



**Akrotiri Environmental  
Education Centre**

Κέντρο Περιβαλλοντικής Εκπαίδευσης Ακροτιρίου



**Centre for  
Ecology & Hydrology**  
NATURAL ENVIRONMENT RESEARCH COUNCIL

*Addressing drivers of ecological change in Lake Akrotiri:*

*Assessing and mitigating impacts of invasive non-native species*

CEH, JSU and the AEEC

Akrotiri Environmental Education Centre, Akrotiri

27<sup>th</sup> - 29<sup>th</sup> November 2019

# **Invasive Alien Plants in Mediterranean Islands & EPPO work on IAPs**

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**uniss**

# European and Mediterranean Plant Protection Organization



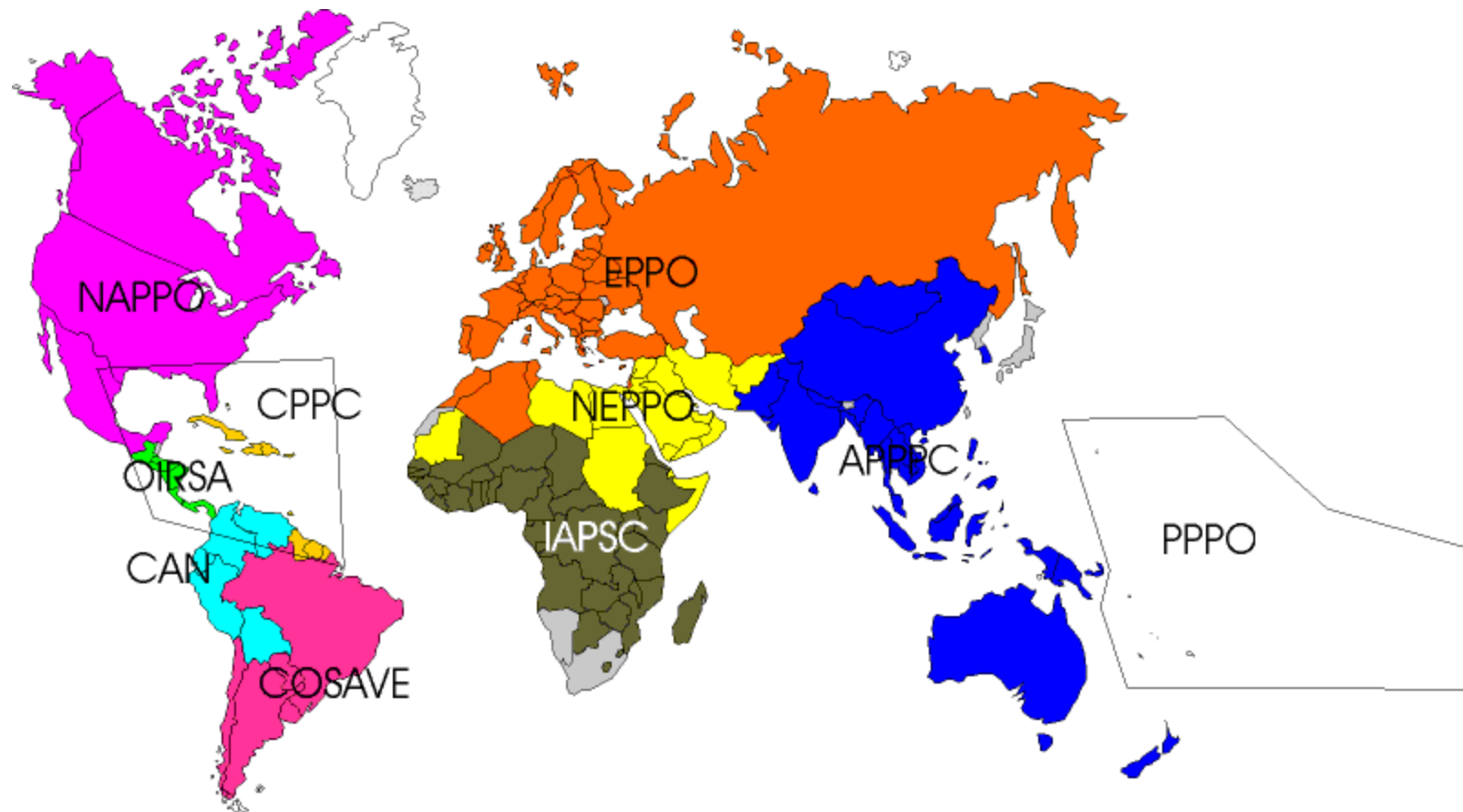
EPPO Secretariat based  
in Paris

- Created in 1951 by 15 countries
- Now 52 Member Countries  
([https://www.eppo.int/ABOUT\\_EPPO/eppo\\_members](https://www.eppo.int/ABOUT_EPPO/eppo_members))
- Under the International Plant Protection Convention (IPPC)
- A Panel on Invasive Alien Species



**EPPO and EU:**  
**28 EU members are all EPPO members**  
**EU prepares black letter law**  
**EPPO makes recommendations**

# Regional Plant Protection Organizations



**International Plant Protection Convention**  
Protecting the world's plant resources from pests



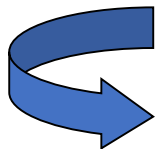
# Aims of EPPO

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## To protect plants

- To ensure cooperation and harmonization in all areas of plant protection where Governments take official measures (regulated pests or “Quarantine”)
- To develop a common strategy against the introduction and spread of pests (recommend phytosanitary measures)
- To promote the use of modern, safe and effective pest control methods
- To provide information services for provision and exchange of information



**Production of regional standards  
(recommendations to NPPOs)**

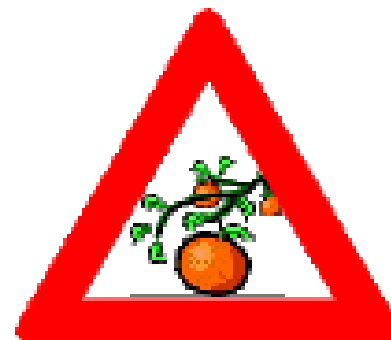
# One of EPPO's main areas of activities

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## Plant Quarantine

Plant quarantine: all activities designed to prevent the introduction and/or spread of quarantine pests or to ensure their official control [IPPC definition].







