Canadian Food Inspection Agency | Agence canadienne d'inspection des aliments

Canadian Food Inspection Agency




Our vision:
To excel as a science-based regulator, trusted and respected by Canadians and the international community.

Our mission:
Dedicated to safeguarding food, animals and plants, which enhances the health and well-being of Canada's people, environment and economy.

Pest Risk Assessment Unit (PHRA)

9th International Conference on the Ecology and Management of Alien Plant Invasions – Weed Risk Assessment Workshop

Perth, Australia

Ken Allison and Karen Castro, PHRA

Canada

Outline

Introduction and background

- ⇨International and national (CFIA) context

Plant Health Risk Assessments

- ⇨Definitions and terms

Example of a CFIA weed risk assesment

- ⇨Giant reed (*Arundo donax* L.)

International Context

WTO Agreement on the Application of Sanitary and Phytosanitary Measures

Countries:

- ⇨Can set their own standards
- ⇨Should use international standards, guidelines
- ⇨Must base their phytosanitary measures on science

International Plant Protection Convention (IPPC)

- ⇨Prevent spread & introduction of pests of plants and plant products, and promote appropriate measures for control
- ⇨Canada signatory since 1951

International Context

Standards for Pest Risk Analysis

- ISPM No. 2: Framework for Pest Risk Analysis (1995)
- ISPM No. 11: Pest Risk Analysis for Quarantine Pests, including Analysis of Environmental Risks and Living Modified Organisms (2004)
- ISPM No. 3: Guidelines for the export, shipment, and release of biological control agents and other beneficial organisms (2005)
- ISPM No. 21: Pest risk analysis for regulated non-quarantine pests (2004)

National Context

CFIA Mandate

- Plant Health and Protection
- Animal Health and Protection
- Food Safety
- Inspection

Aegilops cylindrica Host

Regulations within the CFIA

- Plant Protection Act
  - To protect plant life and the agricultural and forestry sectors of the Canadian economy by preventing the importation, exportation and spread of pests and by controlling or eradicating pests in Canada
- Seeds Act
  - An Act respecting the testing, inspection, quality and sale of seeds


Canadian Food Inspection Agency - Plant Products - Plant Health Division - List of pests regula - Microsoft Internet Explorer
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Address http://www.inspection.gc.ca/english/plaveg/protect/listpespare.shtml
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Plant Protection Policy Directives
Plant Health
- Export
- Forestry
- Grains
- Horticulture
- Import
- Invasive Alien Species
- National Strategies & Initiatives
- Potato
Science Branch
- Laboratories
- Plant Health Risk Assessment
- Plant Pest Surveillance
Contacts
Plants > Plant Pests
PESTS REGULATED BY CANADA
Plant Protection Regulations 29 (2a)
In order to protect Canada's resource base the following pests are regulated. Pests in this list are linked to the policy directives that are available electronically from 1994 on, but some may also be referred to in directives dated prior to 1994. The list may be revised at any time.
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
SCIENTIFIC NAME AND AUTHORITY | ENGLISH COMMON NAME | PEST TYPE | POLICY DIRECTIVE
A Top
Achatina achatina L. | giant west African snail | Mollusc | D-94-14, D-90-07
Achatina fulica Bowdich | giant African snail | Mollusc | D-90-07
Acrobasis pyrivorella Matsumura | pear fruit moth | Insect | D-98-03, D-94-32, D-03-11
Acropolitis rudisana Walker | leafroller caterpillar | Insect | D-95-19
Adelges piceae Ratz | also called Dreyfusia piceae | | D-02-02, D-01-12, D-96-09, D-02-12
Adelges tsugae Annand | hemlock woolly adelgid | Insect | D-01-12
start GroupWise - M... <Recently Edit... Power point pr... PRAs - Weeds CFIA_ACIA-#8... Canadian Food ... EN 4:29 PM

Risk Assessment - CFIA

Science Branch

Science Strategies Directorate

Science Advice Division

- Plant Health Risk Assessment Unit (PHRA)

