Beyond protocols: improving the reliability of expert-based risk analysis underpinning invasive species policies

Perspective

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When policy needs science ...

CDB Aichi Target 9: By 2020, IAS and pathways are identified and prioritized, priority species are controlled or eradicated, measures are in place to manage pathways to prevent their introduction and establishment.

EU Regulation on IAS

National measures

IAS listings is basis for legal action

Risk analyses
Risk analysis =

+ Risk assessment

+ Risk management

+ Risk communication
Risk assessment

Evaluation of the **probability of the introduction** and **spread** of an alien species and of the associated **potential biological and socio-economic consequences** using science-based information

*Standards issued by European Food Safety Authority 2012; IPPC 1997; OiE 201*

Conservation implications

Costly surveillance
Management investment
Smart conservation investment

Quality, transparency and traceability!
Harmonia* and Pandora*: risk screening tools for potentially invasive plants, animals and their pathogens
Bram D’hondt · Sonia Vanderhoeven · Sophie Roelandt · François Mayer · Veerle Versteirt · Tim Adriaens · Els Ducheyne · Gilles San Martin · Jean-Claude Grégoire · Iris Stiers · Sophie Quoilin · Julien Ciglar · André Heughebaert · Etienne Branquart

Guidelines for environmental impact assessment and list classification of non-native organisms in Belgium.
* Version 2.6 (07/12/2009)

The generic impact scoring system (GISS): a standardized tool to quantify the impacts of alien species
Wolfgang Nentwig, Sven Bacher, Petr Pyšek, Montserrat Villà, Sabrina Kumschick

Calibration of FISK, an Invasiveness Screening Tool for Nonnative Freshwater Fishes
Gordon H. Copp,1,2* Lorenzo Vilizzi,3 John Mumford,4 Gemma V. Fenwick,1,5 Michael J. Godard,1 and Rodolphe E. Gozlan2

Framework and guidelines for implementing the proposed IUCN Environmental Impact Classification for Alien Taxa (EICAT)
Charlotte L. Hawkins1, Sven Bacher2, Franz Essl3, Philip E. Hulme4, Jonathan M. Jeschke5,6, Ingolf Kühn7,8, Sabrina Kumschick5,6, Wolfgang Nentwig9, Jan Pergl10, Petr Pyšek11,12,13, Wolfgang Rabitsch14, David M. Richardson15, Montserrat Villà16, John R. U. Wilson17,18, Piero Genovesi19 and Tim M. Blackburn20,21,22,23

Hanno Sandvik1, Bernt-Erik Saxthø1, Tomas Holmenn1*, Jarle Tufto5, Steinar Engen2, and Helen E. Roy3
Current expert-based RA practice: hindrance to effective decision making
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1. The scope ... 

- Generic vs specific purpose (taxon, habitats, ...)
- Quick screening vs full RA
- Pre-border vs post-border
Current expert-based RA practice: hindrance to effective decision making

1. The scope ...

1) Define the purpose of your assessment
2) Chose the most appropriate tool

- Generic vs specific purpose (taxon, habitats, …)
- Quick screening vs full RA
- Pre-border vs post-border
Current expert-based RA practice: hindrance to effective decision making

2. Information demand ...

- Lack of published evidence
- Bias towards e.g. human health impacts
Current expert-based RA practice: hindrance to effective decision making

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- Lack of published evidence
- Bias towards e.g. human health impacts

1) Keep on investing on ecological studies
2) Consider conflicting views in making decisions
Current expert-based RA practice: hindrance to effective decision making

3. Manageability ...

- Management options not adequately covered
- Lack of published evidence
- May lead to bad return on investment
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- Management options not adequately covered
- Lack of published evidence
- May lead to bad return on investment

1) Further invest in risk management developments
2) Record successes and failures → cost-benefit analyses
4. Uncertainty and variability ...

- Lack of information, Conflicting evidence
- Unclear formulation of the protocols
- Context dependency of invasions
- No arguments
Current expert-based RA practice: hindrance to effective decision making

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- Lack of information, Conflicting evidence
- Unclear formulation of the protocols
- Context dependency of invasions
- No arguments

1) « Uncertainty exists, but regardless, decisions must be made » Leung et al. 2012
2) Embrace uncertainty, Quality & robustness of RA
3) Address uncertainty in risk communication
4) Explicit inter-assessor variability
Current expert-based RA practice: hindrance to effective decision making

5. Reviewing process ...

- No rules/procedures
- No clear feedback to authors and reviewers
- Little formal consideration of content quality
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1) Consider proper reviewing process
2) Increase transparency and traceability
Monographs on Invasive Plants in Europe *Botany Letters*

