br>3 |
|                | DATE<br>4 December 2014   | AMENDED   |

## **2.1.3 The Emergency Response Plan**

The membership of the Council (section 3.1 British Columbia Plant Protection Advisory Council (BCPPAC)) in effect, comprises the core list of organizations likely to be involved in an emergency response situation. Other agencies, for example, Environment, Public Health and Municipal Affairs ministries and local citizens groups might be involved as the nature of the emergency requires. Thus, the strategy for response will be built on the aforementioned principles of interagency cooperation and collaboration. The strategy will also consider scope (e.g., isolated, local, provincial, national, international) and duration (i.e., one occasion only to multiple-year, repetitive response).

BCPPAC recognizes that plant health emergencies in forest settings may require different planning and organizational strategies than for agricultural or urban situation. The plan for intervention will be based the principles of ACTIVE AND COOPERATIVE PARTNERSHIPS BETWEEN ALL LEVELS OF GOVERNMENT, PUBLIC AND PRIVATE ORGANIZATIONS, AND THE PUBLIC AT LARGE. This code is particularly important for emergencies with national or international consequences.

The council recognizes seven common features for the preparation of an emergency response plan:

- The emergency response plan must employ a direct communication link from the BCPPAC to the lead agency, especially for notifying officials and staff who must respond.
- It must describe emergency operations and procedures based on an assessment of alternatives, including the option of doing nothing.
- It must propose and describe an organizational structure based on lead, support and monitoring roles of involvement.
- It must include reference to relevant related experiences and the advice from other jurisdictions.
- It must contain a list of the resources required, especially for project staff, sources of legal references and technical information, key contacts and equipment
- It must include a project funding formula agreed upon prior to implementation of the response by all BCPPAC member organizations. This funding formula will be decided by the CPPMC and likely be comprised of two parts: (a) for initial response and (b) for costs of the full emergency response operation.

Finally, it is understood that the emergency response may extend beyond one year. In this case, the roles and responsibilities of the participating agencies may change (Section 3.3 ).

## **2.1.4 Principles for Interagency Cooperation**

Canada is a large and difficult territory to administer in the event of regional emergencies, disasters or threats to the well-being of its citizens, their industries and the regional environment. Experiences during the past 35 years in British Columbia have shown that dependency on a single authority at a remote location for resolution of a problem of national significance, such as plant pest spread across provincial borders or via national or international transportation corridors, is neither desirable nor efficient.

Therefore, BCPPAC supports the principle of continuing and local interagency communication, and when necessary, immediate cooperation and collaboration within the guidelines proposed in the emergency response plan. Thus, in British Columbia, a problem of potential national or international significance should have inputs from all available and recognized resident specialists as well as from those employed by a federal authority. Likewise, an isolated or local emergency

# Plant Health Emergency Manual

|                |                           |           |
|----------------|---------------------------|-----------|
| Section<br>2.0 | Introduction and Overview | Page<br>4 |
|                | DATE<br>4 December 2014   | AMENDED   |

problem likely to affect plants in British Columbia only should be resolved with direct assistance of local specialists employed by the all levels of government.

As a result, BCPPAC endorses a spirit of willingness and involvement to assist in the resolution of any plant health emergency at all jurisdictional levels.

The question of funding will likely be addressed as a function of roles and responsibilities as outlined in law and by the specific emergency response plan. The Council promotes the principle that all participating agencies are prepared to share resources, including staff and funding, as necessary (Sections 4.8 and 4.9 ).

## 2.2 Operational Collaboration

On the assumption of roles and responsibilities in a British Columbia setting, it is likely that any of the agencies of government would be involved as key players: provincial/federal agriculture, and provincial/federal forestry or others. All are members of BCPPAC, and all have experience working together in plant health emergencies.

Other interests, including municipal, public health and private sector agricultural and forestry concerns, have previously been involved in B.C. plant health emergency operations. Thus, the foundation has been established, and the potential for future inter-agency collaboration is excellent. The vehicle to foster the spirit of collaboration and maintain the emergency response process in British Columbia is BCPPAC (Sections 4.6 and 4.7 ).

## 2.3 Agricultural Scenarios

The most extensive experience in British Columbia plant health emergencies has been in agricultural/horticultural settings. Historically, federal and provincial officials, along with the affected growers, have worked together to prevent, eradicate or suppress a new problem, or to contain or slow its spread. Usually federal and provincial statutes and regulations are applied, as are the efforts and strong commitments of the growers. Specialized staff within a crop protection or plant health unit are focused on such events and occurrences. The structure of BCPPAC's standing Technical Advisory Committees (e.g. *Phytophthora ramorum* TAC, Gypsy Moth TAC) reflects this tradition, especially with regard to cooperation.

A generalized and collaborative procedure to demonstrate established response capability based on an agricultural scenario is found in Section 4.8 . It is understood that unusual situations, perhaps the accidental introduction of a non-indigenous pest of major concern (Section 6.1 ), will require an unusual response which includes new partners (e.g., Department of National Defence). Expansion of the conventional framework to accommodate the new partners, versus creation of a new response mechanism, is the preferred method for dealing with such a problem.

Thus, in an agricultural setting, BCPPAC recommends utilization of existing practices and working relationships with flexibility to accommodate change and new partners.

## 2.4 Forestry Scenarios

The forests of British Columbia are particularly vulnerable to foreign pests. Notable examples of serious concern where interagency collaboration was important include introductions of gypsy moth (mostly urban settings), hemlock seedling blight (*Colletotrichum*) in a forest nursery, and

# Plant Health Emergency Manual

|                |                           |           |
|----------------|---------------------------|-----------|
| Section<br>2.0 | Introduction and Overview | Page<br>5 |
|                | DATE<br>4 December 2014   | AMENDED   |

*Phytophthora ramorum*; in horticultural nurseries each problem threatens forests and the forest industry, and required the concerted efforts of several agencies. A proposed forestry problem response procedure, based on the assumption of strong linkage and collaboration as experienced in agricultural and urban settings, also is represented in Section 4.9 .

## 2.5 On Risk, Hazard and Danger

An understanding of definitions of risk, hazard, and danger, is important in determining the nature of a perceived or newly reported threat to plant health in British Columbia (e.g., Sections 4.1 and 4.4 ; Section 6.1 and 6.2 ). The following section was developed by the original REACT Team based on their varied experience before formalized protocols had been developed by National, Regional and International Plant Protection Organizations. It is not a formalized protocol but provides a guideline for rapidly assessing risk. Formalized Risk Assessment protocols are utilized by plant protection organizations such as International Plant Protection Convention, Canadian Food Inspection Agency, European and Mediterranean Plant Protection Organization, Food and Agriculture Organization to evaluate threat posed by incursions of regulated quarantine pests.

**RISK**—The probability related to timing and biological attributes of a non-indigenous species of concern (e.g. list in Section 6.1 ) becoming established in B.C. and affecting one or more host plants of particular importance or value.

Examples of Risk Rating:

- 10- Extremely probable/likely to establish and reproduce in B.C.
- 5- Probability is moderate, uncertain, perhaps limited by seasonal occurrence
- 0- Nil chance, improbable/unlikely

**HAZARD** — The fixed attributes of the host plants, as influenced by their geographic location, ecosystem associations and climatic factors which affect vulnerability or susceptibility to the non-indigenous species of concern.

Examples of Hazard Rating

- 10- Extremely hazardous host plant conditions, severe losses expected
- 5 - Moderately hazardous conditions, up to 50% loss of hosts expected
- 0 – Non-hazardous conditions; crop/ecosystem likely to be unaffected
- 

**DANGER**— The combination or sum of Risk and Hazard considerations influencing the potential for establishment of a non-indigenous species and the expected threat to plant health, spread and other environmental considerations.

Examples of Danger Rating:

- 20- Extremely dangerous threat with severe impacts, rapid spread likely
- 10- Moderately dangerous with some serious impacts, limited spread
- 0 - Non-threatening situation

Vulnerability of potential host plants growing in British Columbia, then, might be equated to a systemic and weighted evaluation of **DANGER**—that expert consideration of probable **RISK** and **HAZARD** related to the non-indigenous and threatening pest species. This exercise will undoubtedly assist decision-makers, including the BCPPAC Executive members (Section 2.1).

The case for Asian gypsy moth (Section 6.4 ) as occurred in 1992, might be summarized as follows:

# Plant Health Emergency Manual

|                |                           |           |
|----------------|---------------------------|-----------|
| Section<br>2.0 | Introduction and Overview | Page<br>6 |
|                | DATE<br>4 December 2014   | AMENDED   |

- *RISK RATING RESULT* - Rugged insect, high reproductive potential, readily dispersed = 9/10
- *HAZARD RATING RESULT* - Many suitable host plants, high nuisance features, climate suitable, serious ecosystem disruption likely at many locations in southern half of B.C. resulting in serious economic, environmental and social impacts =10/10
- *DANGER RATING RESULT*- Together, Risk and Hazard ratings added up to19/20; a ranking level for a possible EXTREME threat to plant health (Section 4.1 ).

Following determination of the danger level, as well as confirmation via the consultative process and other means, the BCPPAC Executive should now have sufficient information to frame an advisory notice to senior officials (Section 6.3 ). The operational expectations thereafter might be (1) a quick and limited initial response (Section 4.4 ), and (2) preparation for a formal operational project (Sections 4.5 - 4.9 ).

In effect then, a formal analysis of danger posed by a non-indigenous species, coupled with other processes for determining the nature of a threat should facilitate a prompt and effective emergency response. A formal and specific operational agreement (i.e. Memorandum of Understanding and pest-specific "Critical Plant Pest Response Plan") would frame the interagency eradication/containment operation.

## 2.6 Current Realities

Government resources are scarce today. And it will likely be rare to see a single government agency, especially a federal agency, continue to fully fund a plant health emergency program in British Columbia. The difficulty may be compounded if the problem occurs in a forest.

Recognizing the nature of British Columbia's plant products industries, funding difficulties, the need to work together, some inexperience and the changing times, BCPPAC has based this manual largely on these realities. BCPPAC reserves the right to modify the content accordingly and to rely on current and relevant advice and procedures. This manual, therefore, is a reflection of collective wisdom and experience in British Columbia; it does not necessarily reflect the special interests, perceived limitations or purposes of the agencies represented by BCPPAC or mentioned in this manual.

## 2.7 Use of this Manual

The BCPPAC Plant Health Emergency Manual is intended as the "first reference to be reached for" in the event of a possible plant health emergency in this region. It is expected to be within arm's length of plant health inspectors, senior management, the BCPPAC membership, BCPEP officials, forest and agricultural survey specialists, interagency committees, industrial associations, and others with potential involvement in an emergency response.

Other complementary documents and references, including operating policies and procedural guidelines, are expected to be consulted and used in formulating individual response and involvement. This manual is intended to facilitate partnerships and rapid deployment of resources, while maintaining compatibility with the goals and objectives of all participants. For example, the federal Plant Health Import Inspection Manual (from the Canadian Food Inspection Agency [CFIA]) or similar provincial or industrial references should serve as complementary and synergistic references and not as alternative, separate guidelines.

# Plant Health Emergency Manual

|                |                           |           |
|----------------|---------------------------|-----------|
| Section<br>2.0 | Introduction and Overview | Page<br>7 |
|                | DATE<br>4 December 2014   | AMENDED   |

Sections 2.0 , 3.0 , and 3.0 are designed to provide philosophical and organizational background to solidify partnerships and to outline roles and responsibilities as seen by BCPPAC. This Council recognizes current situations and limitations of agencies which foster the need for cooperation and collaboration to successfully deal with a threat. Special recognition is given to the need to deal with change and the need to keep current.

Section 4.0 was written for those individuals charged with the plant health emergency response. It outlines functions and guidelines for framing response operations. If this manual is to succeed and actually come down from the shelf, it will be the result of this section.

Recent experiences in British Columbia dictate that an integrated communications network, especially with reach to the public sector and special interest groups, must be connected with all operations. Section 5.0 derives from recent actual plant health emergency experiences in this province, and from successes in responding to other emergencies such as wildfire and floods. It has been prepared with the direct involvement of experts in those fields.

Finally, Section 6.0 is a collection of references, examples and lists for use in planning, organizing, sharing and implementing. These sections are a reflection of the best information from within BCPPAC and from its advisors and contacts.

The first edition was written and assembled by a standing committee of BCPPAC, the Regional Emergency Action and Communications Team (REACT). The second edition contains updates but the context remains the same. As an operational reference, it is recognized that chances are good for error, inadequate explanation and omission. Because of these facts, the manual has been designed for amendments as deemed appropriate by BCPPAC.

It is the intention of BCPPAC to issue amendments and addenda on a periodic basis, and to initiate periodic review of content.

Comments and suggestions concerning the contents of the manual are requested as are copies of documents from other jurisdictions or published reports which could be useful in keeping this manual current and practical. Please participate. Please forward comments to the current BCPPAC Executive.

|                |                            |           |
|----------------|----------------------------|-----------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>8 |
|                | DATE<br>4 December 2014    | AMENDED   |

## **3.0 Roles and Responsibilities**

### ***3.1 British Columbia Plant Protection Advisory Council (BCPPAC) and the Critical Plant Pest Management Committee (CPPMC)***

#### ***3.1.1 Organization***

The British Columbia Plant Protection Advisory Council (BCPPAC) is a forum to address plant health and plant quarantine issues of concern to this province. It is comprised of representatives from the federal and provincial agriculture and forestry agencies and the major agriculture and forest industry organizations in B.C. Independent scientific advice is also provided by the agriculture, forestry and pest management departments of B.C. universities.

BCPPAC consists of an Executive, appointed by the member agencies, and a number of pest or disease specific Technical Advisory Committees (TAC). A TAC may recommend remedial actions to be taken by one or more member agencies. The authority for any actions recommended by a TAC is provided by the mandates of the agencies represented on the TAC. In situations where the mandate is insufficient for a member agency to take action, the Executive may make a formal request for assistance to that agency, and to the Critical Plant Pest Management Committee (CPPMC).

The CPPMC is a committee of senior officials where critical plant pest issues are identified and collaborative approaches are developed in keeping with the legislative mandates of the participants. This committee facilitates the sharing of critical information, resources and expertise to meet the objectives of preventing and eradicating critical plant pests affecting British Columbia. The CPPMC has the responsibility to oversee the development of species specific response plans and execution of those plans deemed necessary by the CPPMC. The CPPMC consists of up to two members from each of the participant organizations and a chair and co-chair, selected by the members on a rotational basis. A member of BCAGRI or BCFLNRO holds either chair or co-chair at all times. A member of the federal government will hold the other chair position (Canadian Food Inspection Agency, Canadian Forest Service, Natural Resources Canada). The CPPMC meets a minimum of once per year but additional meetings can be held at the call of the chair. The CPPMC has the responsibility to initiate additional task force groups when required to respond to critical plant pests. The CPPMC recognizes the importance of the BCPPAC and other organizations, and will use the expertise from these when appropriate. The primary role of the task forces is to provide science and technical advice, recommendations and reports to the CPPMC. The task forces are established with members from all the appropriate participant organizations, and include experts as deemed appropriate and reasonable by the CPPMC. These could include federal and provincial governments, other levels of government such as municipalities, universities, industry associations, and other experts.

#### ***3.1.2 Terms of Reference, BCPPAC***

1. To assess actual or potential hazards to British Columbia agriculture and forestry from insects, plant diseases, weeds, or other biotic agents by providing a broad provincial forum for discussion of such issues. To establish technical committees, as needed, to investigate specific pests of concern to agriculture or forestry.

# Plant Health Emergency Manual

|                |                            |           |
|----------------|----------------------------|-----------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>9 |
|                | DATE<br>4 December 2014    | AMENDED   |

2. To work collaboratively with the CPPMC to deal with critical plant pest issues in British Columbia.
3. To study and evaluate contingency procedures for non-indigenous pests that may be introduced or become established in British Columbia. Through these activities, and via the initiation of Technical Advisory Committees (TAC), BCPPAC will advise member agencies and the CPPMC in their development of a Critical Plant Pest Response Plan.
4. To recommend actions to member agencies, municipalities, industry organizations and the CPPMC when pests of concern to the BCPPAC appear, and will indicate when remedial procedures taken by those agencies or organizations are deemed inadequate or result in unforeseen problems.
5. To advise and counsel federal and provincial agencies and the CPPMC in the preparation of news releases, legislation, or policies on pests in British Columbia. The release of information to the public is at the discretion of member agencies.
6. To review reports submitted by members from attendance at meetings relevant to the concerns of BCPPAC. For example, but not limited to: North American Plant Protection Organization, Western Plant Board and National Plant Protection Advisory Committee.

### **3.1.3 Participants, BCPPAC**

#### **Government Agencies**

- Agriculture and Agri-Food Canada
- BC Ministry of Agriculture
- BC Ministry of Environment
- BC Ministry of Forests, Lands, and Natural Resource Operations
- Canadian Food Inspection Agency
- Canadian Forest Service
- Health Canada

#### **Industry Organizations**

- Agriculture industry organizations including but not limited to: BC Fruit Growers' Association, BC Grape Growers' Association, BC Landscape & Nursery Association, BC Greenhouse Growers Association
- Forest industry organizations including but not limited to: Canada Wood

#### **Academic Institutions**

Academic institutions provide scientific advice to the Council and its technical committees, as required. They include but are not limited to the following:

- Kwantlen Polytechnic University
- Simon Fraser University
- University of British Columbia
- University of Victoria

#### **Regional Governments**

- Regional Governments including but not limited to: Vancouver Parks, City of Victoria

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>10 |
|                | DATE<br>4 December 2014    | AMENDED    |

## 3.1.4 Voting Members

All agencies listed in the Terms of Reference are entitled to appoint voting representatives:

The number and composition of voting members will vary depending upon the issue before the Council. If necessary, voting members on each issue and the agency or organization they represent will be identified by the Chair. Voting members who abstain from voting for any reason may request that their abstention be identified in the minutes.

Members at Large (voting assigned by Chairperson with respect to subject matter and knowledge), and can include all participants who are present at general meetings.

## 3.1.5 Executive Committee

The Executive Committee is composed of one representative of each of the five government agencies, one representative from an agriculture industry organization and one representative from a forest industry organization. The Chair and Secretary shall be members of the Executive Committee.

**Chair**, Tracy Hueppelsheuser, M.P.M., P.Ag.  
British Columbia Ministry of Agriculture,  
Abbotsford  
Email: [Tracy.Hueppelsheuser@gov.bc.ca](mailto:Tracy.Hueppelsheuser@gov.bc.ca)  
Web: <http://www.gov.bc.ca/al/>

Markus Clodius, B.Sc., M.P.M.  
Agriculture & Agri-Food Canada, Agassiz  
Email: [markus.clodius@agr.gc.ca](mailto:markus.clodius@agr.gc.ca)  
Web: <http://www4.agr.gc.ca/AAFC-AAC/display-afficher.do?id=1180620561099&lang=eng>

**Secretary**, Kristine Schlamp  
Kwantlen Polytechnic University, School of  
Horticulture, Langley  
Email: [Kristine.Schlamp@kpu.ca](mailto:Kristine.Schlamp@kpu.ca)  
Web: <http://kwantlen.ca/hort.html>

Nancy A. Kummen, B.Sc. (Agr) M.P.M.,  
Canadian Food Inspection Agency, Kelowna  
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Web: <http://www.inspection.gc.ca/english/plaveg/plavege.shtml>

Harry Kope, Ph.D.,  
British Columbia Ministry of Forests, Lands,  
and Natural Resource Operations, Victoria  
Email: [Harry.Kope@gov.bc.ca](mailto:Harry.Kope@gov.bc.ca)  
web: <http://www.gov.bc.ca/for/>

Eric Allen, Ph.D.,  
Natural Resources Canada, Canadian Forest  
Service, Victoria  
Email: [eallen@nrcan.gc.ca](mailto:eallen@nrcan.gc.ca)  
Web: <http://cfs.nrcan.gc.ca/directory/eallen>

Brian Zak,  
Canada Wood  
Email: [Allforestsolutionsinc@telus.net](mailto:Allforestsolutionsinc@telus.net)  
Web: [www.canadawood.info](http://www.canadawood.info)

Len Smit,  
British Columbia Landscape & Nursery  
Association  
Email: [lsmit77@gmail.com](mailto:lsmit77@gmail.com)  
Web: <http://www.bclna.com/>

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>11 |
|                | DATE<br>4 December 2014    | AMENDED    |

### 3.1.6 Active Technical Advisory Committees

| Name                     | Chairperson                   | E-mail                                   |
|--------------------------|-------------------------------|--|
| Apple Maggot             | Kara Soares, CFIA             | soaresk@inspection.gc.ca                 |
| Balsam Woolly Adelgid    | Gabriella Zilahi-Balogh, CFIA | Gabriella.Zilahi-Balogh@inspection.gc.ca |
| Blueberry Pests          | Tracy Hueppelsheuser, BCAGRI  | Tracy.Hueppelsheuser@gov.bc.ca           |
| Chrysanthemum White Rust | Ken Wong, CFIA                | Ken.Wong@inspection.gc.ca                |
| Gypsy Moth               | Jennifer Burleigh, BCFLNRO    | Jennifer.Burleigh@gov.bc.ca              |
| Eastern Filbert Blight   | Siva Sabaratnam, BCAGRI       | Siva.Sabaratnam@gov.bc.ca                |
| European Brown Snail     | Holly Armstrong, CFIA         | Holly.Armstrong@inspection.gc.ca         |
| Elm Bark Beetle          | David Woodske, BCAGRI         | David.Woodske@gov.bc.ca                  |
| Forest Pests             | Lee Humble, NRCAN/CFS         | Leland.Humble@nrcan-rncan.gc.ca          |
| Grapevine Diseases       | Martine Korban, CFIA          | Martine.Korban@inspection.gc.ca          |
| Grapevine Pests          | Martine Korban, CFIA          | Martine.Korban@inspection.gc.ca          |
| Japanese Beetle          | Tracy Hueppelsheuser, BCAGRI  | Tracy.Hueppelsheuser@gov.bc.ca           |
| Spotted Wing Drosophila  | Tracy Hueppelsheuser, BCAGRI  | Tracy.Hueppelsheuser@gov.bc.ca           |
| Tree Fruit Pests         | Susanna Acheampong, BCAGRI    | Susanna.Acheampong@gov.bc.ca             |
| Urban Pests              | TBA                           | Tracy.Hueppelsheuser@gov.bc.ca           |

### 3.1.7 Inactive Technical Advisory Committees

| Name                     | Name                      | Name                        |
|--------------------------|---------------------------|-----------------------------|
| Colletotricum Blight     | Scleroderris Canker       | Apple Ermine Moth           |
| European Pine Shoot Moth | Tomato Spotted Wilt Virus | Canola Blackleg             |
| Geranium Blight          | Winter Moth               | <i>Phytophthora ramorum</i> |
| Pinewood Nematode        | Pear Trellis Rust         | Golden Nematode             |
| Russian Wheat Aphid      | Little Cherry Disease     | Potato Pests & Diseases     |
|                          | Cherry Bark Tortrix       |                             |

Website: [British Columbia Plant Protection Advisory Council \(BCPPAC\) Executive Committee](http://www.al.gov.bc.ca/cropprot/bcppac2.htm)

<http://www.al.gov.bc.ca/cropprot/bcppac2.htm>

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>12 |
|                | DATE<br>4 December 2014    | AMENDED    |

## 3.2 Enabling Statutes and Regulations

### 3.2.1 Federal Acts and Regulations

The federal government is charged with handling emergencies that:

- occur on crown lands, in territories, or offshore
- result from activities that are federally regulated
- are national in scope.

The Canadian Food Inspection Agency (CFIA) has the primary role for planning and responding to an emergency which comes within its normal responsibilities and legislation. CFIA may also participate in circumstances where assistance is requested by provincial authorities or other federal departments.

A plant pest emergency in most cases will be handled under existing CFIA legislation and under the direct control of the Food Production & Inspection (FP&I) Branch. The emergency may be of a regional or national scope in which there is a threat to plant life of the agricultural and forestry sectors of the Canadian economy.

The purpose of this manual is to set out how local emergencies can be handled within the legislative authorities of CFIA and the provincial statutes of British Columbia. Wherever possible, these emergencies will be dealt with in a partnership approach which may include participation by stakeholder groups.

Current versions of Federal Acts and Regulations are maintained online by the Department of Justice Canada and can be accessed at the following URL: <http://laws.justice.gc.ca/eng/>. **Users of the manual are encouraged to check the most recent version of the applicable acts and regulations when using this manual.** In the following section the name and version of each act as well as the URL (as of 24 January 2012) are provided.

#### 3.2.1.1 Emergencies Act (R.S.C., 1985, c. 22 (4th Supp.))

[URL: [http://www.publicsafety.gc.ca/pol/em/em\\_act-eng.aspx](http://www.publicsafety.gc.ca/pol/em/em_act-eng.aspx) ]

If an emergency escalates beyond the authority or capability of the Plant Protection Act, there is the option of fully activating the Food and Agriculture Emergency Response System (FAERS) and calling upon the Emergencies Act. The Emergencies Act will only be invoked when a National Emergency is declared by the Government in Council. Once it is invoked, additional regulations will be passed to assign broader responsibilities to the Ministers involved in addition to those that currently exist. This usually will apply to emergencies that impact human health and safety, so not likely to be invoked for plant health issues.

#### 3.2.1.2 Plant Protection Act (Canada) (S.C. 1990, c. 22)

[URL: <http://laws-lois.justice.gc.ca/eng/acts/P-14.8/> ]

This Act and its regulations enables the Minister (Canadian Food Inspection Agency) to regulate various activities to protect plant life and the agricultural and forestry sectors of the Canadian economy by preventing the importation, exportation and spread of pests and providing for the control or eradication of pests in Canada.

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>13 |
|                | DATE<br>4 December 2014    | AMENDED    |

The Act and its regulations allow for the inspection of places or things that may harbour a pest. A pest, for the purposes of this Act, is defined as any thing that is injurious, or potentially injurious, whether directly or indirectly, to plants or to products or by-products of plants and includes any plant prescribed as a pest. A thing is any thing and includes plants, plant parts and pests. A place is any place and includes conveyances, which may by aircraft, carriage, motor vehicle, trailer, railway car, vessel, cargo container or other contrivance used to move persons or things. During routine inspection things may be sampled to determine the presence of a pest. If warranted the thing may be prohibited to be moved, seized and detained and may be disposed of, depending on the situation.

An inspector, appointed under this Act, may enter and inspect any place (other than a dwelling where a warrant is required), or stop any conveyance, in which he believes on reasonable grounds there is any thing of which this Act or the regulations apply, and the inspector may:

- prohibit the movement of any thing or conveyance, prohibit or interrupt the loading, unloading or partial loading of the conveyance or permit conveyance to be loaded, unloaded or partially loaded;
- open any receptacle, baggage, package cage or other thing and inspect any thing and take samples;
- require any person to produce for inspection or copy, relevant documents or electronic data where the inspector believes on reasonable grounds this Act or regulations apply;
- conduct any test or analyses or take any measurement;
- seize and detain any thing, if the inspector believes that the Act or deregulations have been contravened;
- declare a place infested, if the inspector suspects or determines that a place is infested with a pest which could spread.
- The Minister may, in accordance with regulations, order compensation to be paid for:
  - Any treatment of place or any treatment, storage or disposition of a thing required under this Act or its regulations;
  - any prohibition or restriction on the use of a place or on the movement of persons or things within, into or out of a place imposed under this Act or its regulations;
  - any prohibition or restriction on the use of a thing or on the sale or other disposition of a thing imposed under this Act or its regulations.