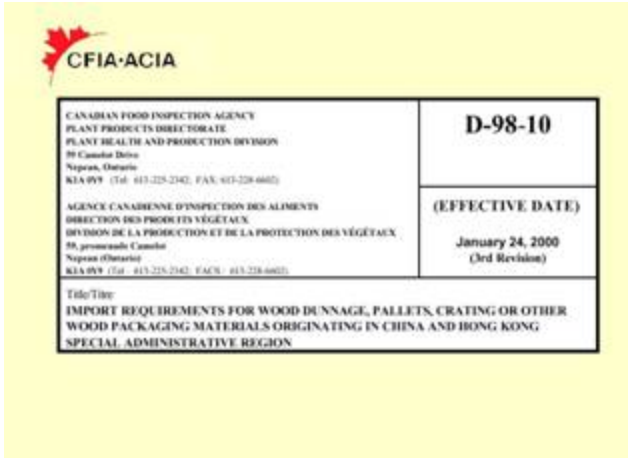
Risk Management - CFIA

Programs Branch

Plant Products Directorate

Plant Health Division

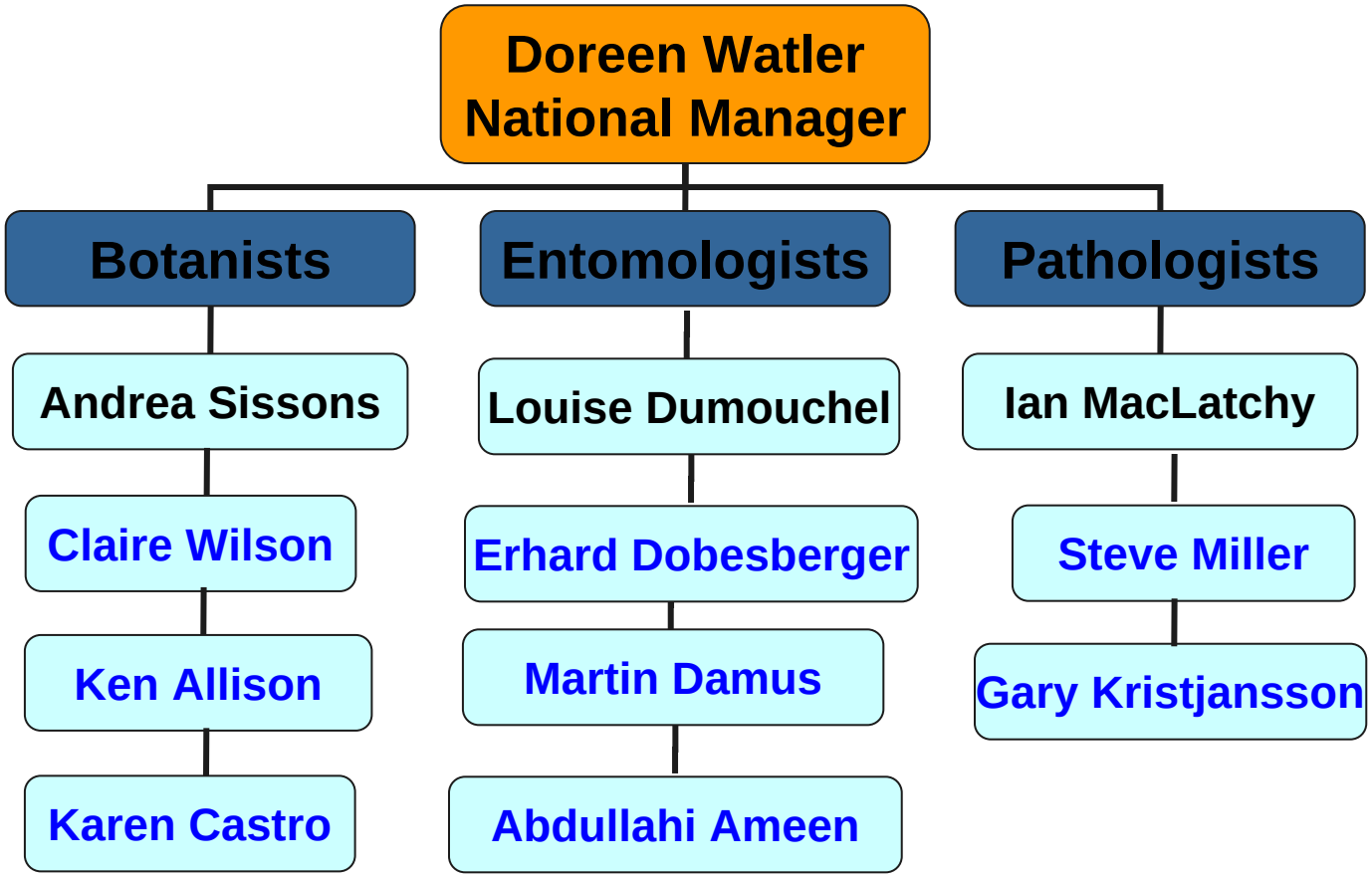
- Invasive Alien Species Section
- Horticulture Section
- Forestry Section
- Grains and Field Crops Section
- Other sections



CFIA·ACIA

CANADIAN FOOD INSPECTION AGENCY PLANT PRODUCTS DIRECTORATE PLANT HEALTH AND PRODUCTION DIVISION 59 Camelot Drive Nepean, Ontario K1A 0Y9 (Tel: 613-225-2342, FAX: 613-228-6602) AGENCE CANADIENNE D'INSPECTION DES ALIMENTS DIRECTION DES PRODUITS VÉGÉTAUX DIVISION DE LA PRODUCTION ET DE LA PROTECTION DES VÉGÉTAUX 59, promenade Camelot Nepean (Ontario) K1A 0Y9 (Tel.: 613-225-2342, FAX: 613-228-6602)	D-98-10 (EFFECTIVE DATE) January 24, 2000 (3rd Revision)
Title/Titre: IMPORT REQUIREMENTS FOR WOOD DUNNAGE, PALLETS, CRATING OR OTHER WOOD PACKAGING MATERIALS ORIGINATING IN CHINA AND HONG KONG SPECIAL ADMINISTRATIVE REGION	

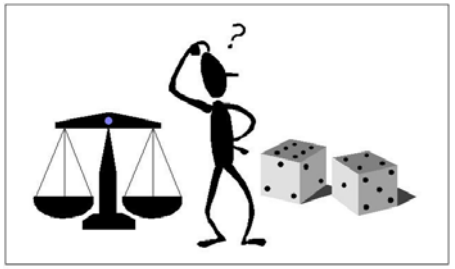
PHRA – Risk Assessors



Pest Risk Assessment - Definition

Evaluation of the probability of the introduction and spread of a pest and of the associated potential economic consequences