HOME

ABOUT EPPO ▾

MEETINGS ▾

ACTIVITIES ▾

RESOURCES ▾

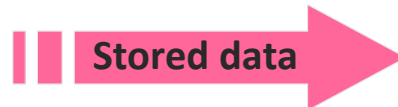
MEMBERS ONLY ▾



## EPPO activities on Invasive Alien Plants




[https://www.eppo.int/ACTIVITIES/iap\\_activities](https://www.eppo.int/ACTIVITIES/iap_activities)

An illustration showing a stack of books in green, red, and blue on the left, and a computer monitor displaying a blue screen on the right.

# ALERT LIST: 6

## EPPO Alert List (extract)

Species included in the Alert List have been selected by the EPPO Secretariat or proposed by EPPO member countries, because they may present a risk to the EPPO region. Most species are still of limited distribution, or absent from the EPPO region. Each addition to the EPPO Alert List is also marked by a short article in the EPPO Reporting Service. The objective of the EPPO Alert List is to provide early warning and eventually to propose candidates which may be subjected to a PRA. Species recorded in the Alert List are assessed through the EPPO Prioritization process to determine whether they should fall into the List of Invasive Alien Plants, the Observation List, or a PRA should be conducted.

**Invasive alien plants included in the EPPO Alert List** – for pests other than invasive alien plants view the [full Alert List](#) 

Plant name	Added in	Mini data sheets	Link to EPPO Global Database
<i>Alternanthera sessilis</i>	2019	<a href="#">Alert List</a>	<a href="#">Link</a>
<i>Amaranthus palmeri</i>	2014	<a href="#">Alert List</a>	<a href="#">Link</a>
<i>Bidens subalternans</i>	2017	<a href="#">Alert List</a>	<a href="#">Link</a>
<i>Prosopis chilensis</i> , <i>P. glandulosa</i> , <i>P. velutina</i>	2018	<a href="#">Alert List</a>	<a href="#">Link1</a> , <a href="#">Link2</a> , <a href="#">Link3</a>



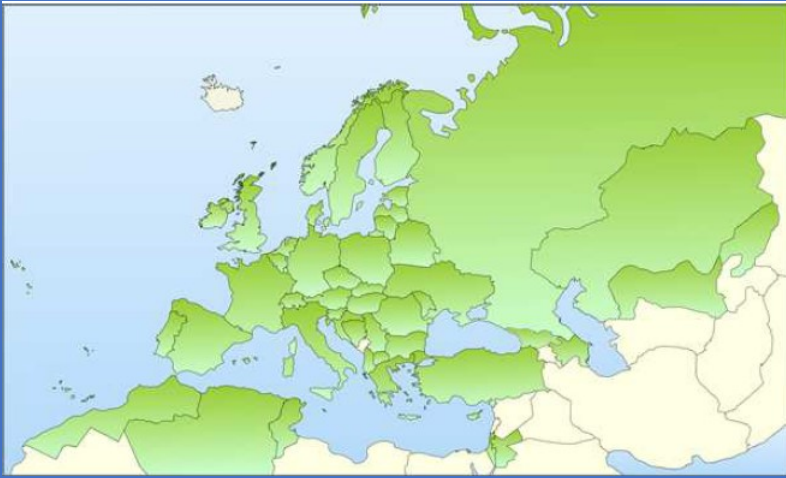
## EPPO Alert List – *Amaranthus palmeri* (Amaranthaceae)

### Pathways

*A. palmeri* is suspected to have entered Belgium as a contaminant of grain, and to have entered the United Kingdom as a contaminant of oil seed rape. Entry may also occur through used machinery as spread has been reported to occur during agricultural management practices such as plowing, mowing, harvesting and moving compost of green waste. The small seeds are predominantly gravity-dispersed, but can also naturally be spread through water flow and irrigation, as well as via the movement of birds and mammals. Although the seeds have no wind dispersal adaptations, strong winds and hurricanes are considered to be responsible for the spread of the species.

### Impacts

The invasive behaviour and range expansion of the species is relatively recent. *A. palmeri* has in the last years been ranked as the most troublesome cotton weed in the southern US. In 2014, at least 300 000 ha of cotton are reported as invaded by the weed in Arkansas, and over one million acres in Georgia. *A. palmeri* significantly affects growth and yield of crops. In the USA, *A. palmeri* densities of 1 and 10 plants per m<sup>2</sup> reduced cotton yields of 11 and 59% respectively. Major impacts have also been reported in soybean, peanut, corn, sweet potato and the plant has become one of the most economically damaging glyphosate-resistant weed species in the USA. In the USA, the maximum predicted soybean loss was 79% from full season interference of *A. palmeri* (density of 8 plants per m<sup>2</sup>). Full season interference from the weed reduced peanut yield by 68% (density of 5.5 plants per m of row). *A. palmeri* with its rapid growth rate and ability to accumulate large quantities of biomass is very competitive, and has also an advantage with its long roots. In addition to reducing yields, the large amount of biomass produced interferes with harvesting of crops. In cotton, the presence of *A. palmeri* doubled to quadrupled harvest time, compared to a weed free field. Equipment can even be damaged if densities of *A. palmeri* are higher than 0.65 plants per m<sup>2</sup>. *A. palmeri* may also affect or suppress crop growth through allelopathy. Experiments indicate that incorporation of a heavy stand of *A. palmeri* into the soil just before planting can hinder seedling growth in carrot, onion, cabbage and sorghum. *A. palmeri* also acts as a host to several nematodes.



# **EPPO prioritisation & EPPO PRA**

**WTO  
SPS Agreement  
IPPC**



# **Prioritisation & PRA**

(LIFE Project IAP-RISK)

**Reg. EU 1143/2014**

## The EPPO prioritization process for invasive alien plants

S. Brunel<sup>1</sup>, E. Branquart<sup>2</sup>, G. Fried<sup>3</sup>, J. van Valkenburg<sup>4</sup>, G. Brundu<sup>5</sup>, U. Starfinger<sup>6</sup>, S. Buholzer<sup>7</sup>, A. Uludag<sup>8</sup>, M. Joseffson<sup>9</sup> and R. Baker<sup>10</sup>

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<sup>6</sup>Julius Kühn Institut (JKI), Federal Research Centre for Cultivated Plants, Institute for National and International Plant Health, Messeweg 11/12, 38104 Braunschweig, Germany

<sup>7</sup>Agroscope Reckenholz- Tänikon Research Station ART, Reckenholzstr. 191, CH-8046 Zurich, Switzerland

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© 2010 The Authors. Journal compilation © 2010 OEPP/EPPO, *Bulletin OEPP/EPPO Bulletin* **40**, 407–422

*Bulletin OEPP/Bulletin* (2012) **42** (3), 463–474

ISSN 0250-8052. DOI: 10.1111/epp.2592

European and Mediterranean Plant Protection Organization  
Organisation Européenne et Méditerranéenne pour la Protection des Plantes