The Minister may by Order:

- declare any place infested which has not already been declared;
- *Note:* The Minister's Determination (MD) under the Plant Protection Act is necessary for an area to be infested with a pest. This is one of the first steps found in (Section 4.8 ) Agricultural Emergency Response Procedure.
- vary the area of the place declared to be infested;
- extend the period of any restriction or prohibition declared by an inspector;
- prohibit or restrict the movement of persons or things within, into or out of any place which is declared infested;

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>14 |
|                | DATE<br>4 December 2014    | AMENDED    |

- permit any movement of persons and things within, into or out of any place that would otherwise be prohibited.

A prohibition or restriction imposed under the federal Plant Protection Act or its regulations supersedes any order of a local authority that is inconsistent with it.

### 3.2.1.3 Pest Control Products Act (S.C. 2002, c. 28)

[URL: <http://laws.justice.gc.ca/eng/acts/P-9.01/> ]

In general, the Act empowers the Minister (Health Canada, Pest Management Regulatory Agency) to regulate, through registration requirements, the use of products for the control of pests and the organic functions of plants and animals.

Specifically, the Governor in Council may make regulations concerning the registration of products, the inspection and operation of establishments, standards for products, the manufacture, storage, distribution, display and use, packaging and labelling and the exemption of control products from the provisions of part or all of the Act.

The provision that the Governor in Council may exempt "any control product or any person from the operation of all or any of the provision of this Act" gives the Minister the authority to formulate rules or regulations governing the registration and use of control products in emergency situations.

### 3.2.1.4 Pesticide Residue Compensation Act (R.S.C., 1985, c. P-10)

[URL: <http://laws-lois.justice.gc.ca/eng/acts/P-10/index.html> ]

This Act enables the Minister to compensate producers for the approved use of a registered pesticide, which nevertheless leaves residue on agricultural products, and thus renders their sale as to be contrary to the Food and Drugs Act and regulations.

This Act provides protection to producers against emergency situations arising from the maladroit handling and use of pesticide.

The authority of an inspector appointed under this Act is similar to that under both the Plant Protection Act and the Pest Control Products Act.

The criteria and conditions for compensation to a farmer in response to any such loss caused by pesticide residues are clearly laid out in the Act: The compensation, in any event, shall not exceed such maximum amount as may be prescribed by the Regulations.

### 3.2.1.5 Farm Income Protection Act (S.C. 1991, c. 22)

[URL: <http://laws-lois.justice.gc.ca/eng/acts/F-3.3/index.html> ]

The Act provides for entry into agreements with the provinces whereby the federal government contributes to the provincial insurance programs.

Generally pests are considered non-insurable perils, provided there are tools to detect and manage them. Exceptions are quarantine pests or new un-anticipated pests, where a case can be made for coverage. The Act provides a means for the Department to pay claims to insured producers for crop losses caused by plant diseases and insect infestations, providing the recommended crop treatments (e.g. use of approved pesticides) are used by the producers, and providing that the producers are insured under the provincial plans where such coverage is

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>15 |
|                | DATE<br>4 December 2014    | AMENDED    |

provided. Payment is made through the provincial crop insurance agency. The nature of the coverage depends on the terms of the policy.

### 3.2.1.6 Forestry Act (R.S.C., 1985, c. F-30)

[URL: <http://laws-lois.justice.gc.ca/eng/acts/F-30/>]

This Act outlines the duties of the Minister of Natural Resources. The Minister:

- shall provide for research relating to the protection, management and utilization of the forest resources of Canada and the better utilization of forest products; and
- may undertake, promote or recommend measures for the encouragement of public cooperation in the protection and wise use of the forest resources of Canada;
- may enter into agreements with the government of any province or with any person for forest protection and management or forest utilization, for the conduct of research related thereto or for forestry publicity or education;
- may provide for forestry surveys and provide advice relating to the protection and management of forests on lands administered by any department or agency of the Government of Canada or belonging to Canada; and
- at the request of any department or agency of the Government of Canada, may assume responsibility for the protection and management of any forest on lands for which that department or agency is responsible, including responsibility for the disposal of timber and grass and for the granting of rights to the natural produce of the forest.
- The Minister may conduct economic studies relating to the forest resources, forest industries and marketing of forest products, make investigations designed to aid the forest industries and woodlot owners of Canada and assist external aid programs relating to forestry
- The Minister has, in relation to silviculture, the same powers, duties and functions as the Minister has under this Act in relation to the protection and management of the forest resources of Canada
- The Minister may, in carrying out the Minister's duties and functions under this Act, consult with and inaugurate conferences of provincial or municipal authorities, universities, representatives of industry or other interested persons.
- The Governor in Council may establish as a Forest Experimental Area (a) lands belonging to Her Majesty in right of Canada, and (b) lands provided therefore, pursuant to an agreement with the government of any province, by the government of the province or any person in the province, and may withdraw lands from or add lands to a Forest Experimental Area.
- Subject to any regulations made under section 6, the Minister may, on lands comprised in any Forest Experimental Area or in respect of which the Minister has assumed responsibility, do such acts and construct such works as the Minister considers necessary for forestry research and forest protection and management, including the disposal of timber and grass and the granting of rights to the natural produce of the forest.
- The Governor in Council may make regulations for the protection, care and management of lands comprised in Forest Experimental Areas and lands in respect of which the Minister has assumed responsibility, including regulations respecting (a) the cutting, removal and disposal of timber, the establishment and use of reservoirs, water power sites, power transmission lines and communication lines and any other use of those

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>16 |
|                | DATE<br>4 December 2014    | AMENDED    |

lands, and the granting of leases and permits therefore; (b) the protection of the flora and fauna; (c) the prevention and extinguishing of fires; (d) the regulation and prohibition of traffic, the carrying on of businesses and other activities and the abatement and prevention of nuisances; (e) the removal and exclusion of trespassers and of persons failing to comply with the regulations; and (f) the prevention of trespass to property, the mutilation or destruction of trees and the destruction or damaging of buildings, materials or notices used in connection with the administration or management of those lands.

### 3.2.1.7 Appropriations Act

[URL: <http://laws.justice.gc.ca/eng/acts/Z-01/index.html> ]

Allows for Federal Departments to spend the money allotted to them in the course of their duties, which can include emergencies. If insufficient funds are available at the Regional level, funding can be sought from the Branch or Department level. If the requirements go beyond Departmental resources, a submission will be made under the supplementary estimates to Treasury Board. These funds require approval by Parliament.

### 3.2.1.8 Canadian Environmental Assessment Act (S.C. 1992, c. 37)

[URL: <http://laws-lois.justice.gc.ca/eng/acts/C-15.2/> ]

This Act ensures that all projects, funded or regulated by a Federal Department, undergo an environmental assessment (EA). These environmental screenings ensure that all factors have been taken into account in the project design. They can involve larger public reviews such as the one undertaken in the AGM spray program in B.C. in 1992. An EA must be completed before any treatment program is undertaken. CFIA has the responsibility to complete the review, the guidelines of which are found in the EA manual.

### 3.2.1.9 Fisheries Act (R.S.C., 1985, c. F-14)

[URL: <http://laws-lois.justice.gc.ca/eng/acts/F-14/> ]

This Act regulates the uses of "deleterious substances" and pollutants, prohibiting them from being deposited in waters frequented by fish. In most emergencies, fish would be protected under the provisions of pesticide registration and use.

### 3.2.1.10 Aeronautics Act (R.S.C., 1985, c. A-2) and Canadian Aviation Regulations (SOR/96-433)

[Act URL: <http://laws-lois.justice.gc.ca/eng/acts/A-2/> ]

[Regulations URL: <http://www.tc.gc.ca/eng/civilaviation/regserv/cars/menu.htm> ]

Canadian Aviation Regulations 603.65 – 603.68 govern the use of aircraft over populated areas. Transport Canada determines the aircraft type and altitude permitted for any aerial spray programs. They may be important in deciding options to be employed in eradication efforts.

### 3.2.1.11 Species at Risk Act (S.C. 2002, c. 29)

[URL: <http://laws.justice.gc.ca/eng/acts/S-15.3/> ]

An Act respecting the protection of wildlife species at risk in Canada.

New species (potentially invasive or pests) can cause direct harm to either the individual or to the critical habitat or the species residence (i.e. nest) of the species deemed at risk. Additionally,

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>17 |
|                | DATE<br>4 December 2014    | AMENDED    |

eradication or containment measures potentially can cause harm to species at risk. Consideration may need to be given in this regard.

## 3.2.2 Provincial Acts and Regulations

Current versions of British Columbia Acts and Regulations are maintained online by the Queen's Printer and can be accessed at the following URL:

[http://www.bclaws.ca/EPLibraries/bclaws\\_new/content?xsl=/templates/toc.xsl/group=A/las&tsearch=/](http://www.bclaws.ca/EPLibraries/bclaws_new/content?xsl=/templates/toc.xsl/group=A/las&tsearch=/)

**Users of the manual are encouraged to check the most recent version of the applicable acts and regulations when using this manual.** In the following section the name and version of each act as well as the URL (as of 24 January 2012) are provided.

### 3.2.2.1 Plant Protection Act (British Columbia) [RSBC 1996] c. 365

[URL: [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/00\\_96365\\_01](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96365_01) ]

The provincial Plant Protection Act is administered by the Plant and Animal Health Branch of the B.C. Ministry of Agriculture. The Act does not apply to matters specifically regulated under the federal Plant Protection Act. Under authority of this Act, the Lieutenant Governor in Council may make regulations to prevent the spread within B.C. of an insect, pest or disease destructive to plants. The regulations may:

- prescribe the type or manner of treatment and who must carry it out
- provide for collection of the expenses of treatment from the owner
- prohibit the sale or provide for the confiscation or destruction of a plant, root medium or container that is infested or infected or suspected of being infested or infected with an insect, pest or disease destructive to plants
- provide for the discovery of a destructive insect pest or disease and for obtaining and sending specimens
- fix fees payable to the Crown for inspection or other service under the regulations
- establish quarantine areas, and regulate or prohibit the moving of a plant, root medium or container from or into a quarantine area
- To carry out duties under this Act and the regulations, an inspector may:
  - enter premises at any reasonable time for an inspection under this act or regulations
  - inspect the premises, a plant, root medium or container
  - detain or order the detention of a plant, root medium or container
  - carry out or direct the carrying out of treatment
  - on the order of the Minister, confiscate or destroy a plant, root medium or container

Regulations pursuant to the provincial Plant Protection Act are usually specific to one insect, pest, or disease. They include:

- Bacterial Ring Rot
- Balsam Woolly Adelgid
- Blueberry Maggot

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>18 |
|                | DATE<br>4 December 2014    | AMENDED    |

- Golden Nematode
- Little Cherry Disease
- Pear Trellis Rust
- Gypsy Moth

Although federal legislation generally supersedes provincial legislation, the provincial Plant Protection Act has been used in the past to enact regulations, such as those for blueberry maggot, balsam woolly adelgid and gypsy moth which provide a provincial quarantine against the pest beyond the federal Plant Protection Regulations.

### 3.2.2.2 Insurance for Crops Act [RSBC 1996] c. 229 and Continuous Crop Insurance Regulation

[URL: [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/00\\_96229\\_01](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96229_01) ]

[URL: [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/10\\_546\\_95](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_546_95) ]

In B.C., there are 28 crops covered under the B.C. Insurance for Crops Act including grains, forages, tree fruits, berries and vegetables. Not all crops within those categories are covered, for example kiwifruit is not an insurable crop. The crops are insured by the owner against named perils - drought, frost, hail and for some vegetable crops, uncontrollable insect and disease damage (either pesticides are unavailable or ineffective). Destruction of crops due to the eradication of a pest can be by Crop Insurance. Compensation for losses of this nature is made under the Plant Protection Regulations. If a pest is not named in the regulations, a new regulation must be enacted to cover it.

### 3.2.2.3 Forest Act [RSBC 1996] c. 157

[URL: [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/96157\\_00](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/96157_00) ]

Section 8. Allowable Annual Cut: The chief forester must determine an allowable annual cut at least once every 5 years after the date of the last determination

Section 72. Removal of dead or damaged timber on lands under an area based tenure

Section 73. Removal of dead or damaged timber from a TSA

### 3.2.2.4 Ministry of Forests and Range Act [RSBC 1996] c. 300

[URL: [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/00\\_96300\\_01](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_96300_01) ]

Section 4 (b) empowers the Ministry to manage, protect and conserve the forest and range resources of the Crown.

Section 6 (a) states that the Minister may enter into an agreement or arrangement with any person or Province or Canada relating to the Minister's duties, powers and functions.

### 3.2.2.5 Forest and Range Practices Act [SBC 2002] c. 69

[URL: [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/00\\_02069\\_01](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_02069_01) ]

This Act and the attendant regulations set out the responsibilities in the management and harvesting of forest resources in B.C., and include regulations, such as the Forest Practices and Planning Regulations (FPPR) which relates to pest control.

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>19 |
|                | DATE<br>4 December 2014    | AMENDED    |

Section 25. Sanitation exemption: The minister may exempt a person in writing from specified provisions of this Act, the regulations or the standards if the minister considers it necessary or desirable so that the person may follow a course of action specified by the minister for the purposes of limiting or mitigating or both limiting and mitigating the spread of forest pests

Section 26. Control of insects, disease, etc.

(1) If the minister determines that on

- (a) private land, or
- (b) Crown land that is subject to an agreement under the *Forest Act*,

there are insects, diseases, animals or abiotic factors that are causing damage to a forest, then, by written notice given to the owner of the private land, to the holder of the agreement under the *Forest Act* or to the timber sales manager, the minister may request the owner, holder or timber sales manager to propose reasonable measures, within the time specified by the minister, to control or dispose of the insects, diseases, animals or abiotic factors.

Section 27. Forest Health Emergency If the Lieutenant Governor in Council considers that a forest health emergency exists in an area of Crown land or private land, he or she may designate the area by regulation as a forest health emergency management area.

(2) The minister may order:

- (a) the holder of an agreement under the *Forest Act* that authorizes timber harvesting in the emergency management area, or
- (b) the timber sales manager

to carry out measures in the emergency management area, limited in the case of the holder, to the area of the holders agreement, to prevent, contain or limit the spread of forest health factors.

Section 47. Invasive Plants

A person carrying out a forest practice or a range practice must carry out measures that are:

- (a) specified in the applicable operational plan, or
- (b) authorized by the minister

to prevent the introduction or spread of prescribed species of invasive plants.

## Forest Practices and Planning Regulations (B.C. Reg. 14/2004)

[URL: [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/12\\_14\\_2004](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/12_14_2004) ]

Section 41. Modification of insect behaviour

A person who uses trap trees or pheromones to concentrate insect populations must ensure that the insect brood is destroyed before the insects emerge.

### 3.2.2.6 Integrated Pest Management Act and Regulation [SBC 2003] c. 58

[URL: [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/00\\_03058\\_01](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_03058_01) ]

This Act and Regulations cover use and sale of pesticides in B.C. In terms of an emergency, some potentially relevant requirements are:

- Pesticides employed must be federally registered and used in accordance with the label.
- Certificate, Licence, Confirmation or Permit may be required

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>20 |
|                | DATE<br>4 December 2014    | AMENDED    |

- Certificate for use of pesticides by individuals is required;
  - For use of permit-restricted and restricted class pesticides
  - To obtain a licence
- Licence for use of pesticides is required;
  - To provide or offer to provide any service respecting pesticides
  - To use a pesticide for a prescribed use (IPMR section 5) some examples are:
    - Forest pests on private land used for timber production,
    - Forest pest on not more than 20 ha a year of public land used for timber production and managed by a single entity,
- Confirmation of receipt of a pesticide use notice is required
  - To use a pesticide for a prescribed use (IPMR section 24), some examples are:
    - The management of forest pests on more than 20 ha a year of public land that are used for timber production or forested and managed by a single entity.
- Permit for use of pesticides is required:
  - To use of permit-restricted pesticides
  - To use a pesticide for a prescribed use (IPMR section 18), some examples are:
    - Aerial applications of a pesticide. Some exceptions are applications to private land used primarily for agriculture and some aerial applications of Schedule 4 pesticides (*Bacillus thuringiensis* var. *israelensis*, *Bacillus thuringiensis* var. *kurstaki*, glyphosate, nuclear polyhedrosis virus and *Bacillus sphaericus*).
    - Use of most non-excluded pesticide in or on a body of water.
    - Use of a pesticide on public land unless a licence or a confirmation is required

In order to apply pesticides for an eradication program, a pesticide use permit may be required. Details concerning the application procedure and time lines are available from regional offices of The B.C. Ministry of Environment (BCMOE).

An important aspect of the permit process is the right of citizens to appeal against the permit. The appeals are heard by the Environmental Appeal Board which operates under the jurisdiction of the Act.

### 3.2.2.7 Environmental Management Act [SBC 2003] c. 53

[URL: [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/03053\\_00](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/03053_00) ]

Section 87 of this Act allows the Minister to declare an environmental emergency and may order labour, services, material, equipment or facilities or allow the use of land for the purposes of preventing, lessening or controlling the hazard.

Note: An environmental emergency is defined by B.C. Ministry of Environment as:

an occurrence or natural disaster that affects the environment and includes the following:

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>21 |
|                | DATE<br>4 December 2014    | AMENDED    |

- (a) a flood;
- (b) a landslide;
- (c) a spill or leakage of oil or of a poisonous or dangerous substance.

Any compensation under this Act may be fixed by arbitration under the Commercial Arbitration Act.

Revenue required for use in a declared emergency may be paid out of the Consolidated Revenue Fund without an appropriation under Section 88 of the Environmental Management Act.

It is arguable whether a plant health emergency would be an environmental emergency as defined by B.C. Ministry of Environment.

### 3.2.2.8 Other Acts and Regulations which may be relevant in an emergency

There may be a necessity to use municipal statutes. These may be obtained either through the municipality in question, or through the Union of B.C. Municipalities.

Where pesticides are being employed in an eradication program, public health is always of a major concern to municipalities. Health impacts are evaluated during the federal pesticide registration process, so any registered pesticide is considered safe for the label uses. However, municipal health authorities should always be involved where there is public concern.

In recent years, municipalities have passed bylaws limiting pesticide use for 'cosmetic' purposes in residents' backyards and on city property ("cosmetic pesticide bans"). The BC Community Charter ([SBC 2003] c. 26 – [http://www.bclaws.ca/EPLibraries/bclaws\\_new/document/ID/freeside/03026\\_00](http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/03026_00)) provides guidance for municipalities wishing to create these types of bylaws, and the Charter also outlines where the municipalities do not have jurisdiction, in particular, when significant pests of agriculture and forestry are concerned. In addition, the Charter allows municipalities to pass bylaws requiring management of alien invasive species or other noxious pests ("noxious pest bylaws"). Additionally, allowance is made for exemptions to the ban, and discussions with the municipalities may be needed to clarify which pests and management practices should be exempt.

Federal and Provincial legislation will supersede municipal bylaws in emergency situations.

## 3.3 Roles and Responsibilities of Participants

### 3.3.1 Introduction

Declaration of a Plant Health Emergency is as dependent upon the scope, intensity and speed of response needed to deal with the incursion of a high-risk species as it is upon the degree of damage anticipated. A situation, even at the extreme danger level, that can be eradicated or contained within normal operational resource parameters of Canadian Food Inspection Agency for example, will not constitute an emergency as defined by BCPPAC. It is when the scope of the response exceeds the mandate, funding base, or expertise of a single agency that BCPPAC will become involved, when the guidelines and procedures contained in this manual will be used to evaluate and qualify the situation, and when the BCPPAC executive will forward recommendations to the Critical Plant Pest Management Committee, and other senior officials

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>22 |
|                | DATE<br>4 December 2014    | AMENDED    |

and decision-makers. It is here that a framework will be required to develop and designate roles and responsibilities for interagency cooperation.

The emergency operation should be organized and based on the available strengths and expertise within the BCPPAC membership. External participants may be required, especially for large operations. These participants, then, will constitute membership of the Emergency Action Team and the Project Steering Committee (Section 4.6 ).The Steering Committee will assume the critical liaison/linkage with the BCPPAC Executive, the Emergency Operations Team, the BCPPAC Technical Advisory Committee, external advisors, and any other essential groups or individuals. It should be expected, and indeed considered desirable, that some highly-qualified and experienced individuals will have involvement in more than one coordinating/facilitating capacity.

### **3.3.2 Roles of Participants**

The roles of the participating agencies and organizations will likely be classified as LEAD (= the KEY partner), SUPPORT, or MONITORING (PASSIVE).

- The LEAD role is usually determined by agreement based on senior legislation, operational mandate and capability, and available resources.
- SUPPORT roles can likewise be determined on the basis of companion statutes, regulatory requirements, policies and special interests relating to plant health in this province. A Support role implies significant contributions to assure success of the emergency operation, including allocation of resources.
- It should be expected that other agencies, organizations or special interest groups might participate in a passive fashion, without direct representation or involvement. However, their role as a MONITORING participant should be identified and considered during planning and in the overall structure of the emergency response organization.

For example, dangerous situations which trigger national or international quarantine and certification functions would place CFIA in the lead role. Provincial forest or agriculture ministries might assume the lead role in cases where a non-indigenous species was newly found in B.C., but known and established elsewhere in Canada.

Support roles arise from either mandated responsibilities of other agencies or from the need for special expertise or services. The guardian nature of environmental agencies or the availability of Certain equipment of forest fire fighters could cause involvement as important agencies occupying support roles. The spirit associated with "good neighbour" policies and shared concern within the BCPPAC membership will likely justify support role involvement of others.

Monitoring roles might be assigned for similar reasons. However, the role might be advisory or regulatory as functions of federal or provincial statutes, local / municipal requirements, to incorporate the concerns and advice of plant industry associations, or because of the imperative to provide complete and accurate information. For example, review of project plans for consideration of environmental side-effects of an eradication treatment, issuance of a provincial pesticide use permit, coordination of citizens' concerns, and advice from a local Health Unit might be identified and formalized as monitoring roles.

### **3.3.3 Responsibilities of Participants**

Limitations on responsibilities attached to Lead, Support and Monitoring Roles will be early considerations during the problem evaluation (Flowchart, Section 4.1.2 ) and response (Section 4.6 ) phases. It should be expected that considerable review, negotiation and communication will be required by potential participants, BCPPAC executive and senior administrators. The nature of

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>23 |
|                | DATE<br>4 December 2014    | AMENDED    |

the threat to plant health, the importance of the threatened plants, past experiences, current policies, the likely consequences of no action, and consideration of treatment methods, costs and odds for success - along with many other variables - will likely define the levels of involvement and responsibility for each participant.

The BCPPAC Executive and the standing Technical Advisory Committee (TAC) should be instrumental in facilitating negotiations and decisions.

### 3.3.4 A Matrix for Roles and Responsibilities

It is best to apply maximum cooperative effort and all available resources at the earliest possible opportunity. A few reference documents and charts will be necessary to identify roles and responsibilities of the participants and as attachments to the operational plan and Memorandum of Understanding (Section 4.4 and Foreword), and Agreement on Emergency Treatment (Section 4.5).

A simple matrix to identify the participants, the critical responsibilities and activities, and the level of involvement will be an early requirement for declaration of the emergency and for implementation of the program. A summary tabulation for quick reference should be constructed on the model below. This example is limited to three federal departments and four provincial ministries for identifying their involvement in only six activities/responsibilities. The reader is cautioned that many more roles and responsibilities are likely to be required for others in a real plant health emergency.

**Figure 1. Emergency response roles and responsibilities matrix\***

| Emergency Response: Roles & Responsibilities |                       |                   |         |          |         |                           |
|--|-----------------------|-------------------|---------|----------|---------|---------------------------|
| PARTICIPANTS                                 | OPERATIONAL<br>POLICY | PUBLIC<br>AFFAIRS | FUNDING | STAFFING | SURVEYS | RESEARCH &<br>DEVELOPMENT |
| Canadian Food<br>Inspection Agency           |                       |                   |         |          |         |                           |
| Federal Agriculture                          |                       |                   |         |          |         |                           |
| Federal Forestry                             |                       |                   |         |          |         |                           |
| Provincial Agriculture                       |                       |                   |         |          |         |                           |
| Provincial Forestry                          |                       |                   |         |          |         |                           |
| Prov. Municipal Affairs                      |                       |                   |         |          |         |                           |
| Provincial Environment                       |                       |                   |         |          |         |                           |

\*For consideration during each outbreak phase (i.e., emergency, early establishment, resident pest – see Figure 2).

Thus, with due consideration for mandated responsibilities and current administrative realities, basic division or sharing of roles might be displayed using the following symbols:

- L** = Lead Role, Major Responsibility
- S** = Support Role and Responsibility
- M** = Monitoring Role

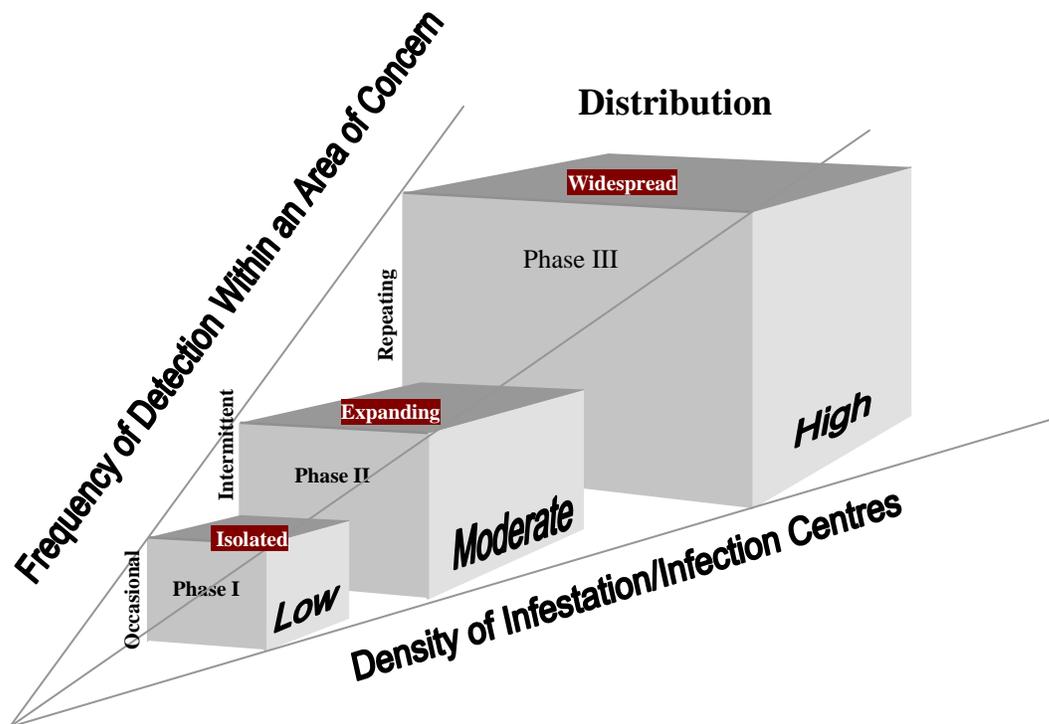
# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>24 |
|                | DATE<br>4 December 2014    | AMENDED    |

### 3.3.5 Dealing with Change

One certainty in B.C. and everywhere else is that the acknowledged emergency situation, and thus roles and responsibilities, will change over time. The matrix above, for example, may expand or condense during a single-season operation. It will surely change should the status of the non-indigenous/ threatening species change or persist over a number of years. Thus, despite eradication treatments and other emergency response procedures, over time it might spread to new locations and it might occur at higher densities from year-to-year.