(ISPM No. 5: Glossary of Phytosanitary Terms (2006))



Purpose

- To determine if a pest is a quarantine pest
- To characterize the risks associated with sp[illegible] introduction of a pest in terms of likelihood and impact
- To present technical information in a way that it can be used to make regulatory decisions

Pest Risk Assessment - PHRA

Qualitative approach which attempts to estimate:

- Likelihood of introduction
- Consequences of introduction
  - ⇨ Potential for establishment and spread
  - ⇨ Potential economic and environmental impacts

Echium vulgare L. Photo by E. Snyder

Risk = likelihood X consequences

Risk expressed as “high”, “medium”, “low”

Final report is a researched & reviewed document

Plant Health Risk Assessments

2 types of PRAs :

1. Pest-specific PRA
   - ⇨Pest interception/detection
   - ⇨Outbreaks in foreign area
   - ⇨Import policy review
   - ⇨Pest alert
   - ⇨Import restrictions from a trading partner
   - ⇨Pest status


PHPD REQUEST: 99-25

PLANT HEALTH RISK ASSESSMENT

PINE SHOOT BEETLE

(*TOMICUS PINIPERDA* (L.))

ACIA·CFIA

Plant Health Risk Assessment Unit
Science Division
Nepean, Ontario

Date: April 30, 2002

Plant Health Risk Assessments

2. Commodity PRA

- Importation of a new plant or plant product
- Importation of a commodity from a new source
- Import policy review
- New treatment of process
- Interception of pests on a previously unsuspected commodity
- Change in pest characteristic(s)
- Change in host susceptibility

Commodity Risk Assessment - Outline

STAGE 1

Initiating the process

- Reason for the PRA
- Description of pathway or commodity
- Weediness potential of the commodity itself
- Quarantine pests associated (?) with commodity

STAGE 2

- Risk assessments for pests identified in Stage 1 (including pest fact sheets)

STAGE 3

- Risk management

Commodity Risk Assessment

- Pest tables by category (e.g., bacteria, fungi, etc.)
- Potential quarantine pest to Canada?

TABLE 2: Bacteria Potentially Associated with Strawberry Plants from Argentina

PEST NAME	OCCURRENCE IN CANADA	QUARANTINE PEST by FAO DEFINITION	BACKGROUND INFORMATION
Agrobacterium tumefaciens (Smith & Towns.) Conn.	+		Worldwide on many hosts, including *Fragaria*; present in Argentina (Bradbury, 1986).
Pseudomonas syringae pv. *syringae* van Hall	+		Worldwide on many hosts including *Fragaria*; present in Argentina (Bradbury, 1986).
Xanthomonas fragariae Kennedy & King	+		Alippi *et al.*, (1989); Alippi *et al.*, (1989) report the presence of the bacterium on *Fragaria* in Argentina; see PHRA facts

Commodity Risk Assessment

- Summary table

Table 1: Regulated and Quarantine Pests Potentially Associated with *Fragaria* Plants from Argentina.			
Quarantine Pest	**Status in Canada**	**Regulations**	**PRA Information**
Fungi			
Fusarium oxysporum f.s.p. *fragariae*	Absent	No specific policy.	"HIGH" entry potential but overall "LOW" impact rating; see pest-specific PRA and pest fact sheet.
Rosellinia necatrix	Absent	Regulated on *Vitis* imports (D-94-34) but many hosts are not specifically regulated.	Fruit tree/grapevine review, 1992-93; Pest Facts Sheet (O drive), *Quercus* PRA # 97-51.
Viruses			

Commodity Risk Assessment

Technical Options for Risk Management Considerations

SAFEGUARD	EFFECTIVE AGAINST	COMMENTS
CERTIFICATION	Any number of pests, including viruses, bacteria, fungi, nematodes, etc..	Information on strawberry certification programs in Argentina were not available to the authors. Information on pests and diseases of strawberry in Argentina as well as details on any certification programs should be requested to reduce uncertainty associated with this commodity pathway.
TISSUE CULTURE	Soil-borne pests such (e.g., nematodes).	Plants in tissue culture should be able to be certified free from ectoparasitic nematodes and most soil-borne fungi. Freedom from other pests like viruses would require a detailed review of production practices, test methods, with verification by inspection, sampling, audits, etc.
AREA/PERIOD FREEDOM	Named pests	Surveillance data will be required to substantiate any claims of area freedom; some pathogens could be symptomless so indexing or serological test methods may be necessary.
FUMIGATION	Soil-borne pests such as *Fusarium oxysporum* f.s.p. *fragariae*.	Soil fumigation with certain products has been effective in reducing the levels of soil-borne inoculum of *Fusarium oxysporum* as well as certain nematodes.

