

POLICY PERSPECTIVE

Ambitious Advances of the European Union in the Legislation of Invasive Alien Species

Joscha Beninde¹, Marietta L. Fischer¹, Axel Hochkirch¹, & Andreas Zink²¹ Department of Biogeography, Trier University, D-54286 Trier, Germany² Institute for Environmental and Technology Law, Trier University, D-54286 Trier, Germany**Keywords**

Conservation policy; polluter pays; risk assessment; invasions.

CorrespondenceJoscha Beninde, Department of Biogeography, Trier University, D-54286 Trier, Germany.
Tel: +49-651-201-4911; fax: +49-651-201-3851.
E-mail: beninde@uni-trier.de**Received**

5 May 2014

Accepted

24 September 2014

Editor

Julie Lockwood

doi: 10.1111/conl.12150

Abstract

Conservation legislation provides a legal basis for conservation action and is crucial for effective conservation management. In April 2014, the European Parliament agreed upon a proposal for an EU-wide regulation to combat invasive alien species (IAS). The proposal incorporates many Guiding Principles of the Convention on Biodiversity for dealing with IAS. In addition, to prevention, eradication, management, and control it involves scientists, stakeholders and the public in decision making processes. It goes further by applying the “polluter-pays” principle: costs of damage induced by IAS and costs for restoration are shifted to the natural person, that is, a human being, or legal person, for example a company, state, etc., responsible for a species introduction. Because of its deterrent and preventive effect, the “polluter-pays” principle is a valued instrument in environmental policy. It now depends upon the Council of the European Union to agree on the ambitious proposal and adopt this modern conservation legislation. However, we recommend further improvements to achieve effective conservation management. Member States need to coordinate actions and adapt measures to newest scientific findings, best accomplished by a European center of IAS. Securing sufficient funding for such a center would greatly increase the likelihood of the regulation to facilitate efficient conservation initiatives. *Before this publication went to press the Council of the European Union adopted this regulation (22. October 2014) in the version of the second proposal as referred to in this text.*

Introduction

Invasive alien species (IAS) are considered the second largest driver of biodiversity loss worldwide and, as such, they are recognized as a major cause of species extinctions (Millennium Ecosystem Assessment 2005). Currently 12,122 alien species (DAISIE-project July 2014) have been documented in Europe. Of these, more than 15% are considered invasive, with ecological or economic impacts documented for 1094 and 1347 species, respectively (Vilà *et al.* 2010). Economic damage alone is estimated > 12.5 billion Euro per annum in the EU through impact on human health or damage to agriculture and infrastructure (Kettunen *et al.* 2009). Ecological impacts of IAS range from competition, predation on and hybridiza-

tion with native species, transmission of parasites and pathogens, alteration of habitats, disruption of ecosystem functioning and services to extinction of native species (Kettunen *et al.* 2009), but an economic valuation of these impacts remains difficult (Born *et al.* 2005). The majority of IAS are introduced accidentally, however, many species are intentionally released as pet species, game animals, exotic plants for gardening, as biological control agents or in forestry and agriculture for economic reasons (Hulme *et al.* 2008).

To reduce the adverse effects of IAS efficient strategies are needed (Lockwood *et al.* 2007). However, regulations within legally binding documents among EU member states vary widely (EU Commission 2013). Only few countries cover all aspects called for by scientists and

practitioners to efficiently combat IAS (EU Commission 2011). Using the Guiding Principles of the Convention on Biodiversity (CBD) as an orientation, the following components of an efficient strategy against IAS can be considered critical: (1) risk assessment strategy for prioritization of species, (2) black listing of priority species, (3) prevention by minimizing effects of most important vectors, (4) establishment of an early warning and rapid response system, (5) control and management of IAS as well as restoration of ecosystems, (6) a central body of coordination of all measures, (7) liability for environmental damage caused by IAS, (8) consultation by a scientific advisory board facilitating rapid adaptation to new scientific findings, (9) installation of financing instruments, (10) public awareness raising, and (11) international cooperation (CBD 2002, see also Lockwood *et al.* 2007; Caffrey *et al.* 2014).

