# A NEW EUROPEAN REGULATION ON INVASIVE ALIEN SPECIES AND ITS IMPORTANCE FOR FORESTRY

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On 4 November 2014 a new regulation on invasive alien species and the measures for their control and management was published in the Official Journal of the European Union and entered in force on 01 January 2015. The definition of invasive alien species given by the proposal, and the frequency with which the alien tree species are cited by explanatory statements and discussion papers, leaves no doubt about the fact that even alien tree species widespread in Italy, such as black locust, could be included in the list of species for which it will be mandatory to put in place regulatory measures. For this reason it is essential that authorities, academies, research institutions and stakeholders take steps to be ready to give a correct interpretation of the regulation and facilitate its effective application on the Italian territory, for the sake of forestry in the whole Europe. The contribution presents the main features of the proposed regulation, it emphasizes the elements of interest for forestry and proposes some lines of research that could help to define the state of risk of the most sensitive ecosystems and to better define the role that forestry should have in controlling this risk.

*Keywords*: alien species, European regulations, Natura 2000, black locust, forest research.
*Parole chiave*: specie esotiche, legislazione europea, Natura 2000, robinia, ricerca forestale.

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## 1. Introduction

The European Parliament and the Council of the European Union has legislated on invasive alien species that may be a threat for the environment and native species both flora and fauna. The Regulation (EU) No 1143/2014 of 22 October 2014 (hereafter "the regulation"), that was published in the Official Journal of the European Union on 4 November 2014, aims at preventing and managing the introduction and spread of invasive alien species and entered in force on 1 January 2015.
The scientific community has great expectations of this regulation (Hulme *et al.*, 2009).
One of the main assumption upon which the regulation is based is that «invasive alien species generally cause damage to ecosystems and reduce the resilience of those ecosystems. Therefore proportionate restoration measures should be undertaken to strengthen the ecosystems' resilience towards invasions, to repair the damage caused and to enhance the conservation status of species and their habitats with Directives 92/43/EEC and 2009/147/EC».
Several are the directly actors involved in the implementation of the regulation. The European commission shall be assisted by a Committee (art. 27).
This committee has also the role of delivering an opinion on draft implementing acts. Therefore, decisions from the committee will have a strong influence on the strength of the new regulation (Genovesi *et al.*, 2014).
Member States can appoint representatives that will take part to the scientific forum (art. 28) with the aim of providing scientific advice on the application of the regulation, in particular on the list of invasive alien species of union concern (art. 4), their risk assessment (art. 5), emergency measures (art. 10) and derogations from the obligation of rapid eradication (art. 18). Strong emphasis is given to public involvement by single Member States on the basis of the concept of early communication and participation as expressed in art. 26.
The definition of alien species in art. 3 identifies these species as any life specimen "introduced outside its natural range" and more specifically invasive alien species are «alien species whose introduction or spread has been found to threaten or adversely impact upon biodiversity and the related ecosystem services». Furthermore, as the uncontrolled spread is a relevant danger for invasive species, importance is given to those "widely spread" that, according to art. 3, refers to «an invasive alien species whose population has gone beyond the naturalization stage, in which a population is self-sustaining, and has spread to colonize a large part of the potential range where it can survive and reproduce».

## 2. List of Union concern

Invasive alien species of Union concern are those for which action is needed to avoid and prevent the introduction, spread and establishment at Community