**Monographs on Invasive Plants in Europe: Baccharis halimifolia L.**

Guillaume Fried, Lidia Caetano, Sarah Brunet, Estela Beteta, Anne Charpentier, Mercedes Herrera, Uwe Stafinger, and F. Danile Gentile

These, Laboratory of the Sante des Vegetaux, Montpellier, France, Faculty of Science and Technology, Department of Plant Biology and Ecology, University of the Basque Country (UPV/EHU), Bilbao, Spain; European and Mediterranean Plants Protection Organization, Paris, France; Rodolfo S.A., Bilbao, Spain; CEE UMB 51 75, CCB - University of Montpellier, Montpellier, France; Lluisa Kohn Institute (IKI), Federal Research Center for Cultivated Plants, Institute for National and International Plant Health, Brunswick, Germany; Faculty of Veterinary and Agricultural Sciences, The University of Melbourne, Parkville, Victoria, Australia

**ABSTRACT**

This account presents information on all aspects of the biology and ecology of Baccharis halimifolia L. that are relevant to understanding its invasive behaviour. The main topics are presented within the framework of the new series of Botany Letters on Monographs on invasive plants in Europe: Taxonomy, distribution, history of introduction and spread, ecology (including preferred climatic habitats, responses to edaphic and biotic factors, ecological interactions), biology (including physiology, phenology and reproductive biology), impacts and management. Baccharis halimifolia L. (Asteraceae), ground shrub, is a broad-leaved shrub native to the coastal area of southeastern North America. It has become naturalized in several coastal habitats, as well as in disturbed areas of western Europe. The shrub is known on the Atlantic coast of Europe from northern Spain to Belgium and it is an emerging problem on the Mediterranean coast. Baccharis halimifolia is a light-demanding pioneer species that colonizes following disturbance but can then become dominant in natural habitats. The shrub can grow on a large range of soil types but prefers moist soils with high organic content and it is well adapted to poorly drained saline soils. In contrast to its native range, where it is competitive with other coastal shrubs, populations in the secondary range have almost no native analogues across most of its ecological niche except for Tamarix gallica in Mediterranean areas. Baccharis halimifolia reproduces sexually, but it has a high reproducing ability following mechanical damage or fire. Very high seed production, coupled with dispersal by wind and water, ensure a good colonization capacity of suitable habitats. The species shows a relatively high plasticity for both morphological and ecophysiological traits, which is probably the basis for its tolerance to a wide range of ecological conditions, including salinity and light availability. Baccharis halimifolia is host to a limited number of insects, both in the native and introduced ranges, but a number of highly specific agents have contributed to the control of this plant following its introduction to Australia. In Europe, B. halimifolia is considered an invasive non-indigenous plant and the shrub is the object of control programmes. Negative impacts include the addition of a new canopy layer in formerly open habitats (e.g., Juncus maritimus communities), which causes a strong decrease in species richness and herbaceous cover and poses a threat to some birds by modifying habitat quality, mainly in priority habitats and in many natural protected sites. Most efficient control methods are mechanical removal and herbicide application either on leaves or stumps. Due to the high cost of mechanical removal and the unintended effects of herbicide application on other species, alternative management methods such as controlled introductions and biological control could also be considered. The plant is legally prohibited in several countries and it is protected on EU Regulation 1143/2014.

**Taxonomy**

**Names and classification**

**Scientific name:** Baccharis halimifolia L., 1753

**Synonyms:** Baccharis cuneifolia Moench, 1794

**Taxonomic position:** Eriocotyledons, Order: Asterales, Family: Asteraceae, Tribe: Asterine

**Common names:** Krenstrauchs (DE), eastern baccharis, ground baccharis, ground bush, seepwillow, silverling, sea myrtle, manglier, consumption weed, saltbush (EN), tres Marias, bicares, chicha de boja de oraga, carpeta (ES), baccharide à feuilles d’halime, seneçon en arbre (FR)

**EPPO code:** BACHA

Baccharis halimifolia is the type species of the genus *Baccharis*, i.e. the species on which the concept of the genus is based (Nisson 2006).

**Figure 2.** Leaves of Baccharis halimifolia L. 04/10/2012, Torrelles (France). © Guillaume Fried.
Current expert-based RA practice: hindrance to effective decision making

5. Reviewing process ...

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1) Consider proper reviewing process
2) Increase transparency and traceability
When policy needs science ...

- Proper decisions
- Best available evidence
- Transparency, traceability
- Smart allocation of conservation budget to IAS
When policy needs science ...

Stop investing in new risk analysis protocols, start focusing on the way their outcomes are used!
Thank you!
Data and expert knowledge

Individual risk assessment

Peer-review panel

Single overall score and confidence

Decision
Data and expert knowledge

Individual risk assessments

Delphi-like process

Consensus vs dissensus
Level of agreement

Single overall score and confidence

Decision