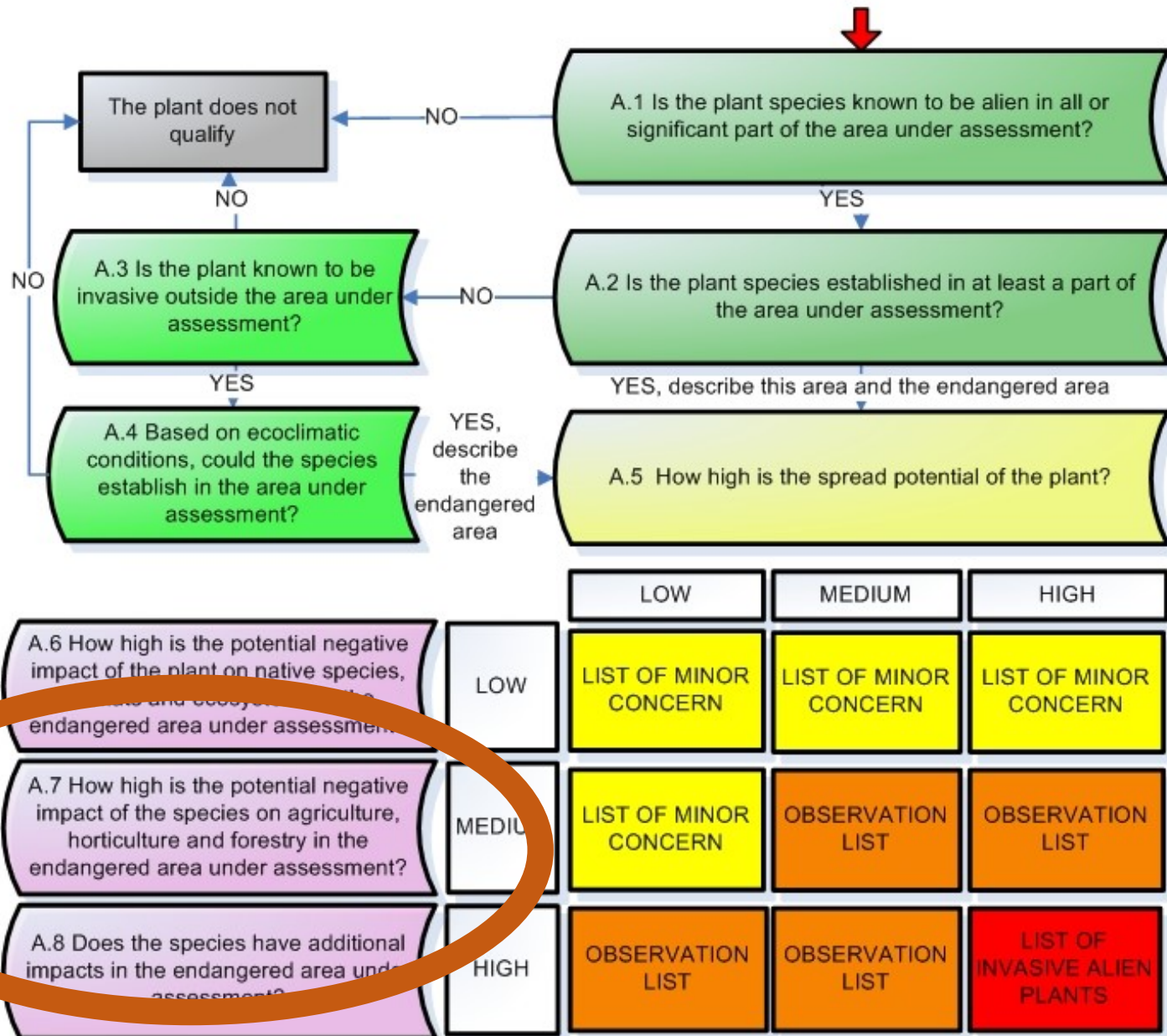
PM 5/6 (1)

Guidelines on Pest Risk Analysis  
Lignes directrices pour l'analyse du risque phytosanitaire

**EPPO prioritization process for invasive alien plants**

# Decision tree for the EPPO prioritization process for invasive alien plants

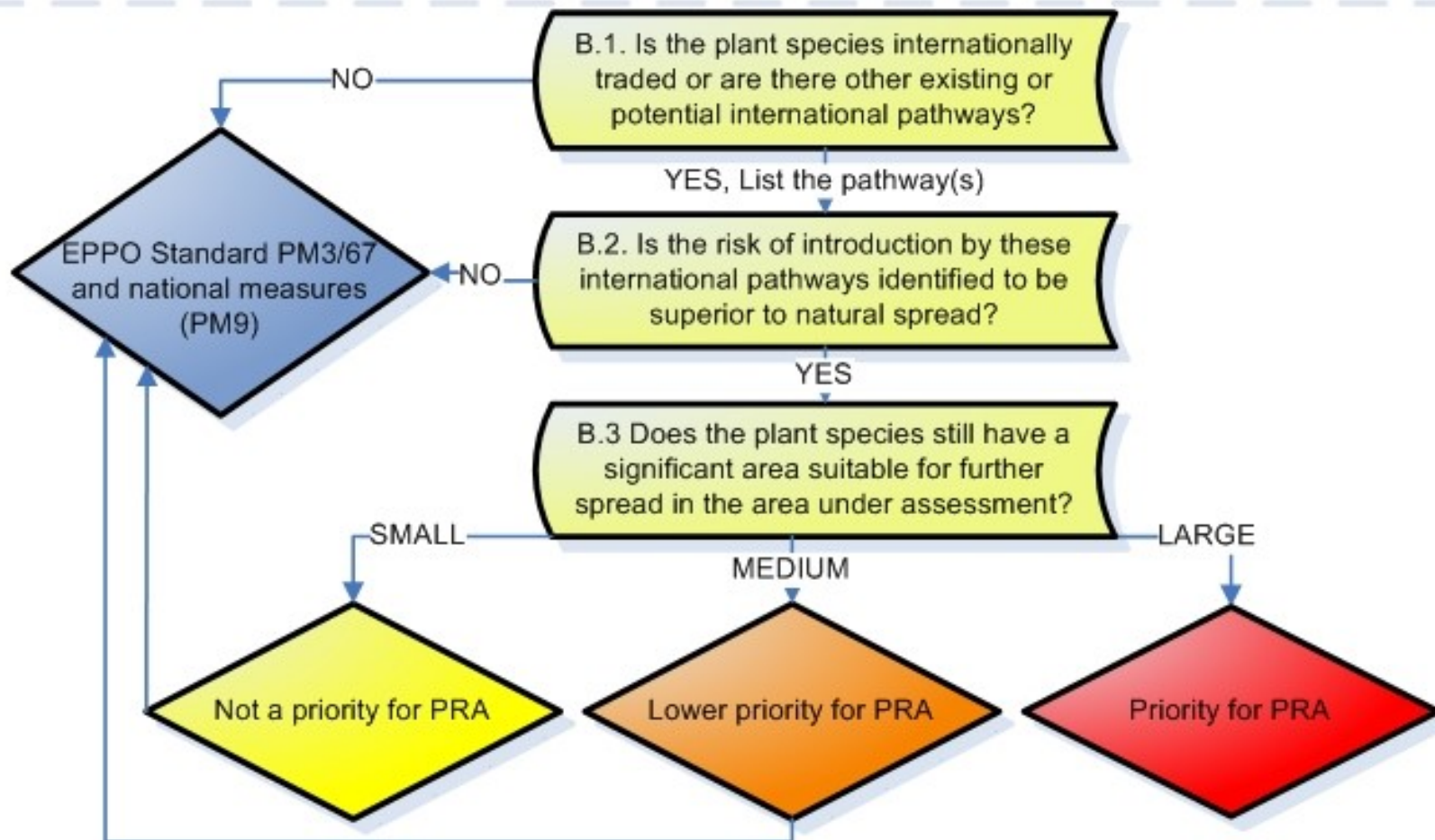
To create a clear overview of all invasive alien plants in the area under assessment