level. When one species is proposed it must undergo a risk assessment (art. 5).
The risk assessment will be carried out through an analysis of the range (current and potential) of invasive alien species by considering and reporting some key elements such as: (i) description of the species; (ii) reproduction and distribution by considering the conditions necessary for the diffusion; (iii) analysis of possible pathways of introduction and spread whether accidental or deliberate; (iv) risk of introduction, establishment and spread under current and future conditions; (v) current distribution; (vi) possible negative effects on biodiversity and related ecosystem services; (vii) the assessment of costs of their potential impacts; and (viii) uses and social and economic benefits. This risk assessment will be carried out on those species proposed to be of Union concern. To be entered in the list, species must meet, based on available scientific evidence, five criteria (Fig. 1): (i) are alien to the Union territory; (ii) are able to thrive and spread into the environment under the current and future climate and the biological conditions in at least one biogeographical a region and at least three countries; (iii) are likely to negatively impact on biodiversity, ecosystem services, human health or the economy; (iv) concerted action is required as underlined by risk assessment; and (v) actions will likely affect their negative impacts. Furthermore, Member States can propose species to be listed among those of Union concern and may, according to art. 12, establish a national list of invasive alien species of Member State concern. For the latter species, Member States may apply a set of measures as prevention (arts. 7, 8, and 13), early detection and rapid eradication (arts. 14-17), and management and restoration of habitats (arts. 19 and 20). As the case for the list of Union concern, even the list of Member State concern must under approval from the committee.

## 3. Deadlines

A set of deadlines related to the list of Union concern are indicated in the regulation in order for its effective implementation (Fig. 2). The commission must submit to the Committee by 2 January 2016 the implementing acts through which it identifies invasive alien species to be included in the list. Moreover, Member States within 18 months from the adoption of the list must:
a) according to art. 13, analyse the pathways of introduction and spread of invasive alien species within their terrestrial and marine territory in order to rank possible actions for 'priority pathways'.
Furthermore, to tackle these pathways one or more action plans must be in place within three years since the adoption of the list of concern;
b) according to art. 14, establish a surveillance system that collects and records data on invasive alien species using surveys, monitoring and general procedures that prevent the spread of these species.
The monitoring system provides coverage of the entire territory of the member states to assess the presence of new species, the rapid identification of potential entry of invasive alien species within the member countries, and must be an internationally recognized system;
(c) according to art. 19, prepare adequate management measures (see the following chapter for further explanation).

## 4. Management of widely spread invasive alien species

The European Commission shall also prepare plans for managing invasive alien species whether through management or restoration measures according to art. 19 and art. 20 of the Regulation, respectively.
Management measures are identified as physical, chemical or biological actions which are lethal or non-lethal to control or contain and eradicate invasive alien species.
For already established invasive alien species comercial use can be only temporarily permitted after that all appropriate controls are taken into account.
Restoration measures must be proportional to the impacts that the species have on the environment, taking into account a cost/benefit analysis of the related activities.

## 5. Polluter pays principle

According to art. 21, the regulation also establishes that costs of invasive alien species will be paid based on the polluter pays principle.
Therefore, all Member States must aim at recovering costs undergone to prevent, minimise and mitigate the negative impacts brought by invasive alien species, as well as cost related to habitat restoration.
As stated by Beninde *et al.* (2014) payments must be covered by human beings or legal person found to be the cause of the introduction or spread of invasive alien species.
These authors also highlighted that in this way society as a whole will not bear the costs of these activities.

## 6. Invasive alien tree species: the example of *Robinia pseudoacacia*

This new regulation is an opportunity for silviculturists and forest research to deepen the knowledge on invasive alien tree species (Sitzia, 2014). An example of an alien species important to many forest stakeholders and that is invasive in many countries around the world and that covers large areas in certain European countries, such as Italy (see Fig. 3), is the black locust (*Robinia pseudoacacia*).
Many different habitats are threatened by this invasive alien tree species. For example, in north-east Italy it can invade different forest habitats, river corridors, fixed dunes and other open lands.
The invasion of this species drives changes on tree and understory communities (Essl *et al.*, 2011; Sitzia *et al.*, 2012; Trentanovi *et al.*, 2013; Staska *et al.*, 2014).
Nevertheless, in floodplain forests, ceasing coppicing can favour a more natural forest structure (Motta *et al.*, 2009).

