

SCIENTIFIC WORKING GROUP – ICE/CIL MANDATE

EU REGULATION ON INVASIVE ALIEN SPECIES

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INTRODUCTION

The scientific working group on Invasive Alien Species (IAS) was mandated by the Working group on IAS (ICE/CIL) to analyze the implications of the EU Regulation on IAS for Belgium from a scientific perspective.

It started its work on 9 October 2014 and has performed a scientific evaluation of the provisions of the Regulation, in light of the question whether or not inter-regional / federal cooperation seems required in order to ensure adequate fulfillment of the obligations of the Regulation. The scientific working group has come to the conclusions as reported in this document, after consultations which took place during meetings supplemented by e-mail correspondence.

Concretely, the group analyzed the scientific implications of the Regulation, reflecting upon how the Belgian scientific community might best support the adequate fulfillment of the obligations of the Regulation. For each article, specific recommendations are provided in order to maximize the use of scientific knowledge on IAS in Belgium and develop it further when needed.

Based on the identification of existing structures currently supporting the IAS policy processes as well as on the identification of the existing gaps and the tools needed, the working group identified for each article if some kind of cooperation was needed between the different competent authorities and related scientific initiatives.

As a matter of principle, one could think about 3 options to implement the regulation: 1) **no cooperation**, 2) an **ad hoc cooperation at administrative or ministerial level but without legally binding force**, and 3) a **cooperation agreement with legally binding force after parliamentary approval**.

Different scientific institutions or initiatives currently support the IAS policy processes in Belgium:

- **The Belgian Biodiversity Platform (BBPF).** The Belgian Biodiversity Platform is an initiative of the Belgian Science Policy Office. It provides services to the Belgian community engaged in biodiversity research and policy. The Belgian Forum on Invasive Species (BFIS) is an informal structure animated by the Belgian Biodiversity Platform where scientists involved in biological invasions are involved. A major tool developed through this forum is **Harmonia** ⁽³⁾, an information system on alien species. It provides species fact sheets but also includes the results of quick risk assessments for terrestrial and freshwater alien species in Belgium. Risk is assessed through dedicated protocols, **ISEIA** ⁽¹⁾ and **Harmonia+** ⁽²⁾ developed by the Platform. They are internationally recognized ⁽⁷⁾ and consequently used in several foreign countries ⁽¹⁾. These protocols enable the digestion of scientific information into a risk classification. The results from the species assessments are disseminated through Harmonia in an easily understandable message to policy makers and managers by means of a list system comprising a black list, watch list, white list and alert list of alien species. Additional species mapping tools are currently being developed by IT experts.
- **Cellule Interdépartementale sur les Espèces Invasives – Service Public de Wallonie (CiEi).** The CiEi is coordinating the measures taken in Wallonia to limit the damages caused by IAS. Main responsibilities are the establishment of preventive measures and the adaptation of the legal framework, the development of an early warning system, the coordination of management actions, the knowledge improvement, and the communication towards land managers and the general public.

