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workshop summary

State of the art and perspectives of risk assessment analysis

International workshop on methods and applications for managing biological invasions – Girona, Spain, 18th-20th April 2011

The introduction of invasive alien species (IAS) has added an additional level of complexity in the management of ecosystems (Hobbs and Humphries 1995). Given that once a non-indigenous species is established in a new region it is extremely difficult and costly to eradicate or control, recent attention has switched to developing risk assessment protocols that identify high-risk situations for species that may become established and have a negative impact in a new region. Risk analyses are systematic and comprehensive methodologies evaluate risks and uncertainties associated with the introduction/expansion of certain organisms, based on the magnitude of their possible adverse consequences and the likelihood of occurrence of these consequences (Pheloung et al. 1999). Risk assessment can thus be an important tool to avoid further invasions.

Risk assessment protocols have initially been largely developed in those parts of the world (e.g. Australia, New Zealand, South Africa) which are hit most severely by biological invasions, but a common standard of key elements of risk assessment protocols has not emerged so far. In Europe, which has substantially lagged behind in performing risk analyses for alien species, this topic has recently gained importance. This was driven by the ongoing development of an EU strategy for invasive alien species (http://www.ec.europa.eu/environment/nature/invasivealien/index_en.htm) and via EU-funded projects such as ALARM (<http://www.alarmproject.net>) and DAISIE (<http://www.europe-aliens.org>). So the time was right to evaluate to what extent risk analysis protocols may really be useful in simplifying the decision-making process that guides EU environmental policies.

The European Science Foundation (ESF) and the Agency for Management of University and Research Grants (AGAUR) of the Government of Catalonia jointly funded a workshop on methods and applications of risk assessment analysis in ma-

ning biological invasions, a meeting hosted in Girona, Spain (18th-20th April 2011). This workshop, which was co-organized by Núria Roura-Pascual, Ingolf Kühn, Wolfgang Rabitsch and Daniel Sol, brought together 21 of the world's top experts on risk analysis for biological invasion, with the overarching objective to evaluate the status quo of the field and guide the development of standard protocols for setting management priorities.

The participants presented and discussed key elements of existing risk assessment systems and their strengths and their weaknesses, and explored key future research needs. Several speakers presented the state of the art of fundamentals in risk assessment methods. Mark Burgman, the Director of the Australian Centre of Excellence for Risk Analysis (University of Melbourne), opened the workshop and used the extensive Australian experience to present fundamentals and pitfalls of risk assessment. David M. Richardson, the Deputy Director of the South African Centre of Excellence for Invasion Biology (University of Stellenbosch), highlighted recent scientific progress achieved in identifying which aspects make species invasive. Brian Leung (McGill University, Canada) outlined ways of including socio-economic assessments when analyzing the risks posed by invading species, an issue gaining increasing importance, when political decisions on IAS management are to be made. Daniel Sol (Centre for Ecological Research and Forestry Applications, Spanish National Research Council) talked about the features that make a species a successful invader, whereas Katharina Dehnen-Schmutz (University of Warwick, UK) highlighted the importance of horticulture as an entrance pathway for alien plants. Jaakko Heikkilä from MTT Agrifood Research Finland presented the results of a recent overview of current European risk analysis systems. Although objectives are similar in most cases, he found considerable differences between different approa-

ches. These presentations showed considerable progress in unravelling determinants of invasiveness and in developing methods for risk assessment, but they also pointed out that there are still many challenges.

A second set of talks was devoted to learning from experiences gained in the application of risk assessment methods. Francoise Petter from the European Plant Protection Organization (EPPO) presented the weed risk assessment system used to identify emerging plant pests in Europe (<http://www.eppo.org/QUARANTINE/quarantine.htm>), which is the most widely used risk assessment system in Europe. Piero Genovesi, the head of the IUCN SSC Invasive Species Specialist Group, presented the current status of political discussion for a more concise management of IAS in Europe. There is hope for a pan-EU risk assessment to be adopted in the coming years by the EU member states, and this political perspective has to be considered when contributing to the development of risk assessment standards. Stephan Gollasch (GoConsult) presented experiences gained in the implementation of the International Maritime Organization ballast water management convention, while Sven Bacher (University of Fribourg, Switzerland) presented the foundations of the new Swiss risk assessment method and Franz Essl (Environmental Agency, Austria) the risk analysis scheme developed for Germany and Austria (GABLIS) to prioritize management actions. These talks showed that there is substantial recent progress in Europe, but that there is a strong need for developing a unified framework for risk assessment.

Much time in the workshop was devoted to discussions and perspectives for follow-up activities. The participants selected three aspects of risk assessment that will undergo an in-depth review. These include a methodological analysis of risk

analysis, an assessment of the cost–benefit balance of risk management actions and an analysis of the linkage between risk assessment and risk management at the European level. These revisions will contribute to a better understanding of the limitations and advantages of qualitative and quantitative approaches for risk analyses, to the identification and clarification of different types of uncertainties in risk analyses, and to the assessment and cost–benefit analysis of economic costs in decision making.

This workshop on biological invasions and risk analyses has advanced dialogue and contributed to better coordination of efforts towards the development of standard protocols. This is not only important for scientific purposes, but also to implement coordinated policies and strategies aimed at reducing the effects of invasive species at the European level.

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Edited by Núria Roura-Pascual