On September 9, 2013, 10 years after the European Strategy on IAS was adopted (Genovesi & Shine 2004), the EU Commission (EC) published a “Proposal for a Regulation of the European Parliament and of the Council on the Prevention and Management of the Introduction and Spread of Invasive Alien Species” (EU Commission 2013b). Unlike other elements of the EU environmental legislation, such as the birds (2009/147/EC) or habitats (92/43/EEC) directives, regulations take direct legal effect in Member States without having to be transformed into national law. This regulation is necessary to reach the self-proclaimed goals of biodiversity protection within the EU (Aichi Biodiversity Targets 2011; EU Commission 2011a) and to fulfill the obligations arising from the CBD.

The European Parliament (EP) supported the proposal of the regulation on IAS by the EC, but voted to include additional amendments suggested by its Environmental Committee (for simplicity we refer to the initial proposal of September 2013 as the first proposal and to the amended proposal of the EP of April 16, 2014 as the second proposal (European Parliament 2014)). Based on Article 192 of the Treaty on the Functioning of the European Union (TFEU), a proposal needs to be adopted by the EP and the Council of the European Union (Council) in a co-decision procedure to become operative. The Council can either accept the second proposal or reject it. In case of rejection, the EP has to perform a second reading and incorporate criticized aspects of the Council until agreement over particulars can be reached (Figure 1). Finally, the accepted proposal will become an operative regulation and enter into force earliest in 2015 or 2016. This regulation will become the third legislative instrument dedicated to the conservation of nature, following on the influential birds and habitats directives (Hochkirch *et al.* 2013) and its implementation is suspected to profoundly affect conservation initiatives within the EU. We here give an overview of what this regulation entails and

how it can be made more efficient, bridging a gap between legal particulars of environmental policy and its implications for practical implementation.

The regulation and potential for its improvement

In the following, we provide an overview of the current state of the second proposal, including the improvements made by the EP and compare it to the first proposal. We introduce the general mode of action and instruments, that is, lists, risk assessments as well as measures, and further elaborate on ways to create a more efficient legislation.

Legal scope

The proposed regulation and all measures it entails will only take effect for species listed on the List of IAS of Union concern (see later section: *List of IAS of Union concern*). Generally, this can apply to any IAS in the EU, provided that a requirement for action has been demonstrated through risk assessment (see later section: *Risk assessment*). Exempted a priori from the scope are IAS already regulated through existing EU Law of other sectors, such as Genetically Modified Organisms (GMOs; Directive 2001/18/EC), microorganisms used in biocidal or plant protection products (Regulation [EU] No. 528/2012), animal disease species (COM (2013) 260 final) and plant pests (COM (2013) 267). At this point, the second proposal expands the scope compared to its predecessor by also including species used in aquaculture (listed on Annex VI of Regulation (EC) No. 708/2007).

Apart from the above-mentioned exceptions, candidate species have to be “alien” and “invasive” to be eligible for listing. Concise definitions of terms are thus critical. Here, the second proposal includes two novelties: species invasive to one part of the Union, but native to another Member State are now included in the definition of “alien,” an important addition, as the EU territory spans several biogeographic regions, potentially covering both the native and invasive range of a species (e.g., Schulte *et al.* 2012). Second, a species can also be considered “alien” when it “migrated into its present distribution” without human intervention (Article 3—point 1, second proposal). This inclusion is conditional on a negative impact of that species in its newly colonized range (Recital 7, second proposal). However, this inclusion is not in line with Article 2b, which excludes all species “changing their natural range without human intervention, in response to changing ecological conditions and climate change,” which remained unchanged. This inconsistency needs clarification by the EC before the final adoption of the regulation.