**Figure 2. Three phases of a plant health emergency based on number of specimens detected**



### Phases of a Plant Health Emergency

These changes will require a long-term perspective and an understanding that planning for changing roles and responsibilities will be desirable. The matrix above can be useful in consideration of temporal changes occurring in three phases:

- PHASE I - First year; few specimens detected, very limited/localized distribution; odds for eradication considered excellent.
- PHASE II - First to third year; still limited number of specimens; some spread; occurrence intermittent or erratic; density still mostly low; chance still exists for eradication; containment possible.

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>25 |
|                | DATE<br>4 December 2014    | AMENDED    |

- PHASE III - Infestation/infection centres increasing, numbers growing; repeating occurrence same locations for several years; eradication/containment likely at some new centres only.

Simple examples to depict these changes in status of the non-indigenous species as well as for roles and responsibilities within the BCPPAC matrix follow below. In this case, consider the 1992 Asian Gypsy Moth Eradication Program case study (Section 6.4 ) and extend this situation over a five- to ten-year horizon:

**Figure 3. Hypothetical Example: Emergency Response: Roles & Responsibilities – Phase I.**

| Emergency Response: Roles & Responsibilities – Phase I |                    |                |         |          |         |                        |
|--|--------------------|----------------|---------|----------|---------|------------------------|
| PARTICIPANTS   | OPERATIONAL POLICY | PUBLIC AFFAIRS | FUNDING | STAFFING | SURVEYS | RESEARCH & DEVELOPMENT |
| Canadian Food Inspection Agency                        | L                  | L              | L       | L        | L       | L                      |
| Federal Agriculture                                    | S                  | S              | S       | S        | L       | L                      |
| Federal Forestry                                       | S                  | S              | S       | S        | L       | L                      |
| Provincial Agriculture                                 | S                  | S              | M       | S        | L       | S                      |
| Provincial Forestry                                    | L                  | L              | S       | L        | L       | L                      |
| Prov. Municipal Affairs                                | S                  | S              | M       | M        | M       | S                      |
| Provincial Environment                                 | S                  | S              | M       | M        | M       | L                      |

**L** = Lead Role, Major Responsibility  
**S** = Support Role and Responsibility  
**M** = Monitoring Role

Phase I conditions will prevail as long as density is low, locations are few and senior administrators support the BCPPAC recommendations for continued assertive action:

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>26 |
|                | DATE<br>4 December 2014    | AMENDED    |

**Figure 4. Hypothetical Example: Emergency Response: Roles & Responsibilities– Phase II**

| Emergency Response: Roles & Responsibilities – Phase II |                    |                |         |          |         |                        |
|---|--------------------|----------------|---------|----------|---------|------------------------|
| PARTICIPANTS  | OPERATIONAL POLICY | PUBLIC AFFAIRS | FUNDING | STAFFING | SURVEYS | RESEARCH & DEVELOPMENT |
| Canadian Food Inspection Agency                         | L                  | L              | L       | L        | L       | L                      |
| Federal Agriculture                                     | L                  | L              | S       | L        | L       | L                      |
| Federal Forestry  | L                  | L              | S       | L        | L       | L                      |
| Provincial Agriculture                                  | L                  | L              | S       | S        | L       | S                      |
| Provincial Forestry                                     | L                  | L              | L       | L        | L       | L                      |
| Prov. Municipal Affairs                                 | S                  | S              | M       | M        | M       | S                      |
| Provincial Environment                                  | S                  | L              | M       | M        | M       | L                      |

**L** = Lead Role, Major Responsibility  
**S** = Support Role and Responsibility  
**M** = Monitoring Role

The intermediate Phase II can be envisioned when eradicated treatments have not been entirely successful, when new and increasing number of introductions and some damage occur, or when the resources for an emergency program (as for a Phase I situation) are stretched to or beyond the limit of the usual participants. Odds for eradication are reduced; extra effort is required. Important changes in roles are required and responsibilities are now different:

**Figure 5. Hypothetical Example: Emergency Response: Roles & Responsibilities– Phase III**

| Emergency Response: Roles & Responsibilities – Phase III |                    |                |         |          |         |                        |
|--|--------------------|----------------|---------|----------|---------|------------------------|
| PARTICIPANTS   | OPERATIONAL POLICY | PUBLIC AFFAIRS | FUNDING | STAFFING | SURVEYS | RESEARCH & DEVELOPMENT |
| Canadian Food Inspection Agency                          | S                  | S              | S       | S        | M       | S                      |
| Federal Agriculture                                      | L                  | L              | L       | L        | L       | L                      |
| Federal Forestry   | L                  | L              | L       | L        | L       | L                      |
| Provincial Agriculture                                   | M                  | M              | M       | S        | M       | M                      |
| Provincial Forestry                                      | L                  | L              | L       | L        | L       | L                      |
| Prov. Municipal Affairs                                  | M                  | M              | M       | M        | M       | M                      |
| Provincial Environment                                   | M                  | M              | M       | M        | M       | M                      |

**L** = Lead Role, Major Responsibility  
**S** = Support Role and Responsibility  
**M** = Monitoring Role

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>27 |
|                | DATE<br>4 December 2014    | AMENDED    |

Finally, only some opportunity for emergency response might exist in a Phase III situation. In the interest of maintaining pest-free zones within the province or spread to other jurisdictions, BCPPAC might facilitate some eradication or containment projects. In this near resident-pest situation, significant changes in roles and responsibilities might be expected.

British Columbia's geographical position will require superior survey and emergency response capability in the years ahead. Past experience and current realities demand close cooperation and pooling of resources for continuing successful programs in the future. Recognition and assumption of roles and responsibilities as described above will constitute an essential ingredient towards this end.

### **3.3.6 Afterword — On the Framework of Interagency Cooperation**

As in the recent past in B.C., two or more levels of government, the concerned industry or its organizations, and perhaps additional groups might provide members and other resources for the project Steering Committee and the Emergency Action Team (Sections 3.3 ). For purposes of discussion and development, for planning and for assigning roles and responsibilities, it will be useful to clearly depict each participant according to both specific activity and level of involvement.

The participants and their commitment to the project can be illustrated in as simple three-dimensional matrix as shown above. Here, involved agencies of government and other participants can be listed with brief notation of role and responsibility according to activities required for a successful interagency operation, e.g.:

1. Vertical axis / left-hand column— List participants by order of importance
2. Horizontal axis/other columns— Give headers to columns for each activity
3. "Third Dimension" — Level of involvement (Section 2.1 ), for example:
  - o Lead (key) role, major responsibility
  - o Support role and responsibility
  - o Monitoring (passive) role only

If the problem persists, or if it occurs intermittently over a number of years, it is likely that this framework (developed for Year 1, for example) will also be useful for review purposes and for dealing with changes in roles and responsibilities over time. Changes in frequency of occurrence and distribution of the threatening non-indigenous species (as well as changes in the mandate or policy of the co-operators) will be critical in framing continuing interagency relationships.

Changes in roles and responsibilities can be related most readily to the status of the current emergency situation. If new (Phase I), and chances for eradication are considered good or better, then the senior legislated agency will likely assume the lead/key role. This role might change over time for a variety of reasons, but it will likely survive longest if backed by active supporters able to provide some of the required resources.

A continuing emergency situation, say over a five year period, might require considerable change in roles and responsibilities, particularly if the problem is spreading, if eradication is unsuccessful, or if additional resources are required. Mandated by supporting legislation or policy, the situation might now be considered as Phase II, and some of the co-operators might now assume a key role within the same operational framework. In Phase II, some of the work might be classified as "containment" - to slow or prevent further spread.

# Plant Health Emergency Manual

|                |                            |            |
|----------------|----------------------------|------------|
| Section<br>3.0 | Roles and Responsibilities | Page<br>28 |
|                | DATE<br>4 December 2014    | AMENDED    |

Finally, after many years of only partially successful emergency response operations, or because of exceptionally rapid spread and establishment, BCPPAC might consider the problem at the Phase III level -where the non-indigenous species is becoming established. At this point, operations might be framed, planned and conducted as if the species was a resident pest; perhaps only a few special containment operations would be conducted under the emergency response framework.

**NOTE:** It is most important to apply maximum efforts and resources early in an emergency response program, i.e. Phase I, especially under conditions of High/Extreme Danger (Section 4.1 ).

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>29 |
|                | DATE<br>4 December 2014          | AMENDED    |

## 4.0 Emergency Response Procedures

### 4.1 *Danger Analysis: Determining the Nature of a Threat*

#### 4.1.1 Introduction

New non-indigenous species (with a potential to become pests) may be encountered by staff of a number of organizations. An inspector at a border point, harbour, and/or the importer's premises may detect a new insect in a shipment; a forester may detect a new disease in trees; or an extension officer may discover a new insect when responding to a public inquiry. Often the initial assessment following this first interception can be critical in the eventual outcome of the issue. Generally speaking, initial response to new interceptions is the legislated responsibility of the Canadian Food Inspection Agency (CFIA), although they are not always the first to detect the presence of a new species. Employees in other organizations should immediately contact the local CFIA office when a new pest species is discovered. Often other organizations will join with CFIA in responding to a new introduction.

For the purposes of this manual, the following definitions have been adopted:

|   |  |
|---|--|
| <b>Non-Indigenous:</b>                  | A species which occurs in an area beyond its native range or its potential native range (i.e. the area into which a species would disperse in the absence of significant human influence). This term includes species at other times referred to as “alien”, “exotic”, “foreign”, or “introduced”. |
| <b>Pest:</b>                            | Any species, strain or biotype of plant, animal or pathogenic agent injurious to plants or plant products [FAO, 1990; revised FAO, 1995; IPPC, 1997] (FAO 2010)  |
| <b>Containment</b>                      | Application of phytosanitary measures in and around an infested area to prevent spread of a pest [FAO, 1995] (FAO 2010)  |
| <b>Eradication (Eradicate)</b>          | Application of phytosanitary measures to eliminate a pest from an area [FAO, 1990; revised FAO, 1995; formerly eradicate (FAO 2010)  |
| <b>Establishment (Established):</b>     | Perpetuation, for the foreseeable future, of a pest within an area after entry (FAO, 1990; revised FAO, 1995; IPPC, 1997; formerly “established”)  |
| <b>Incursion</b>                        | An isolated population of a pest recently detected in an area, not known to be established, but expected to survive for the immediate future (FAO 2010)  |
| <b>Interception:</b>                    | The detection of a pest during inspection or testing of an imported consignment [FAO, 1990; revised CEPM, 1996] i.e. the detection of a pest before it reaches the natural environment   |
| <b>Introduction:</b>                    | The entry of a pest resulting in its establishment [FAO, 1990; revised FAO, 1995; IPPC, 1997]  |
| <b>Surveillance</b>                     | An official process which collects and records data on pest occurrence or absence by survey, monitoring or other procedures [CEPM, 1996] (FAO 2010)  |
| <b>Risk:</b>                            | For this evaluation, risk is defined as the probability of a newly-discovered non-indigenous species becoming permanently established and attaining pest status.   |
| <b>pest risk (for quarantine pests)</b> | The probability of introduction and spread of a pest and the magnitude of the associated potential economic consequences (see Glossary Supplement No. 2) [ISPM No. 2, 2007] [FAO 2010])  |

# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>30 |
|                | DATE<br>4 December 2014          | AMENDED    |

**pest risk (for regulated non-quarantine pests) Hazard:**

The probability that a pest in plants for planting affects the intended use of those plants with an economically unacceptable impact (see Glossary Supplement No. 2) [ISPM No. 2, 2007] ] (FAO 2010)

In this evaluation, hazard defines the nature and vulnerability of the host species.

**Danger:**

A rating which attempts to quantify the degree of threat posed by a non-indigenous species as expressed by the Risk and Hazard Ratings.

The following list of considerations should be used to make the early decisions around such an interception. However, this list is intended as a guide and each pest should be considered on its own merits. The goal of this section is to assist in making two key decisions, namely: "Is the interception a new pest?" and, if so "Is eradication feasible?" The most critical information needed for an initial assessment of the threat posed by a new plant pest incursion or introduction is knowledge of the organism's distribution. Workers discovering new introductions or incursions are encouraged to rapidly delimit the pest's distribution in the province.

## 1. Pest Considerations

- Has the pest been conclusively identified (by CFIA or other expert taxonomists) and the identification recognized by the CFIA?
- Who are the local experts?
- Is the organism a pest?
- In what way is the interception considered a pest, i.e., what is the form of damage the pest is capable of?
- Is the pest actually new and, if so, new to what area? (versus where it is already established)
- Is the pest similar to other locally established pests? Has it already spread, i.e., can we make any assumptions based on the relationship? Is this interception already established but not detected until now?
- How long might the pest have been where it was intercepted, i.e. attempted introductions or an early established introduction?
- Is the pest still contained?
- Does spread make future containment possible?
- Has the initial introduction already resulted in spread and, if so, do we know the extent of distribution?
- What would be required to determine the extent of distribution?

## 2. Impact Considerations

- How damaging is the pest to host material in B.C./Canada/North America?
- What is the economic value of the affected hosts?
- Are there environmental impacts from the pest?
- Are there likely to be trade restrictions placed on B.C. goods if the pest became established?
- Are there any human health implications to the pest?
- Is there a societal impact (i.e. aesthetics, etc.)?

## 3. Containment/Control/Eradication Considerations

- What means are available to contain the pest in its current situation? At what costs?
- What legal treatments are available to deal with the pest as it is now?
- What legal treatments would be available if it spread?
- What is the practical feasibility of proposed immediate response actions?

# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>31 |
|                | DATE<br>4 December 2014          | AMENDED    |

- What would the predicted follow-up actions be if immediate action was unsuccessful or did not occur?

## 4. Mandate and Administrative Considerations

- Who owns the infected/contaminated material or land?
- Who has the mandate to respond?
- What is the rough cost estimate of the immediate response action plan?
- Can the immediate action plan be delivered by one agency or will partners be required?
- Can the immediate action plan be financed by the organization identified above or can it be financed by an interagency team as described by the Initial Response Enabling MOU (Section 4.4 )?

## 5. Summary

The questions above will act as a guide for the individual or team involved in the investigation of an apparent new introduction. Close contact should always be maintained with the organization holding the appropriate mandate. To the extent possible, immediate containment should be done to prevent spread, and specimens should be taken for authoritative identification. Based on the answers to the questions, key people within BCPPAC will ratify an immediate response action plan, an eradication plan, or some other form of action (Section 4.3 ).

In addition to the list of questions relating to the non-indigenous species of concern, potential impacts, response and administrative considerations, it is suggested that all of these factors be organized for systematic analysis by members of a BCPPAC expert committee or assigned staff specialists. Technical considerations especially must be segregated and evaluated separately: What is the nature of the threat? What is this non-indigenous species? How vulnerable are the potential plant hosts? What are the secondary effects of attack or infection? What is the magnitude of this threat? In other words, what is the Danger level: Extreme, Serious, Moderate, Minor/Low or Nil?

The balance of this deals with these and other questions.

### 4.1.2 Procedure Flow

The first response by BCPPAC is initiated by reporting the introduction of a non-indigenous species to the BCPPAC Executive. Where possible the initial report should contain any readily available information: on the identity of the pest; its known range in B.C.; and any other data which would allow the Executive to assess the need for further action. Following this initial assessment, one of two outcomes is possible: (1) a further technical evaluation of threat is required; or (2) no immediate threat is perceived, no further action is required at this time. Should option (2) be selected at this stage, it is recommended that the perceived pest status of the non-indigenous species be periodically re-evaluated to confirm the initial assessment.

A Danger Analysis is initiated at the request of the BCPPAC Executive to provide additional technical information. At this stage in the process, a Technical Advisory Committee or similar group is assigned to conduct a formal assessment of the potential pest status of the non-indigenous species as per methodology outlined below. This process is intended to provide a timely report (within 2 weeks) for consideration by the Executive. All readily available sources of data on the non-indigenous species, its known or potential pest status, host range, geographic range should be briefly summarized for the Executive. The completed Technical Report, including an evaluation of the potential pest status of the introduction is forwarded to the Executive for

## Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>32 |
|                | DATE<br>4 December 2014          | AMENDED    |

further consideration. Additionally, the Technical Report is shared with the Critical Plant Pest Management Committee (CPPMC).

Following consideration of the Technical Report, the BCPPAC Executive will make recommendations for any subsequent actions to the introduction. Should the introduction be perceived to be a threat to plant health in B.C., the Executive will formally request the implementation of appropriate action(s) by the responsible agency/agencies. Should additional resources be needed, the CPPMC may need to meet and discuss.

Following acceptance of the BCPPAC recommendations for action by the agencies responding to the introduction, appropriate pest-specific MOUs are developed as required (Section 4.4 and 4.5 ) and an emergency operations team is organized.

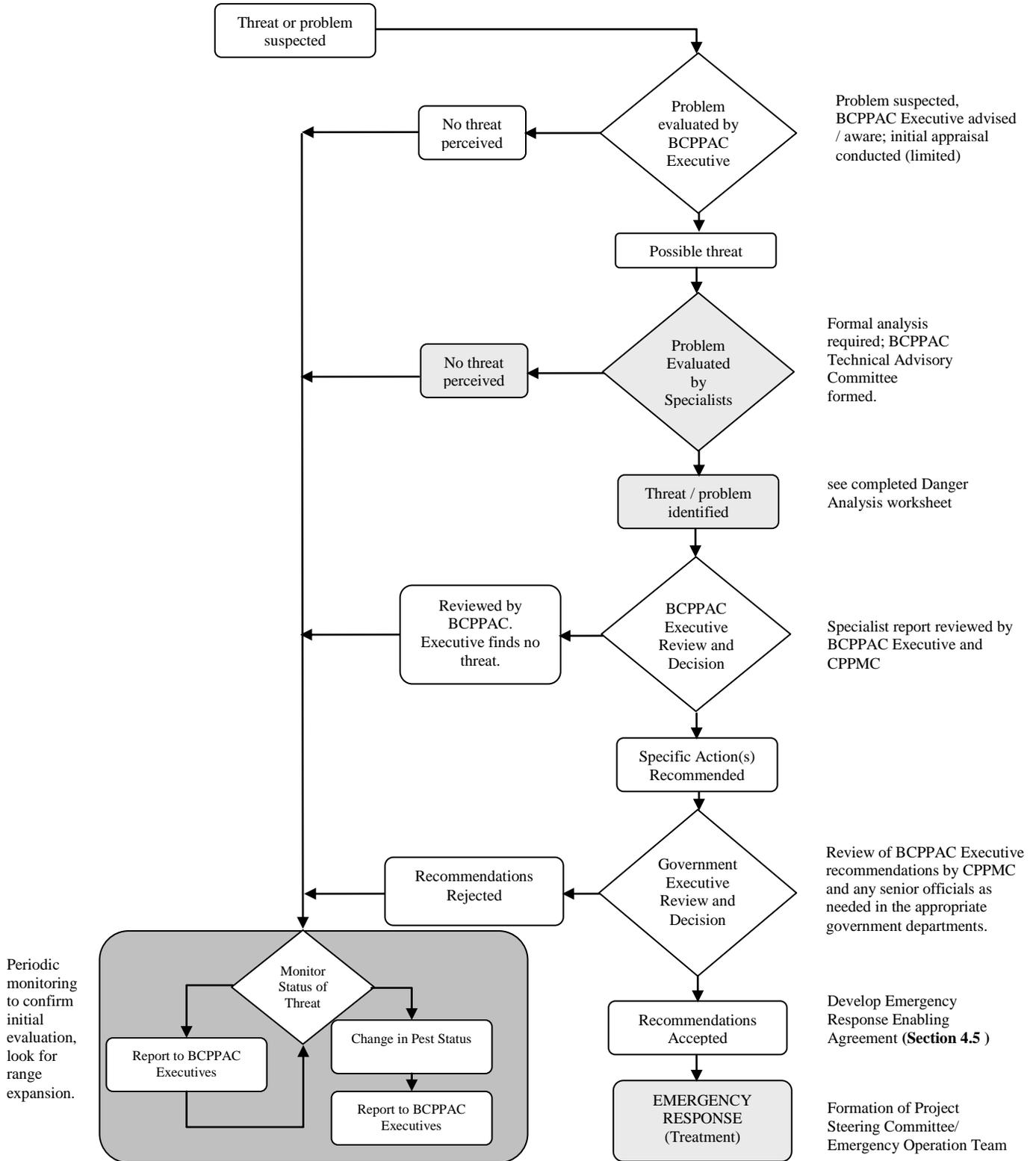
It should be noted that for each stage in the decision making process, the decision for no further action leads to the same alternate action, "Monitor Status of Threat". This action has been introduced into the evaluation process to ensure that any non-indigenous introduction is periodically monitored (on an increasingly infrequent basis if its status doesn't change), for any evidence in a change of its pest status (i.e., rapid expansion, host shift etc.). Non-indigenous introductions/interceptions requiring periodic re-evaluation to confirm their status are identified in Section 6.1 (as Status 3 or 4).

The following flowchart outlines the procedural guidelines recommended by BCPPAC to evaluate a pest threat in British Columbia.

# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>33 |
|                | DATE<br>4 December 2014          | AMENDED    |

**Figure 6. Procedural guidelines to evaluate a pest threat**



# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>34 |
|                | DATE<br>4 December 2014          | AMENDED    |

### 4.1.3 Danger Analysis

This section is intended to provide guidelines which will allow the user(s) to determine the potential threat posed by a non-indigenous species to plant health following its initial discovery in British Columbia or outside of its known range in British Columbia. This section assumes that:

- An initial report of the occurrence of the species and concerns about the potential or known pest status of the species has been made to the BCPPAC Chairperson or alternate on the Executive;
- All members of the BCPPAC Executive have been notified of the occurrence of the species in question and have been supplied with report outlining initial concerns (each member should be notified and should confirm receipt of notification by fax or e-mail);
- BCPPAC Executive have met to evaluate the initial report (e.g. by conference call) and have concluded that sufficient evidence exists to suggest that a more detailed evaluation of the potential threat is required and either a BCPPAC Initial Response Squad (Sections 4.6 and 4.7) or a pest-specific committee (Section 3.1; Sections 4.6 and 4.7) has been appointed to evaluate the threat.

This process is intended to provide a timely (within 2 weeks), concise (2 pages) and technical evaluation of the non-indigenous species in question. The report is prepared under the auspices of and for the Executive of BCPPAC and is intended to provide the Executive with the necessary information to determine if any further action by BCPPAC is warranted.

The suggested equation for rating the technical and biological factors to facilitate a report is:

$$\text{DANGER} = \text{RISK} + \text{HAZARD}$$

The factors for Risk and Hazard can be listed and rated numerically. In the examples which follow 10 points are used for Risk and Hazard; when added together the total will not exceed 20. Further, to qualify the danger level point ranges as suggested below, they might be translated to descriptions in order to facilitate executive consideration; i.e.

| Danger Level | Points <sup>1</sup> |
|--------------|---------------------|
| Extreme      | 18-20               |
| Serious      | 14-17               |
| Moderate     | 10-13               |
| Minor / Low  | 1-9                 |
| Nil          | 0                   |

### 4.1.4 Risk Rating

For BCPPAC purposes, the first factors to consider for systematic analysis of a perceived threat to plant health are those associated with the non-indigenous species itself. That is, the committee or team of staff specialists must consider the biological attributes seasonal occurrence, reproductive potential, life history and habits/etiology, rate of dispersal, and any other features

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<sup>1</sup>Because half points can occur during either Risk Rating or Hazard Rating; the Danger value Obtained may require rounding before a determination of Danger Level based on point ranges assigned above can be made. In cases where the direction of rounding would result in the assignment of differing Danger Levels, the assessment committee shall consider all factors before assigning either Danger Level.

# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>35 |
|                | DATE<br>4 December 2014          | AMENDED    |

which will allow appraisal of the species as a threat to host plants, their ecological associates and their survival.

It is suggested that for rating the risk (probability) of a species entering, establishing and spreading in B.C., each of the ten factors listed below (or other appropriate substitutions) be rated on a three option value scale:

- 1.0—Risk, according to biological and temporal considerations, is HIGH
- 0.5—Risk, moderated by biological, temporal factors, is MODERATE
- 0.0—Risk, limited by biological and temporal considerations, is LOW

**Figure 7. Risk factor descriptions**

| RISK FACTOR |  | DESCRIPTION/ GUIDELINES  |
|-------------|--|--|
| 1.          | <b>Current and/or historical status</b>            | Recognized as a pest—on CFIA, EPPO, APHIS lists; previous records as non-indigenous risk, especially concerning ease of entry, and establishment   |
| 2.          | <b>Life history/ habits/ etiology</b>              | Attributes of the species related to 1 above, e.g. number of generations , duration of a generation  |
| 3.          | <b>Mobility/ expected spread</b>                   | Rapid, moderate/ intermittent, slow  |
| 4.          | <b>Containment/ eradication potential</b>          | Considering Factors 1-3 above, rate degree of difficulty for eradication or containment of species as: High (1); Moderate (0.5); or Low (0).   |
| 5.          | <b>Vector/ Vectored</b>                            | Is this species a vector for another (rate); is it vectored or transported by another species (rate); consider factors 1-3 again regarding the relationship  |
| 6.          | <b>Pathway analysis</b>                            | Consider commerce/ trade/ travel influences, human parameters, relationships affecting or enhancing Factors 1-5 above  |
| 7.          | <b>Natural enemies/ barriers</b>                   | Evaluate and rate those local or regional biological factors affecting entry, establishment, spread. Rate in reverse, e.g. if there are few factors which would prevent entry, establishment or spread the value assigned is 1.0 |
| 8.          | <b>Related environmental or social connections</b> | Does the species induce side-effects/ related impacts; human health consideration; nuisance value; negative biological/ intraspecific competition (secondary impacts to other flora and/ or fauna)                               |
| 9.          | <b>Temporal analysis</b>                           | Biological influences related to time of year or time of day; those variables associated with climatic or geographical influences on the non-indigenous species  |
| 10.         | <b>Technical knowledge</b>                         | Knowledge level from literature or experts concerning Factors 1-6; rate in reverse – if level is low = 1; moderate = 0.5; and high = 0. If there is none or limited literature, then rating is high.                             |

The cost/benefit of various approaches must be determined. A minimum of three treatment options should be evaluated and compared. Again, short-term costs/benefits of an early **eradication** program should be compared to costs/benefits of a longer term **containment** program. Public consultation concerning treatment must occur at an early date — after confirmation of the emergency situation or sooner.

Examples of other Risk Assessment approaches:

# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>36 |
|                | DATE<br>4 December 2014          | AMENDED    |

## USA, United States Department of Agriculture, Animal and Plant Health Inspection Service (USDA, APHIS)

<http://www.aphis.usda.gov/is/sps/mod3/5guidpl.html>

## European and Mediterranean Plant Protection Organization (EPPO)

[http://www.eppo.org/QUARANTINE/Pest\\_Risk\\_Analysis/PRA\\_intro.htm](http://www.eppo.org/QUARANTINE/Pest_Risk_Analysis/PRA_intro.htm)

## International Plant Protection Convention – ISPM No. 11 Pest risk analysis for quarantine pests including analysis of environmental risks and living modified organisms (FAO 2004).