Some Recent Commodity PRAs

06-51 : Bumble bees from Mexico

07-06 : Niger seed (*Guizotia abyssinica*)

07-08 : Fresh strawberries from Israel

07-10 : *Rosa* from China

07-25 : Bulbs from the Netherlands

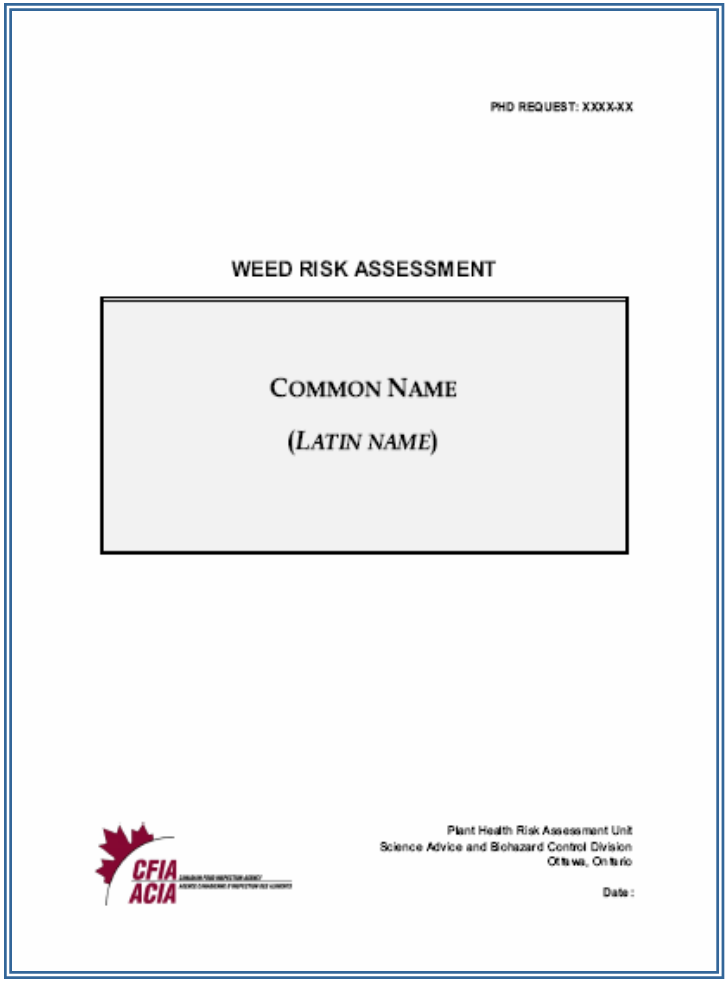
07-27 : Drying process for pine cones

Pest-Specific Risk Assessment - Outline

STAGE 1:
Initiating the process

STAGE 2:
Pest Fact Sheet

STAGE 3:
Pest Risk Assessment


PHD REQUEST: XXXX-XX

WEED RISK ASSESSMENT

COMMON NAME

(*LATIN NAME*)

CFIA ACIA

Plant Health Risk Assessment Unit
Science Advice and Biohazard Control Division
Ottawa, Ontario

Date :

Pest Risk Assessment - PHRA botanists

1980s-1990s	Risk assessment on insects and pathogens associated with commodities	Development of risk assessment format
2000	First botanist joined PHRA Unit (Claire Wilson) First weed risk assessments	00-42a *Cabomba caroliniana* (Fanwort) 00-42b *Trapa natans* (European water-chestnut)
2001		01-42 *Eriochloa villosa* (Woolly cupgrass)
2005		05-19 *Rottboellia cochinchinensis* (Itch grass)
2006	Three additional botanists joined PHRA Unit (Ken Allison, Karen Castro, Eric Snyder) Increased capacity for weed risk assessments	06-06 *Nassella trichotoma* (Serrated tussock) 06-07 *Crupina vulgaris* (Common crupina) 06-08 *Halogeton glomeratus* (Salt-lover) 06-12 *Arundo donax* (Giant reed) 06-29 *Tamarix* sp. (Saltcedar) 06-30 *Soliva sessilis* (Carpet burweed) 06-31 *Aegilops cylindrica* (Jointed goat grass) 06-33 *Nymphoides peltata* (Yellow floating heart) 06-54 *Persicaria perfoliata* (Mile-a-minute weed) 06-55 *Miscanthus* spp. 06-63 *Wollemia nobilis* (Wollemi pine) 06-65 *Cordyline* spp.
2007	Senior botanist joined PHRA Unit (Andrea Sissons, senior botanist)	07-06 *Guizotia abyssinica* (Niger seed) 07-14 *Didymosphenia geminata* 07-28 *Cuphea viscossima* X *C. lanceolata* 07-29 *Calendula officinalis* (Pot marigold) 07-30 *Echium plantagineum* (Paterson's curse) 07-34 *Pistia stratiotes* (Water lettuce) 07-35 *Eichhornia crassipes* (Water hyacinth)

Stage 1: Initiating the Process

Identify reason for PRA:

- New pest identified at home or abroad
- New biological / economic information
- Request to import a new commodity/commodity from new source
- Interception

Background information
Identify PRA area
Review previous PRAs

Stage 1: Initiating the Process
Arundo donax (Giant reed)