- **Instituut voor Natuur- en Bosonderzoek (INBO).** The Research Institute for Nature and Forest is the Flemish research and knowledge centre on biodiversity and its sustainable management and use. INBO conducts research and supplies knowledge to all who prepare or make policies or are interested in them. The institute works for the Flemish government primarily but is also a member of national and European research networks and makes its findings available to the general public. INBO also supplies information for international reporting and deals with questions from local authorities. In addition, it supports organisations in nature management, forestry, agriculture, hunting and fisheries. With regards to invasive alien species, INBO has statutory duties stipulated in the Government Decision on Species Conservation and Management (15 May 2009). These include coordination of the monitoring of (potentially) invasive species in Flanders in terms of early warning & rapid response for non-established species as well as the monitoring of already established species. The institute is also competent for monitoring the management of these species and the results of this management. Apart from monitoring the status and trends of invasive alien species, INBO organizes early warning in Flanders, performs management follow-up, conducts research into the effectiveness and efficiency of management methods and performs and reviews risk assessment for alien species. The institute is also involved in several European-funded IAS projects (e.g. Invexo, RINSE, Alien Challenge).
- **Vlaams Instituut voor de Zee (VLIZ).** Flanders Marine Institute coordinates the *VLIZ Alien Species Consortium*, a network of experts delivering data and fact sheets on non-native species from the Belgian part of the North Sea and adjacent estuaries (e.g. Spuikom Ostend and Westerscheldt). The fact sheets include information about the year of the first observation, native range and references, present distribution of the species and parameters influencing their spread, pathways of introduction and references on impact and potential measures.
- Instituut voor Landbouw- en Visserijonderzoek (ILVO). One of the clusters within the ILVO research programme includes the investigation of the impacts from invasive species. ILVO has the expertise and facilitates to perform research on non native species, such as the American ctenophore *Mnemiopsis leidyi* or the American razor clam *Ensis directus*. Subsequently, results are used to formulate advice towards policy makers within the framework of the Water Framework Directive.
- **The Royal Belgian Institute of Natural Sciences (RBINS), Operational Directorate Natural Environment (OD Nature) has a long standing expertise in the study and detecting of introduced species. It provides the Belgian delegate in the ICES Working Group on Introduction and Transfers of Marine Organisms (WGITMO) and Working Group on Ballast and Other Ship Vectors (WGBOSV).**
- In addition to quick risk assessments developed by the Belgian Biodiversity Platform, a detailed risk analysis scheme compliant with WTO standards was developed in close cooperation between BBPF, DEMNA, INBO, RBINS, ULg and the Federal FOD Environment. Such detailed risk analyses were performed for 23 alien species on the Belgian territory as scientific argumentation for possible trade restriction in Belgium.

ANALYSIS

ARTICLE 4 : LIST OF INVASIVE ALIEN SPECIES OF UNION CONCERN

- 1) Summary of the article:** Establishment by the CION of an invasive alien species list of species of EU concern based on the criteria laid down in paragraph 3 with consideration to implementation costs for MS, cost of inaction, cost-effectiveness and socio-economic aspect. A comprehensive review is undertaken at least every six years. The list will be submitted to MS through the Committee (Article 27). MS may submit requests for the inclusion of IAS to the EU list based on risk assessments.
- 2) Recommendations:** A Belgian formal scientific committee should provide science base for the Belgian representation to the Standing Committee. The Belgian position on the species to be included in the EU list and Belgian requests for species inclusion must be based on the best scientific evidence, make best use of existing tools in Belgium (Belgian risk analysis and risk assessment protocols) and mobilize the knowhow of the Belgian scientific community.
- 3) Related articles:** 5, 27, 28
- 4) List of existing structure:** None
- 5) Gaps and tools needed :**

Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)
Provide science base for BE position on species list of EU concern	Formal scientific committee + <i>ad hoc</i> experts	Human resources, budget for experts
Provide science base for BE requests for IAS inclusion to the species list of EU concern	Formal scientific committee + <i>ad hoc</i> experts	Human resources, budget for experts

- 6) Best option suggested by the scientific working group : Cooperation agreement.**

The IAS list of EU concern has strong implications for policies in the entire country. Intra Belgian cooperation is therefore needed to ensure coherence between the different policies.

ARTICLES 5: RISK ASSESSMENT

1) **Summary of the article:** Risk assessments will be carried out by the CION for the purpose of article 4 regarding the establishment of a list of invasive alien species of EU concern based on criteria laid down in article 4, paragraph 3 with consideration of implementation costs for MS, cost of inaction, cost-effectiveness and socio-economic aspect. The same is expected from MS when proposing species for inclusion. The focus of the assessment is the impacts on biodiversity and ecosystem processes and should also include costs of damages and management. The assessment must be done at the European scale.

2) **Recommendations:** A Belgian formal scientific committee should provide science base for the Belgian representation to the Standing Committee. This will concern:

- The Belgian position on the species to be included in the EU list;
- The Belgian requests for inclusion in the EU list

Arguments must be based on the best scientific evidence, make best use of existing tools in Belgium such as Belgian risk analysis and risk assessment protocols, and mobilize the knowhow of the Belgian scientific community.