[https://www.ippc.int/file\\_uploaded/1146658377367\\_ISPM11.pdf](https://www.ippc.int/file_uploaded/1146658377367_ISPM11.pdf)

## 4.2 Monitoring and Surveillance

### 4.2.1 Trapping or Systematic Sampling

In all cases, detection of a new pest or plant disease will require immediate monitoring and surveillance to determine the current extent of infestation and the rate of spread. Accurate survey data are essential especially to delimit an infestation if the objective is to eradicate the introduced pest or plant disease. During the development of a monitoring and surveillance program, specialists with knowledge of the biology/etiology of the species and those with knowledge of the movement of goods must be consulted to ensure the survey methodology is designed to provide accurate census and distribution data of the population, clearly delimit areas not currently infested, and restrict movements as required.

Monitoring for insect pests is usually done by various types of trapping or searching. Insect traps generally attract the target species by the use of pheromones or other specific baits or attractants (kairomones), and either capture the insects on a sticky coating on the inside of the trap, or capture them in fluid-filled or dry containers. Specific pheromones are available for very few of the more significant known quarantine risks (e.g. *Ips typographus*, *Lymantria dispar*, *Popillia japonica*) and general lures are known for some of the other pests of concern. Other, non-specific collecting techniques such as light traps for night-flying insects (e.g. moths), flight interception traps (e.g. Malaise traps or window traps) for diurnally active species, visual (color-based) traps (e.g. metallic woodboring beetles, fruit flies and sawflies), or direct sampling techniques such as beating or sweep-netting.

Monitoring for plant disease or pathogens can, in some instances, also be done directly (e.g. spore traps for fungi). However, because plant pathogens are likely to be present at very low levels immediately after their initial introduction, most surveys for these plant pathogens are indirect (e.g. searching for symptoms on diseased plants).

Organized monitoring and surveillance may be required even if eradication is not recommended. In such cases, monitoring the status of a threat (see flowchart Section 4.1 ) might become an inter-agency activity within the BCPPAC framework. In any trapping program, the traps must be set strategically to minimize the cost of servicing them, yet maximize the information gleaned from them. They should be placed at the most likely points of entry for the pest (e.g. border crossing points, recreational sites, transfer points for commercial cargoes, waste disposal sites), or at sites most likely to maintain populations of the pest (e.g. commercial nurseries, urban parks).

For the majority of the non-indigenous species of concern (Section 6.1 ), specific trapping techniques will not be known, and other means including organized searches may be necessary.

## **Plant Health Emergency Manual**

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>37 |
|                | DATE<br>4 December 2014          | AMENDED    |

When trapping systems are not available, detection surveys are reliant on visual searches of host plants and/or the pest's known environment for evidence of its presence. Such surveys will often be the only means available for use in detection of introduced pathogens and many of the insect pests of concern. Such surveys involve intensive sampling of susceptible host plants (e.g. plant viruses, chrysanthemum white rust) or substrates (e.g. soil sampling for golden nematode, searching for gypsy moth egg masses) and laboratory analysis of the samples.

### **4.3 Basic Treatment Options**

#### **4.3.1 Legislative Control**

Under the authority of plant protection legislation, CFIA or BC Ministry of Agriculture can prevent or restrict the movement of potentially infested plant material from areas of known infestation (Section 3.2 ). The threat of action pursuant to statutory regulations often has great deterrent value. Further, there are a number of associated activities, such as inspections of vehicles or searches of premises, which might be involved in this category of control. Such timely use of legal authority helps to prevent rapid and/or widespread dispersal of a dangerous plant pest or pathogen through human activities.

#### **4.3.2 Trapping**

Trapping is a primary method of surveillance and monitoring. While in some instances trapping programs may impact low density populations of plant pests, they are not considered to be primary tools for eradication.

#### **4.3.3 Containment**

The objective of a containment program usually is to slow the natural spread and/or to prevent any further accidental spread of the pest or disease from a specific area. Containment may be the only objective, due to either low pest danger (Section 4.1 ) or the high cost of farther action, or it may be the initial response in an emergency situation where the final objective is eradication. Dangerous species containment may be enforced through regulatory programs (e.g. plant quarantines, Section 3.2 ) or developed through public education and participation. Monitoring and surveillance systems are critical components of a containment program because the survey data are necessary to define the boundaries of the infested area.

Treatment options to prevent the natural spread of an insect pest, noxious weed or plant disease will depend on the potential rate and means of spread. Development of the recommended treatments requires a detailed knowledge of the life history and biology of the pest or disease in question.

Depending on circumstances, the use of physical barriers (e.g. screening) and/or applications of pesticides (i.e. insecticides, herbicides, fungicides, fumigants) may be effective in preventing natural expansion of a newly discovered non-indigenous pest until eradication programs can be initiated.

Treatment options to prevent accidental spread of an introduced insect pest or plant pathogen include visual inspections or sampling and testing (e.g. genomic analysis, enzyme-linked immunosorbent assay (ELISA) of susceptible plant material and/or other goods intended to be moved out of the infested area. Infested or infected plant material or substrates can either be destroyed or returned to the place of origin.

# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>38 |
|                | DATE<br>4 December 2014          | AMENDED    |

## **4.3.4 Eradication**

The objective of an eradication program is to eliminate a dangerous non-indigenous species (see Section 4.1 ) from a specific area defined by a monitoring and surveillance program, or to reduce its numbers so that a population cannot be sustained. This is usually the only objective where the pest is of quarantine significance and the extent of the infestation and the nature of the pest are such that eradication is possible.

In order to achieve eradication, the treatment options are limited to those that are known to achieve a very high level of control, e.g. removal and destruction of infested and/or susceptible plant material, use of an appropriate pesticide known to be highly effective for its intended purpose. Eradication treatments may have to be repeated in successive years to achieve success.

Follow-up monitoring and surveillance programs, over multiple years after treatment, are essential for evaluating the success of an eradication attempt at the need for any further action (see accompanying Flowchart).

## **4.3.5 Integrated Pest Management**

The objective of an integrated pest management (IPM) program is to reduce or prevent economic or environmental damage caused by insect pests, weeds or plant diseases. IPM programs are usually long-term, may include combinations of methods, and may change over time. An IPM program may be the best treatment option where a non-indigenous pest has become established and eradication is no longer feasible (see graphic in Section 3.3 ).

## **4.3.6 Model Flowchart for Consideration of Options and Development of a Treatment Program**

The accompanying flowchart provides a basic outline of some key questions to be asked during the development of a treatment program for a potential/new plant pest. It is intended as a general guide. Only the critical stages in the development of a response are presented. Although the flow chart depicts a linear sequence of evaluations, the actions and / or information required to complete these evaluations are not necessarily independent. Thus, some evaluations may occur concurrently. As well, information critical to the development of the emergency response may already be available in the completed Danger Analysis (Section 4.1 ). The approach taken against a plant pest in an emergency situation will be determined by parameters unique to each occurrence.

During the initial stage(s) of any emergency, the distribution of the plant health threat must be determined, if it is not already known. The distribution must then be evaluated to determine if further treatment is warranted. A limited distribution may lend itself to the development of a containment or trapping program to prevent accidental spread of the pest until such time as other controls can be implemented. A more widespread distribution may not support containment or eradication actions in the context of an emergency response, but may still warrant the development of a containment, suppression or IPM program as a strategy to prevent further spread to other parts of the province, other provinces or elsewhere.

Should eradication be considered feasible, the best possible treatment with the highest probability of success should be chosen from the available treatment options. Following any eradication program, the success of the program must be determined through active monitoring for the target organism within and especially immediately outside of the treatment area(s). The duration of any

## **Plant Health Emergency Manual**

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>39 |
|                | DATE<br>4 December 2014          | AMENDED    |

such monitoring program will be determined by life history, etiology and/or other biological traits of the target organism. While the absence of gypsy moth for a minimum of two reproductive cycles or the absence a pathogen in a controlled environment for a minimum of two years following treatment could confirm successful eradication for specific pests, monitoring programs of longer duration may be necessary (e.g. Asian longhorned beetle eradication in ON) because of differences in life histories or detection abilities.

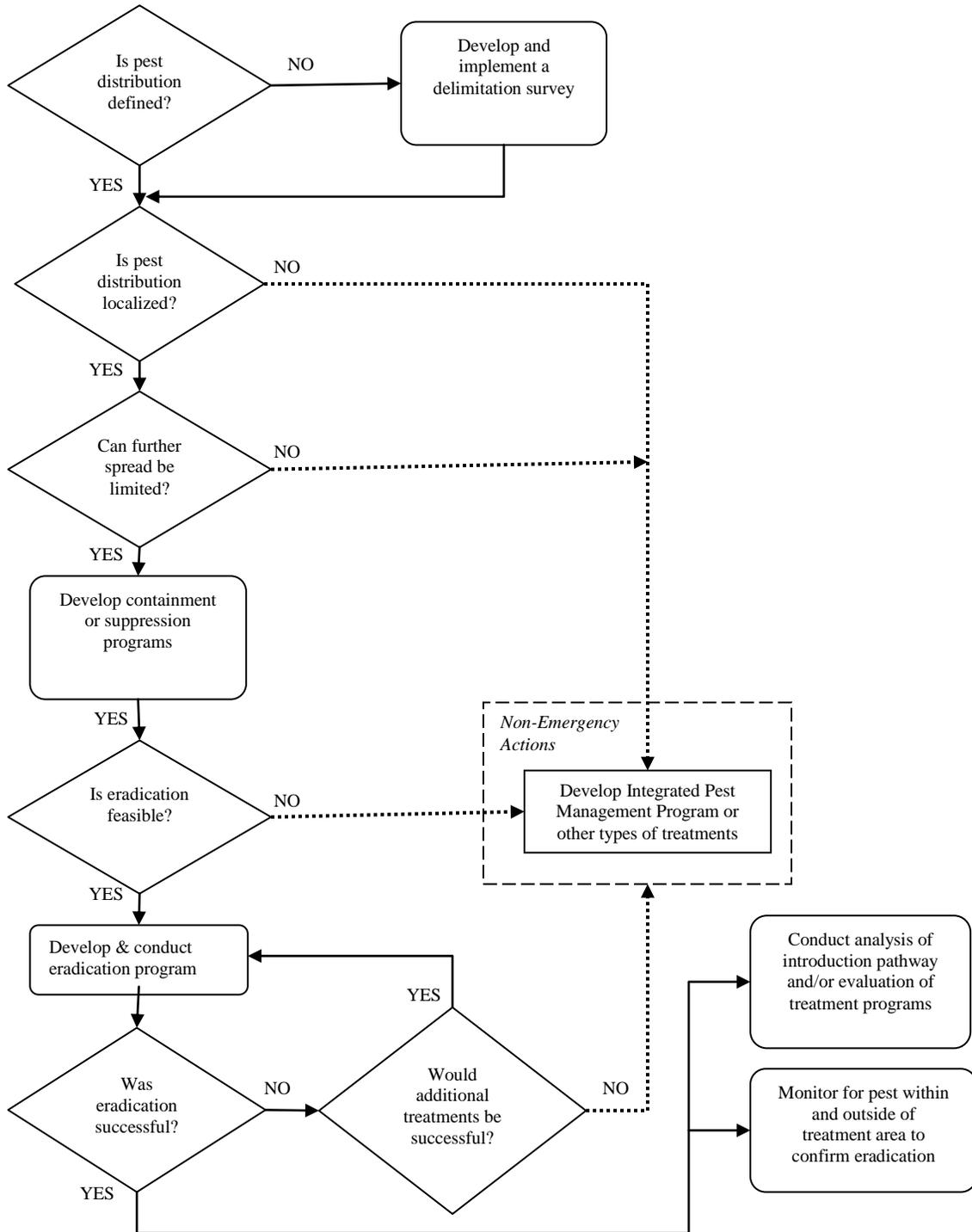
In instances where the initial eradication attempt does not eliminate the plant pest from the treatment area, the feasibility of re-treatment in the following season should be evaluated. All aspects of the previous treatment and monitoring program should be reviewed to determine the likelihood of success with further treatments. All options, including modifications to the previous program or the use of two or more methods, should be considered to maximize the probability of success.

Following any treatment program, an analysis of the pathway(s) by which the introduction occurred as well as an evaluation of the treatment program itself should be conducted. These actions may result in the development of procedures to prevent the recurrence of similar introductions and/or enhance the success of any future eradication programs.

# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>40 |
|                | DATE<br>4 December 2014          | AMENDED    |

**Figure 8. Pathway and eradication flowchart**



# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>41 |
|                | DATE<br>4 December 2014          | AMENDED    |

**Figure 9. Summary of some basic treatment options**

| METHODS / ACTIVITIES  | EXAMPLES   | BENEFITS/CONSTRAINTS   |
|---|--|--|
| <b>Legislation</b>  |  |  |
| <b>A. Inspection</b> — federal and provincial legislation allows for inspection of places or things that may harbour a plant health threat  | May be conducted to prevent entry of a plant health threat (e.g. offshore inspections of vessels having visited infested Asian ports to prevent the entry of Asian gypsy moth); or to determine if a pest is present (e.g. inspection of property for gypsy moth through use of pheromone traps and visual inspection for presence of gypsy moth egg masses).          | Inspections to prevent introductions of potential plant health threats are proactive. Cost of program is generally lower than cost of comprehensive eradication program if pest has become established. Inspection programs constrained by inability to inspect all commodities, lack of knowledge of range of plant health risks, high costs of inspection. |
| <b>B. Detention &amp; Destruction</b> — federal and provincial legislation allows for detention and destruction of any materials found to be harbouring a plant health threat   | Destruction of bark beetle infested pine dunnage to prevent emergence and flight to shore of non-indigenous Scolytidae (pine logs debarked in hold of vessel; bark collected and incinerated); destruction of plant material infested with chrysanthemum white rust and <i>Phytophthora ramorum</i> .  | Prevents the introduction and establishment of potentially threatening plant health risks. May be labour-intensive. May require payment of compensation.   |
| <b>C. Quarantine</b> —federal and provincial legislation allows for the establishment of quarantines to restrict the domestic and/or International movement of plant pests from areas of known infestation; a key method of containment | Can prevent further expansion of pest range through unintentional movement by man or other means until more effective tools can be applied. May prevent dispersal of propagules when pest itself is dormant (e.g. gypsy moth egg masses, golden nematode cysts).   | Requires knowledge of the distribution of the pest, an understanding of the pathways by which the pest can move, and an efficient survey methodology to determine effectiveness. Most effective when area of infestation is small and pest has low vagility. Can be implemented quickly.   |
| <b>Indirect Control</b>   |  |  |
| <b>A. Mass Trapping</b> —use of pheromones or semiochemicals in conjunction with traps to reduce pest populations   | Reduction of localized population of an introduced bark beetle through use of semiochemicals to attract pest to trap trees for subsequent destruction; capture and removal of residual population of a pest following treatment through mass trapping.   | Requires availability of both an efficient synthetic pheromone and/or attractant and a non-saturating trap system for the pest species. Usually requires placement of traps at extremely high densities. Labour intensive.   |
| <b>B. Physical/ Mechanical</b> — reduce pest population through use of methods that affect them directly or alter their physical environment  | Heat treatment of grape and fruit tree stock for plant viruses; mechanical removal of adult beetles from green lumber; heat treatment of wood-products. Mechanical cleaning of weed-contaminated seed or surface sterilization of surface-contaminated seed and help prevent the accidental spread of pests associated with seed destined for agriculture of forestry. | Direct destruction of all infested plant material and potential hosts is an effective tool for eradication or containment; can be implemented quickly. High cost often associated with treatments. For most known pests of quarantine concern there is little existing information on effective physical/mechanical controls.                                |
| <b>C. Searching</b> — can be used to define a containment area, to prevent the accidental movement of a plant pest of as part of a detection program.   | Visual searches are a key component of detection and containment/ eradication programs, e.g. gypsy moth egg mass searches to determine epicentre; community-based volunteer detection program for chrysanthemum white rust.  | Visual searching is often the only means of detection for those plant health pests for which no effective trapping protocol exists. Usually labour intensive. May provide good opportunity for stakeholder participation.  |
| <b>Direct Control</b>   |  |  |
| <b>A. Microbial Pesticides</b> — application of various types of micro-organisms  | Use of various commercial formulations of Btk ( <i>Bacillus thuringiensis var. kurstaki</i> ) to eradicate small introduced populations of   | More specific than most chemical pesticides, thus non-target effects reduced. Low avian and mammalian toxicity.  |

# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>42 |
|                | DATE<br>4 December 2014          | AMENDED    |

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|---|---|--|
| (e.g. bacteria, fungi, viruses) as pesticides to reduce or eliminate the pest population  | gypsy moth in western North America; use of Gypchek®, a gypsy moth nuclear polyhedrosis virus (NPV) in an eradication program in the eastern U.S.   | Requires suitable application technologies; appropriate formulations and registration. Specific microbial controls available for some pest organisms only. May require high rates and/or multiple applications to be effective (e.g. Btk). May require lifestage-specific treatment of the pest.   |
| <b>B. Synthetic Chemicals</b> – application of various classes of chemical pesticides (insecticides, miticides, herbicides, fungicides, fumigants) to reduce or eliminate the pest population | A wide range of products is registered and commercially available. Chemical pesticides generally afford a higher level of control than microbial methods. Synthetic chemicals have been employed in gypsy moth eradication programs (e.g. carbaryl) and knapweed control programs (e.g. Tordon®). | Wide range of effective products and application technologies available. Treatment can be implemented quickly. Usually only a single application is required. Non-target effects may be more pronounced than those caused by microbial products. Avian and mammalian toxicity is product-dependent; may be higher than that of microbial pesticides. Some products are highly toxic (e.g. Temik®, methyl bromide). |
| <b>C. Growth Regulators/Inhibitors</b> – application of synthetic compounds which disrupt normal growth and development of a pest organism  | Diflubenzuron (Dimilin®) used in the control of gypsy moth larvae in U.S.   | Non-target effects similar to those of synthetic chemicals. Relatively low mammalian toxicity.   |

## 4.4 Initial Response Enabling Memorandum of Understanding

Pests of forests and agricultural crops can move long distances and enter B.C. from other sites in Canada or from other countries. Initial detection of such new introductions can occur in a wide variety of ways, ranging from specific surveys or inspections of imported commodities to extension personnel responding to a gardener, farmer or forester reporting a new pest problem,

The detection of a non-indigenous species always calls for an immediate evaluation of the potential impact on the sector involved. Such an evaluation should include confirmatory identification of the species, Danger Analysis, determination of the extent of infestation, and initial evaluation of response options. This initial response often requires the expertise of a number of organizations and success usually depends on swift action.

In some cases the initial response can be handled totally by the organization which first encounters the pest or by a small group working on the initial project. However, in other situations this initial response will exceed the normal day-to-day capabilities of the organizations involved. In such cases the combined efforts of the organizations party to this agreement which are involved in the issue at hand will need to assemble and operate under the terms of an MOU.

## 4.5 Preparing an Agreement on Emergency Treatment

An interagency agreement should be prepared regardless of whether a federal or provincial agency is the lead agency and regardless of how program funding is shared. A separate agreement will be needed for each major plant health emergency as the pest, site, treatment, objectives, and work plan will vary. The agreement should clearly state the objective(s) of the program, identify lead and support agencies, and facilitate implementation of the program.

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>43 |
|                | DATE<br>4 December 2014          | AMENDED    |

## ***4.6 Preparing for an Emergency Response***

### ***4.6.1 Initial Response***

Following initial detection and preliminary identification of a non-indigenous species, there will be several considerations for immediate action:

- Is the species listed as one of particular concern ( Section 6.1 )
- Have BCPPAC Executive members been advised?
- Should a preliminary Danger Analysis (Section 4.1 ) be initiated, e.g. per worksheet format and expertise available within the BCPPAC membership?

These and other questions must be posed should the situation suggest or approach the potential for a true emergency. Experienced staff, BCPPAC members and their associates most likely will be best qualified to judge the situation (Section 3.1 ).

In the case of a real threat, several basic steps will be required to implement a coordinated Initial Response:

1. Confirmation (by experts) of the identification of the species detected.
2. Consultation with the most knowledgeable advisors available.
3. Additional field surveys and associated work to clarify or to determine more about the nature of the threat
4. Consideration of, and early planning for, treatment or control operations via an interagency Emergency Operations Team and a related Project Steering Committee.

Ideally, all of these basic steps will be completed as soon after of the initial discovery of the potential pest as possible by the Technical Advisory Committee and responsible agencies.

#### **4.6.1.1 Identification**

Following the discovery of any potentially dangerous non-indigenous species, rapidity of initial reporting to both the Canadian Food Inspection Agency and BCPPAC is paramount. It should be expected that the person making the discovery, likely an agricultural or forestry officer, will notify senior staff colleagues and follow procedures current in their own organization. The notification relay to BCPPAC should occur at this level of responsibility.

All BCPPAC members should then be alerted, especially members with particular crop or forest protection responsibilities.

Local scientific authorities, as well as expert diagnosticians at Ottawa or elsewhere will most likely be needed to confirm the identification. These specialists must be advised of the urgent nature of the request for identification, and they must be asked to respond promptly. Procedures for collecting and shipping specimens will follow established practices and the requirements of the agencies providing diagnostic services. Before any regulatory action can be taken by the CFIA, suspect new pests must be forwarded to their national laboratory for final confirmation of the identification.

Because some identifications may be difficult, or require extra time, a provisional but expert identification of a potential threat will suffice for serious consideration by BCPPAC. The Council might consider implementing additional emergency response procedures (Sections 4.8 , 4.9 ) at this time, pending final verification of identification and the completion of the formal Danger Analysis (Section 4.1 ).

# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>44 |
|                | DATE<br>4 December 2014          | AMENDED    |

## 4.6.1.2 Internal Communication

Good communications within BCPPAC, with outside experts, and with senior administrators of government and concerned industries will be very important soon after the confirmation of the organism of concern and preliminary assessment of danger. Sharing information promptly and completely is a fundamental responsibility and expectation of BCPPAC. In this situation, and at this stage of detection, it is better to err conservatively and to be overly concerned.

It will be expected that staff specialists will work to augment the identification process, to ensure proper communications, and to facilitate emergency response decisions within BCPPAC.

It is expected that all participating staff will take full responsibility to ensure rapid and complete communication within their own agencies. As required by their own administrative policies, they will be expected to pass on information to their national, regional, district or field offices and appropriate colleagues.

Public information specialists will handle all communications and information sessions (Section 5.0) for the media, for other interested parties, and for the general public in the case of a declared emergency.

## 4.6.1.3 Initial Response

A field team may be required to conduct additional surveys or other kinds of preliminary local investigations. Critical considerations will be:

|                |  |
|----------------|--|
| <b>Staff</b>   | From one or more agencies; might include local and/ or headquarters staff, local residents, volunteer special interest groups. |
| <b>Funding</b> | Likely to come from several sources, e.g., from lead, support or passive participants, local industry, other stakeholders.     |
| <b>Timing</b>  | Short term, within the Initial Response window.  |
| <b>Roles</b>   | Will result from BCPPAC recommendations, available specialists, and responsibilities of lead agency.                           |

## 4.6.1.4 Steering Committee

Following confirmation of an emergency situation, CPPMC may recommend the formation of a Steering Committee. The Committee will be composed of experienced staff assigned by the participating agencies and others with skills deemed necessary to guide the project. This peer group might exist from the Initial Response phase right through to project completion, debriefing and final reporting. In most cases, it should be formed within the window of the Initial Response, and well in advance of the formal declaration of the plant health emergency.

The role of the Steering Committee will be to provide administrative guidance and overall management of the project, to determine the need for, size and composition of an Emergency Operations Team, and to execute decisions or make recommendations concerning costs, expenditures, contracts, and the disposition of all resources.

The nature of the non-indigenous species and the associated considerations of risk, hazard and danger (Section 4.1), as well as the legislated responsibilities of the participating agencies, will constitute the critical factors for the formation of the Steering Committee (Section 4.7). Clearly, agricultural specialists should assume key roles in the case of danger to agricultural crops while forestry specialists should lead in forest settings.

# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>45 |
|                | DATE<br>4 December 2014          | AMENDED    |

The purpose of the first meeting of the Steering Committee, under the guidance of the CPPMC, will be to determine these roles, concomitant funding responsibilities, membership, formation of the Emergency Operations Team, and activities within the operational plan.

The Committee membership must be endorsed by senior administrators of the participating organizations. It should be expected that regular communication will be required, including at meetings. Special accommodation for the Committee and the Operations Team may be required, such as transferring staff into emergency management for the long or short term. In the past, BCPPAC has learned that financial management is the most critical activity for smooth functioning of all aspects of the operation. Because of differing procedures and policies of government and industrial concerns, it is likely that a new system might be required at the outset. Financial specialists should determine the best, most efficient procedures for the Steering Committee as soon as the budget has been approved.

Because of the ad hoc nature of the Steering Committee, duties of the members should be outlined in some detail. The members, then functioning as officers, should have clear understanding of their duties, responsibilities and relationships. A sample organization chart of the Steering Committee is found in the next section of this chapter.

#### 4.6.1.5 Emergency Operations Team

The Emergency Operations Team is the "heart and soul" of the emergency response operation. It will be composed of technical specialists from participating agencies and others, either assigned or on a contractual basis, who will assume responsibilities of all daily activities. The Emergency Operations Team, in consultation with the Steering Committee, will implement the operational plan.

The selection of the chairperson and the members of the Team will require considerable expertise in "human chemistry". The overall success of the project will depend on BCPPAC's or the Steering Committee's selection of experienced, self-starting, responsible, and knowledgeable individuals for the Team. After approval of the plan and delegation of duties, the Team will be expected to act with minimal or no supervision in actions that may have considerable public environmental or media interface. These relationships will be very important for the overall acceptance and success of the project.

Both the Emergency Operations Team and the Steering Committee will be highly dependent on the department and the initiatives of the Communications Specialists within the Team's organization (Section 4.7 ; 5.0 ).

## 4.7 Model Organization Charts

At the earliest possible opportunity, serious consideration of special committees and working groups will be required (Section 4.6 ). Several levels and combinations of involvement might be required to facilitate interagency cooperation and collaboration under the BCPPAC umbrella. Following are Model Organization Charts for consideration in the event of detection and the need for follow-up concerning a non-indigenous species.