Reason for PRA

- ⇨Request to import for pulp and paper production trials

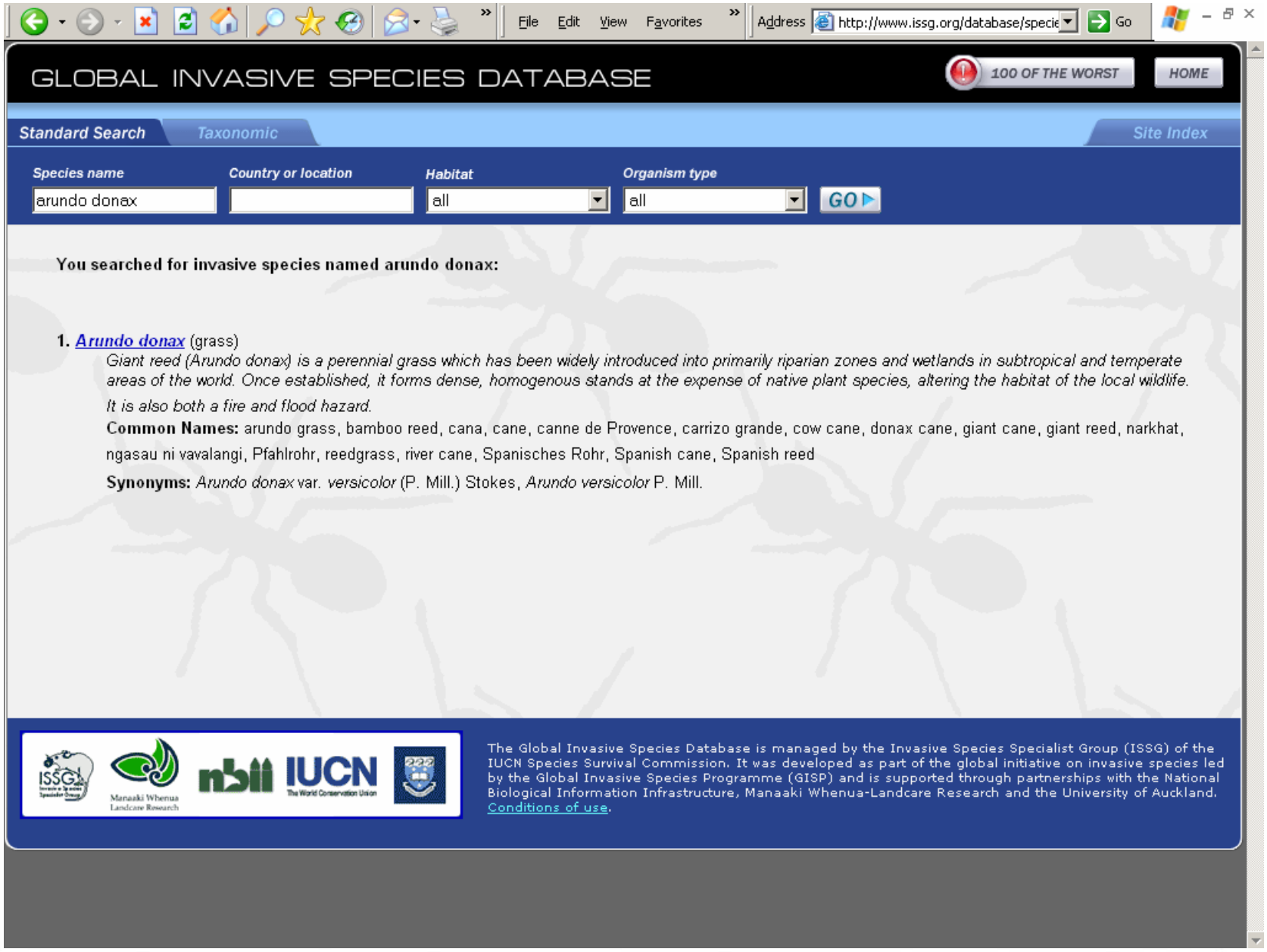
Background information

- ⇨Tall, perennial grass with wide subtropical and warm temperate distribution
- ⇨Highly invasive in some countries where introduced, especially in riparian areas and wetlands
- ⇨Forms dense monocultures, excluding native species
- ⇨Variegated variety is a popular ornamental plant
- ⇨Also used for reed-making, thatch for roofing, biofuel

Identify PRA area

- ⇨All of Canada

No previous PRA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Go
GLOBAL INVASIVE SPECIES DATABASE
100 OF THE WORST
HOME
Standard Search
Taxonomic
Site Index
Species name
arundo donax
Country or location
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You searched for invasive species named arundo donax:
1. Arundo donax (grass)
Giant reed (Arundo donax) is a perennial grass which has been widely introduced into primarily riparian zones and wetlands in subtropical and temperate areas of the world. Once established, it forms dense, homogenous stands at the expense of native plant species, altering the habitat of the local wildlife. It is also both a fire and flood hazard.
Common Names: arundo grass, bamboo reed, cana, cane, canne de Provence, carrizo grande, cow cane, donax cane, giant cane, giant reed, narkhat, ngasau ni vavalangi, Pfahlrohr, reedgrass, river cane, Spanisches Rohr, Spanish cane, Spanish reed
Synonyms: Arundo donax var. versicolor (P. Mill.) Stokes, Arundo versicolor P. Mill.
ISSG
Manaaki Whenua Landcare Research
nbii
IUCN The World Conservation Union
The Global Invasive Species Database is managed by the Invasive Species Specialist Group (ISSG) of the IUCN Species Survival Commission. It was developed as part of the global initiative on invasive species led by the Global Invasive Species Programme (GISP) and is supported through partnerships with the National Biological Information Infrastructure, Manaaki Whenua-Landcare Research and the University of Auckland.
Conditions of use.