The highest score to one of the 3 questions should be taken, but additional impacts (Q A.8) cannot be taken as the highest impact on their own.



To identify invasive alien plants for which a  
PRA should be performed





# A prioritization process for invasive alien plant species incorporating the requirements of EU Regulation no. 1143/2014

E. Branquart<sup>1</sup>, G. Brundu<sup>2</sup>, S. Buholzer<sup>3</sup>, D. Chapman<sup>4</sup>, P. Ehret<sup>5</sup>, G. Fried<sup>6</sup>, U. Starfinger<sup>7</sup>, J. van Valkenburg<sup>8</sup> and R. Tanner<sup>9</sup>

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<sup>3</sup>*Agroscope Institute for Sustainability Sciences, Zurich (Switzerland)*

<sup>4</sup>*NERC Centre for Ecology and Hydrology, Edinburgh (UK)*

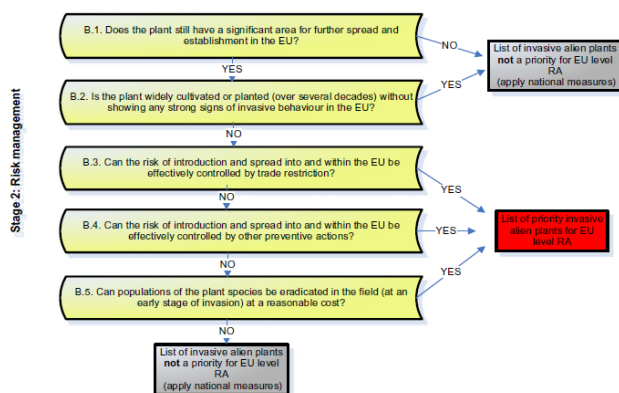
<sup>5</sup>*Ministry of Agriculture, National Plant Protection Organization, Montpellier Cedex 2 (France)*

<sup>6</sup>*Anses, Laboratoire de la Santé des Végétaux, Unité Entomologie et Plantes Invasives, Montferrier-sur-Lez Cedex (France)*

<sup>7</sup>*Julius Kühn Institut (JKI), Federal Research Centre for Cultivated Plants, Institute for National and International Plant Health, Braunschweig (Germany)*

<sup>8</sup>*National Plant Protection Organization, Wageningen (The Netherlands)*

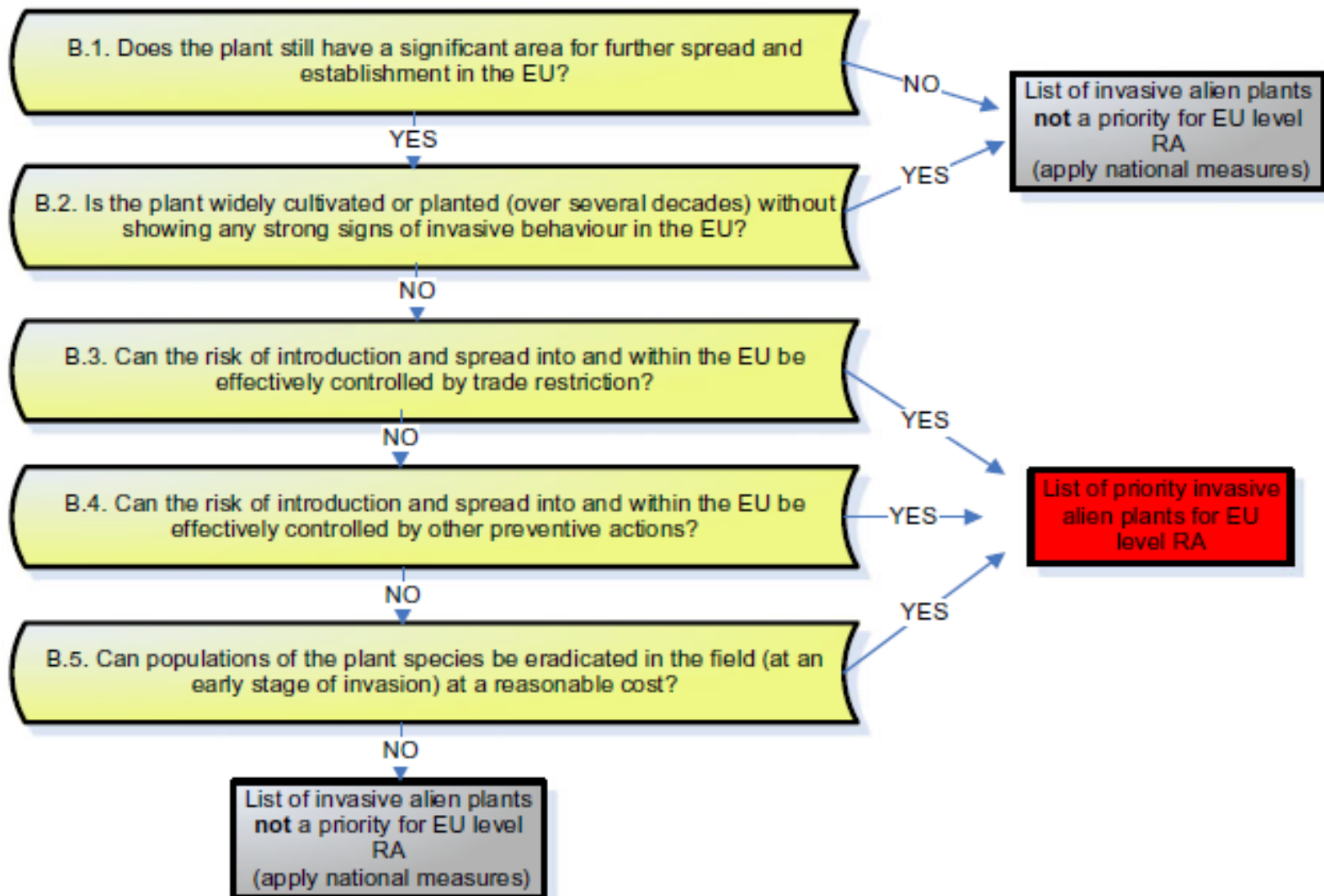
<sup>9</sup>*European and Mediterranean Plant Protection Organization, Paris, France*