While risk assessments are related to the European scale, it is however necessary to consider the relevance of each species for the Belgian territory. Risk assessment should use standardized protocols compliant with international standards and be peer-reviewed ⁽⁴⁾. Collaborations on risk assessments with MS from the same bioregion would reduce efforts and related costs.

3) **Related articles:** 4; 10, 11, 12, 22, 28

4) **List of existing structure to be used:**

- The Belgian Biodiversity Platform (Belspo). Partly fulfills the regulation.

Description: The Belgian Biodiversity Platform is an initiative of the Belgian Science Policy Office. It provides services to the Belgian community engaged in biodiversity research and policy. The Belgian Forum on Invasive Species (BFIS) is an informal structure animated by the Belgian Biodiversity Platform where scientists involved in biological invasions are involved. A major tool developed through this forum is **Harmonia** ⁽³⁾, an information system on alien species. It provides species fact sheets but also includes the results of quick risk assessments for terrestrial and freshwater alien species in Belgium. Risk is assessed through dedicated protocols, **ISEIA** ⁽¹⁾ and **Harmonia+** ⁽²⁾ developed by the Platform. They are internationally recognized ⁽⁷⁾ and consequently used in several foreign countries ⁽¹⁾. These protocols enable the digestion of scientific information into a risk classification. The results from the species assessments are disseminated through Harmonia in an easily understandable message to policy makers and managers by means of a list system comprising a black list, watch list, white list and alert list of alien species. The Harmonia+ can be used for horizon scanning exercises to identify potentially emerging species.

- In addition to the quick risk assessments, a detailed risk analysis scheme compliant with WTO standards was developed in close cooperation between BBPF, DEMNA, INBO, RBINS, ULg and the Federal FOD Environment. Such detailed risk

analyses were performed for 23 alien species on the Belgian territory as scientific argumentation for possible trade restriction in Belgium. The enlargement of these detailed risk analyses to marine species and the EU territory is missing.

5) Gaps and tools needed:

Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)
Provide science base for BE representation in the committee	Formal scientific committee + <i>ad hoc</i> experts	Human resources, budget for experts
Knowledge flow from the scientific community to the formal scientific committee	Procedure for information exchange	Human <i>resources</i> , IT
Risk assessment panel ; Ability to run series quick risk analysis	Belgian Biodiversity Platform	Human resources, budget for experts
Methodology for cost efficiency and manageability assessment	Revision of the ANB Manageability Protocol	Protocol
Detailed species occurrence information in Belgium	National distribution maps	Aggregating tools from existing databases
Enlarge focus of Harmonia+ to marine species	Adaptation of the Harmonia+ protocol	Human resources
Scientific argumentation for trade restriction	Detailed RA at EU scale	Budget and/or human resources (BBPF or call for tender)
Cooperation with other MS from the same bioregion		Budget; call for dedicated projects

6) Best option suggested by the scientific working group : Cooperation agreement. Strong cooperation is required in order to avoid duplicating efforts and costs, to mobilize sufficient pools of experts for the assessments and therefore ensure the quality of scientific analyses.

ARTICLES 8: PERMITS

- 1) **Summary of the article:** Reasoned opinion is required on conditions holding for species concerned by research objectives or *ex situ* conservation. Scientific opinion should be based on the risk of escape or spread (Article 8 paragraph 2e), the surveillance system and the contingency plan established by the applicant (Article 8, paragraph 2f). Any withdrawal of a permit because of evident damages on biodiversity or ecosystem services shall be justified on scientific evidence (paragraph 5).
- 2) **Recommendations:** A Belgian formal scientific committee should provide reasoned opinion on holding conditions by using the best scientific evidence, make best use of existing tools in Belgium (Belgian risk analysis and risk assessment protocols) and mobilize the knowhow of the Belgian scientific community. Inspections related to those permits should be based on scientific grounds (training).
- 3) **Related articles:** 15 considering training for inspections, 12.
- 4) **List of existing structure to be used:** None
- 5) **Gaps and tools needed :**

Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)
Advisory body	Formal scientific committee + <i>ad hoc</i> experts	Human resources, budget for experts
Knowledge flow from the scientific community to the formal scientific committee	Procedure for information exchange	Human resources, IT
Scientific grounds to inform inspections related to permits	Guidelines, training programmes, identification material	Human resources, budget

- 6) **Best option suggested by the scientific working group : Cooperation agreement.** Strong cooperation is required in order to avoid duplicating efforts and costs, to mobilize sufficient pools of experts and therefore ensure the quality of scientific advice. This is particularly relevant for the cases for which two permits are required.