Stage 2: Weed Fact Sheet

- Identity (names, taxonomy)
- Geographical Distribution
  - ⇨Origin and history of introductions
  - ⇨Country / regional reports
- Habitat
- Field Recognition / Morphology
- Biology / Life Cycle
- Means of Movement and Dispersal
- Pest Significance
  - ⇨Economic impacts
  - ⇨Environmental impacts
  - ⇨Control / Management

Image by O. Wilhelm Tome, Available from Kurt Stüber's Online Library

World distribution of giant reed (CABI, 2005)

Stage 3: Pest Risk Assessment Likelihood of Introduction

- Potential pathways
- Prevalence of pest in area of origin
- Likelihood of association with commodity
  - Likelihood of survival in transit
  - Likelihood of surviving physanitary procedures
  - Ease of detection at entry inspection
  - Intended end-use of commodity

Arundo donax L. Photo by S. Darbyshire

Stage 3: Pest Risk Assessment Likelihood of Introduction (Giant reed)

If the primary pathway is intentional importation of plants for planting, likelihood of introduction rated ‘HIGH’

Already present in Canada

- Available in nurseries and garden centers in British Columbia and Ontario
- Specimens grown in botanical gardens

No further discussion necessary

Stage 3: Pest Risk Assessment Likelihood of Introduction (Giant reed)

RATING GUIDELINES

NEGLIGIBLE: Likelihood of introduction is extremely low given the combination of factors necessary for introduction

LOW: Likelihood is low but clearly possible

MEDIUM: Pest introduction is likely

HIGH: Pest introduction is very likely or certain

Stage 3: Pest Risk Assessment Consequences of Introduction

ESTABLISHMENT POTENTIAL

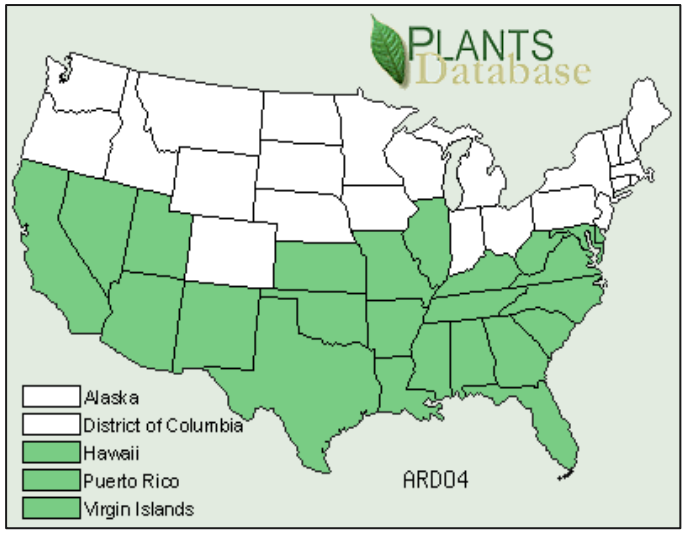
- ⇨Climatic suitability in PRA area
- ⇨Abundance of suitable habitats
- ⇨Potential range in PRA area
- ⇨Potential for adaptation
- ⇨Cultural practices and control measures

Arundo donax* var. *versicolor
Photo by C. Forrás

Stage 3: Pest Risk Assessment Consequences of Introduction

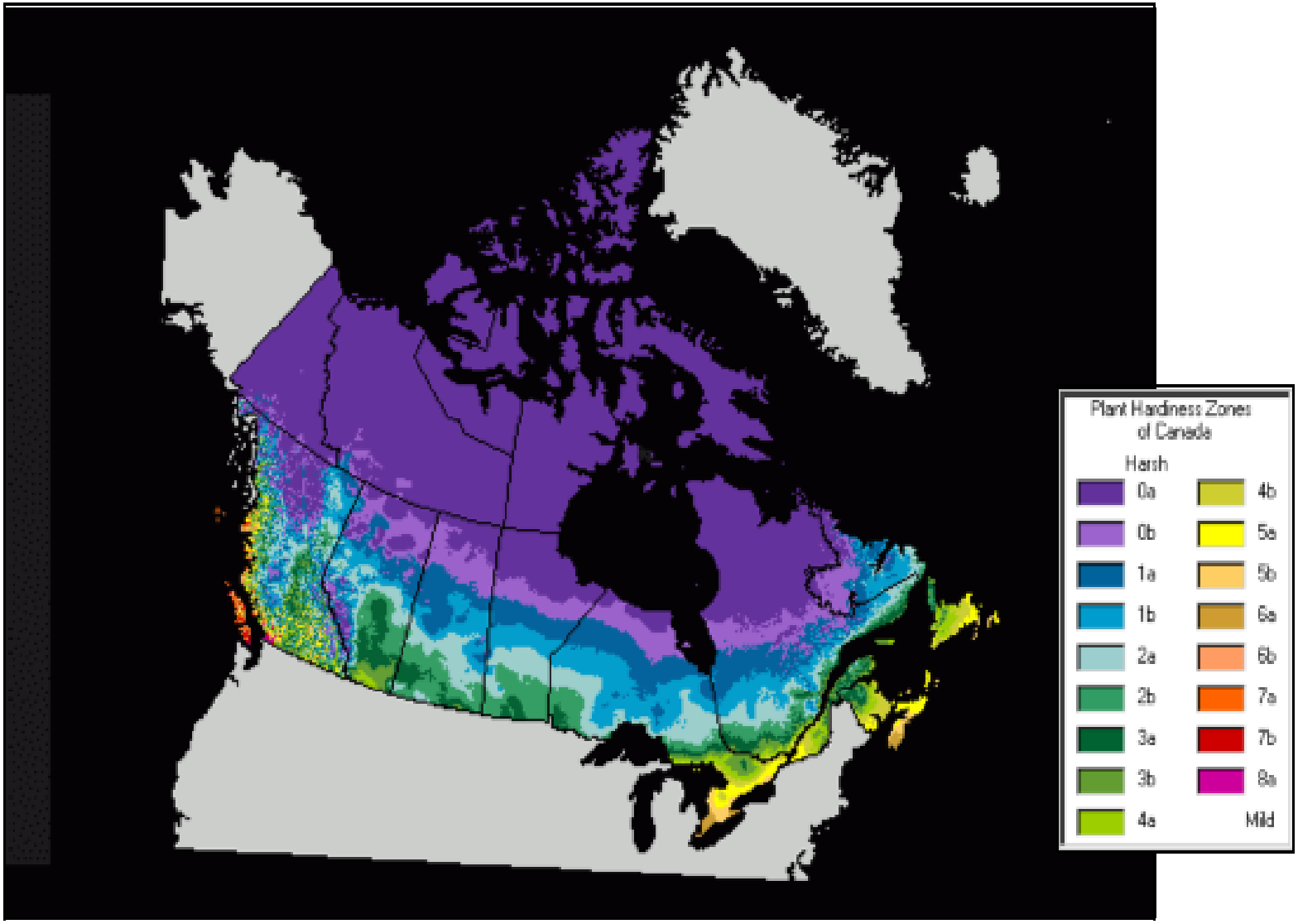
ESTABLISHMENT POTENTIAL (Giant reed)