## Acknowledgements

This research was funded in part by the European Commission, DG Environment LIFE funding under the project LIFE15 PRE FR 001: Mitigating the threat of invasive alien plants in the EU through pest risk analysis to support the Regulation (EU) No 1143/2014. Authors acknowledge Wolfgang Rabitsch, Sonia Vanderhoeven, Montserrat Villà and other members of the scientific forum dedicated to this Regulation for useful suggestions and comments.

Stage 2: Risk management



European and Mediterranean Plant Protection Organization  
Organisation Européenne et Méditerranéenne pour la Protection des Plantes

PM 5/5(1)

**Guidelines on pest risk analysis**  
**Lignes directrices pour l'analyse du risque phytosanitaire**

## **Decision-support scheme for an Express Pest Risk Analysis**

### **Specific scope**

This Standard provides a simplified scheme for the rapid production of pest risk analyses.

### **Specific approval and amendment**

2012-09.

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# **EPPO A<sub>1</sub>/A<sub>2</sub> Lists of pests recommended for regulation as quarantine pests**

Invasive alien plants which have been added to the EPPO A<sub>1</sub>/A<sub>2</sub> Lists of pests recommended for regulation as quarantine pests are listed in the table below. The purpose of the EPPO A<sub>1</sub>/A<sub>2</sub> Lists is to recommend that organisms of serious phytosanitary concern should be regulated as quarantine pests by EPPO member countries (A<sub>1</sub> pests are absent from the EPPO region and A<sub>2</sub> pests are locally present in the EPPO region). The listing of pests is based on technical justifications (i.e. PRAs) and follows a meticulous approval procedure. Plant species, before being submitted to a PRA, have been identified as posing a risk by the EPPO prioritization process.

[https://www.eppo.int/ACTIVITIES/invasive\\_alien\\_plants/iap\\_lists](https://www.eppo.int/ACTIVITIES/invasive_alien_plants/iap_lists)

Plant name (link to EPPO Global Database to retrieve PRA documents and datasheets)	EPPO A1/A2 Lists
<i>Alternanthera philoxeroides</i>	A2 in 2015
<i>Ambrosia confertiflora</i> [evaluated under EU LIFE project]	A2 in 2018
<i>Ambrosia trifida</i>	A2 in 2019
<i>Andropogon virginicus</i> [evaluated under EU LIFE project]	A2 in 2018
<i>Baccharis halimifolia</i>	A2 in 2013
<i>Cardiospermum grandiflorum</i> [evaluated under EU LIFE project]	A2 in 2017
<i>Cortaderia jubata</i> [evaluated under EU LIFE project]	A1 in 2018
<i>Crassula helmsii</i>	A2 in 2006
<i>Ehrharta calycina</i> [evaluated under EU LIFE project]	A2 in 2018
<i>Eichhornia crassipes</i>	A2 in 2008
<i>Gymnocoronis spilanthoides</i> [evaluated under EU LIFE project]	A2 in 2017
<i>Hakea sericea</i> [evaluated under EU LIFE project]	A2 in 2018
<i>Heracleum persicum</i>	A2 in 2009
<i>Heracleum sosnowskyi</i>	A2 in 2009
<i>Humulus scandens</i> [evaluated under EU LIFE project]	A2 in 2018
<i>Hydrocotyle ranunculoides</i>	A2 in 2005
<i>Lespedeza cuneata</i> [evaluated under EU LIFE project]	A1 in 2018
<i>Ludwigia grandiflora</i>	A2 in 2011
<i>Ludwigia peploides</i>	A2 in 2011
<i>Lygodium japonicum</i> [evaluated under EU LIFE project]	A1 in 2018
<i>Microstegium vimineum</i>	A2 in 2015
<i>Myriophyllum heterophyllum</i>	A2 in 2015
<i>Parthenium hysterophorus</i>	A2 in 2014
<i>Pistia stratiotes</i> [evaluated under EU LIFE project]	A2 in 2017
<i>Polygonum perfoliatum</i>	A2 in 2008
<i>Prosopis juliflora</i> [evaluated under EU LIFE project]	A2 in 2018
<i>Pueraria montana</i> var. <i>lobata</i>	A2 in 2006
<i>Salvinia molesta</i> [evaluated under EU LIFE project]	A2 in 2017
<i>Solanum elaeagnifolium</i>	A2 in 2006
<i>Triadica sebifera</i> [evaluated under EU LIFE project]	A1 in 2018

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# EPPO Observation List of invasive alien plants

The EPPO Observation List was created by the EPPO Panel on Invasive Alien Plants in 2012. This list contains plant species (absent or present in the EPPO region) which present a medium risk or for which information currently available is not sufficient to make an accurate assessment. It is stressed that inclusion in the Observation List is not definitive, and changes can be made when additional information is recorded, particularly when information on invasiveness becomes available, or when a significant change in the invasive behaviour is observed.