## 7. Conclusion

Forest research should try to contribute to the future steps linked to this new regulation. We highlight five main research topics that will require further research. These may play a key role in controlling the spread and control of invasive alien tree species. Investigation should focus on (a) defining the composition and structure of spontaneously developed and planted stands formed by invasive alien tree species, (b) the invasion process of adjacent native woodlands, (c) the invasion of adjacent semi-natural and natural non-wooded ecosystems, (d) the phenotypic and genetic differentiation between populations of invasive alien tree species and their equivalents in the species' native range, (e) the changes in the provision of ecosystem services.

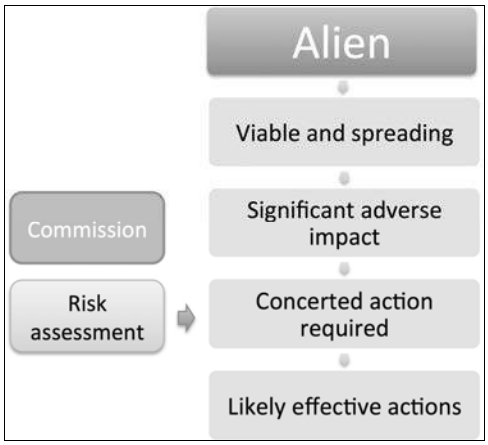


Figure 1. Criteria for listing invasive alien species of Union concern.


Figure 2. Important deadlines and steps for the implementtation of the Regulation.

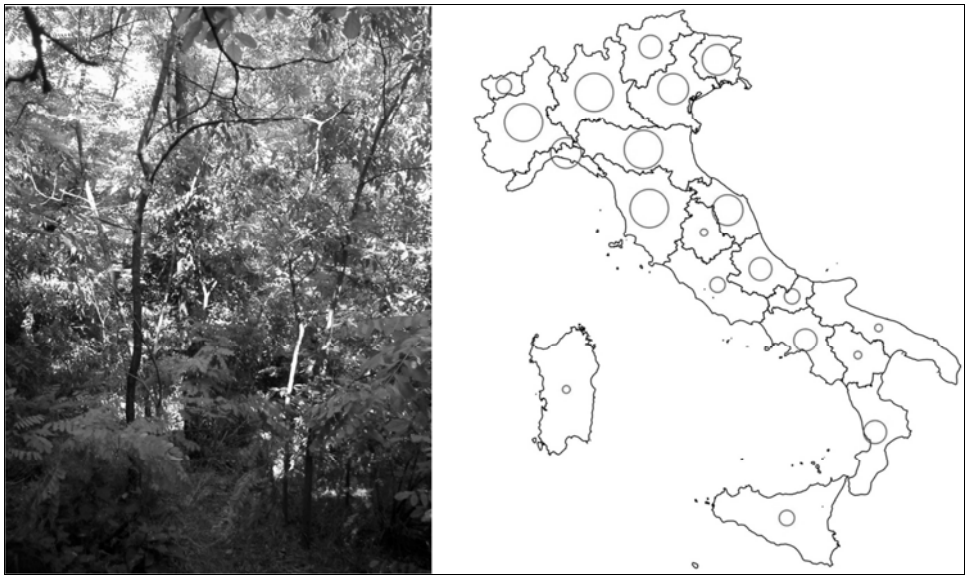

Figure 3. Stand of black locust in the outer Alpine hills of Veneto Region (left) and the distribution of black locust and tree of heaven (*Ailanthus altissima*) woodlands within the Italian administrative regions. Size of the circles are proportional to the ratio of regional to Italian area (2,335 km$^2$) they represent (right) (data from Tabacchi *et al.*, 2007).