- ⇨Subtropical to warm temperate species
- ⇨Northern climatic limits unknown
- ⇨Has overwintered in WA, southern ON, and southern BC
- ⇨At least borderline hardy to Canada Plant Hardiness Zone 5



Distribution of giant reed in the US (USDA-NRCS, 2006)

Plant Hardiness Zones of Canada



Stage 3: Pest Risk Assessment Consequences of Introduction

RATING GUIDELINES – Establishment potential

NEGLIGIBLE: Pest has no potential to survive and become established

LOW: Pest could survive and become established in 1-3 Plant Hardiness Zones or 1/3 of PRA area

MEDIUM: 4-5 Plant Hardiness Zones or 1/3-2/3 of PRA area

HIGH: 5+ Plant Hardiness Zones or most to all of the PRA area

Stage 3: Pest Risk Assessment Consequences of Introduction

SPREAD POTENTIAL

- Biology of weed
- Environmental versatility
- Suitability of environments for dispersal
- History of introductions
- Potential hybridization
- Human-mediated dispersal

Arundo donax var. *versicolor* in Adelaide Botanic Garden. Photo by K. Castro

Stage 3: Pest Risk Assessment Consequences of Introduction

SPREAD POTENTIAL (Giant reed)

- Vegetative spread by rhizomes and stem pieces
  - Rhizome expansion
  - Water-mediated dispersal of fragments
- Does not produce viable seed
- Dispersal potential in upland areas is low
- Post-disturbance dispersal potential in riparian areas and wetlands is greater

Stage 3: Pest Risk Assessment Consequences of Introduction

RATING GUIDELINES – Natural spread potential

⇨NEGLIGIBLE: Pest has no potential for natural spread

⇨LOW: Potential for spread locally within a year (some reproductive potential and/or some mobility of propagules)

⇨MEDIUM: Potential for spread throughout a physiographical region within a year (high reproductive potential OR highly mobile propagules)

⇨HIGH: Rapid natural spread throughout potential range (high reproductive potential AND highly mobile propagules)

Stage 3: Pest Risk Assessment Consequences of Introduction

POTENTIAL ECONOMIC IMPACT

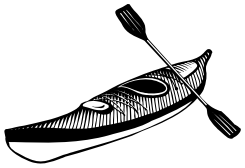
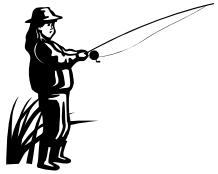
- ⇨Reduced crop yield / commodity quality
- ⇨Lower commodity value
- ⇨Loss of markets
- ⇨Capacity to vector other plant pests
- ⇨Cost of control

Arundo donax L. in Hermosillo, Mexico. Photo by S. Darbyshire

Stage 3: Pest Risk Assessment Consequences of Introduction

POTENTIAL ECONOMIC IMPACT (Giant reed)

- Unintentional introduction of the European corn borer (*Ostrinia nubilalis* Hübner) into BC
- Economic losses from water-related industries
  - Recreational boating
  - Tourism
  - Irrigation
  - Hydroelectric power generation
  - Wild rice production


- Potential economic benefits of the species?