[https://www.eppo.int/ACTIVITIES/invasive\\_alien\\_plants/iap\\_lists](https://www.eppo.int/ACTIVITIES/invasive_alien_plants/iap_lists)

Plant name (link to EPPO Global Database to retrieve PRA documents and datasheets, if available)	Added in
<i>Akebia quinata</i>	2012
<i>Araujia sericifera</i>	2012
<i>Asparagus asparagoides</i>	2013
<i>Azolla filiculoides</i>	2012
<i>Baccharis spicata</i>	2019
<i>Bidens frondosa</i>	2012
<i>Broussonetia papyrifera</i>	2019
<i>Cenchrus incertus</i>	2012
<i>Cenchrus longispinus</i>	2018
<i>Eragrostis curvula</i>	2012
<i>Eriochloa villosa</i>	2012
<i>Galenia pubescens</i>	2018
<i>Hygrophila polysperma</i> [evaluated under EU LIFE project]	2017
<i>Impatiens edgeworthii</i>	2018
<i>Limnophila sessiliflora</i>	2013
<i>Lupinus polyphyllus</i>	2012
<i>Lysichiton americanus</i> [A2 in 2005 - deleted in 2009]	2012
<i>Miscanthus sinensis</i>	2018
<i>Nassella trichotoma</i> , <i>N. neesiana</i> and <i>N. tenuissima</i>	2012
<i>Rhododendron ponticum</i>	2012
<i>Sesbania punicea</i>	2012
<i>Solidago nemoralis</i>	2012
<i>Verbesina encelioides</i>	2012

Obs.: 25

# EPPO List of invasive alien plants

The plants listed below have been identified by the Panel as being absent or present in the EPPO region; as having a high potential for spread; as posing an important threat to plant health and/or the environment and biodiversity; and eventually as having other detrimental social impacts in the EPPO region. Because a large number of invasive alien plants are already present in the EPPO region, priorities were set in order to select those species considered to pose the greatest threat to species and ecosystems in the EPPO region. EPPO therefore strongly recommends countries endangered by these species to take measures to prevent their introduction and spread, or to manage unwanted populations (for example with publicity, restrictions on sale and planting, and control measures). This List is constantly being reviewed by the Panel (new species can be added and others removed). The list is not meant to be exhaustive but to focus on the main risks.

[https://www.eppo.int/ACTIVITIES/invasive\\_alien\\_plants/iap\\_lists](https://www.eppo.int/ACTIVITIES/invasive_alien_plants/iap_lists)

Plant name (link to EPPO Global Database to retrieve PRA documents and datasheets, if available)	Added in
<i>Acacia dealbata</i>	2006
<i>Acer rufrinerve</i>	2019
<i>Acroptilon repens</i>	2005
<i>Ailanthus altissima</i>	2004
<i>Ambrosia artemisiifolia</i>	2004
<i>Amelanchier spicata</i>	2004
<i>Amorpha fruticosa</i>	2006
<i>Arctotheca calendula</i>	2014
<i>Buddleja davidii</i>	2006
<i>Cabomba caroliniana</i>	2006
<i>Carpobrotus acinaciformis</i>	2006
<i>Carpobrotus edulis</i>	2006
<i>Cornus sericea</i>	2012
<i>Cortaderia selloana</i>	2006
<i>Cyperus esculentus</i>	2004
<i>Delawarea odorata</i>	2012
<i>Egeria densa</i>	2005
<i>Elodea nuttallii</i>	2004
<i>Fallopia baldschuanica</i>	2012
<i>Fallopia japonica</i>	2004
<i>Fallopia sachalinensis</i>	2004
<i>Fallopia x bohemica</i>	2004
<i>Gunnera tinctoria</i>	2014
<i>Helianthus tuberosus</i>	2004
<i>Heracleum mantegazzianum</i>	2004
<i>Hydrilla verticillata</i>	2012
<i>Impatiens glandulifera</i>	2004
<i>Lagarosiphon major</i>	2004
<i>Myriophyllum aquaticum</i>	2004
<i>Paspalum distichum</i>	2006
<i>Oxalis pes-caprae</i>	2006
<i>Pennisetum setaceum</i>	2012
<i>Prunus serotina</i>	2004
<i>Senecio inaequidens</i>	2004
<i>Sicyos angulatus</i>	2005
<i>Solidago canadensis</i>	2004
<i>Solidago gigantea</i>	2004

37 (to be updated)



# Invasive Species and Human Health

EDITED BY GIUSEPPE MAZZA  
AND ELENA TRICARICO





# Examples of Mediterranean agricultural land uses and IAS

Green house / tunnel

Ornamentals

Winter crops and forages (*Centaurea diluta*, perennial weeds)

Rice (*Cotula* sp.pl.)

Irrigated crops (vegetables) (*Datura* sp.pl.)

Irrigated forages (*Gomphocarpus fruticosus*, *Solanum* sp.pl.)

Traditional or modern fruticulture and viticulture (including olive)

Biomass crops

Plantation forest (*Acacia* sp.pl.)

Agro-forestry (*Xanthium* sp.pl.)

Natural rangelands (*Nicotiana glauca*)

Irrigation and drainage networks, ponds (watering place for cattle)

# Examples of Mediterranean agricultural land uses and IAS

*Webbia: Journal of Plant Taxonomy and Geography*, 2014

Vol. 69, No. 1, 145–156, <http://dx.doi.org/10.1080/00837792.2014.898365>



## A catalogue of non-native weeds in irrigated crops in Sardinia (Italy)

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*(Received 15 January 2014; final version received 23 February 2014)*

Taxon	L-APG III	Family	Residence time	Invasion status	Native range	Year first record	M	P	V	C	A	CG	B
<i>Azolla filiculoides</i> Lam.	17	Salviniaceae	NEO	NAT	T America	1922	*					*	
<i>Heteranthera limosa</i> (Sw.) Willd.	80	Pontederiaceae	NEO	NAT	C America	1981		*					*
<i>Heteranthera rotundifolia</i> (Kunth) Griseb.	80	Pontederiaceae	NEO	NAT	C America	1981		*				*	
<i>Cyperus alternifolius</i> L.	99	Cyperaceae	NEO	NAT	T Africa	1988							*
<i>Cyperus difformis</i> L.	99	Cyperaceae	NEO	NAT	T Africa	1981		*				*	*
<i>Cyperus eragrostis</i> Lam.	99	Cyperaceae	NEO	NAT	S America	1981		*				*	*
<i>Cyperus michelianus</i> (L.) Delile	99	Cyperaceae	ARC	NAT	T Africa	2003							*
<i>Eleocharis geniculata</i> (L.) Roem. & Schult.	99	Cyperaceae	NEO	CAS	America	2009							*
<i>Schoenoplectus mucronatus</i> (L.) Palla	99	Cyperaceae	ARC	INV	T Africa	1981		*					*
<i>Alopecurus myosuroides</i> Huds.	106	Poaceae	ARC	CAS	Asia	1966		*	*				*
<i>Arundo donax</i> L.	106	Poaceae	ARC	INV	Eurasia	1837-59	*	*	*			*	*
<i>Cenchrus longisetus</i> M.C. Johnst.	106	Poaceae	NEO	NAT	Africa	1982		*				*	*
<i>Cenchrus setaceus</i> (Forssk.) Morrone	106	Poaceae	NEO	NAT	T Africa	1980		*				*	*
<i>Chloris gayana</i> Kunth	106	Poaceae	NEO	NAT	T Africa	2014							
<i>Digitaria ciliaris</i> (Retz.) Koeler	106	Poaceae	NEO	NAT	Tropics	2010						*	
<i>Echinochloa colona</i> (L.) Link.	106	Poaceae	NEO	NAT	Tropics	1984							*