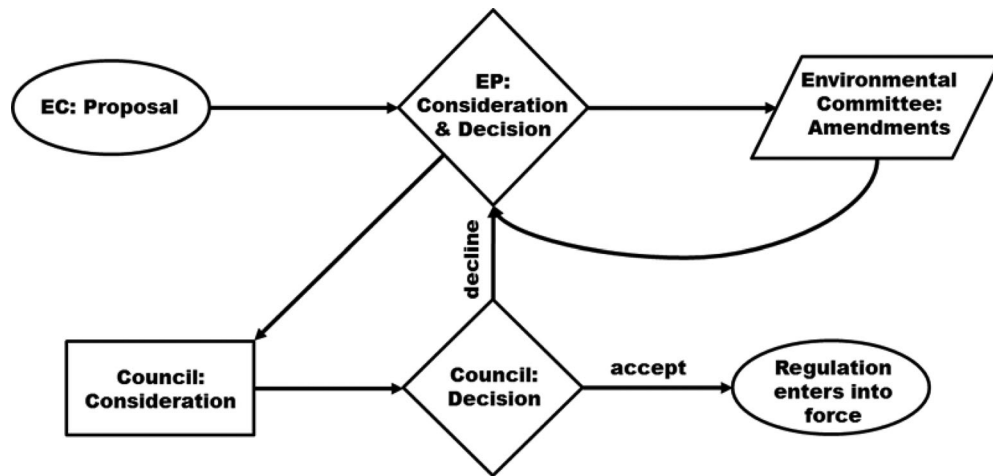


Figure 1 Overview of EU legislative procedure: co-decision procedure based on Art. 192 and Art. 294 TFEU. The proposal by the European Commission (EC) was forwarded from the European Parliament (EP) to its Environmental Committee for review. The amended proposal, referred to as second proposal in the text, was adopted by the EP (April 16, 2014) and is now under consideration by the Council of the European Union (Council) which will have to decide on the issue before the regulation can enter into force. In case the Council declines the second proposal the EP can respond with modifications, which both the EP and the Council will have to adopt in a further decision making procedure.

Risk assessment

Both the List of IAS of Union concern and risk assessments provide tools for prioritization of IAS and enable investment of resources and application of measures to be based on risk and scientific knowledge. Risk assessments constitute the evaluation of natural characteristics and biogeographical patterns of IAS with regard to potential and existing impacts on biodiversity, ecosystem services, and the economy. Prioritizing species requiring action at Union level, the List of IAS of Union concern is composed pursuant to risk assessments. These must include a description of the IAS, information on its native and potential range, patterns of reproduction and spread, potential pathways of entry into the EU, an assessment of negative impacts on biodiversity and ecosystem services as well as a quantified forecasts of economic damage at Union level (Article 5 (1) lit. a–h). Risk assessments are to be carried out by the EC or the EU Member States proposing species for listing. The type of scientific evidence admissible for risk assessments shall be specified by the EC through the adoption of delegated acts (a special form of legal acts by the EC). Given the broad empowerment of the EC to specify both the extent and quality of data and evidence admissible for proper conduct of risk assessments, a detailed methodology for risk assessments taking into account national and international standards will also be adopted (Article 5). This is an important step, as already, heterogeneity of scientific approaches regularly leads to difficulties in risk assessments (Born *et al.* 2005).

Economic valuation of IAS, for example, are particularly complex (Born *et al.* 2005) due to disparities in feasibility and ease of quantification of different economic values of species (Lockwood *et al.* 2007). Many ecological impacts represent nonmarket values and they are generally more difficult to quantify than market values (Charles & Dukes 2007; Kelly *et al.* 2013). This can be pivotal for the process of prioritization of IAS, which is strictly bound to the information delivered by risk assessments. Despite a broad scope of information input to the risk assessment (Article 5 (1) lit. a–h), most important, and presumably decisive for prioritization, will be “economic damage, including that deriving from biodiversity loss” (Article 5 (2) first proposal). This also includes economic damage to human health (an amendment of the second proposal). Although this improvement complies with CBD recommendations, precise terms on how such costs shall be estimated remain unspecified. Also, how non-market values are provisioned for in the future regulation is still an open question.