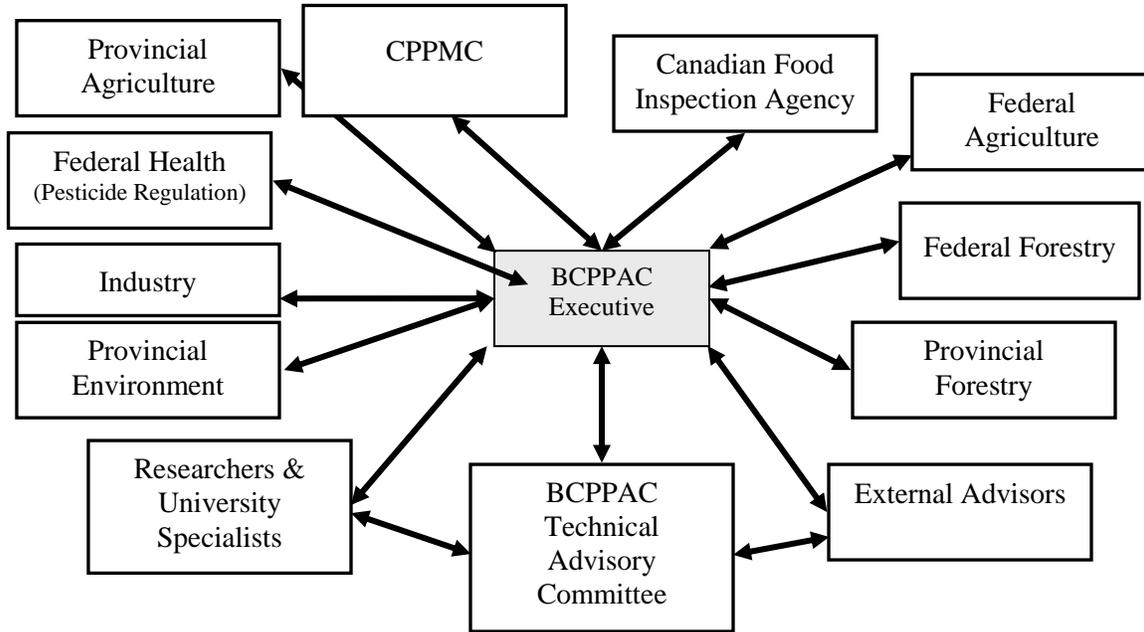
### 4.7.1 BCPPAC and its Relationship with Member Agencies

Formal communication, especially regarding a potential problem, should come from the Chairperson of the BCPPAC Executive to the CPPMC and other key senior officials of concerned plant industry agencies. For example:

# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>46 |
|                | DATE<br>4 December 2014          | AMENDED    |

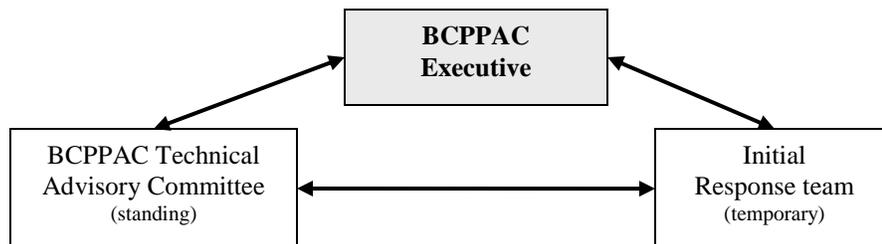
**Figure 10. Relationships**



### 4.7.2 Initial Response / Verification and Survey

On the advice or response to BCPPAC from the concerned and responsible agencies and/or advisors, BCPPAC might organize a temporary Initial Response field team in order to inspect field sites of concern and to acquire information to further assess the nature of the threat to plant health. The field team might be assembled from available and experienced staff (headquarters or local) and/or from the BCPPAC Technical Advisory Committee.

**Figure 11. Initial Response Team**



### 4.7.3 Project Steering Committee

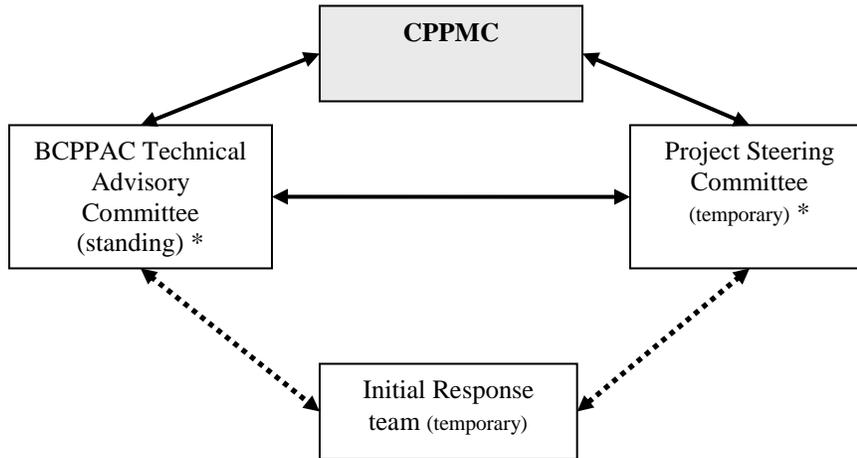
Once confirmation of possible Danger (Section 2.3 ) has been indicated, the CPPMC, with the approval of responsible member agencies, may establish a Project Steering Committee of experienced plant health personnel to (1) offer technical advice, and to (2) guide the emergency operations. The Steering Committee might be composed of the Technical Advisory Committee (in

# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>47 |
|                | DATE<br>4 December 2014          | AMENDED    |

whole or in part) or with outside specialists assigned for the duration of the project. The Steering Committee will be project-oriented, and it will report directly to the CPPMC.

**Figure 12. Project steering committee**



\* May be some overlap

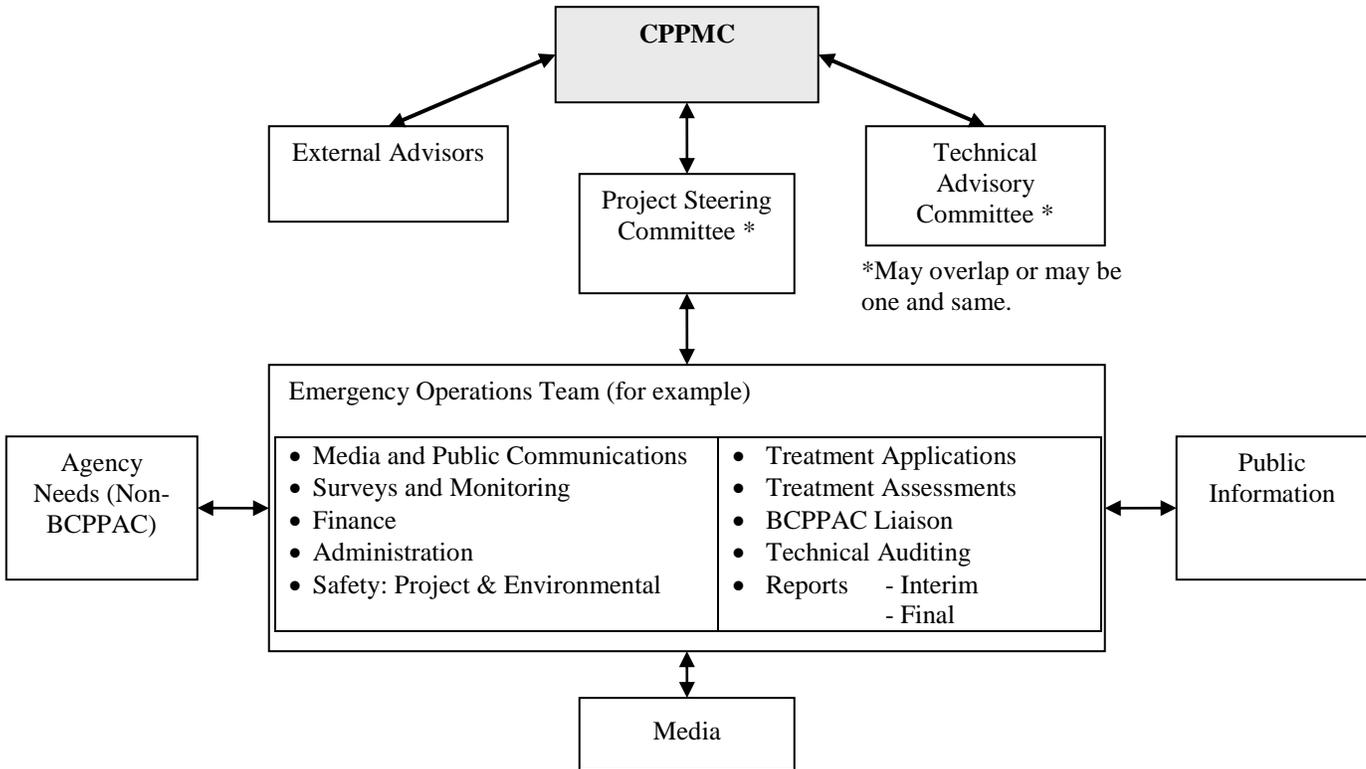
## 4.7.4 Emergency Operations Team

The Emergency Operations Team is formed after declaration of a plant health emergency requiring immediate treatment by the CPPMC. The Team should be composed of the best available staff specialists from BCPPAC member agencies and contracted individuals and firms from the private sector. The Project Steering Committee will work closely with the Team to ensure optimum efficiencies and success.

The composition of the Emergency Operations Team should be comprehensive, as required to cover all needs, including public concerns. The 1992 Asian Gypsy Moth Case Study (Section 6.4) should serve as a reference for organizing large-scale and successful operations.

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>48 |
|                | DATE<br>4 December 2014          | AMENDED    |

**Figure 13. Relationship of Emergency Operations Team**



## **4.8 Guidelines for Agricultural Emergency Response Procedures**

### **4.8.1 Introduction**

Procedures for responding to the discovery of non-indigenous species which could pose a significant threat to the agriculture of British Columbia are highlighted in this section. Agriculture in this instance is considered to be mainly primary production, although other secondary industries or sectors may also be affected, and would be involved in an emergency response as appropriate. It is important to note that some "agricultural" concerns, e.g. nurseries, would also fall under the Forest Pest Emergency category (Section 4.9), since they produce material which is vulnerable to forest pest attack and may later be transported to or spread into forest settings. Similarly, non-indigenous pests may affect or be discovered in urban settings such as parks, boulevard trees, or private properties. Thus, there could be a very wide range of stakeholders in an agricultural emergency.

The objectives of this section are:

1. to provide a guide to dealing with such an emergency, and

# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>49 |
|                | DATE<br>4 December 2014          | AMENDED    |

2. to identify prime organizations which could be involved either as active participants or as routes to reach other stakeholders.

The two main agencies concerned with plant health, relating to agriculture in B.C. are the Canadian Food Inspection Agency (CFIA) and the British Columbia Ministry of Agriculture (BCAGRI). CFIA has the principal mandate to prevent the introduction and spread of plant pests of quarantine significance which is undertaken by the Plant Health and Biosecurity Directorate (PHBD) of the CFIA in B.C. This mandate is supported by the work of Agriculture and Agri-food Canada (AAFC) Research Branch which has two centres in B.C. (Agassiz, Summerland) involved in research on crops, pests and diagnostic procedures for plant pests. A network of PHBD specialists, including entomologists and plant pathologists at plant health laboratories provides diagnostic support to field staff, and a "Pest Risk Assessment" (PRA) group in Ottawa assesses the scientific data available to determine the potential risk and trade impacts that a particular non-indigenous species poses for this region of Canada.

BCAGRI has the mandate to prevent the spread of destructive agricultural pests within the province. This mandate is the responsibility of the Plant and Animal Health Branch. Insect and disease surveys and monitoring activities may be carried out by Plant Health specialists, i.e. entomologists and plant pathologists, supported by BCAGRI Industry Specialists and Agrologists, CFIA field staff and other personnel. Disease and plant pest identification is done mainly at the Provincial Plant Health Laboratory in Abbotsford, as well at regional offices (i.e., Kelowna, Kamloops).

The overlap of agriculture and forestry means that the other two significant partners in an emergency might be the B.C. Ministry responsible for forests (Ministry of Forests, Land, and Natural Resource Operations, MFLNRO) and the Canadian Forest Service (CFS) of Natural Resources Canada. Both organizations can provide valuable information on the location, severity and identification of wood- and tree-related pests.

In an emergency situation, each agency will be guided by its own policies and procedures, and involvement will depend on the nature of the emergency and the role played by that particular agency. It is anticipated that the following procedures will be adapted to suit the various emergency situations.

## **4.8.2 Emergency Process**

Please note that each stage of an emergency is not necessarily separate and that a number of steps may take place simultaneously.

It is assumed that the ultimate aim of emergency action is to either eradicate or contain a pest threat to prevent further spread or economic damage. The pest of concern will usually be new to B.C. or have escaped from a restricted and known area. Initial actions will need to be rapid and might involve two or more of the BCPPAC member agencies. However, treatment may not be necessary immediately, depending on the pest and time of year.

### **4.8.2.1 The Alert**

A pest can be discovered in a number of different ways:

- submission by grower / public
- routine federal/provincial agency surveys
- intercepted during an import inspection
- found on product inspected for export

## Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>50 |
|                | DATE<br>4 December 2014          | AMENDED    |

- alert from a co-operating agency, e.g. CFIA, BCAGRI, MFLNRO, CFS, Environment Canada, university, or pest control company
- alert from another province, state, or country

### 4.8.2.2 Diagnostics

Accurate identification of a potential pest is of paramount importance. Information on proper handling of samples submitted for identification is provided in Section 6.2 .

Species may be identified locally by CFIA, CFS, provincial staff, or university experts, or sent directly to other taxonomic specialists. CFIA will always require confirmation by specialists in Ottawa of any pest of quarantine significance. Some species may need to be identified by experts in other countries, because expertise or reference specimens may not be available in Canada.

### 4.8.2.3 Problem Evaluation / Danger Analysis

A potential plant health emergency should be evaluated by specialists of the member agencies who then bring their expertise and advice to the initial meeting of the BCPPAC Technical Advisory Committee.

Throughout the period preceding this meeting, it is expected that the agencies will be in constant communication as the situation develops or more information becomes available.

Once a potential pest has been identified as non-indigenous to B.C., the Technical Advisory Committee should complete a Danger Analysis to determine the significance to B.C. agriculture or forestry (Section 4.1 ). The Technical Committee may also request a CFIA- or NAPPO-type "pest risk assessment" from specialists in Ottawa at this time. Further, the Committee should consider FAO and other international guidelines for emergency response programs.

The BCPPAC Danger Analysis will be concerned with:

- nature of the insect or pathogen, i.e. biology, strain or variant
- location of the detection(s) or interception(s)
- damage potential and possible rate of spread
- possible pathways of introduction and spread
- potential impact on exports or the environment
- risk and urgency of the situation
- consequence of not acting

Each member agency should be empowered by its senior management to commit initial local resources to actions which the Technical Advisory Committee may consider immediately necessary (Section 4.4 ). For example, if the immediate action required is a survey to determine the extent of the problem, co-operating agencies should be able to commit limited human resources to sharing the survey work at least in its initial stages. They should also be empowered to purchase supplies, etc., to expedite the process. It is not expected that any agency would commit resources beyond its normal operational capability at this point. An Agreement on Emergency Treatment (Section 4.5 ) should be prepared once it is evident that available resources will be inadequate. When an emergency situation has been recognized, it is expected that each agency (and possibly stakeholders) will activate the processes necessary to release additional funds as required.

# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>51 |
|                | DATE<br>4 December 2014          | AMENDED    |

Once information on the species has been assessed, the Technical Advisory Committee may recommend a number of actions to further evaluate the extent of the problem. These may include:

- monitoring (i.e. small-scale and intensive grid surveys);
- tracebacks / traceouts (i.e. origin/ destination pathways);
- other investigations (e.g. literature reviews, telecommunications, laboratory-type tests);
- treatment/ destruction/ quarantine (i.e. in a small area of known occurrence);
- no action but further monitoring (at this point, with no further detections, there is no emergency).

See action sequence in Flowchart in Section 4.1 .

The recommendations of the Technical Advisory Committee will be passed on to the BCPPAC Executive for ratification/comment. This does not preclude immediate action on the part of the co-operators, if required. Officially, BCPPAC will forward the recommendations to the lead agency, but as each agency is involved at the committee level, it is expected that their senior management will already have been briefed so that action can take place without delay. Additionally, BCPPAC will forward the recommendations to CPPMC for information and discussion, if more resources are proposed.

#### 4.8.2.4 Emergency Response

If the situation appears to be extremely urgent (Extreme Danger) or the problem widespread, appropriate agencies should activate their internal emergency processes which will release funds or set up field operations for housing an on-site Initial Response Team (4.6 , 4.7 ). At this time, the BCPPAC Technical Advisory Committee should be involved in an advisory capacity to ensure an efficient response.

Once the extent, severity and urgency of the situation have been more closely determined, options for dealing with it are developed by the Technical Advisory Committee and conveyed to the BCPPAC Executive. As the Technical Advisory Committee is activated, each member will confirm his/her agency's role and responsibilities during the emergency response, i.e. lead, supporting or monitoring (Section 3.3 ).

#### 4.8.2.5 Stakeholder Involvement

The objectives at this time are to identify all potential stakeholders who could be affected, either directly or indirectly. It may also be appropriate at this time to consider the formation of a specific Project Steering Committee (Sections 4.6 , 4.7 ), which may or may not include stakeholders. It is also important to note that the aforementioned Technical Advisory Committee might, in fact, become the Steering Committee. In any case, the Steering Committee is obliged to consider stakeholder interests and ensure that information about the current situation continues to be provided to them.

The first level of stakeholders will be those directly affected. These would be producers or exporters/importers of a product which could be affected by the pest, or municipalities or homeowners who may have property destroyed or treated in order to prevent further spread of the pest.

## Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>52 |
|                | DATE<br>4 December 2014          | AMENDED    |

The second level will be interested parties whose livelihood or environment may, via legislative procedures (Section 3.2 ), be affected or included within a treatment area. Again, the Steering Committee will ensure prompt information transfer at all times, especially to stakeholders, via the Communications Unit within the Emergency Operations Team (Section 4.7 ) during the treatment phase of these operations.

### 4.8.2.6 Treatment and Control Programs

Any emergency response (treatment) recommended will be pest- and situation-specific. Treatment options are summarized in Section 4.3 . The programs will be implemented under the direction of a CPPMC Emergency Operations Team.

### 4.8.2.7 Enforcement Actions

If a pest is discovered which is of a significant quarantine status and containment is possible, the site(s) may be declared infested and put under quarantine by CFIA or BCAGRI to legally prevent the movement of infested or infected articles (Section 3.2 ). In fact, the determination of a dangerous situation may have:

- international consequences and concerns where product shipments (imports, exports), economic well-being, and plant health are threatened;
- national aspects where spread via transportation corridors or other means might extend the problem across provincial boundaries; and
- provincial problems where spread to unaffected areas within B.C. is of primary concern.

Then, depending on the potential extent and severity of the problem, federal or provincial legislation may be applied (Section 3.2 ) and roles and responsibilities may be determined (Section 3.3 ).

Depending on the severity of the situation, quarantines may involve closing routes to and from the premises, and prohibitions of movement. The Royal Canadian Mounted Police (RCMP), Canada Border Services Agency (CBSA), provincial Conservation Officers, local police or other non-police enforcement officials may need to be involved in enforcing these movement restrictions.

Provisions exist within federal and provincial jurisdictions which allow for declaration of emergencies at the Cabinet level (Section 3.2 ). Once invoked, additional regulations may be passed which assign broader responsibilities to Ministers involved. For example, in the 1992 Asian Gypsy Moth Program, the provincial Cabinet declared an emergency under the **Pesticide Control Act** and the provincial **Plant Protection Act** (Section 6.4 ). Similarly, in the event that a plant health emergency is regaled as a national catastrophe, the federal Minister of Agriculture can obtain additional empowerment under the **Emergencies Act**.

## 4.9 Forestry Emergency Response Procedures

### 4.9.1 Introduction

The procedures for responding to the discovery of a non-indigenous threat to plant health in a forested environment presented in this section parallel those for an agricultural emergency response (Section 4.8 ). They provide a mechanism for determining the threat potential of an introduction and provide guidelines for the development of an emergency response to a dangerous pest introduction. Five agencies have mandates that relate to plant health within B.C.

## Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>53 |
|                | DATE<br>4 December 2014          | AMENDED    |

forests: the B.C. Ministry of Forests, Lands and Natural Resource Operations (MFLNRO); BC Ministry of Environment (BCMOE), the Canadian Forest Service (CFS) of Natural Resources Canada; Canadian Food Inspection Agency (CFIA); and the B.C. Ministry of Agriculture (BCAGRI). A summary of their roles and mandates are outlined below.

With most forest lands in B.C. being under provincial jurisdiction, the lead role in an emergency response in forested environments would have to involve MFLNRO. Staff from MFLNRO headquarters in Victoria, the 8 regional and numerous district offices situated throughout the province are familiar with emergency response procedures (e.g. wildfire suppression) and with the detection and treatment of forest pests. They would provide key experience and expertise in the development and delivery of any emergency response in the provincial forests.

It is expected that the nearest MFLNRO District Office will have direct involvement in response to a forest health emergency. Leadership will be provided by specialists at headquarters in Victoria and from f specialists located at Regional Offices. Operating within the BCPPAC recommended structure and with the involvement of experienced staff from the other core agencies (i.e., via the coordinated activities of an Initial Response Team, Technical Committee, Steering Committee, Emergency Response Team and/or BCPPAC Executive), it is expected that organization and implementation of all treatments will be smooth and professional.

A good example of MFLNRO involvement, but not in the lead role, is the 1992 eradication program against the Asian gypsy moth in Vancouver (Section 6.4 ). In that instance, MFLNRO staff had critical roles and contributed to the overall success of the program.

CFS provides identification of forest insects and diseases in British Columbia in support of plant health, utilizing regional reference collections and national historical databases. The regional CFS facility also provides biological research (including quarantine rearing) used in evaluating the threat to plant health posed by non-indigenous pest introductions.

CFIA has a mandate to prevent the introduction and spread of non-indigenous pests of quarantine significance in the forest as well as the agriculture sector. CFIA inspects import goods (e.g. wood chips, raw logs) to prevent the accidental introduction of pests, and leads eradications of non-indigenous pest introductions (e.g. Asian longhorned beetle, emerald ash borer). Quarantine issues of international significance to the forest sector are the mandate of CFIA headquarters in Ottawa. Other roles and responsibilities are summarized in Section 4.8 .

BCAGRI supports monitoring on farms and horticultural nurseries for pests, may conduct surveys, and recommends appropriate treatment programs to industry. BCAGRI has a mandate to prevent the spread of pests destructive to plants and maintain provincial quarantine regulations in support of forestry and agriculture.

### **4.9.2 Emergency Process**

The goal of any forest emergency response will be either to eradicate the non-indigenous pest or, when eradication is not feasible, to contain it and thus prevent any further spread. The essential stages in the response to a forestry plant health emergency include:

- detection of non-indigenous organism;
- identification of the insect, weed or disease;
- assessing the urgency of response and the extent and severity of actual or potential damage;
- developing plans and recommendations through BCPPAC;

# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>54 |
|                | DATE<br>4 December 2014          | AMENDED    |

- deciding on the level of support and participation by each organization, including MFLNRO Regional and District Offices; and
- planning and conducting operations.

Each of the stages in an emergency response is not necessarily independent, thus a number of steps may take place concurrently.

## 4.9.2.1 The Alert

New or suspected introductions of importance to the forest sector may be detected during surveys initiated by an alert from co-operating agencies within B.C., or outside of the province or country, to the presence, in other regions, of a pest quarantine significance. They may also be encountered by reforestation workers, forest company employees, or by MFLNRO or CFS staff during forestry related activities; by CFIA staff, during plant quarantine surveys or inspections; or by BCAGRI personnel in association with work in the horticultural or Christmas tree sector.

The majority of the recent discoveries of non-indigenous pests in British Columbia have occurred in industrial, urban or suburban environs. Prompt eradication efforts taken in these habitats can protect forest resources before extensive spread occurs. But, because of the extent and diversity of B.C.'s forests, special efforts will be required to implement all activities. Thus, a spirit of cooperation under the BCPPAC banner will be most important.

Some scenarios in which unrecognized non-indigenous introductions have been or may be encountered include:

- inspections at forest seedling nurseries or seed orchards;
- reports of damage by horticultural growers;
- public inquiries about problems on urban trees or native forests;
- federal/provincial agency surveys;
- detection of new or unusual damage by forestry operations staff;
- interceptions associated with imports.

## 4.9.2.2 Identification

As for agricultural and urban situations, an authoritative and accurate identification of any suspected threat is essential before any analysis of the danger posed to forest health in B.C. can be undertaken. Information on the proper handling of samples for identification and the resources available for pest diagnostics are found in Section 6.2 .

Upon receipt of an authoritative identification of a new insect or disease, the member agency initiates the first step of the Emergency Response by the immediate notification of the BCPPAC Chairperson. The Chairperson will then notify all other members of the Executive and the CPPMC.

## 4.9.2.3 Problem Evaluation/ Danger Analysis

Upon confirmation of a non-indigenous forest health threat, the Chairperson and/or the Executive of BCPPAC will assign the problem to an existing Technical Advisory Committee (TAC) or appoint a new one. The role and activities of the TAC are outlined in Section 3.1 . The initial priority of this committee is to conduct a Danger Analysis (Section 4.1 ) and provide a prompt assessment of the non-indigenous pest to the Executive. To ensure adequate commitment of time by field staff to collect necessary data for a Danger Analysis, specific approval by

## Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>55 |
|                | DATE<br>4 December 2014          | AMENDED    |

participating agencies will likely be required. A model for an enabling agreement to undertake Initial assessments and other action is included in this manual (Section 4.4 ).

The Danger Analysis evaluates various aspects of the plant health threat including the:

- biology and taxonomy of the organism;
- location(s) of the detection;
- damage potential and potential rate of spread;
- possible pathways of introduction and spread;
- potential impact on exports or the environment;
- risk and urgency of situation;
- consequences of not acting.

It includes reference to pertinent scientific literature related to the biology, damage and control of the insect or disease, as well as relevant data on its status or occurrence in British Columbia. Current or recent "pest risk analyses" done by other agencies such as the U.S. Department of Agriculture Animal and Plant Health Inspection Service (USDA - APHIS) would be included. It is important that MFLNRO staff and/or BCPPAC communicate with colleagues in the U.S. Forest Service and elsewhere. Their reports of previous experiences can be crucial in staging subsequent activities in B.C. Results and observations must be thoroughly documented because of potential regulatory and legal implications.

Completion of the Danger Analysis is the first essential step for determining the nature of the threat and whether further action is required. It is also an essential step in developing action plans with cooperating or affected agencies and companies through BCPPAC. Following a review of the Danger Analysis, the BCPPAC Executive may request that the TAC develop recommendations for a response to the non-indigenous pest.

Generally, the TAC will consider all aspects of the pest situation, including pest risk assessments, and provide written recommendations to the BCPPAC Executive on the need for additional research, detection and/or delimitation surveys, eradication projects, quarantine restrictions or other appropriate responses. Members of the BCPPAC Executive are responsible for informing their respective agencies of the recommendations from the TAC and decisions of the Executive, and for soliciting the support of their agencies if required.

#### 4.9.2.4 Emergency Response

When immediate action is required (i.e. Extreme Danger) the TAC develops recommendations for dealing with the pest situation and submits them to the Executive. Once approved, these recommendations are conveyed in a resolution from the Executive to CPPMC, and member agencies. The member agencies consider the BCPPAC resolution, and determine their level of support. An initial response (e.g. containment, destruction of infested plant material) may already have been undertaken by the lead agency (e.g. MFLNRO staff) under the terms of a quick response agreement (Section 4.4 ).

Often, an interagency agreement, such as a Memorandum of Understanding, will have to be developed to finalize support and responsibilities for a pest-specific operation. Guidelines for preparing such agreements are outlined in Section 4.5 . By this stage, organization, including lead role, should be clarified (Section 3.3 ). Stakeholders may be asked to contribute to the cost of any Emergency Response negotiated on a case-by-case basis.

# Plant Health Emergency Manual

|                |                                  |            |
|----------------|----------------------------------|------------|
| Section<br>4.0 | Emergency Response<br>Procedures | Page<br>56 |
|                | DATE<br>4 December 2014          | AMENDED    |

#### 4.9.2.5 Stakeholder Involvement

During the development of an Emergency Response, it is important that all potential stakeholders who could be affected either directly or indirectly by the non-indigenous pest or by actions taken against it be identified, and when appropriate be involved in determining the best course of action.