Invading Nature  
Springer Series in Invasion Ecology 7



Llewellyn C. Foxcroft  
Petr Pyšek  
David M. Richardson  
Piero Genovesi *Editors*

# Plant Invasions in Protected Areas

Patterns, Problems and Challenges

 Springer

**Table 18.4** Key invasive alien plant species in the Mediterranean island protected areas and their main impacts on biodiversity (I1), agriculture and forestry (I2) and other sectors (I3), according to the definitions of the EPPO prioritisation method (Brunel et al. 2010a, b)



Species	I1	I2	I3	References for impacts on PAMIs
<i>Acacia</i> spp.	H	L	Na	Hadjikyriakou and Hadjisterkoti (2002), Cardinale et al. (2008), Le Maitre et al. (2011), and Wilson et al. 2011
<i>Agave</i> spp.	H	Ns	Na	Camarda et al. (2004) and Lambdon et al. (2008a, b)
<i>Akebia quinata</i>	H	Na	Na	Brunel et al. (2010b)
<i>Ailanthus altissima</i>	H	M	Y	Vilà et al. (2006), Traveset et al. (2008a), and Jeanmonod et al. (2011)
<i>Alternanthera philoxeroides</i>	H	M	Y	Brunel et al. (2010b)
<i>Amaranthus</i> spp.	L	H	Y	Brundu et al. (2003, 2004) and Camarda et al. (2004)
<i>Ambrosia artemisiifolia</i>	L	H	Y	Brunel et al. (2010b)
<i>Aptenia cordifolia</i>	M	Ns	Na	Brundu et al. (2003, 2004) and Camarda et al. (2004)
<i>Araujia sericifera</i>	M	M	Y	Brunel et al. (2010b)
<i>Baccharis halimifolia</i>	H	L	Y	Brunel et al. (2010b)

## Chapter 18

### Invasive Alien Plants in Protected Areas in Mediterranean Islands: Knowledge Gaps and Main Threats

Giuseppe Brundu

## Plant invasions on small Mediterranean islands: An overview

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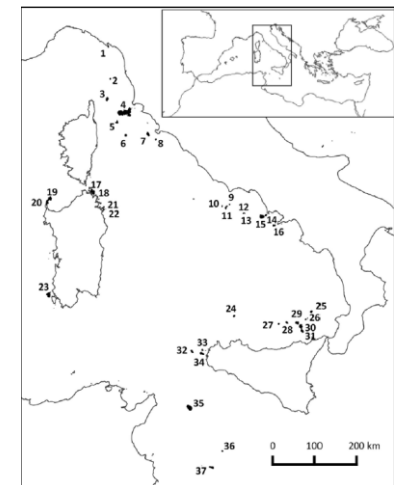


Table 1. List of the most widespread non-native vascular plant species in the 37 investigated islands.

Taxon	Family	Est	N
<i>Agave americana</i> L.	Agavaceae	I	35
<i>Opuntia ficus-indica</i> (L.) Mill.	Cactaceae	I	34
<i>Erigeron bonariensis</i> L.	Asteraceae	I	33
<i>Oxalis pes-caprae</i> L.	Oxalidaceae	I	32
<i>Carpobrotus acinaciformis</i> (L.) L.Bolus	Aizoaceae	I	31
<i>Ailanthus altissima</i> (Mill.) Swingle	Simaroubaceae	I	26
<i>Mesembryanthemum cordifolium</i> L.f.	Aizoaceae	I	26
<i>Symphytotrichum squamatum</i> (Spreng.) G.L.Nesom	Asteraceae	I	26
<i>Amaranthus deflexus</i> L.	Amaranthaceae	I	23
<i>Mirabilis jalapa</i> L.	Nyctaginaceae	I	23
<i>Erigeron canadensis</i> L.	Asteraceae	I	19
<i>Amaranthus retroflexus</i> L.	Amaranthaceae	I	18
<i>Carpobrotus edulis</i> (L.) N.E.Br.	Aizoaceae	I	18
<i>Senecio angulatus</i> L.f.	Asteraceae	I	17
<i>Acacia saligna</i> (Labill.) H.L.Wendl.	Fabaceae	I	16
<i>Erigeron sumatrensis</i> Retz.	Asteraceae	I	16
<i>Nicotiana glauca</i> Graham	Solanaceae	I	16
<i>Austrocylindropuntia subulata</i> (Muehlenpf.) Backeb.	Cactaceae	N	16
<i>Robinia pseudoacacia</i> L.	Fabaceae	I	16
<i>Solanum linnaeanum</i> Hepper & P.-M.L.Jaeger	Solanaceae	N	15
<i>Tropaeolum majus</i> L.	Tropaeolaceae	N	15
<i>Opuntia amyclaea</i> Ten.	Cactaceae	I	14
<i>Solanum lycopersicum</i> L.	Solanaceae	C	14

Notes: Est = establishment status in the study area, assigned on the basis of the highest stage in the invasion process documented in any island. I = invasive, N = naturalized, C = casual (see text for details on the methods). N = number of islands where the species occurs.



Table 2. List of the non-native vascular plant species showing the greatest increase in the number of islands where the species was recorded as regards the previous survey of the same study area (Pretto et al. 2012).