List of IAS of Union concern

The List of IAS of Union concern constitutes another core element of the regulation, as all efforts and strategic measures are exclusively focused on the species listed here. Being listed is thus imperative for IAS to be managed within the framework of the regulation. The requirement for being published on the List of IAS of Union concern is a demonstration, through risk assessment of available

scientific evidence (Article 4), that a species' impact makes action at Union level necessary. This prioritization of IAS requires availability of scientific data on multiple aspects of a species' distribution, behavior, and life history traits (Lockwood *et al.* 2007). Empirical findings will not meet all requirements for listing for all species and scientific uncertainties will thus persist beyond risk assessments throughout the process of prioritization. The EC is supported in the compilation of the List of IAS of Union concern by a body of scientists, the "Scientific Forum" (a key amendment of the second proposal). A major function of the Scientific Forum is the provisioning of guidance on this process, especially when dealing with incomplete and uncertain data.

As a major improvement, the second proposal also reversed the space-limit of the List of IAS of Union concern, initially set to 50 species in the first proposal, now leaving it open ended. In addition, the second proposal introduces a List of IAS of Member State concern, which was also amiss previously. Member states are empowered to apply measures of prevention (Art. 7 (1) lit. a–g), early detection, control and eradication to IAS of Member State concern at their own discretion.

Generally, it will be decisive how high a standard the EC will set, in regard to the negative impact of IAS, before it sees the requirement of action at Union level to be fulfilled, in order to prevent further establishment and spread (Article 4 2 c). Given the overarching importance for species of being listed and there being no point of reference on the criteria defining how much impact is enough for publication on the List of IAS of Union concern, this process would benefit further elucidation and transparency.

This is especially important as the proposed regulation aims to review and update the List of IAS of Union concern (Article 19 3) five years after adoption of the regulation, at the earliest. Monitoring obligations are scheduled every 4 years thereafter (EU Commission 2013a). Generally, the importance of species being listed in instruments of conservation policy has recently been emphasized by Casado (2013). While lists generally serve as powerful tools in conservation policy, their major drawback is infrequent synchronization with newly accumulating scientific knowledge (Casado 2013, Hochkirch *et al.* 2013). Therefore, it is critical that results of monitoring and new scientific findings are used more regularly for updates of lists (Hochkirch *et al.* 2013). The 4-year interval for monitoring and reporting obligations does not take potentially exponential expansion of IAS into account (Lockwood *et al.* 2007) and jeopardizes a precautionary approach to invasions. The second proposal thus needs improvement by installing a fast track updating procedure, when rapid action is needed.

Measures

The provisions of the proposals contain preventive and reactive measures towards introduction and release of IAS within EU territory. Preventive measures include early detection and rapid eradication. Reactive measures cover eradication, population control or containment, elevation of resilience of ecosystems and implementation of surveillance systems. Differentiation between preventive and reactive measures is based on the "three-stage hierarchical approach" as set out in the "Guiding Principles for the management of IAS" of the CBD (CBD 2002). It acknowledges the need to differentiate stages of biological invasions (Williamson 1996) and adjust measures accordingly based on cost-effectiveness. All measures, from prohibition or import of IAS into the EU to national action plans and national surveillance systems for border controls, have to be implemented by the EU Member States (Articles 7 to 18).

In another major amendment of the second proposal the "polluter-pays" principle is introduced. It ensures that not society as a whole, but the natural or legal person responsible for intentional or negligent introduction or spread of species on the List of IAS of Union concern is held accountable for the damage induced and will bear the costs of restoration. Invasion science demands the application of the "polluter-pays" principle to finance costs of eradication and restoration (Hulme *et al.* 2008). The principle is well accepted in international environmental law as it remedies ecosystem damage due to its deterrent effect on natural and legal persons to introduce or facilitate the spread of IAS in the EU, in addition to ensuring funding of restoration measures (Perrault *et al.* 2002). Furthermore, member states can impose other sanctions against responsible natural or legal persons (Article 24).