#### 4.9.2.6 Treatment and Control Programs

A variety of treatment programs are usually considered (Section 4.3 ), and may be implemented as required. These can range from quarantine restrictions to aerial spray programs. Treatment programs are developed in response to specific instances and situations, and details cannot be anticipated or covered here. Procedures must conform to the requirements or directives of all levels of government. Previous experiences of MFLNRO staff and their procedural references for the control of insect pests, noxious weeds and disease pathogens should be reviewed.

#### 4.9.2.7 Enforcement Actions

Enforcement actions which can be taken to contain a pest of significant quarantine status are outlined in Section 4.8 .The array of provincial statutes, especially the **Forest Act** should be consulted to determine the role and extent of empowerment of forest officers under unusual circumstances.

Provisions exist within federal and provincial jurisdictions which allow for declaration of emergencies at the Cabinet level (Section 3.2 ). Once invoked, additional regulations may be passed which assign broader responsibilities to the Ministers involved. In the case of a forest health emergency, the **Forest and Range Practices Act** empowers the MFLNRO District manager to order measures for control or disposal of destructive insects or diseases to be undertaken on private or Crown land.

# Plant Health Emergency Manual

|                |                         |            |
|----------------|-------------------------|------------|
| Section<br>5.0 | Communications          | Page<br>57 |
|                | DATE<br>4 December 2014 | AMENDED    |

## 5.0 Communications

### 5.1 *Basic Communications Network for a Plant Health Emergency*

A communication strategy is needed in the case of a plant health emergency. Member agencies have professional communications staff available in house who need to be brought into the emergency response process early in its development.

This section details some background on the steps and procedures necessary to establish and maintain effective public information and media relations during plant health emergency situations.

#### 5.1.1 *Purpose*

Keeping the media and public informed is critical for successful communication during and after a crisis. Plant health emergencies demand fast and accurate responses. As an information officer you are required to:

- inform the public about the nature of pests and their effect on plant health
- inform the public of current plant health emergencies
- inform the public of the effect of threats to urban and wild land areas
- stimulate co-operation of the public in responding to the emergency

#### 5.1.2 *Objectives*

The objectives of an information officer are to:

- keep the general public informed about the current emergency
- gather and make available accurate news story material and other related public information
- deal with the news media and other parties, acting as a buffer for personnel directly involved in the field operation
- foster good relations between operations staff, the media, elected officials, other agencies, local communities and the general public
- improve plant health education and awareness

## 5.2 *Crisis Communication*

### 5.2.1 *Principles of Effective Communication*

The special field of public relations known as crisis communications has also developed practices to assist government and industry in emergency situations— explosions, terrorist activities, spills of dangerous goods, earthquakes, wildfires and other life-threatening disasters requiring quick control of information and its orderly release.

# Plant Health Emergency Manual

|                |                         |            |
|----------------|-------------------------|------------|
| Section<br>5.0 | Communications          | Page<br>58 |
|                | DATE<br>4 December 2014 | AMENDED    |

Pest management information operations are largely routine, but in emergencies, increased demands from the public and the media can hamper effectiveness. To avoid being overwhelmed during an emergency, the procedures relating to good crisis communication are outlined in the following principles. These principles are based on experience in successfully completing the 1992 Asian Gypsy Moth Eradication Program (Section 6.4 ) and other crisis communication situations.

## 5.2.1.1 Principle 1 COMMUNICATE WITH ONE VOICE

No matter how many employees are assigned to gather and disseminate emergency information, only designated spokespersons may represent the project to the public. This is the single source approach to communication.

Controlled information flow depends on sticking to the single source philosophy - that is, speaking with one voice. Keeping with this philosophy does not mean that only one person talks, but that co-ordinated public relations efforts permit the experts from each area to speak on their area of expertise. All disseminated information forms one coherent story that is free of contradictions, misinformation and rumours.

As an example of this approach, in 1992 news reporters interviewed the "project manager" about project timelines, the "command team" about pest management strategy, the project entomologist on insect biology and other personnel on their areas of expertise as the demand arose. This allowed the project to maintain a professional standard of conduct and provide a consistent, accurate and timely message to the media, communities and the general public.

## 5.2.1.2 Principle 2 EFFECTIVE COMMUNICATION IS IMPORTANT

Demand for information from the public and media can seriously impair the effectiveness of project operational personnel. Forcing the media to turn to non-project sources greatly increases the chance of misleading news reports based on bias, rumour or allegation.

Badly communicated information can lead to serious repercussions in BCPPAC's relationships with communities or other agencies. Efficiently handled information will ensure that the credibility of BCPPAC is maintained or even improved.

## 5.2.1.3 Principle 3 PREVENTION IS CHEAPER THAN THE CURE

This handbook is intended for use during emergencies, but the success of these procedures depends on the advance work you have done. It is particularly important to foster good relations within your local community.

The importance of pre-planning information activities cannot be over-stressed. It is important to involve all team members in the pre-planning process.

## 5.2.1.4 Principle 4 CRISIS COMMUNICATION WORK IS DEMANDING

Providing information to the public and media is demanding and challenging but can also be rewarding. Information spokespeople have to operate under difficult conditions – overwhelming demands from media, public controversy or with an understaffed communications centre. Being able to cope with adverse conditions will produce good results, acceptance and recognition.

# Plant Health Emergency Manual

|                |                         |            |
|----------------|-------------------------|------------|
| Section<br>5.0 | Communications          | Page<br>59 |
|                | DATE<br>4 December 2014 | AMENDED    |

## **5.2.2 Assessing Information Needs**

### **5.2.2.1 Escalating Situations**

A crisis typically develops in a matter of hours. Accurate and early assessment of a potential crisis is essential for maintaining an efficient information operation that is rapidly expanding.

If, for example, citizens protest their concerns about the possible use of a pesticide, dozens of reporters and TV crews will be on the scene within hours, all with tight deadlines for filing stories on the protest. In an escalating event it is important to have a plan of action in place to deal with as many potential impacts as possible.

### **5.2.2.2 Mobilizing an Information Team**

All organizations should have designated staff members who are both qualified and enthusiastic members of the Information Team. Depending on the urgency of the situation and the location, an experienced and trained team from a federal or provincial pool of information specialists can be on site within a few hours.

It is important to be responsive and flexible. Functions should be interchangeable between members of the Information Team and training will be provided to additional staff as situations develop in order to expand the number of trained, available staff.

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>60 |
|                | DATE<br>4 December 2014   | AMENDED    |

## 6.0 Appendices and References

### 6.1 Lists of Non-indigenous Species of Concern to British Columbia

#### 6.1.1 Introduction

The ever increasing activities at all British Columbia points of international contact—airports, harbours and borders, for example—are of particular concern to agencies with plant health responsibilities. Current levels of inspection (frequency, intensity) may be inadequate to consistently prevent introductions of non-indigenous species now and in the future. Thus, the need for awareness of the importance of a timely and organized response (as presented in this manual) becomes even more important should any non-indigenous species be discovered in the province.

Non-indigenous species of concern to B.C. included in lists created by agencies responsible for plant health are available. Lists are best estimates of species that could cause plant health emergencies in BC, and they are updated at various intervals. The URL's provided are current to 24 Jan. 2012. Following are some examples of regulated pest lists.

- Pests Regulated by the Canadian Food Inspection Agency (CFIA):  
<http://www.inspection.gc.ca/english/plaveg/protect/listpespare.shtml>
- United States Department of Agriculture Animal and Plant Health Inspection Service (USDA APHIS) main plant health page:  
[http://www.aphis.usda.gov/plant\\_health/plant\\_pest\\_info/index.shtml](http://www.aphis.usda.gov/plant_health/plant_pest_info/index.shtml)
- USDA APHIS maintains both a Regulated Plant Pest List and a list of higher taxa of regulatory concern. They note that the former list is not all inclusive and therefore quarantine action may be taken on organisms included within list of higher taxa whether or not they are included on the pest list.
  - Regulated plant pest list:  
[http://www.aphis.usda.gov/import\\_export/plants/plant\\_imports/downloads/RegulatedPestList.pdf](http://www.aphis.usda.gov/import_export/plants/plant_imports/downloads/RegulatedPestList.pdf)
  - Higher taxon list:  
[http://www.aphis.usda.gov/import\\_export/plants/plant\\_imports/downloads/Qualstatement.pdf](http://www.aphis.usda.gov/import_export/plants/plant_imports/downloads/Qualstatement.pdf)
- North American Plant Protection Organization (NAPPO) Phytosanitary Alert System (PAS) [ [http://www.pestalert.org/newsAlert\\_search.cfm](http://www.pestalert.org/newsAlert_search.cfm) ] provides up-to-date information on pest situations of significance to North America. It is intended to facilitate awareness, detection, prevention and management of exotic species in North America and provides information in two ways:
  - "Official Pest Reports" provided by NPPO's of Canada, the United States, or Mexico They are official communication from the country of origin in compliance with the IPPC Standard on Pest Reporting (ISPM No. 17).
  - "Alerts" obtained from public sources. They are not official communications from NAPPO and information within alerts are provided solely as an early warning to NAPPO countries of invasive species issues in other jurisdictions.

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>61 |
|                | DATE<br>4 December 2014   | AMENDED    |

- European and Mediterranean Plant Protection Organization (EPPO) recommends its member countries to regulate the pests listed below as quarantine pests:  
<http://www.eppo.org/QUARANTINE/listA2.htm> and  
<http://www.eppo.org/QUARANTINE/listA1.htm>
- Comité de Sanidad Vegetal del Cono Sur [South Cone Plant Protection Committee] (COSAVE) maintains a list major regulated pests Argentina, Brasil, Chile, Paraguay and Uruguay  
<http://www.cosave.org/admin/files/firmas/a13378d9f88fbae5f78534a4b9468a7eLista%20de%20plagas%20reglamentadas%20del%20COSAVE.pdf>

Many insects and diseases present in foreign lands have poorly known life histories and habits. Past experiences have shown that organisms which are often innocuous and poorly known within their native ranges can become serious pest when introduced into other parts of the world. For these reasons, any non-indigenous species threatening plant health, whether listed or not, discovered in B.C. would likely be considered for Initial Response by BCPPAC (Section 4.1 ). Eradication or other assertive treatments (Section 4.3 ) may be considered if a threatening non-indigenous species is confirmed to be present in B.C.

## 6.2 Sample Submission and Identification

### 6.2.1 Introduction

The development of a response in a plant health emergency requires a confirmed identification of the plant pest. To ensure that those agencies with diagnostic capabilities can provide prompt, accurate and complete identifications of suspect plant pests it is essential that they receive sufficient, well documented specimens in good condition for examination. This section provides general guidelines for the collection, submission and shipment of plant health pests to specialists for identification or confirmation and identifies the diagnostic capabilities of the member agencies. In all instances, the first level of contact for diagnostics should be through the key contacts within one's agency. Should those contacts be unable to determine the identity of the pest of concern, the sample is forwarded to an appropriate agency with diagnostic capabilities.

The general guidelines for preservation of material are for those taxa that will be identified morphologically. Increasingly, molecular techniques are being applied to confirm morphological identifications or to provide definitive identifications for life stages of plant pests that cannot be reliably identified morphologically (e.g. Barr et al 2009). Specimens requiring molecular identification must be preserved in a specific manner to conserve DNA. Specialists should be consulted for preferred preservation techniques for taxa requiring molecular identification.

The diversity of non-indigenous species affecting plant health precludes the development of general instructions for the collection and submission criteria for different groups of pests. Instructions for handling of samples from specific groups of organisms can be obtained from standard references or from specialists within the appropriate member agencies. Some guidelines are provided in this manual.

### 6.2.2 Sample Handling Procedures

Collection and shipping protocols differ widely across taxonomic groups. Standard references for the various groups of plant health pests include:

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>62 |
|                | DATE<br>4 December 2014   | AMENDED    |

- **Insects**
  - Martin, J.E.H. 1977. The Insects and Arachnids of Canada, Part 1. Collecting, preparing and preserving insects, mites and spiders. Research Branch, Canada Department of Agriculture Publication 1643, 182 pp.[available online at: [http://www.esc-sec.ca/aafcmonographs/insects\\_and\\_arachnids\\_part\\_1\\_eng.pdf](http://www.esc-sec.ca/aafcmonographs/insects_and_arachnids_part_1_eng.pdf) ]
- **Fungi and Bacteria**
  - Callan, B.E. and A. Funk.-1994. Introduction to forest diseases. Can. For. Serv. Forest Pest leaflet #54. Pacific Forestry Centre [available online at: <http://dsp-psd.pwgsc.gc.ca/Collection/Fo29-6-54-2001E.pdf> ]
  - Hawksworth. D.L., 1974. Mycologist's Handbook. Commonwealth Agricultural Bureaux, Slough.
- **Vascular Plants & Weeds**
  - Saville, D.B.O.1962. Collection and care of botanical specimens. Res. Branch Canada Dept. of Agric. Publ. No. 1113

Adequate sample material documenting all life stages of the plant pest present at the time of collection must be available to the specialist providing the identification. Should only immature stages be found, collect enough live material to allow for the immature stages to be reared or cultured. It is easier for the specialist to discard excess material than to request additional specimens. When in doubt contact a specialist for guidance.

Collection data accompanying submissions should be detailed. Specialized collection forms are used by various BCPPAC agencies to document both collection data and final identifications for samples submitted. As one example, the link below includes general instructions on collections and the submission process from the BC Ministry of Agriculture Plant Health Laboratory:

- <http://www.agf.gov.bc.ca/cropprot/lab.htm>

Samples collected from differing locations, hosts or dates should be accompanied by separate collection forms. **Complete all specimen labels with pencil (HB) or India ink only.** Do not use a ball-point pen or other markers, as the ink is not permanent.

In the absence of pre-printed forms include the following information with each collection:

- Geographic location of collection - supply enough information so that individuals unfamiliar with the area can relocate the site. For urban areas provide complete street address; for rural areas document GPS coordinates or provide a map.

Include GPS coordinates as:

1. Latitude and longitude [49° 15' 30" N, 122° 30' 00" W] or
  2. Decimal degrees [49.2550° -122.5000°]
- Date of collection—to avoid ambiguity, spell out the month or use Roman numerals (02 Nov 1996 or 02 xi 1996);
  - Host or substrate data — host species, age, condition, number of hosts similarly affected, location of damage on host, or type of substrate if not a plant;
  - Description of area (e.g., fallow field, natural forest, plantation, bog, urban);

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>63 |
|                | DATE<br>4 December 2014   | AMENDED    |

- Unusual conditions/contributing factors— e.g. heavy frost, drought, chemical applications, proximity to roads etc.;
- Collector— including the name, agency affiliation, and mailing address, of individual who collected the sample and a telephone, fax number or e-mail address at which the collector can be reached during business hours.

## 6.2.3 Shipment of Samples

CAUTION: Live material of known quarantine significance (e.g. interceptions of non-indigenous pests) should not be shipped by mail or courier without authorization from CFIA, as well as approval of the intended recipient. Such samples should be packed in secure containers and hand carried to the intended recipient.

To prevent deterioration of live material in transit, please insure prompt delivery (Priority Post or Courier). Use crush-resistant containers (e.g. mailing tins) for shipping fragile specimens. Pack so that the specimens can withstand rough treatment.

## 6.2.4 CFIA Pest Identification

The CFIA has several laboratories that do pest identification of various types of pests. An internal submission and tracking system has replaced the paper forms used in the past.

## 6.3 Danger Analysis Worksheet

A Danger Analysis is the first systematic analysis to be conducted following the detection of a new non-indigenous species in British Columbia (Section 4.1 ). It is expected to be completed by a BCPPAC Technical Advisory Committee (TAC), and it is intended to provide a timely evaluation to the BCPPAC Executive of the potential threat posed to plant health by the non-indigenous introduction in question. The accompanying worksheet is provided as a template for use by the TAC during the Danger Analysis. It provides the basis for Executive recommendations for any further action.

### 6.3.1 Danger Analysis

Before a Danger Analysis can be properly initiated, the relevant literature and all known data pertaining to the species in question must be assembled. The Chairperson of the TAC should arrange for a review of the literature, determine the expertise required to conduct the Danger Analysis, and coordinate the distribution of literature and data to ensure that all pertinent technical information is available to the TAC conducting the assessment. Members of the TAC should forward all available information on the species in question to the Chair. External experts should be consulted promptly and as frequently as required.

**Risk and Hazard** are evaluated by considering the factors listed on the worksheet (or, when appropriate or, other/additional factors selected by the TAC). The factors are rated numerically according to a three- value scale corresponding to the following categories: 1.0 - HIGH; 0.5 - MODERATE; or 0.0 - LOW Risk which define the degree of Risk or Hazard for each factor evaluated as determined by the expert committee.

The factors of relevance to the determination of Risk and their evaluation are described in detail in Section 4.1 .To determine Risk, the biological attributes, seasonal occurrence, reproductive potential, life history and habits / etiology, rate of dispersal or other features of the non-indigenous

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>64 |
|                | DATE<br>4 December 2014   | AMENDED    |

introduction which could provide insight into the threat it poses to potential hosts and their ecological associates in British Columbia are evaluated.

The **Risk Rating** (i.e. the probability of a newly discovered non-indigenous species becoming permanently established and attaining pest status) is based on a maximum of 10 points and is obtained by adding the individual values obtained for each factor considered. Each Risk factor analyzed can be given a potential impact level based on the following range of values: 8.5 -10 - EXTREME / SEVERE Level of Risk; 6.5 - 8 - HIGH / SERIOUS Level of Risk; 4.5 - 6 - MODERATE Level of Risk; 0.5 - 4.0 - LOW Level of Risk; and 0 - NO IMPACT.

The local (or regional) ecological, climatic, environmental and/or economic factors of importance in defining the nature and vulnerability of the plant species threatened by a non-indigenous introduction are evaluated in the Hazard Rating. Those factors are described in Section 4.1 . The **Hazard Rating** defines the nature and vulnerability of the host or associated species at a specific location (or region) with due consideration to spread potential. It also is based on a maximum of 10 points and is obtained by summing the individual values for each hazard factor considered. A Hazard Rating can be assigned to a potential impact level based on the same range of values employed in the Risk Rating system outlined above.

The **Danger Level** is derived by adding the ratings arrived at in the evaluation of Risk and Hazard (i.e. **Danger = Risk + Hazard**). Because half points can result from both the Risk and the Danger Ratings, the value may require rounding before a Danger Level based on the point ranges and the associated descriptors listed below can be assigned. In those cases where rounding would result in a change in the Danger Level, the working committee members should err on the side of caution and assign the higher level.

| Danger Level | Points |
|--------------|--------|
| Extreme      | 18-20  |
| Serious      | 14-17  |
| Moderate     | 10-13  |
| Minor/ Low   | 1-9    |
| Nil          | 0      |

The accompanying Worksheet provides sections in which the individual values and reasons for their assignment (Comments section) can be recorded for each of the factors assessed. Space is provided for the summation of factors for both Risk Rating and Hazard Rating, as well as a field in which the Danger Level can be recorded. The completed worksheet should be signed by the Chairperson of the Technical Committee and should accompany the cover letter along with any supporting documentation or recommendations. The committees report should include:

- Cover letter with result and recommendation(s) highlighted;
- Completed Danger Analysis Worksheet;
- Key references and documents;
- Correspondence from advisors, other experienced specialists.

Sample completed worksheets based on the 1991 detection of an Asian race of gypsy moth (*Lymantria dispar*) in Vancouver and the 1995 discovery of an Asian ambrosia beetle (*Xylosandrus germanus*) in Richmond follow the blank worksheets.

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>65 |
|                | DATE<br>4 December 2014   | AMENDED    |

**Figure 14. Danger Analysis Worksheet (for use, remove and photocopy).**

BRITISH COLUMBIA  
PLANT PROTECTION TECHNICAL ADVISORY COMMITTEE

|                          |  |  |
|--------------------------|--|--|
| <i>Species Evaluated</i> | <b>Danger Level</b><br><i>(Sum Risk and Hazard Levels)</i> |  |
|--------------------------|--|--|

| <b>Risk Evaluation</b>                         |       |   |
|--|-------|---|
| Factor   | Value | Comments <i>(attach extra sheets if required)</i> |
| 1. Current and historical status               |       |   |
| 2. Life history / habits / etiology            |       |   |
| 3. Mobility / Expected spread                  |       |   |
| 4. Containment and / or Eradication potential  |       |   |
| 5. Vector / Vectored                           |       |   |
| 6. Pathway analysis                            |       |   |
| 7. Natural enemies / Barriers                  |       |   |
| 8. Related environmental or social connections |       |   |
| 9. Temporal analysis                           |       |   |
| 10. Technical Knowledge (Rate in reverse)      |       |   |
| <b>Risk Total</b>                              |       |   |

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>66 |
|                | DATE<br>4 December 2014   | AMENDED    |

Danger Analysis Worksheet (*Continued*)

-----

| Hazard Evaluation              |       |   |
|--------------------------------|-------|---|
| Factor                         | Value | Comments ( <i>attach extra sheets if required</i> ) |
| 1. Host availability           |       |   |
| 2. Host distribution           |       |   |
| 3. Host location               |       |   |
| 4. Host range, types           |       |   |
| 5 Host values                  |       |   |
| 6. Climatic influences         |       |   |
| 7. Damage                      |       |   |
| 8. Consequence of damage       |       |   |
| 9. National implications       |       |   |
| 10. International implications |       |   |
| <b>Hazard Total</b>            |       |   |

|                |                 |                             |
|----------------|-----------------|-----------------------------|
| Date Initiated | Committee Chair | Date Completed              |
|                |                 | No. of Extra Pages Attached |

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>67 |
|                | DATE<br>4 December 2014   | AMENDED    |

Figure 15. Danger Analysis Worksheet (SAMPLE 1)

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BRITISH COLUMBIA  
PLANT PROTECTION ADVISORY COMMITTEE

|   |  |             |
|---|--|-------------|
| <b>Asian Gypsy Moth (<i>Lymantria dispar</i>)</b><br><i>Species Evaluated</i> | <b>Danger Level</b><br><i>(Sum Risk and Hazard Levels)</i> | <b>19.0</b> |
|---|--|-------------|

| <b>Risk Evaluation</b>                         |            |   |
|--|------------|---|
| Factor   | Value      | Comments <i>(attach extra sheets if required)</i>   |
| 1. Current and historical status               | 1.0        | <i>species is on every list, previous experience</i>  |
| 2. Life history / habits / etiology            | 1.0        | <i>very fecund species, up to 1000 eggs per female</i>  |
| 3. Mobility / Expected spread                  | 1.0        | <i>female capable of rising and sustained flight, distances of more than 10 km recorded in literature; females attracted to light, will oviposit on objects which facilitates long distance dispersal</i> |
| 4. Containment and / or Eradication potential  | 1.0        | <i>Difficult to contain because of dispersal ability; no hard chemical option available for immediate control required before female dispersal</i>  |
| 5. Vector / Vectored                           | 0.5        | <i>eggs on plants, inanimate objects</i>  |
| 6. Pathway analysis                            | 1.0        | <i>easily and frequently spread by man</i>  |
| 7. Natural enemies / Barriers                  | 1.0        | <i>natural enemies ineffective, no known barriers to dispersal or establishment in southern BC</i>  |
| 8. Related environmental or social connections | 1.0        | <i>egg masses and live larvae introduced during spring when risk for and ease of establishment is greatest</i>  |
| 9. Temporal analysis                           | 1.0        | <i>no known seasonal barriers, introductions coincide with host availability</i>  |
| 10. Technical Knowledge (Rate in reverse)      | 0.5        | <i>large volume of technical knowledge available, biology and life history well understood, techniques available for differentiation of Asian from European/ North American strains</i>                   |
| <b>Risk Total</b>                              | <b>9.0</b> |   |

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>68 |
|                | DATE<br>4 December 2014   | AMENDED    |

Danger Analysis Worksheet (SAMPLE 1 - continued)

-----

| Hazard Evaluation              |             |   |
|--------------------------------|-------------|---|
| Factor                         | Value       | Comments (attach extra sheets if required)  |
| 1. Host availability           | 1.0         | <i>wide range of known hosts available at the site of introduction</i>  |
| 2. Host distribution           | 1.0         | <i>known hosts widely distributed in BC</i>   |
| 3. Host location               | 1.0         | <i>presence of males in flight indicates that population has developed on suitable hosts</i>  |
| 4. Host range, types           | 1.0         | <i>able to complete development on a wide range of hosts, confers included in the host list will complete development from egg to adult on Douglas fir</i>                        |
| 5. Host values                 | 1.0         | <i>Known to impact host values</i>  |
| 6. Climatic influences         | 1.0         | <i>area of establishment known to be climatically suitable</i>  |
| 7. Damage                      | 1.0         | <i>can cause serious damage</i>   |
| 8. Consequence of damage       | 1.0         | <i>a quarantinable pest with serious direct and severe indirect consequences to plant health and commerce</i>   |
| 9. National implications       | 1.0         | <i>a serious threat to eastern Canadian deciduous forests, potential for hybrid vigour should populations of Asian gypsy moth mate with existing "North American" populations</i> |
| 10. International implications | 1.0         | <i>a serious plant health threat to United States agriculture and forestry, is also a threat to trading partners in southern hemisphere (Australia, New Zealand, Chile)</i>       |
| <b>Hazard Total</b>            | <b>10.0</b> |   |

|                                       |  |                                       |
|---------------------------------------|--|---------------------------------------|
| Date Initiated<br><b>EXAMPLE ONLY</b> | Committee Chair<br><b>EXAMPLE ONLY</b> | Date Completed<br><b>EXAMPLE ONLY</b> |
|                                       |  | No. of Extra Pages Attached           |

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>69 |
|                | DATE<br>4 December 2014   | AMENDED    |

Figure 16. Danger Analysis Worksheet (SAMPLE 2)

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BRITISH COLUMBIA  
PLANT PROTECTION ADVISORY COMMITTEE

|   |  |             |
|---|--|-------------|
| <b><i>An Asian Ambrosia Beetle (Xylosandrus germanus)</i></b><br><i>Species Evaluated</i> | <b>Danger Level</b><br><i>(Sum Risk and Hazard Levels)</i> | <b>18.0</b> |
|---|--|-------------|

| <b>Risk Evaluation</b>                         |              |   |
|--|--------------|---|
| <b>Factor</b>                                  | <b>Value</b> | <b>Comments</b> <i>(attach extra sheets if required)</i>  |
| 1. Current and historical status               | 0.5          | <i>previously introduced in eastern North America, has been collected in eastern Canada, introduced into Germany, Yugoslavia, Switzerland., not on quarantine lists</i> |
| 2. Life history / habits / etiology            | 1.0          | <i>population, is hidden within its host for most of its life cycle</i>   |
| 3. Mobility / Expected spread                  | 1.0          | <i>likely to spread relatively quickly through movement of wood with galleries (e.g., firewood, prunings)</i>   |
| 4. Containment and / or Eradication potential  | 1.0          | <i>will be difficult to contain, cannot be eradicated without complete host removal</i>   |
| 5. Vector / Vectored                           | 0.5          | <i>serious threat, known to be capable of vectoring Dutch elm disease, has been associated with causal agent of pine pitch canker, as well as other plant diseases</i>  |
| 6. Pathway analysis                            | 1.0          | <i>has repeatedly been moved in commerce, could vector plant diseases</i>   |
| 7. Natural enemies / Barriers                  | 1.0          | <i>no known natural enemies, has been taken at high elevations in Europe</i>  |
| 8. Related environmental or social connections | 1.0          | <i>found in a wide range of habitat throughout the world.</i>   |
| 9. Temporal analysis                           | 1.0          | <i>no known limitations</i>   |
| 10. Technical Knowledge (Rate in reverse)      | 0.5          | <i>considerable technical information available, little information available on control</i>  |
| <b>Risk Total</b>                              | <b>9.0</b>   |   |

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>70 |
|                | DATE<br>4 December 2014   | AMENDED    |

Danger Analysis Worksheet (Continued – SAMPLE 2)

-----

| Hazard Evaluation              |            |  |
|--------------------------------|------------|--|
| Factor                         | Value      | Comments (attach extra sheets if required)   |
| 1. Host availability           | <b>1.0</b> | <i>more than 150 hosts known including both coniferous and deciduous hosts; likely no specific host requirements, needs only wood with correct moisture requirements</i> |
| 2. Host distribution           | <b>1.0</b> | <i>suitable host material widely distributed</i>   |
| 3. Host location               | <b>1.0</b> | <i>suitable host available at immediate site of detection</i>  |
| 4. Host range, types           | <b>1.0</b> | <i>potentially could breed in all species of woody hosts</i>   |
| 5. Host values                 | <b>1.0</b> | <i>Host values in urban areas of discovery, species capable of attacking "healthy" hosts</i>   |
| 6. Climatic influences         | <b>1.0</b> | <i>Climatic influences not likely to limit distribution in southern British Columbia; northern range limits unknown</i>  |
| 7. Damage                      | <b>1.0</b> | <i>will attack healthy plants in plantation, more likely to breed in stressed plants; vector serious plant pathogens</i>   |
| 8. Consequence of damage       | <b>1.0</b> | <i>presence may affect commerce indirectly if pest found in nursery stock</i>  |
| 9. National implications       | <b>0.5</b> | <i>species is present in south-eastern Ontario.</i>  |
| 10. International implications | <b>0.5</b> | <i>not known to occur in western United States, however this species is present in the eastern US.</i>   |
| <b>Hazard Total</b>            | <b>9.0</b> |  |

|                                       |  |                                       |
|---------------------------------------|--|---------------------------------------|
| Date Initiated<br><b>EXAMPLE ONLY</b> | Committee Chair<br><b>EXAMPLE ONLY</b> | Date Completed<br><b>EXAMPLE ONLY</b> |
|                                       |  | No. of Extra Pages Attached           |

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>71 |
|                | DATE<br>4 December 2014   | AMENDED    |

## **6.4 Case Study: 1992 Asian Gypsy Moth Eradication Program**

### **6.4.1 Introduction**

In 1992, an extensive "emergency" operation was undertaken to eradicate Asian gypsy moth in Vancouver, British Columbia. This case study summarizes the major and critical events leading up to and following the operation, provides additional background information, and refers to the corresponding sections that address relevant aspects of an emergency response in this Manual.