Taxon	Family	Est	+ N
<i>Austrocyllindropuntia subulata</i> (Muehlenpf.) Backeb.	Cactaceae	N	10
<i>Erigeron sumatrensis</i> Retz.	Asteraceae	I	9
<i>Opuntia amyclaea</i> Ten.	Cactaceae	I	9
<i>Solanum lycopersicum</i> L.	Solanaceae	C	8
<i>Anredera cordifolia</i> (Ten.) Steenis	Basellaceae	I	6
<i>Cotyledon orbiculata</i> L.	Crassulaceae	C	5
<i>Eucalyptus camaldulensis</i> Dehnh.	Myrtaceae	N	5
<i>Lantana camara</i> L.	Verbenaceae	N	5
<i>Mirabilis jalapa</i> L.	Nyctaginaceae	I	5
<i>Pelargonium zonale</i> (L.) L'Hér.	Geraniaceae	C	5
<i>Pittosporum tobira</i> (Thunb.) W.T.Aiton	Pittosporaceae	N	5
<i>Symphyotrichum squamatum</i> (Spreng.) G.L.Nesom	Asteraceae	I	5
<i>Aeonium haworthii</i> Salm-Dyck ex Webb & Berth.	Crassulaceae	N	4
<i>Carpobrotus edulis</i> (L.) N.E.Br.	Aizoaceae	I	4
<i>Euphorbia maculata</i> L.	Euphorbiaceae	I	4
<i>Cyperus alternifolius</i> L. subsp. <i>flabelliformis</i> Kük.	Cyperaceae	N	4
<i>Iris albicans</i> Lange	Iridaceae	N	4
<i>Malephora crocea</i> (Jacq.) Schwantes	Aizoaceae	C	4
<i>Oxalis articulata</i> Savigny	Oxalidaceae	N	4
<i>Parthenocissus quinquefolia</i> (L.) Planch.	Vitaceae	N	4
<i>Tropaeolum majus</i> L.	Tropaeolaceae	N	4
<i>Acacia saligna</i> (Labill.) H.L.Wendl.	Fabaceae	I	3
<i>Amaranthus hybridus</i> L.	Amaranthaceae	N	3
<i>Amaranthus retroflexus</i> L.	Amaranthaceae	I	3
<i>Crassula muscosa</i> L.	Crassulaceae	C	3
<i>Drosanthemum floribundum</i> (Haw.) Schwantes	Aizoaceae	N	3
<i>Kalanchoë daigremontiana</i> Raym.-Hamet & H.Perrier	Crassulaceae	C	3
<i>Opuntia stricta</i> (Haw.) Haw.	Cactaceae	I	3
<i>Paraserianthes lophantha</i> (Willd.) I. C.Nielsen	Fabaceae	I	3
<i>Senecio angulatus</i> L.f.	Asteraceae	I	3
<i>Veronica persica</i> Poir.	Plantaginaceae	I	3
<i>Zantedeschia aethiopica</i> (L.) Spreng.	Araceae	I	3



Table 3. List of the non-native vascular plant species that have progressed to a subsequent stage of the invasion process within the study area as regards the previous survey (Pretto et al. 2012).

Taxon	Family	Est	Prev est
<i>Acacia dealbata</i> Link	Fabaceae	I	C
<i>Acacia melanoxylon</i> R.Br.	Fabaceae	N	C
<i>Acacia pycnantha</i> Benth.	Fabaceae	I	C
<i>Aeonium haworthii</i> Salm-Dyck ex Webb & Berth.	Crassulaceae	N	C
<i>Anredera cordifolia</i> (Ten.) Steenis	Basellaceae	I	C
<i>Campsis radicans</i> (L.) Bureau	Bignoniaceae	N	C
<i>Casuarina equisetifolia</i> L.	Casuarinaceae	N	C
<i>Delairea odorata</i> Lem.	Asteraceae	N	C
<i>Drosanthemum floribundum</i> (Haw.) Schwantes	Aizoaceae	N	C
<i>Dysphania ambrosioides</i> (L.) Mosyakin & Clemants	Amaranthaceae	I	N
<i>Erigeron karvinskianus</i> DC.	Asteraceae	I	N
<i>Eucalyptus globulus</i> Labill.	Myrtaceae	N	C
<i>Euphorbia maculata</i> L.	Euphorbiaceae	I	N
<i>Lonicera japonica</i> Thunb.	Caprifoliaceae	N	C
<i>Mesembryanthemum cordifolium</i> L.f.	Aizoaceae	I	N
<i>Mirabilis jalapa</i> L.	Nyctaginaceae	I	N
<i>Opuntia stricta</i> (Haw.) Haw.	Cactaceae	I	C
<i>Paraserianthes lophantha</i> (Willd.) I. C.Nielsen	Fabaceae	I	N
<i>Passiflora caerulea</i> L.	Passifloraceae	N	C
<i>Phytolacca americana</i> L.	Phytolaccaceae	I	N
<i>Prunus domestica</i> L.	Rosaceae	N	C
<i>Senecio angulatus</i> L.f.	Asteraceae	I	N
<i>Tradescantia fluminensis</i> Vell.	Commelinaceae	N	C
<i>Zantedeschia aethiopica</i> (L.) Spreng.	Araceae	I	N

Notes: Est = current establishment status in the study area, assigned on the basis of the highest stage in the invasion process documented in any island. Prev est = establishment status in the study area in the previous survey (see text for details on the methods).



## Towards alien plant prioritization in Italy: methodological issues and first results

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**Table 1.** List of the candidate species to be submitted to the national prioritization procedure for their inclusion in a national list according to the Regulation (EU) n. 1143/2014.

Species	Family	Number of regions in which the species occurs	Number of regions with impacts on plant communities
<i>Acacia longifolia</i> (Andrews) Willd.	Fabaceae	5	2
<i>Acacia mearnsii</i> De Wild.	Fabaceae	1	1
<sup>§</sup> <i>Acacia melanoxylon</i> R.Br.	Fabaceae	5	1
<i>Acacia pycnantha</i> Benth.	Fabaceae	2	2
<sup>§</sup> <i>Acacia saligna</i> (Labill.) H.L.Wendl.	Fabaceae	10	7
<i>Amaranthus muricatus</i> (Moq.) Gillies ex Hieron.	Amaranthaceae	4	1
<i>Amaranthus tuberculatus</i> (Moq.) J.D.Sauer	Amaranthaceae	8	3
<i>Ambrosia trifida</i> L.	Asteraceae	8	3
<i>Ammannia coccinea</i> Rottb.	Lythraceae	4	1
<i>Anredera cordifolia</i> (Ten.) Steenis	Basellaceae	11	1
<i>Apios americana</i> Medik.	Fabaceae	5	2
<i>Araujia sericifera</i> Brot.	Apocynaceae	12	2
<i>Arctotheca calendula</i> (L.) Levyns	Asteraceae	4	1
<i>Asclepias fruticosa</i> L.	Apocynaceae	8	1
<i>Bidens connata</i> Muhl. ex Willd.	Asteraceae	7	1
<i>Bidens subalternans</i> DC.	Asteraceae	13	3
<i>Boerhavia coccinea</i> Mill.	Nyctaginaceae	2	0