The proposed regulation explicitly allows Member States to maintain and lay down more stringent national rules to combat IAS of Union or Member State concern (Article 10). Moreover, Member States may derogate from the regulation if they can provide sufficient evidence to the EC, that no significant negative cross-border effects are to be expected (Article 4a second proposal). As some EU Member States have already installed units to prevent, control, and manage IAS and have legally binding national lists of IAS in place, this flexibility of the regulation is central to make use of existing structures and systems of Member States.

Committee, scientific and consultation forum

The proposals include a committee composed of competent ministers of Member States (Article 22 within the meaning of Regulation (EU) No. 182/2011 of February

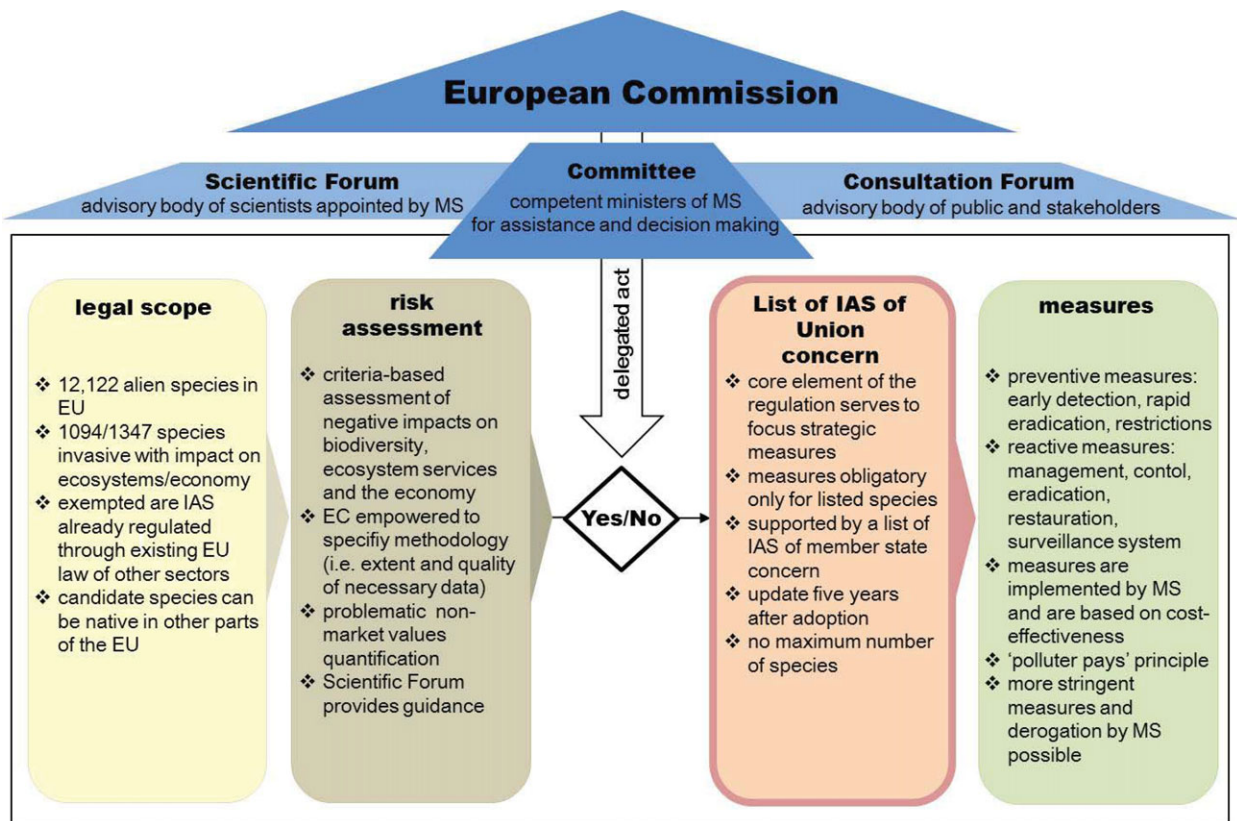


Figure 2 Mode of action of the proposed regulation including the amendments of the second proposal. Measures will only be implemented for those species listed on “The List of IAS of Union concern” and this instrument of the proposal is more boldly framed to emphasize the overarching importance of the list. Decisive for inclusion on the list is the requirement of action at Union level to prevent further damage and spread of IAS, which has to be demonstrated through risk assessments of candidate species; MS, member states.