ARTICLES 9: AUTHORIZATIONS

- 1) **Summary of the article:** For reasons of compelling public interest and following the approval by the EC, MS may issue permits allowing establishments to carry out activities other than those related to article 8. Applications for authorization should include several criteria described in paragraph 4, among others, an assessment of the risk of escape and the description of the risk mitigation measures.
- 2) **Recommendations:** Belgian authorities might have to assess the risk of escape and the description of the risk mitigation measures. To that end, the formal scientific committee should provide reasoned opinion by using the best scientific evidence, make best use of existing tools in Belgium (Belgian risk analysis and risk assessment protocols) and mobilize the knowhow of the Belgian scientific community.
- 3) **Related articles:** 8
- 4) **List of existing structure to be used:** None
- 5) **Gaps and tools needed:**

Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)
Advisory body	Formal scientific committee + <i>ad hoc</i> experts	Human resources, budget for experts
Knowledge flow from the scientific community to the formal scientific committee	Procedure for information exchange	Human resources, IT

- 6) **Best option suggested by the scientific working group : Cooperation agreement.** Strong cooperation is required in order to avoid duplicating efforts and costs, to mobilize sufficient pools of experts and therefore ensure the quality of scientific advice. This is particularly relevant for the cases for which two permits are required.

ARTICLES 10: EMERGENCY MEASURES

- 1) **Summary of the article:** In case of evidence concerning the presence in, or imminent risk of introduction into its territory of a IAS not included in the list of EU concern, but which the competent authority have found, on the basis of preliminary scientific evidence, to be likely to meet the criteria set out in Article 4(3), Member States may take emergency measures consisting of any of the restrictions set out in article 7. Concerned MS have to carry out risk assessment with a view to include that species on the EU list. They must assess how criteria identified in article 4 paragraph 3 are met at the EU and national scales, with a focus on the impacts on biodiversity and the related ecosystem services. In addition to those criteria, costs of inaction, and costs of management have to be considered.
- 2) **Recommendations:** In case of evidence concerning the presence in, or imminent risk of introduction into the Belgian territory, a formal scientific committee should provide science base for the establishment of emergency measures. This should be based on the best scientific evidence, make best use of existing tools in Belgium (Belgian risk analysis and risk assessment protocols) and mobilize the knowhow of the Belgian scientific community. In this case, the risk assessment concerns both the European and the Belgian territory. Risk assessment should use standardized protocols compliant with international standards and be peer-reviewed ⁽⁴⁾. A horizon scanning may be used to identify imminent risk based on standardized protocols such as the Harmonia⁺ protocol. Scientific evidence justifying the urgency measures have to be provided by Belgium, as well as the identification of measures to be taken at the national level. Collaborations on risk assessments with MS from the same bioregion would reduce efforts and related costs.
- 3) **Related articles:** Article 5, 11, 12, 22, 28
- 4) **List of existing structure to be used:**
 - The Belgian Biodiversity Platform (Belspo). Partly fulfills the regulation.

Description: The Belgian Biodiversity Platform is an initiative of the Belgian Science Policy Office. It provides services to the Belgian community engaged in biodiversity research and policy. The Belgian Forum on Invasive Species (BFIS) is an informal structure animated by the Belgian Biodiversity Platform where scientists interested in biological invasions are involved. A major tool developed through this forum is **Harmonia** ⁽³⁾, an information system on alien species. It provides species fact sheets but also includes the results of quick risk assessments for terrestrial and freshwater alien species in Belgium. Risk is assessed through dedicated protocols, **ISEIA** ⁽¹⁾ and **Harmonia**⁺ ⁽²⁾ developed by the Platform. They are internationally recognized ⁽⁷⁾ and consequently used in several foreign countries ⁽¹⁾. These protocols enable the digestion of scientific information into a risk classification. The results from the species assessments are disseminated through Harmonia in an easily understandable message to policy makers and managers by means of a list system comprising a black list, watch list, white list and alert list of alien species. The Harmonia⁺ can be used for horizon scanning exercises to identify potentially emerging species.