## RIASSUNTO

**Un nuovo regolamento europeo sulle specie esotiche invasive e la sua importanza per la selvicoltura**

Il 4 Novembre 2014 un nuovo regolamento sulle specie aliene invasive e sulle misure per il loro controllo e gestione è stato pubblicato sulla Gazzetta Ufficiale dell'Unione Europea ed è in vigore dal 1° Gennaio 2015. La definizione di specie esotica invasiva che questo nuovo regolamento formula, e la frequenza con la quale le specie arboree esotiche sono citate dai documenti esplicativi e di discussione della norma, non lascia dubbi sul fatto che anche specie arboree aliene molto diffuse in Italia, come la robinia, potrebbero essere inserite nell'elenco delle specie per le quali sarà obbligatorio mettere in atto le misure regolamentari. Per questo motivo è fondamentale che le autorità, le accademie, gli enti di ricerca e i portatori di interesse si attivino per essere pronti a dare una corretta interpretazione del regolamento e favorirne la più efficace applicazione sul territorio italiano, per il bene della selvicoltura dell'Europa intera.

Il contributo espone i tratti salienti della proposta di regolamento, ne sottolinea gli elementi di interesse per la selvicoltura e propone alcune linee di ricerca che potrebbero contribuire a definire lo stato di rischio degli ecosistemi più sensibili e a meglio definire il ruolo che la selvicoltura dovrebbe avere nel controllo del rischio stesso.

## REFERENCES

Beninde J., Fischer M.L., Hochkirch A., Zink A., 2014 – *Ambitious advances of the European Union in the legislation of invasive alien species*. Conservation Letters, 49: 1-17.

Essl F., Milasowszky N., Dirnböck T., 2011 – *Plant invasions in temperate forests: Resistance or ephemeral phenomenon?* Basic and Applied Ecology, 12: 1-9. http://dx.doi.org/10.1016/j.baae.2010.10.003

Genovesi P., Carboneras C., Vilà M., Walton P., 2014 – *EU adopts innovative legislation on invasive species: a step towards a global response to biological invasions*? Biological Invasions, 17 (5): 1307-1311. http://dx.doi.org/10.1007/s10530-014-0817-8

Hulme P.E., Pysek P., Nentwig W., Vilà M., 2009 – *Will threat of biological invasions unite the European Union?* Science, 324: 40-41. http://dx.doi.org/10.1126/science.1171111

Motta R., Nola P., Berretti R., 2009 – *The rise and fall of the black locust (*Robinia pseudoacacia *L.) in the " Siro Negri " Forest Reserve (Lombardy , Italy): lessons learned and future uncertainties*. Annals of Forest Science, 66: 410. http://dx.doi.org/10.1051/forest/2009012

Sitzia T., 2014 – *A call to silviculturists for a new field of science: The forestry of invasive alien species*. The Forestry Chronicle, 90: 486-488. http://dx.doi.org/10.5558/tfc2014-098

Sitzia T., Campagnaro T., Dainese M., Cierjacks A., 2012 – *Plant species diversity in alien black locust stands: A paired comparison with native stands across a north-Mediterranean range expansion*. Forest Ecology and Management, 285: 85-91. http://dx.doi.org/10.1016/j.foreco.2012.08.016

Staska B., Essl F., Samimi C., 2014 – *Density and age of invasive* Robinia pseudoacacia *modulate its impact on floodplain forests*. Basic and Applied Ecology, 15: 551-558. http://dx.doi.org/10.1016/j.baae.2014.07.010

Tabacchi G., De Natale F., Di Cosmo L., Floris A., Gagliano C., Gasparini P., Genchi L., Scrinzi G., Tosi V., 2007 – *Le stime di superficie 2005 – Prima parte. Inventario Nazionale delle Foreste e dei Serbatoi Forestali di Carbonio*. MiPAF – Corpo Forestale dello Stato - Ispettorato Generale, CRA - ISAFA, Trento, Italy.

Trentanovi G., von der Lippe M., Sitzia T., Ziechmann U., Kowarik I., Cierjacks A., 2013 – *Biotic homogenization at the community scale: disentangling the roles of urbanization and plant invasion*. Diversity and Distribution, 19: 738-748. http://dx.doi.org/10.1111/ddi.12028