16, 2011) for assistance and decision making in the procedure of compilation and updating of lists. The second proposal additionally suggests the establishment of a dedicated scientific body, “Scientific Forum,” to provide opinions concerning species considered for risk assessment and to conduct risk assessments upon request of the EC as well as a “Consultation Forum” for public and stakeholder participation (Figure 2). Inclusion of these advisory bodies in the decision making process of the List of IAS of Union concern, in management measures and for information exchange are essential improvements over the first proposal.

However, one of the most important measures still lacking in the second proposal is the constitution of a broadly empowered European Center of IAS. This institution should centralize information accruing from the regulation, supervise and serve as a specialist contact point for tasks like risk assessment, prioritization, and amendments to the the List of IAS of Union concern, classifying monitoring results and trends of IAS

and coordinating subsequent EU-wide actions of control and management. The establishment of an EU Center of IAS has already been proposed by Hulme *et al.* (2009) and was iterated by Caffrey *et al.* (2014) and could be similar to other implemented EU agencies, for example the European Food Safety Authority (EFSA) or the European Center for Disease Prevention and Control (ECDC). These agencies work in close collaboration with national authorities, provide scientific advice, coordinate flow of information and facilitate joint actions, conduct risk assessments, and strengthen surveillance and early warning systems. All of these tasks are also entailed in this regulation. Moreover, the proposed Scientific Forum could affiliate here and facilitate scientific coherence of measures adopted by the EC, thus providing a basis for meeting set objectives. A European Center of IAS would greatly increase the efficacy of the regulation, but, in lack of any EU financing instruments thus far, formation of such a center seems a distant goal. To date, financing will rely heavily on Member

States. However, under the LIFE Program, the funding instrument of the EU for the environment, projects of Member States leading to effective implementation of this regulation could be co-financed through the EU.

Legislative future

The proposed regulation in its current version of the second proposal conveys the impression that criticism expressed toward the first proposal (Carboneras *et al.* 2013, Joint Call 2013) was taken seriously by the Environmental Committee of the EP, which formulated the amendments (i.e., inclusion of the Scientific and Consultation Forum, the removal of the cap to 50 species of the List of IAS of Union concern, and more strict control measures). Furthermore, the second proposal employs the polluter-pays principle toward environmental costs of IAS. We appreciate this science-backed approach in dealing with biological invasions in the EU and it is essential that the Council of the EU does not backpedal from the ambitious second proposal. Nevertheless, the Council has the capability of further improvement. Before its adoption in the upcoming decision of the Council of the EU, the second proposal needs a second reading in the EP with updates to include shorter time intervals for monitoring obligations, elucidation on economic valuation of species, and sufficient funding for implementation of the regulation, intended especially for an EU Center of IAS. It is to be feared that without the creation and appropriate funding of such an agency, all good intentions of the second proposal might nonetheless fail to create efficient conservation initiatives for the European Union.

Acknowledgments

We thank P. Genovesi and two anonymous reviewers for useful comments on a previous draft of the manuscript. All authors are members of the interdisciplinary graduate school “Cooperation of Science and Jurisprudence in Improving Development and Use of Standards for Environmental Protection – Strategies for Risk Assessment and Management” funded by the German Science Foundation (DFG, GRK 1319).