- In addition to the quick risk assessments, a detailed risk analysis scheme compliant with WTO standards was developed in close cooperation between BBPF, DEMNA, INBO, RBINS, ULg and the Federal FOD Environment. Such detailed risk analyses were performed for 23 alien species on the Belgian territory as scientific argumentation for possible trade restriction in Belgium. The enlargement of these detailed risk analyses to marine species and the EU territory is missing.

5) Gaps and tools needed:

Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)
Provide science base for BE position on proposals by other MS within the bioregion	Formal scientific committee + <i>ad hoc</i> experts	Human resources, budget for experts
Knowledge flow from the scientific community to the formal scientific committee	Procedure for information exchange	Human resources, IT
Risk assessment panel; Ability to run series quick risk analysis	Belgian Biodiversity Platform	Human resources, budget for experts
Methodology for cost efficiency and manageability assessment	Revision of the ANB Manageability Protocol	Protocol
Detailed species occurrence information in Belgium	National distribution maps	Aggregating tools from existing databases
Enlarge focus of Harmonia+ to marine species	Adaptation of the Harmonia+ protocol	Human resources
Scientific argumentation for trade restriction	Detailed RA at EU scale	Budget and/or human resources (BBPF or call for tender)
Cooperation with other MS from the same bioregion		

6) Best option suggested by the scientific working group : Cooperation agreement. Strong cooperation is required in order to avoid duplicating efforts and costs, to mobilize sufficient pools of experts and therefore ensure the quality of scientific advice.

ARTICLES 11: IAS OF REGIONAL CONCERN AND SPECIES NATIVE TO THE EU

- 1) **Summary of the article:** In order to define species of regional concern, MS may identify among their species of national concern the ones requiring enhanced regional cooperation based on scientific evidence. Where necessary and based on relevant elements (paragraph 2 article 11), CION may request concerned MS to apply in their territory Articles 13, 14, 16, 17, 18, 19 and 20 as appropriate.
- 2) **Recommendations:** A formal scientific committee should provide science base for 1) the BE position on the inclusion of species to the regional list suggested by other MS and 2) the BE suggestion for inclusion to the regional list. Arguments must be based on the best scientific evidence, make best use of existing tools in Belgium (Belgian risk analysis and risk assessment protocols) and mobilize the knowhow of the Belgian scientific community. Risk assessments should be carried out at the bioregional and national scales with consideration to implementation costs for MS, cost of inaction, cost-effectiveness and socio-economic aspect. The focus of the assessment is the impacts on biodiversity and ecosystem processes and should also include costs of damages and management. Risk assessment should use standardized protocols compliant with international standards and be peer-reviewed ⁽⁴⁾
- 3) **Related articles:** Article 5, 10, 12, 13, 14, 16, 17, 18, 19, 20, 22
- 4) **List of existing structure:**

- The Belgian Biodiversity Platform (Belspo). Partly fulfills the regulation.

Description: The Belgian Biodiversity Platform is an initiative of the Belgian Science Policy Office. It provides services to the Belgian community engaged in biodiversity research and policy. The Belgian Forum on Invasive Species (BFIS) is an informal structure animated by the Belgian Biodiversity Platform where scientists involved in biological invasions are involved. A major tool developed through this forum is **Harmonia** ⁽³⁾, an information system on alien species. It provides species fact sheets but also includes the results of quick risk assessments for terrestrial and freshwater alien species in Belgium. Risk is assessed through dedicated protocols, **ISEIA** ⁽¹⁾ and **Harmonia+** ⁽²⁾ developed by the Platform. They are internationally recognized ⁽⁷⁾ and consequently used in several foreign countries ⁽¹⁾. These protocols enable the digestion of scientific information into a risk classification. The results from the species assessments are disseminated through Harmonia in an easily understandable message to policy makers and managers by means of a list system comprising a black list, watch list, white list and alert list of alien species. The Harmonia+ can be used for horizon scanning exercises to identify potentially emerging species.