This BCPPAC-coordinated response to the threat of Asian gypsy moth is probably the best example of interagency cooperation in B.C., but there have been many others both before and after the 1992 Asian gypsy moth eradication program. For example, the detection of European elm bark beetle in Calgary in 1994 and in Edmonton in 1995, and the suspicion that this pest may have been transported to Alberta on nursery stock from B.C., resulted in trapping at elm-producing nurseries in Kelowna, Grand Forks and Midway in 1995. Beetles were detected at all three sites; the captures at Grand Forks and Midway were new records for B.C. The well-known potential of this insect to vector Dutch elm disease resulted in the establishment of a new BCPPAC Technical Advisory Committee and the development of an inter-agency strategy to prevent the reproduction of this quarantinable disease.

The following case study has three components: a chronological sequence of events from April 1991 to September 1993 (who? what? where? when?), analysis or explanation of the events (why?) in italics and a reference to the appropriate section(s) of this manual (how?) in the shaded boxes.

### **6.4.2 Background**

In the early 1980's, federal Agriculture Inspectors carrying out routine inspections of grain ships sailing between the Russian Far East and B.C. ports detected small numbers of gypsy moth egg masses on some ships. These were removed or destroyed as part of normal inspection procedures conducted by Agriculture and Agri-Food Canada.

During the winter of 1989-90, larger numbers of gypsy moth egg masses were found in the holds and on exterior surfaces of empty grain ships arriving in the Port of Vancouver. Again, these egg masses were removed and destroyed.

#### *Notes:*

*Although this gypsy moth was suspected to be an Asian "variant", the biology and potential host range were not well known at his time.*

*The risk of introduction was minimal as these ships would usually leave the port prior to any expected hatch of gypsy moth eggs. However, concern had now mounted because it was known that the female Asian gypsy moth could fly and that it could develop on more than 300 coniferous and deciduous hosts.*

**MANUAL REFERENCE** ▶ Section 4.1 :  
*Determining the Nature of a Threat*

## Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>72 |
|                | DATE<br>4 December 2014   | AMENDED    |

During the winter of 1990-91, even larger numbers of egg masses were found on grain ships. Federal Agriculture developed a contingency plan in case ships arrived during the period of egg hatch in the spring. This plan included obtaining advance information on vessels arriving in B.C. ports from northeast Asia, intensive inspection for gypsy moth egg masses, removal and/or treatment of egg masses found, determination of the viability of egg masses through quarantine rearing, and re-inspection for emerging larvae.

*Although Federal Agriculture had taken necessary steps to increase surveillance for gypsy moth from the Russian Far East, the BCPPAC Executive and the Gypsy Moth Committee were notified as critical events took place and became increasingly involved in providing advice.*

*These interceptions were correlated to expanding populations of Asian gypsy moth in eastern Russian and their occurrence allowed BCPPAC to signal and activate a coordinated and intensified domestic response process.*

**MANUAL REFERENCE** ▶ Section 2.2 & 2.5 :  
*Operational Collaboration & On Risk, Hazard and Danger; Section 3.1 : BCPPAC*

### 6.4.3 Detection and Initial Response

In April 1991, federal Agriculture Inspectors detected hatching gypsy moth egg masses on vessels originating from the Russian Far East. In spite of efforts to find and treat all egg masses, larvae were observed ballooning from ships. As a result, infested ships were ordered out of Canadian waters and a policy of ship inspection at Constance Bank, south of Victoria was immediately implemented.

**MANUAL REFERENCE** ▶ Section 4.3 : *Basic Treatment Options/ Monitoring and Surveillance*

*As a result of the inspection policy, a total of 17 vessels were banned from Canadian waters until October 15, 1991.*

In the summer of 1991, Federal Agriculture, by deploying regular staff and term employees, intensified pheromone trapping around the port facilities, at remote anchorages off southern Vancouver Island and along the shipping routes leading to the port. By September 1991, adult moths had been captured at several locations along the Vancouver waterfront including the West End, Stanley Park, and the south end of Second Narrows Bridge.

*Because larvae were thought to have blown ashore from docked ships, and suitable host material was available for their development, Federal Agriculture implemented additional detection surveys to determine if any larvae developed to adults. More than 2000 traps were placed in the Vancouver Harbour area.*

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>73 |
|                | DATE<br>4 December 2014   | AMENDED    |

Figure 17. Map of British Columbia and Greater Vancouver District

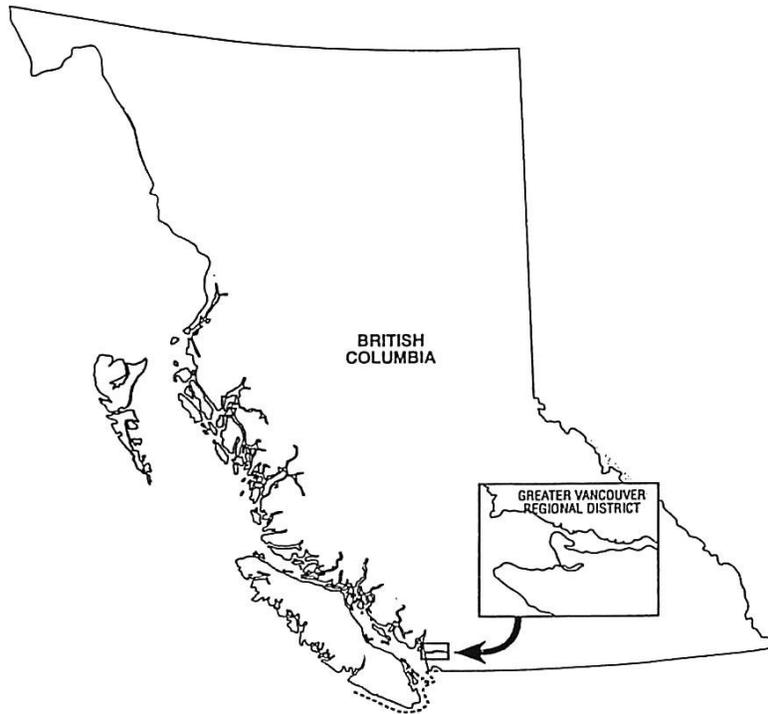
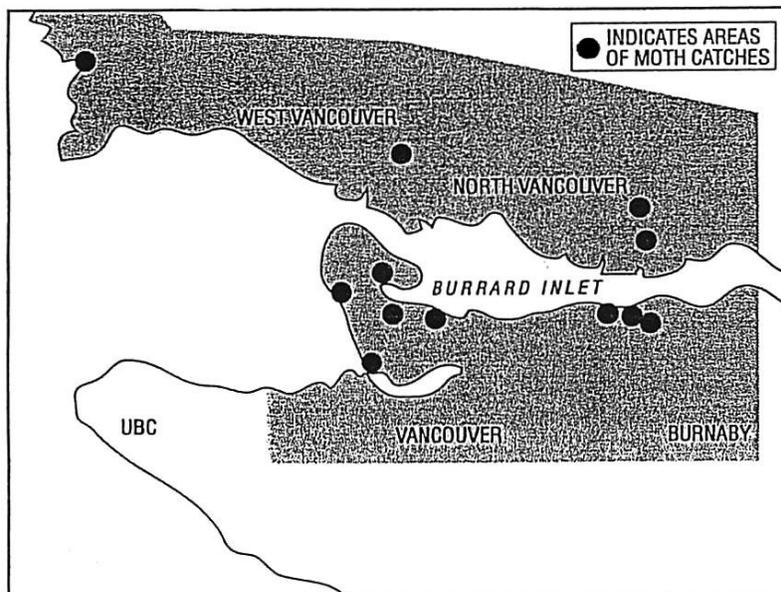


Figure 18. Distribution of male Gypsy Moth trap captures within the area of concern and possible treatment, Greater Vancouver, 1991



# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>74 |
|                | DATE<br>4 December 2014   | AMENDED    |

On October 1, 1991, researchers in the Department of Ecology and Systematics at Cornell University confirmed that the moths captured in Vancouver and sent for genetic analysis were of two distinct biotypes. Mitochondrial DNA diagnostic tools confirmed that 17 of the 33 moths analyzed were Asian gypsy moth.

*This was the first confirmed discovery of AGM in North America. At this time, the DNA fingerprinting technique used to distinguish Asian gypsy moth from the European biotype was not available in Canada. This illustrates the value of international cooperators.*

**MANUAL REFERENCE** ► Section 6.2 :  
*Sample Submission and identification*

Federal Agriculture began intensive ground searches for AGM egg masses in order to identify the epicentre(s) of the introduction. To this point, Federal Agriculture was able to conduct all field activities using their own resources.

**MANUAL REFERENCE** ► Section 4.3 :  
*Basic Treatment Options / Containment*

In November 1991, Federal Agriculture and the City of Vancouver notified residents in areas of suspected infestation of voluntary controls placed on the movement of garden waste and tree prunings to prevent accidental spread of AGM.

*Up to this point, most of the activities were under the direct control of Federal Agriculture. BCPPAC functioned mainly in an advisory role as most of the initial response activities were within the capability of the federal government.*

## 6.4.4 Response Planning

After confirmation of the Asian biotype, review of the current distribution in the area, and with due consideration of the nature of the threat, the costs of an eradication program, and the varied resources required, it became clear that the nature of this threat was now beyond the ability of Federal Agriculture alone.

*The BCPPAC philosophy supports the definition of a plant health emergency: "a major event which requires a coordinated response from a number of agencies".*

**MANUAL REFERENCE** ► Section 2.1 :  
*Definition of a Plant Health Emergency*

During October, the BCPPAC Gypsy Moth Committee quickly undertook to ensure that member agencies and all other potential stakeholders were apprised of the new introduction. For example, the provincial Pesticide Control Branch was notified of the detection of AGM in Vancouver and significance of this pest in B.C. Similarly, a number of special interest groups were invited to participate in consultation meetings.

**MANUAL REFERENCE** ► Section 4.4 :  
*Preparing for an Emergency Response*

*These initiatives in public and stake holder awareness resulted from gypsy moth experiences in the 1970's as described by Cram (1989).*

Also, as the western United States were becoming increasingly concerned about the introduction of Asian gypsy moth at U.S. ports, an ad hoc Canada-U.S. Working Group Meeting on AGM was held at Parksville, B.C. on October 17 and 18, 1991.

*Due to the international significance of AGM, subsequent bilateral meetings between AAFC (representing BCPPAC interests) and American authorities were essential to develop and maintain consistent strategies for the development of short term and long-term regulatory, research and control actions.*

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>75 |
|                | DATE<br>4 December 2014   | AMENDED    |

Because AGM was now also confirmed in the Western States, it was time for officials to discuss strategies for surveillance and response to this extended threat. Details were noted concerning trapping methodology, inspections, the biology of this variant and the options for coordinated response. It was recognized that quarantine and international embargoes could be imposed to curtail shipments from both countries because of infestations at west coast ports.

As a result of the assessment of the situation and the anticipated scale of the eradication program required, and with full support from the BCPPAC Gypsy Moth Committee, a senior Federal Agriculture official in New Westminster submitted a formal request for a declaration of an emergency to the Director of Plant Protection Division in Ottawa on October 23, 1991.

However, the anticipated response was not immediate. On November 7 - 8, 1991, over two weeks after the request, the decision was made in Ottawa that an emergency would not be declared. Instead, Federal Agriculture authorities there proposed that the operation should be jointly funded by the federal and provincial governments. They suggested that the operational budget and the cost-sharing arrangements were to be developed in B.C. This communication was received with great surprise by all provincial agencies.

Also, Federal Agriculture and Forestry officials meeting in Ottawa undertook an initial evaluation of treatment options at this time. Their assessment, in the form of the following three options, were subsequently presented to the BCPPAC Gypsy Moth Committee for consideration:

1. No Treatment— trapping and surveillance only
2. Suppression Program —including egg mass searching, larval searching and spot treatment, larval trapping, mass trapping and/or mating confusion.
3. Eradication Program— spray treatment using an effective pest control product
  - Full Scale - 8 km wide treatment area
  - Mid-Range - 4 km wide treatment area
  - Limited - 2 km wide treatment area

*One potential course of action in the early phase of the eradication program was for AAFC to declare a plant health emergency. This was a recognized procedure according to the Agriculture Canada Plant Protection Manual (Ottawa, 1991). It was also an expectation of BCPPAC and its member agencies.*

**MANUAL REFERENCE** ► Section 3.2 :  
*Federal Statutes and Regulations / Federal Acts and Regulations*

*If an emergency had been declared, Federal Agriculture would have assumed full responsibility for planning, funding and conducting the operations as had been done in the past for animal health emergencies.*

*This was consistent with the federal government policy to involve partners in cost-sharing arrangements wherever possible. At the time, this was not an established working principle within BCPPAC.*

*The BCPPAC Gypsy Moth Committee was active, and had effectively organized and coordinated a number of small-scale eradication operations in previous years.*

**MANUAL REFERENCE** ► Section 4.3 :  
*Basic Treatment Options*

*The resolution stated that: "BCPPAC, through the Gypsy Moth Committee, endorse a program aimed at eradication of the Asian gypsy moth using the authority offered by the federal Plant Protection Act, but with the technical, logistical and financial support of the member agencies cooperating in a team approach to program design and delivery"*

# Plant Health Emergency Manual

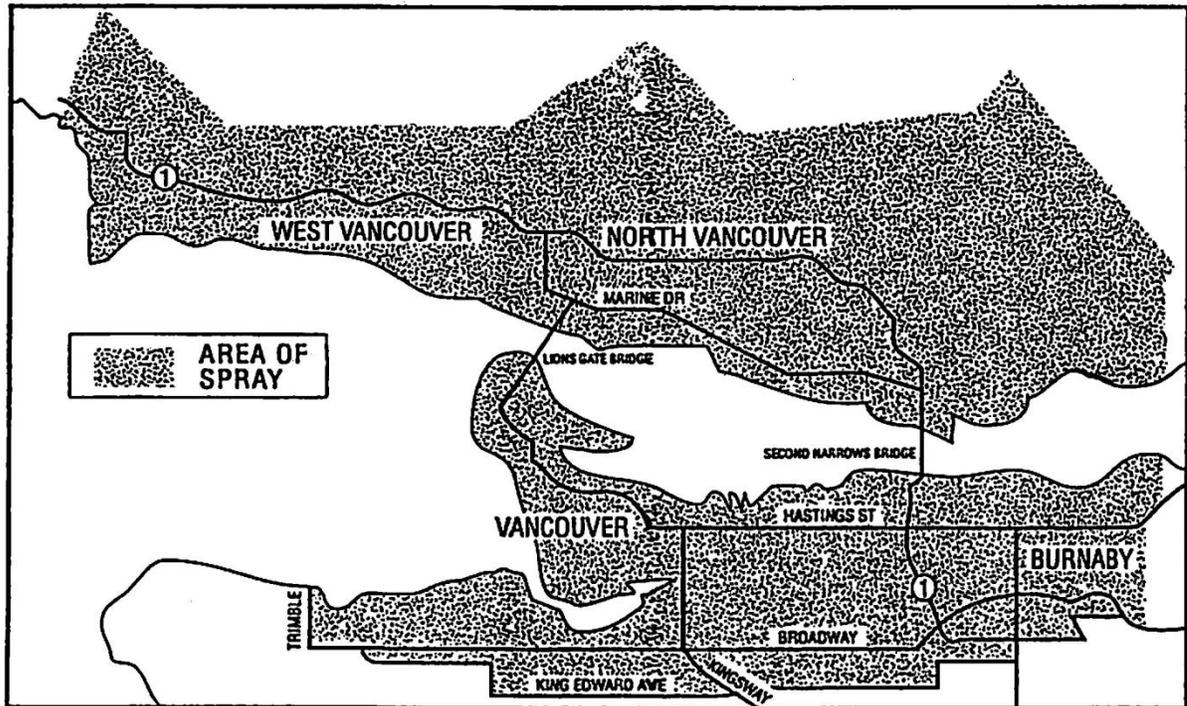
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|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>76 |
|                | DATE<br>4 December 2014   | AMENDED    |

On November 13, 1991, the BCPPAC Gypsy Moth Committee recommended an eradication program consisting of aerial and ground spraying of a commercial formulation of *Bacillus thuringiensis* var. *kurstaki* (Btk) - Foray 48B®. Treatment was proposed to include a 4 km wide area (approx. 18,000 ha) in 1992, plus a contingency "clean-up" program for 1993. The cost of the entire program was initially estimated to be \$4.5 million. This recommendation was endorsed by member agencies at the BCPPAC General Meeting on November 14, 1991.

*This resolution was used by representatives of the member agencies obtain support from their senior officials, and commitment of staff and/or other resources to the program. This process took several months to complete and resulted in a formal agreement between the federal and provincial government.*

**MANUAL REFERENCE** ► Section 4.5 :  
Guidelines on Preparing an Agreement on  
Emergency Treatment

Figure 19. The Asian Gypsy Moth Eradication Program: Treatment Area, 1992



# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>77 |
|                | DATE<br>4 December 2014   | AMENDED    |

Further communication with U.S. agencies was undertaken. First, on November 20-23, 1991, Federal Forestry staff visited Cornell University for training in DNA diagnostic techniques used to distinguish the Asian biotype of gypsy moth from the European in preparation for the establishment of a DNA diagnostic facility in British Columbia.

Secondly, on November 24-28, Federal Agriculture and Forestry research staff attended a USDA-FS-sponsored research and applications planning workshop in Connecticut to coordinate research efforts for the detection and identification of AGM.

In December 1991, a Project Steering Committee for the proposed eradication project was set up, and an inter-agency Project Team — the "Emergency Action Team" referred to in this Manual, was established. Federal Agriculture was confirmed as the lead agency. Provincial Forestry and Agriculture and Federal Forestry were identified as support agencies. The Greater Vancouver Regional District represented the affected municipalities on the Steering Committee.

The Emergency Action Team ("AGM Eradication Project Committee" at that time) held its first meeting in New Westminster on December 18, 1991. A manager and team units and functions were identified. Team units included administration, technical advice, information/ communication, survey and quarantine operations, and spray operations.

Initially, it was intended that the eradication program would be conducted under the "umbrella" of BCPPAC. However, it was determined that legal requirements would not allow recognition of BCPPAC. In the end, the permit application to the Pesticide Control Branch was made in the name of Federal Agriculture — Agriculture and Agri-Food Canada.

**MANUAL REFERENCE ► Section 4.8 & 4.9 : Agriculture & Forestry Emergency Response / Diagnostics & Identification**

*A diagnostic facility was subsequently established at the Pacific Forestry Centre in Victoria. The B.C. facility and its resources were a major contribution of Federal Forestry.*

*After this meeting, the research support function was confirmed, scientific staff identified, and inter-agency linkages established.*

**MANUAL REFERENCE ► Section 4.6 : Preparing for an Emergency Response / Steering Committee**

**MANUAL REFERENCE ► Section 3.3 : Roles and Responsibilities of Participants**

*In addition, several other interested parties, such as the City of Vancouver, Council of Forest Industries, and local Public Health Units, were involved as passive support agencies at this point.*

**MANUAL REFERENCE ► Section 4.7 : Model Organization Charts**

*Throughout the eradication program, BCPPAC played a coordinating role, but it was recognized that only the member agencies had the legal authority and administrative capability to conduct a large scale eradication program*

**MANUAL REFERENCE ► Section 3.1 : B.C. Plant Protection Advisory Council**

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>78 |
|                | DATE<br>4 December 2014   | AMENDED    |

## 6.4.5 Communications

Early in the planning, and as a result of past experiences, it was recognized that public information and communications were crucial to the success of the program. The Communications Unit, with specialists from Federal Agriculture and Provincial Forestry, became an integral component of the project. Critical functions for the Unit included:

- Public Information
- Media Liaison
- Staff Training
- Internal Communications

For example, Federal Agriculture set up a public information telephone line (666-MOTH) to handle inquiries and provide information. Six public information meetings were held in late January and early February, 1992. Three "Gypsy Moth Update." notices and an information poster were prepared and distributed by staff and commercial delivery services to libraries, offices and households in the affected area.

Because of the size and the importance of the communications functions, a temporary media centre was established within the treatment area in April 1992.

## 6.4.6 Legislative Authority

On January 10, 1992, Federal Agriculture submitted an application for a pesticide use permit with BCPPAC named as the applicant. However, the provincial Pesticide Control Branch did not recognize BCPPAC as a legal entity, and on January 17, Federal Agriculture re-submitted the application in its own name.

*A Communications Unit was one of the first groups designated and activated because of the perceived importance of delivering timely and comprehensive information to the public to ensure local support for the project*

**MANUAL REFERENCE** ► Section 5.0 :  
*Communications*

*Provincial Forestry staff had developed considerable expertise in public information and communications based on an extensive forest fire protection program.*

*Public information meetings featured a panel of experts from BCPPAC member agencies. A federal research entomologist described the biology of AGM the nature of the threat to B.C. Other officials outlined the treatment options and explained why aerial application of Btk would provide the best chance for successful eradication. A local medical health officer provided information on the safety of Btk from a public health perspective. Members of the audience were given an opportunity to ask questions of the panel.*

*The operational headquarters (called Moth Hall by staff) were also set up at this site at the same time.*

*Although emergency spray operations undertaken by federal authorities do not require provincial permits, previous gypsy moth eradication operations in B.C. had been conducted by Federal Agriculture under provincial pesticide use permits to allow public input through the appeal process*

**MANUAL REFERENCE** ► Section 3.2 :  
*Enabling Statutes and Regulations /  
Provincial Acts and Regulations*

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>79 |
|                | DATE<br>4 December 2014   | AMENDED    |

On March 18, 1992, a senior Plant Health official in New Westminster submitted a formal report to the federal Minister of Agriculture. The report stated that a survey had been conducted to determine whether Greater Vancouver was infested with AGM and that, on the basis of the survey, a certain area was believed to be infested and should be treated to prevent spread of this non-indigenous pest.

*This is a normal Federal Agriculture procedure prior to a major treatment program.*

On March 24, the federal Minister of Agriculture issued a "Minister's Determination" in response to the formal report. This document confirmed the Minister's approval for treatment of an area of Greater Vancouver to prevent the spread of AGM.

**MANUAL REFERENCE ► Section 3.2 :**  
*Enabling Statutes and Regulations /  
Federal Acts and Regulations*

The processing of the application for the pesticide use permit was further delayed by late responses from external reviewers of the permit application and additional medical advice requested by provincial Pesticide Control Branch. The permit was finally issued on March 26, 1992, only six days before the commencement date proposed in the permit application.

*The Pesticide Control Branch amended the commencement date on the permit to April 26, 1992 to allow for a 30-day appeal period.*

The 30-day appeal would have delayed spray operations until April 26, 1992, or later. Known gypsy moth phenology and examination of egg masses in rearings indicated that early mild spring weather would advance egg hatch. The BCPPAC Gypsy Moth Committee determined that spraying would have to be initiated by April 15 to ensure that emerging larvae were treated at their most vulnerable stage.

*Btk is most effective against gypsy moth when it is eaten by early instar (newly-hatched) larvae, thus it must be applied as the eggs are hatching. Because gypsy moth egg masses can hatch over an extended period of time, and because Btk is inactivated quickly, multiple applications are necessary.*

As a result, the Province of British Columbia entered into an agreement with Canada on eradication of AGM, including a cost-sharing formula. This agreement was signed by the provincial Minister of Forests on March 31, 1992 by the provincial Minister of Agriculture, Fisheries and Food on April 1, and by the federal Minister of Agriculture on April 13.

**MANUAL REFERENCE ► Section 4.5 :**  
*Guidelines for Preparing an Agreement  
on Emergency Treatment*

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>80 |
|                | DATE<br>4 December 2014   | AMENDED    |

On April 8, 1992, the Province of British Columbia declared an emergency so that the spray operations could proceed on April 15 without an appeal. A provincial regulation (B.C. Reg. 129/92), pursuant to the Pesticide Control Act and the Plant Protection Act, provided the necessary authority to apply Btk in the Greater Vancouver area. A joint press release was issued on that date by Provincial Agriculture, Forestry and Environment

One municipality and a few members of the public applied for injunctions to prevent spraying, but these were unsuccessful.

## 6.4.7 Operations

Aerial and ground spray operations proceeded smoothly, as a result of extensive planning by the operations team and expertise of contractors. Conair Aviation of Abbotsford and Frontier Helicopters were contracted for the aerial applications. The first aerial application was made by Bell 212 helicopter on April 18, 1992 and aerial applications with modified Douglas DC-6 fixed-wing aircraft commenced the next day. Spraying was completed on May 28.

The Communications Unit continued to advise the public and media of spray dates and other operations. Public advisories on BCPPAC letterhead were issued to the media several times each day throughout the spray period in April and May 1992.

## 6.4.8 Follow Up

Federal agriculture coordinated an intensive pheromone trapping effort both within and outside of the treatment area following the spray operations. No Asian gypsy moths were trapped in 1992. Accordingly, no spray treatment was planned for 1993.