References

- Born, W., Rauschmayer, F. & Bräuer, I. (2005) Economic evaluation of biological invasions—a survey. *Ecol. Econom.*, **55**, 321–336.
- Caffrey, J.M., Baars, J.-R., Barbour, J.H., *et al.* (2014) Tackling invasive alien species in Europe: the top 20 issues. *Manage. Biol. Invasions*, **5**, 1–20.
- Carboneras, C., Walton, P. & Vilà, M. (2013) Capping progress on invasive species? *Science*, **342**, 930–931.
- Casado, S. (2013) The importance of being listed: birds, lists and the history of conservation. *Ardeola*, **60**, 397–401.
- CBD, “Aichi Biodiversity Targets”. (2011) <http://www.cbd.int/sp/targets/> (visited July 02, 2014).
- CBD. (2002). Guiding principles for the prevention, introduction and mitigation of impacts of alien species that threaten ecosystems, habitats or species, COP 6 Decision VI/23 (Annex).
- Charles, H. & Dukes, J.S. (2007). Impacts of invasive species on ecosystem services. *Biol. Invasions*, **193**, 217–237.
- DAISIE-project. Delivering alien invasive species inventories for Europe, <http://www.europe-aliens.org/> (cited July 02, 2014).
- European Commission. (2011). A comparative Assessment of existing policies on invasive species in the EU member states and in selected OECD countries. Final Report.
- EU Commission. (2011a). Our life insurance, our natural capital: an EU biodiversity strategy to 2020, COM(2011) 244 final.
- EU Commission. (2013). Executive Summary of the Impact Assessment on the prevention and management of the introduction and spread of invasive alien species. SWD (2013) 322 final.
- EU Commission. (2013a). Impact Assessment on the prevention and management of the introduction and spread of invasive alien species. SWD (2013) 321 final.
- EU Commission. (2013b). Proposal for a Regulation of the European Parliament and of the Council on the prevention and management of the introduction and spread of invasive alien species. COM (2013) 620 final.
- European Parliament. (2014). Report on the proposal for a regulation of the European Parliament and of the Council on the prevention and management of the introduction and spread of invasive alien species. A7-0088/2014.
- Genovesi, P. & Shine, C. (2004). European strategy on invasive alien species. *Nat. Environ.*, **137**.
- Hochkirch, A., Schmitt, T., Beninde, J., *et al.* (2013). Europe needs a new vision for a natura 2020 network. *Conserv. Lett.*, **6**, 462–467.
- Hulme, P.E., Bacher, S., Kenis, M., *et al.* (2008). Grasping at the routes of biological invasions: a framework for integrating pathways into policy. *J. Appl. Ecol.*, **45**, 403–414.
- Hulme, P.E., Pyšek, P., Nentwig, W. & Vilà, M. (2009). Will threat of biological invasions unite the European Union? *Science*, **324**, 40–41.
- Kelly, J., Tosh, D., Dale, K., Jackson, A. (2013). The economic cost of invasive and non-native species in Ireland and Northern Ireland. Invasive Species Ireland. The Northern Ireland Environment Agency and the National Parks and Wildlife Service.
- Kettunen, M., Genovesi, P., Gollasch, S., *et al.* (2009). Technical support to EU strategy on invasive alien species (IAS)-Assessment of the impacts of IAS in Europe and the

- EU. Brussels: Institute for European Environmental Policy.
- Lockwood, J.L., Hoopes, M.F. & Marchetti, M.P. (Eds.) (2007). *Invasion ecology*. Blackwell Publishing Ltd., Malden.
- Millennium Ecosystem Assessment. (2005). *Ecosystems and human well-being: biodiversity synthesis*. World Resources Institute, Washington, DC.
- Perrault, A.M. & Muffett, W.C. (2002). Turning off the tap: a strategy to address international aspects of alien invasive species. *RECIEL*, **11**, 211-224.
- Schulte, U., Veith, M., Hochkirch, A. (2012). Rapid genetic assimilation of native wall lizard populations (*Podarcis muralis*) through extensive hybridization with introduced lineages. *Mol. Ecol.*, **21**, 4313-4326.
- Vilà, M., Basnou, C., Pyšek, P., *et al.* (2010). How well do we understand the impacts of alien species on ecosystem services? A pan-European, cross-taxa assessment. *Front. Ecol. Environ.*, **8**, 135-144.
- Williamson, M. (1996). *Biological invasions*. Chapman & Hall, London, UK.