- In addition to the quick risk assessments, a detailed risk analysis scheme compliant with WTO standards was developed in close cooperation between BBPF, DEMNA, INBO, RBINS, ULg and the Federal FOD Environment. Such detailed risk analyses were performed for 23 alien species on the Belgian territory as scientific argumentation for possible trade restriction in Belgium. The enlargement of these detailed risk analyses to marine species and the bioregion territory is missing.

5) Gaps and tools needed:

Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)
Provide science base for BE position on proposals by other MS within the bioregion	Formal scientific committee + <i>ad hoc</i> experts	Human resources, budget for experts
Knowledge flow from the scientific community to the formal scientific committee	Procedure for information exchange	Human resources, IT
Risk assessment panel; Ability to run series quick risk analysis at the bioregion level	Belgian Biodiversity Platform	Human resources, budget for experts
Methodology for cost efficiency and manageability assessment	Revision of the ANB Manageability Protocol	protocol
Detailed species occurrence information in Belgium and the bioregion	National and bioregional distribution maps	Aggregating tools from existing databases
Enlarge focus of Harmonia+ to marine species	Adaptation of the Harmonia+ protocol	Human resources

6) **Best option suggested by the scientific working group : Cooperation agreement.** Strong cooperation is required in order to avoid duplicating efforts and costs, to mobilize sufficient pools of experts and therefore ensure the quality of scientific advice.

ARTICLES 12: IAS OF MEMBER STATE CONCERN

- 1) **Summary of the article:** MS may establish a national list of IAS and thereby may apply in their territory measures provided by articles 7, 8, 13, 14, 15, 16, 17, 18, 19 and 20 as appropriate
- 2) **Recommendations:** A formal Belgian scientific committee should provide science base for the inclusion of species in a national list of IAS. Arguments must be based on the best scientific evidence, make best use of existing tools in Belgium (Belgian risk analysis and risk assessment protocols) and mobilize the knowhow of the Belgian scientific community. Risk assessments should be carried out at the Belgian scale with consideration to implementation costs, cost of inaction, cost-effectiveness and socio-economic aspect. The focus of the assessment is the impacts on biodiversity and ecosystem processes and should also include costs of damages and management. Risk assessment should use standardized protocols compliant with international standards and be peer-reviewed ⁽⁴⁾. In addition to detailed risk analyses, a scoring system can be used to quantitatively rank species. Such risk analyses have to be performed on species being identified as priority species by horizon scanning exercises.
- 3) **Related articles:** 5, 8, 10, 11, 13, 14, 15, 17, 18, 19, 20, 22.
- 4) **List of existing structure to be used:**

- The Belgian Biodiversity Platform (Belspo). Partly fulfills the regulation.

Description: The Belgian Biodiversity Platform is an initiative of the Belgian Science Policy Office. It provides services to the Belgian community engaged in biodiversity research and policy. The Belgian Forum on Invasive Species (BFIS) is an informal structure animated by the Belgian Biodiversity Platform where scientists interested in biological invasions are involved. A major tool developed through this forum is **Harmonia** ⁽³⁾, an information system on alien species. It provides species fact sheets but also includes the results of quick risk assessments for terrestrial and freshwater alien species in Belgium. Risk is assessed through dedicated protocols, **ISEIA** ⁽¹⁾ and **Harmonia+** ⁽²⁾ developed by the Platform. They are internationally recognized ⁽⁷⁾ and consequently used in several foreign countries ⁽¹⁾. These protocols enable the digestion of scientific information into a risk classification. The results from the species assessments are disseminated through Harmonia in an easily understandable message to policy makers and managers by means of a list system comprising a black list, watch list, white list and alert list of alien species. The Harmonia+ can be used for horizon scanning exercises to identify potentially emerging species.

- In addition to the quick risk assessments, a detailed risk analysis scheme compliant with WTO standards was developed in close cooperation between BBPF, DEMNA, INBO, RBINS, ULg and the Federal FOD Environment. Such detailed risk analyses were performed for 23 alien species on the Belgian territory as scientific argumentation for possible trade restriction in Belgium. The enlargement of these detailed risk analyses to marine species and the EU territory is missing.