Stage 3: Pest Risk Assessment Consequences of Introduction

RATING GUIDELINES – Economic impact

⇨Negligible: No potential economic impact

⇨Low: Limited potential (e.g. causes one of the listed impacts)

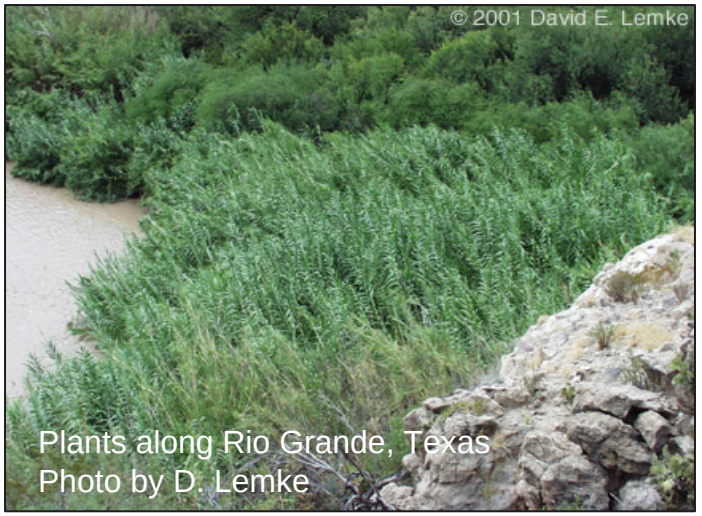
⇨Medium: Moderate potential (e.g. causes two listed impacts, or one over a wide range of plants/products/animals)

⇨High: Significant potential (e.g. all of the listed impacts, or any two on a wide range)

Stage 3: Pest Risk Assessment Consequences of Introduction

POTENTIAL ENVIRONMENTAL IMPACT

- ⇨ Impacts on ecosystem processes
- ⇨ Impacts on natural community composition
- ⇨ Impacts on natural community structure
- ⇨ Impacts on human / animal health
- ⇨ Sociological impacts
- ⇨ Impacts of associated control programs



Plants along Rio Grande, Texas
Photo by D. Lemke

Stage 3: Pest Risk Assessment Consequences of Introduction

POTENTIAL ENVIRONMENTAL IMPACT (Giant reed)

- High water use
- Interference with floodwater control
- Constricts irrigational canals and ditches
- Reduced water quality for aquatic animals
- Reduced biodiversity (flora AND fauna)
- Changes in canopy structure along streams
- Increased fire hazard
- Reduced recreation and aesthetic value

Stage 3: Pest Risk Assessment Consequences of Introduction

RATING GUIDELINES – Environmental impact

- ⇨Negligible: No potential environmental impact
- ⇨Low: Limited potential (e.g. causes one of the listed impacts)
- ⇨Medium: Moderate potential (e.g. causes two listed impacts)
- ⇨High: Potential to cause major damage (e.g. 3+ listed impacts OR affects threatened or endangered species)

Stage 3: Pest Risk Assessment Calculation of Risk (Giant reed)

Likelihood of Introduction =

HIGH (3)

Consequences of Introduction =

- ⇨Establishment Potential – Medium (2)
- ⇨Natural Spread Potential – Low (1)
- ⇨Potential Economic Impact – Medium (2)
- ⇨Potential Environmental Impact – High (3)

MEDIUM (8)

Assign Scores:
Negligible (0)
Low (1)
Medium (2)
High (3)

Stage 3: Pest Risk Assessment Calculation of Risk (Giant reed)

Cumulative Scores Establishment Potential + Spread Potential + Economic Impact + Environmental Impact	Rating for Overall Consequences of Introduction	NumericalScore for Consequences of Introduction
0 - 2	NEGLIGIBLE	0
3 - 6	LOW	1
7 - 10	MEDIUM	2
11 - 12	HIGH	3

Stage 3: Pest Risk Assessment
Calculation of Risk

- Multiply Scores:

  Likelihood of Introduction X Consequences of Introduction

  Example: HIGH (3) X MEDIUM (2) = 6

- Convert back to words:

  Negligible (0); Low (1-3); Medium (4-6); High (9)

  Example: MEDIUM (6)

Stage 3: Pest Risk Assessment Interpretation of Overall Risk Rating

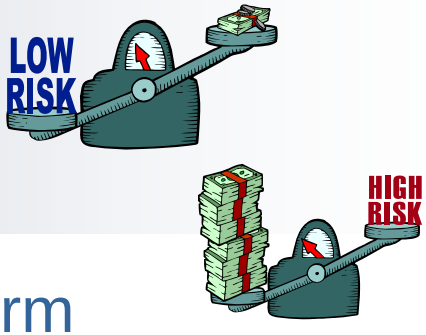
- ⇨Negligible: No specific phytosanitary measures are necessary.
- ⇨Low: No specific phytosanitary measures may be necessary. Existing practices are expected to provide sufficient phytosanitary security.
- ⇨Medium: Specific phytosanitary measures may be necessary.
- ⇨High: Specific phytosanitary measures are strongly recommended.

Stage 3: Pest Risk Assessment
Risk Assessment Conclusion

- Discussion of uncertainty
  - conflicting information
  - lack of information
  - incorrect information

Arundo donax L. in Coahuila, Mexico
Photo by J. Goolsby

Risk Management Document



Purpose: To seek stakeholder input, inform stakeholders, or record a risk management decision

1.0 Risk Assessment Summary

2.0 Risk Management Considerations

- Level of Uncertainty
- Values at Risk
- Government or CFIA Priorities

3.0 Pest Risk Management Options

- Risks and Consequences
- Cost-benefit analysis
- Feasibility

4.0 Risk Management Decision

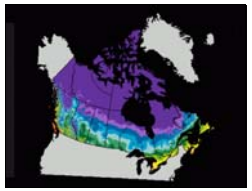
Next Steps

Likelihood of Introduction

Environmental impacts

Establishment potential

Overall Risk Rating



Economic impacts

Spread potential

Photo credits

- Ken Allison, Plant Health Risk Assessment Unit, Canadian Food Inspection Agency
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