The intensive monitoring program was repeated in 1993. Again, no Asian gypsy moths were caught within or near the treatment area. In September 1993, the AGM eradication program was declared a complete success.

*The Province used these two statutes as authority for declaring the emergency. This action by the provincial government (1) waived the need for a permit, (2) enabled funding under authority of the provincial Treasury Board, and (3) publicly elevated the eradication program to an emergency status, which the federal government had failed to do.*

**MANUAL REFERENCE** ► Section 3.2 :  
*Enabling Statutes and Regulations /  
Provincial Acts and Regulations*

*Responding to applications for injunctions against the spraying was a very time consuming task. Notes, documents and depositions had to be arranged and provided to legal counsel on very short notice.*

*Ministry of Transport required the use of multi-engine aircraft for spray applications over urban areas. This resulted in the first use of DC-6 aircraft for spray operations over a large urban area in British Columbia. These aircraft were accompanied by "bird dog" spotter planes flying above and behind on all flight lines*

*Provincial Forestry staff in Vancouver prepared an aerial spray program operations manual to document what was done, and to provide guidance for future, large-scale aerial spray operations.*

*A public health surveillance project was undertaken by UBC medical staff under contract to Provincial Forestry to determine any detrimental effects of the spray. The study did not show any significant health effects, even among ground spray crews who were exposed to very high concentrations of Btk.*

*In September 1992, two European gypsy moths were trapped within the AGM treatment area. However, as these were single moth captures in separate traps and no other life stages were found, the BCPPAC Gypsy Moth Committee did not recommend a spray treatment for this site for 1993.*

*The BCPPAC Gypsy Moth Committee has remained active and has continued to apprise the BCPPAC Executive of all new detections of gypsy moth in B.C.*

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>81 |
|                | DATE<br>4 December 2014   | AMENDED    |

## 6.4.9 Lessons Learned

The 1992 Asian Gypsy Moth Eradication Program was planned, coordinated and conducted without the benefit of a Plant Health Emergency Manual for British Columbia. The success of the project must be attributed to the high calibre of scientific and technical expertise within BCPPAC member agencies as well as the ability and willingness of the agencies to work together to deal with a situation that no one agency could have handled alone. The concept of an Emergency Action Team and a Project Steering Committee evolved in 1992 due to the need for interagency cooperation. They have served as a model for emergency response organization and procedures outlined in this Manual.

The participants learned through experience that a project of this magnitude requires:

- contingency funding for an initial response,
- a formal agreement for interagency cooperation,
- legislative authority to undertake an emergency response,
- re-assignment of knowledgeable and skilled personnel,
- open and ongoing communications with the public and the media

## 6.4.10 Afterword

The 1992 Asian gypsy moth story reported here is not the only experience of the B.C. Plant Protection Advisory Council during the past forty years. During the first quarter century the Council members, especially via the Technical Committees, have grappled with a variety of plant health threats, including:

- continuing spread of the Balsam Woolly Adelgid;
- continuing introductions of European gypsy moth from eastern North America;
- periodic detections and eradications of chrysanthemum white rust in commercial operations;
- embargo of B.C. wood products alleged to be infested with pinewood nematode by northern European countries;
- contamination of forest seedling nursery beds by hemlock seedling blight fungus introduced on imported strawberry plants previously grown on the same sites;
- potential introduction of blueberry maggot from infested areas in eastern North America, a problem requiring quarantine action under provincial regulations.

Since the completion of the first edition of this manual in 1997, a wide range of non-indigenous species impacting all sectors of plant health have established in British Columbia. Some of the more notable establishments include:

- establishment and spread of European chafer in urban environments around metro Vancouver
- establishment and rapid spread of spotted wing Drosophila on soft fruits
- establishment of apple clearwing moth in coastal and interior orchards
- establishment of apple maggot in urban areas of south-coastal BC
- establishment of the banded elm bark beetle and the elm flea beetle in the interior of BC
- expansion of a horticultural pest, the arborvitae weevil, from urban areas of metro Vancouver onto conifers in adjacent native forests

In addition, interceptions and/or incursions of either North American or Asian races of gypsy moth continue to occur on an almost annual basis. Indeed, the recent detection of an Asian gypsy moth on Vancouver Island led to the first activation of the CPPMC since its inception.

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>82 |
|                | DATE<br>4 December 2014   | AMENDED    |

In fact, the establishment, structure, legacy, and reconfirmation of BCPPAC are all based on the chronic dangers threatening crops and forests by mostly non-indigenous species. While the Asian gypsy moth experience was not the only BCPPAC coordinated operation in recent years, it was the most serious, the most expensive, the most demanding, and the most educational experience to date.

The Case Study, with pertinent commentary and references to Manual Sections, is a core feature of this Manual and should be considered a structural mainframe for future operations. It highlights both strengths and weaknesses in inter-agency relationships, confirming especially (a) the need to be prepared to deal with change (e.g. roles, responsibilities of line agencies especially), and (b) to expect to deal with the unexpected (e.g. an obvious emergency situation for some will be a non-emergency for others).

The "Lessons Learned" from such emergency pest operations each will connect to the basic questions— and especially the bottom line for BCPPAC Executive— "who pays for this next program?" Clearly, senior legislation and recent first-hand experiences, or funding formulas borrowed from other jurisdictions, will not necessarily apply to any future situation in B.C. Analysis of the situation at hand and recommendation from the best expertise available—as via BCPPAC —will, however, lend considerable credibility to the evaluation of the problem and its "solution". At present, BCPPAC is the most experienced and best qualified group to do this work. Readers of this Case Study, and the Manual, will know:

- BCPPAC and the CPPMC offers the best chance to deal successfully with a dangerous situation whenever the ability to deal with a plant health emergency is beyond the means of a single member agency;
- Funding for field activities from early collection of specimens to confirmation of the problem (e.g. utilization of an expert Initial Response Team can be funded from current budgets providing line managers plan for, and clearly identify potential sources of funds from existing budgets;
- Should an eradication program be required, a Lead Agency must be identified;
- Pooling experienced Communications personnel for early and regular communication with local residents and stakeholders such as Community Associations, as well as with senior officials, the media and others, will be paramount to gain and keep public support;
- The program must include debriefing and reporting of results as well as consideration of its relationship to similar operations elsewhere and to the need for repeated (annual) treatment to ensure success.

## 6.4.11 Annotated References

Agriculture Canada. 1991. Discussion document on Asian gypsy moth in Vancouver. Unpublished Report, 28pp. [*The first comprehensive document compiled for public information and stakeholder consultation.*]

Cram, W.A. 1989. Gaining Support for British Columbia's Gypsy Moth Wars 1978 -1988. B.C. Ministry of Forests Pest Management Report No. 12.35 pp. [*A report detailing eradication programs and the importance of public communication.*]

Humble, L. and A.J. Stewart. 1994. Gypsy Moth. Canadian Forest Service Forest Pest Leaflet 75. 8pp. [*Biology, life history and habits, hosts, damage, importance, and history of gypsy moth in B.C. since 1912.*]

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>83 |
|                | DATE<br>4 December 2014   | AMENDED    |

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## 6.5 Project Evaluation Checklist

### 6.5.1 Introduction

At the end of every plant health emergency project, however large or small, is the obligation to (1) conduct a comprehensive debriefing session, and to (2) summarize and record the salient features of importance to BCPPAC / CPPMC and the participating agencies. The debriefing should be held soon after, completion of field operations. It is here where the nature of the report should be determined.

The report must emphasize evaluation of the effectiveness of the work— from start to finish. It should be filed for future reference purposes; copies should be distributed to all interested parties. The report should follow the Danger Analysis pathway (Section 4.1 ) with special attention to planning, monitoring, implementation, treatment efficacy, public relations, and other features influencing special activities, organization, successes, and difficulties.

Four representative categories could be included in a Project Evaluation. These four parts or stages are normally encountered during a plant health emergency situation:

- Initial response to the interception/detection of a non-indigenous species;
- Danger Analysis and Evaluation of treatment options;
- Implementation and operational treatment;
- Review (including debriefing) and follow-up recommendations.

These steps can be summarized in the form of the Project Evaluation Checklist.

In any case, the checklist and any other relevant documents such as project guidelines and evaluations should be safely retained by the lead agency for legal and historical purposes, and as primary reference for shaping future operations.

The Project Evaluation Checklist should be conducted under the auspices of BCPPAC with significant input from the lead agency involved from start to finish. The evaluation work might be conducted by:

- The standing BCPPAC Technical Advisory Committee;
- A subcommittee or special working group;
- An experienced contractor working with BCPPAC members.

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>84 |
|                | DATE<br>4 December 2014   | AMENDED    |

See Sections in this Manual (Sections 4.1 - 4.7 , 4.8 and 4.9 ) pertaining to evaluation for more details.

## 6.6 Literature References

The literature relating to plant health emergencies is voluminous, dynamic and found in just about every country having social, environmental and economic values attached to plants. The shelves storing scientific and technical literature in libraries are filled with specific accounts of organized responses to non-indigenous and threatening species.

North American experiences usually have involved federal agencies in the lead, (key) role, often with the critical support of provincial or state departments of government. As a result, close working relationships between these senior levels of government have evolved from coast-to-coast, and especially in British Columbia during the past 40 years. The literature available usually includes interagency agreements, plans, procedures, organization charts, accounts of operations, and summaries or assessments of results.

In preparing the first version of this manual many staff specialists and department managers across Canada and in the United States were consulted or asked for documents for potential reference and use in B.C. situations. Since that time a number of plant health emergencies have been dealt with across regionally, nationally or internationally by various agencies that provide good models for plant health emergency response. A collection of pertinent documents has been compiled below.

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# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>85 |
|                | DATE<br>4 December 2014   | AMENDED    |

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# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>86 |
|                | DATE<br>4 December 2014   | AMENDED    |

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# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>87 |
|                | DATE<br>4 December 2014   | AMENDED    |

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# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>88 |
|                | DATE<br>4 December 2014   | AMENDED    |

**MEMORANDUM OF UNDERSTANDING  
FOR  
CRITICAL PLANT PEST RESPONSE  
IN BRITISH COLUMBIA**

**Among:**

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

**- and -**

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

**- and -**

**Natural Resources Canada, the Canadian Forest Service (NRCan/CFS)**

**- and -**

**The BC Ministry of Agriculture and Lands (BCMAL)**

**- and -**

**The BC Ministry of Forests and Range (BCMFR)**

**- and -**

**The BC Ministry of Environment (BCMoE)**

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>89 |
|                | DATE<br>4 December 2014   | AMENDED    |

**Whereas the Canadian Food Inspection Agency (CFIA), Agriculture and Agri-Food Canada (AAFC), Natural Resources Canada, the Canadian Forest Service (NRCan/CFS), the BC Ministry of Agriculture and Lands (BCMAL), the BC Ministry of Forests and Range (BCMFR), and the BC Ministry of Environment (BCMoe) (“the Participants”)** recognize that agriculture, forestry, and the biodiversity of British Columbia are major contributors to the economy of both the province of British Columbia and Canada;

**Whereas,** the CFIA is responsible for the administration and enforcement of the *Plant Protection Act (Canada), 1990, c.22* and is the lead authority for the protection of plant life and the agricultural and forestry sectors of the Canadian economy through the prevention, detection, regulation, and eradication of quarantine plant pests in Canada;

**Whereas,** AAFC is responsible for providing information, research and technology, and policies and programs to achieve security of the food system, health of the environment and innovation for growth in Canada.

**Whereas,** NRCan/CFS is responsible for promoting the sustainable development of Canada’s forests and competitiveness of the Canadian forest sector for the well-being of present and future generations of Canadians;

**Whereas,** the BCMAL is responsible for promoting economic development and environmental sustainability for the agriculture, aquaculture and food sectors, supporting them in delivering safe, healthy and high-quality food, and for managing Crown land in a manner that contributes to the economic, societal and environmental goals of government. BCMAL is responsible for the administration and enforcement of the *Plant Protection Act (British Columbia), 1996,* and the *Weed Control Act, 1996.*

**Whereas,** the BCMFR is responsible for the management and conservation of forest and range resources for short- and long-term socio-economic benefits, to protect and sustain British Columbia’s forest & range productivity and health and to encourage competitive forest and range industries. BCMFR is responsible for the administration and enforcement of the *Forest and Range Practices Act, 2008.*

**Whereas,** the BCMoe is responsible for the administration and enforcement of the *Integrated Pest Management Act, 2003;* delivering programs that promote sustainable environmental management and providing scientific expertise and information intended to maintain British Columbia’s biodiversity and associated environmental, economic and social benefits.

**Whereas,** a Critical Plant Pest introduction, if not effectively managed, could have serious economic, environmental and social impact on the agriculture, forestry, tourism and recreation resource base of British Columbia and Canada;

**Whereas,** the Participants wish to establish a framework and a committee of senior officials to deal with Critical Plant Pests as portrayed in Appendix 1 as the “Critical Plant Pest Management Committee”(CPPMC).

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>90 |
|                | DATE<br>4 December 2014   | AMENDED    |

**Whereas**, the Participants recognize that the objective is to prevent, eradicate, and contain Critical Plant Pest introductions in British Columbia;

**Whereas**, there is a necessity for federal and provincial government ministries that manage plant pest introductions to act cooperatively when introductions that impact the public interest at both the provincial and federal levels of government occur or arise, and that a lead agency may be designated on a case-by-case basis by the CPPMC;

**Whereas**, the Participants wish to provide a coordinated and cooperative approach to sharing information, and applying all appropriate resources to minimize the environmental, economic, and social impacts of a Critical Plant Pest introduction, and therefore wish to develop an overall, comprehensive Critical Plant Pest Response Plan for British Columbia, and in addition, individual, species-specific plant pest response plans as needed;

**And Whereas**, the Participants wish to optimize opportunities for efficiencies and further reinforce collaboration to prevent or respond to Critical Plant Pest introductions and, if required, set the stage for ongoing management programs.

**NOW THEREFORE** senior representatives of the Canadian Food Inspection Agency, Agriculture and Agri-Food Canada, Natural Resources Canada, the Canadian Forest Service, the BC Ministry of Agriculture and Lands, the BC Ministry of Forests and Range, and the BC Ministry of Environment agree:

1. To establish a standing Critical Plant Pest Management Committee (CPPMC) of senior officials, as defined in Appendix 1, to deal with issues respecting Critical Plant Pests as defined in Appendix 2.
2. To have a Critical Plant Pest Response Plan for British Columbia, which, once developed, will be appended as Appendix 4 to this Memorandum of Understanding (MOU).
3. To enable the CPPMC to establish or support Task Forces to develop comprehensive, species-specific plant pest response plans in keeping with existing provincial and federal plant health strategies such as the National Forest Pest Strategy and Alien Invasive Species Strategies to provide for a coordinated, efficient and effective inter-agency management of a Critical Plant Pest introduction in British Columbia on either private, provincial or federal lands as described in Appendix 3. The plans are not intended to constrain or intrude on the jurisdictional prerogatives of any government or agency.
4. To share resources where practicable, and to develop and share opportunities amongst the participants such as training, coordinated post-pest detection and surveillance activities.
5. To share critical information, and to have an agreement among the Participants to share confidential information as permitted by federal and provincial access to information and

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>91 |
|                | DATE<br>4 December 2014   | AMENDED    |

privacy legislation as outlined in Appendix 5, and to advance common communication approaches.

6. This MOU will remain in effect for a period of five (5) years from the effective date hereof and shall be automatically renewed thereafter for successive periods of five (5) years unless terminated. Revisions or additions to the MOU may be made with the written consent of all Participants.
7. Any Participant may terminate its participation in this MOU by providing thirty (30) days written notice to all the other Participants.
8. It is hereby understood by the Participants that:
  - a) AAFC, NRCan/CFS, BCMAL, BCMFR, and BCMoE officers or employees may need to be designated as analysts, inspectors, or officers for the purposes of the Federal Plant Protection Act.
  - b) AAFC, NRCan/CFS, BCMAL, BCMFR, and BCMoE will remain responsible for all actions undertaken by their respective officers or employees when those officers or employees are not performing powers, duties or functions as designated analysts, inspectors or officers under the Federal Plant Protection Act.
9. This Memorandum of Understanding is not intended to create a binding legal relationship between or among the Participants.
10. This MOU will not impose any financial responsibilities on the Participants, except that each Participant will be responsible for the funding costs s/he incurs in her/his own interest, related to the support of this MOU.
11. Any disputes regarding the interpretation or implementation of this MOU will be resolved only by consultation among the Participants and will not be referred to a national tribunal or other third party for settlement.
12. This MOU comes into effect on the date of the last signature by the Participants.

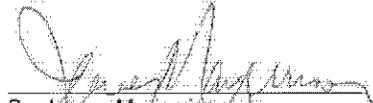
# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>92 |
|                | DATE<br>4 December 2014   | AMENDED    |

IN WITNESS WHEREOF the Participants' authorized representatives have duly executed this MOU on the dates indicated.

## FEDERAL AGENCIES

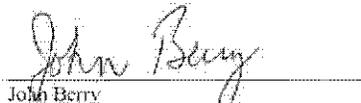
For CFIA

  
Dr. James Marjerrison  
As Executive Director, Western Area  
Date JUN 25 2009

For CFIA

  
Paul Littlewood  
Regional Director, BC Coastal  
Date MAY 04 2009

For AAFC

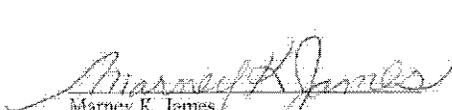
  
John Berry  
Regional Director, BC  
Date MAY 04 2009

For NRCan/CFS

  
Karan Ramcharan  
Director General  
Date June 12/09

## PROVINCIAL AGENCIES

For BCMAL

  
Marney K. James  
Director, Agri-Food Protection Branch  
Date May 04, 2009

For BCMFR

  
Jim Snetsinger  
Chief Forester  
Date May 27/09

For BCMoE

  
Tina Hofveber  
Director, Environmental Management Branch  
Date May 17/2009

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>93 |
|                | DATE<br>4 December 2014   | AMENDED    |

## APPENDIX 1

### Critical Plant Pest Management Committee

The CPPMC is a committee of senior officials where Critical Plant Pest issues are identified and collaborative approaches are developed in keeping with the legislative mandates of the Participants. This committee facilitates the sharing of critical information, resources and expertise to meet the objectives to prevent and eradicate Critical Plant Pests affecting British Columbia. The CPPMC has the responsibility to oversee the development of species-specific plant pest response plans and execution of those plans when deemed necessary by the CPPMC. The CPPMC consists of up to two members from each of the Participants and a Chair and Co-Chair are selected by the members. The Chair and Co-chair normally serve for a period as determined by the members and are selected on a rotational basis from among the Participants. A member of BCMAL or BCMFR holds either the Chair or Co-chair at all times. The CPPMC meets a minimum of once per year but additional meetings are held at the call of the Chair as necessitated by the Critical Plant Pest circumstance.

The CPPMC also has the responsibility to initiate additional Task Force groups when required to respond to Critical Plant Pest situations. The CPPMC recognizes the importance of the BC Plant Protection Advisory Council (BCPPAC) (see Appendix 6) and other organizations, and will use the expertise from the BCPPAC technical committees when appropriate or will create new Task Forces as required. The primary role of the Task Forces is to provide science and technical advice, recommendations, and reports to the CPPMC. The Task Forces are established with members from all the appropriate Participants and include experts, as deemed appropriate and reasonable by the CPPMC, from other organizations such as universities, other levels of government such as municipalities, industry associations, and other experts. The structure, role, responsibilities, and membership of the Task Forces are described in Appendix 3.

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>94 |
|                | DATE<br>4 December 2014   | AMENDED    |

## APPENDIX 2

### Definitions

**Critical Plant Pest:** A plant pest whose introduction or spread into previously uninfested areas of BC from other regions of BC, from other regions within Canada, or from other countries threatens the environment, the economy or society in British Columbia.

**Plant Pest:** For the purpose of this MOU, plant pests include insects, diseases, invasive plants, or other pests.

- **Insect:** For the purpose of this MOU, 'insect' includes any arthropods, such as insects and arachnids, that are identified as plant pests.
- **Disease:** For the purpose of this MOU, 'diseases' include fungi, bacteria, viruses, viroids, protists, phytoplasmas, and nematodes that are identified as plant pests.
- **Invasive plant:** For the purpose of this MOU, an 'invasive plant' is any plant that is not native to British Columbia that is determined to be an invasive plant.
- **Other pest:** For the purpose of this MOU, 'other pest' may include higher parasitic plants, molluscs, or vertebrates.

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>95 |
|                | DATE<br>4 December 2014   | AMENDED    |

## APPENDIX 3

### Task Force (s)

The Task Forces (T/Fs) are established by the CPPMC with selected members from all the appropriate participants and could include experts from universities, industry associations, and other groups, and other levels of government such as municipalities when deemed appropriate and reasonable by the CPPMC. The CPPMC establishes the membership of the T/Fs and appoints the Chair. The Chair calls the T/Fs meetings when required to obtain and examine expert scientific advice, draft and / or review species-specific plant pest response plans, and report to the CPPMC.

The structure of the T/Fs allows for the establishment of sub-committees where members are drawn from the T/Fs and the sub-committee chairs are appointed by the T/F Chair. The sub-committees report to the T/Fs in a structure as follows:

Chair..... As determined by the CPPMC

Members..... As determined by the CPPMC

Sub-committees      May include but are not limited to  
- Science/ Research  
- Operations (Surveillance and control)  
- Communication

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>96 |
|                | DATE<br>4 December 2014   | AMENDED    |

## APPENDIX 4

### British Columbia Critical Plant Pest Response Plan

(to be appended)

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>97 |
|                | DATE<br>4 December 2014   | AMENDED    |

## APPENDIX 5

### Information Sharing Process

#### PURPOSE

1. The purpose of this Appendix which forms part of the Memorandum of Understanding (MOU) is to facilitate the sharing of information between the Participants for the common purpose of monitoring or regulating the control of, spread or eradication of critical plant pest introductions and for the enhancement of regulatory activities by the Participants, as well as for notification of the public of an introduction within British Columbia.
2. Information sharing pursuant to this MOU is meant to:
  - (a) enhance the general regulatory intent of the Acts administered and enforced by the Participants;
  - (b) where applicable, protect the privacy of individuals to whom the information relates, as well as confidential information, according to applicable federal and provincial access to information and privacy legislation; and
  - (c) enhance the Participant's ability to ensure appropriate notice to the public of any emergencies or risks of harm to the public, plants or the environment.

#### USE OF INFORMATION

- 3.1 The information shared pursuant to this MOU will be used to enhance decision-making within the specific authorities and legislative schemes of the Participants by creating a clear understanding of relevant plant introduction facts.
- 3.2 The information provided by any Participant will only be used to:
  - (a) provide each Participant with essential, supplementary or complimentary facts and other information such as licenses and permits, related to the common purpose of plant health regulatory decision making as deemed necessary by a Participant for the identified purpose;
  - (b) enhance enforcement activities of the Participants; and
  - (c) avoid unnecessary duplication of facts or voids of relevant facts.

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>98 |
|                | DATE<br>4 December 2014   | AMENDED    |

## INFORMATION TO BE EXCHANGED

- 4.1 In case of an introduction of a critical plant pest, each Participant will, as soon as practicable, notify all members of the BC Critical Plant Pest Management Committee (CPPMC) of all critical plant pest information.
- 4.2 Upon request, any Participant will receive any or all of the following from other Participants in respect of an introduction or generally as the information is available to the Participant from whom it is requested. The information to be exchanged among participants may include:
- (a) laboratory test results;
  - (b) inspectors reports;
  - (c) disease or introduction reports;
  - (d) plant movement permits or licenses;
  - (e) quarantine documents;
  - (f) import certificates;
  - (g) export certificates; and
  - (h) pest risk assessment documentation.

## REPORTS AND CONFIDENTIALITY

- 5.1 The Participants may prepare reports based upon the data provided by one to the other under the terms of this MOU.
- 5.2 If a Participant wishes to release a report containing information which was provided by another Participant, external to the CPPMC or the associated Task Force, it must provide a copy of the report to the other Participants of the CPPMC. The other Participants shall have at least three (3) business days from the day of receipt to examine the external report and make known whether it consents to the release in whole or in part, having consideration of the following principles:
- (a) the overriding concern for public, plant and environmental safety and well being;
  - (b) protection of personal and confidential information according to the respective provincial and federal laws; and
  - (c) each Participant will act in good faith and will not unreasonably withhold consent to release.
- 5.3 A Participant will not release an external report s/he has prepared without the consent of the other Participants as per clause 5.2.
- 5.4 Notwithstanding clauses 5.2 and 5.3, in an emergency situation, a Participant has an obligation to notify the public or any affected group of people of any information of risk of significant harm to the environment or to the health or safety of the public or plants or

# Plant Health Emergency Manual

|                |                           |            |
|----------------|---------------------------|------------|
| Section<br>6.0 | Appendices and References | Page<br>99 |
|                | DATE<br>4 December 2014   | AMENDED    |

information the disclosure of which is, for any other reason, in the public interest. If it is not practicable to comply with clauses 5.2 and 5.3, that Participant shall notify the other Participants at the time the external report is provided, and the other Participants shall have three (3) hours to advise of any concerns with the release of the external report. If a response is not received within three (3) hours the Participant may release the external report without further recourse to the other Participants.

- 5.5 In the event a Participant receives a request from a third party to disclose any information received pursuant to this MOU, that Participant will promptly advise the other Participants of the request in writing and will refrain from disclosing the information until the remitting Participant has reviewed the request and has either consented to the disclosure or provided reasons for not disclosing the information. Should the requesting Participant not receive the consent or the reasons for refusing disclosure within 30 days of the date of the advice, the requesting Participant may disclose the requested information without further recourse to the remitting Participants.
- 5.6 Nothing in this MOU will be interpreted so as to prevent a Participant from disclosing any information received under the MOU which the participant may be authorized or required to disclose under legislation, administrative process or court order, but the disclosing Participant shall where feasible notify the remitting Participant prior to any such disclosure.

#### DESTRUCTION OF INFORMATION

- 6.1 In the event of termination of this MOU, each Participant will destroy or dispose of the information received from the other Participants, upon written request of the remitting Participant and in accordance with the legislative requirements of that Participant, unless that information is incorporated into and forms part of an "external report" prepared by the other Participants.
- 6.2 Each Participant will inform all other Participants, in writing, of the destruction or disposition of all pertinent information.

# Plant Health Emergency Manual

|                |                           |             |
|----------------|---------------------------|-------------|
| Section<br>6.0 | Appendices and References | Page<br>100 |
|                | DATE<br>4 December 2014   | AMENDED     |

## APPENDIX 6

### British Columbia Plant Protection Advisory Council (BCPPAC)

The BCPPAC was created in 1973 to provide a forum to address plant health and plant quarantine issues of concern to British Columbia. Membership on the Council includes representatives from federal and provincial governments, industries and universities. The major functions of the council are to evaluate new occurrences of agricultural or forest insects or diseases in the province, and to recommend strategies or options to appropriate agencies to eradicate, contain or control these occurrences. The council appoints technical committees to conduct these evaluations and to develop recommendations for approval by council.

The Terms of Reference for BCPPAC is expected to be updated in FY2009/10 to reflect current activities of the Council and to harmonize with the CPPMC that will be created in accordance with this MOU. BCPPAC's 2009 Terms of Reference, once developed and approved, will be appended to this MOU.