5) Gaps and tools needed:

Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)
Provide science base for inclusion of species to a national list of IAS.	Formal scientific committee + <i>ad hoc</i> experts	Human resources, budget for experts
Knowledge flow from the scientific community to the formal scientific committee	Procedure for information exchange	Human resources, IT
Scientific argumentation for trade restriction	Detailed RA at BE scale,	Human resources, budget for experts
Horizon scanning exercises	Belgian Risk assessment panel	Human resources, budget for experts
Methodology for cost efficiency and manageability assessment	Revision of the ANB Manageability Protocol	protocol
Detailed species occurrence information in Belgium	National distribution maps	Aggregating tools from existing databases
Enlarge focus of Harmonia+ to marine species	Adaptation of the Harmonia+ protocol	Human resources

6) Best option suggested by the scientific working group : Cooperation agreement. Strong cooperation is required in order to avoid duplicating efforts and costs, to mobilize sufficient pools of experts and therefore ensure the quality of scientific advice.

ARTICLE 13: ACTION PLANS ON PATHWAYS

- 1) **Summary of the article:** MS shall carry out comprehensive analysis of the pathways of unintentional introduction and spread of IAS of EU concern, at least in their territory as well as in their marine waters and identify which require priority actions because of the volume of species or the potential damage caused by the species entering the EU through those pathways. MS shall ensure coordination for their territory and as far as possible coordinated at the appropriate regional level.
- 2) **Recommendations:** Pathways analysis is a research domain that is quite recent and demands totally different approached as compared to risk analysis focusing on individual species. Particularly, a shift from qualitative to quantitative approaches is needed in order to prioritize pathways as requested to define action plans ^(5,6). Guidance is needed from the CION on what is meant by « pathways of unintentional introduction and spread ». A formal scientific forum should provide science base for the comprehensive analysis of pathways. There is however currently a clear lack of evidence related to pathways analysis in Belgium and therefore no undertaken actions related to pathways.
- 3) **Related articles:** 11, 12, 15, 17, 22
- 4) **List of existing structure to be used:** None
- 5) **Gaps and tools needed:**

Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)
No comprehensive analysis of the pathways for species of EU concern	Comprehensive analysis of unintentional pathways introduction in Belgium	Budget and/or human resources (BBPF or call for tender).
No comprehensive analysis of the pathways for the other IAS species	Comprehensive analysis of unintentional pathways introduction in Belgium	Budget and/or human resources (BBPF or call for tender).
Scientific capacity		
Rationale for performing it at the bioregional level		

- 6) **Best option suggested by the scientific working group : Cooperation agreement.** Strong cooperation is required in order to avoid duplicating efforts and costs related to pathways analysis. Measures to be identified for the establishment of action plans will only be efficient if taken and implemented in a concerted way.

ARTICLE 14: SURVEILLANCE SYSTEM

- 1) **Summary of the article:** MS shall establish a surveillance system of alien species of Union concern, or include it in their existing system. Systems have to collect and record data on the occurrence in the environment of invasive species by survey,

monitoring or other procedures to prevent the spread of IAS into or within EU. The system should cover the territory including marine territorial waters, to be sufficiently dynamic to detect rapidly the appearance of species in the environment and take into account the relevant transboundary impacts and transboundary features to the extent possible. Systems should include both targeted and general surveys and benefit from the involvement of different sectors and stakeholders. In the interest of efficiency and cost-effectiveness, it should build on existing systems already established by Union law, in particular those set out in Directives 92/43/EEC, 2000/60/EC, 2008/56/EC and 2009/147/EC.

- 2) **Recommendations:** Many monitoring initiatives exist, some of them professional schemes at the level of the regions (Natura2000, WFD, MSFD), other systems are professionally supported but are run at the level of local authorities/managers (e.g. invasive macrophytes monitored by Flemish provinces). Also, a range of general surveillance systems is available for various taxonomic groups, often involving verified citizen science schemes (e.g. early warning system through observations.be). Only a minority of monitoring schemes can be classified as risk oriented (mosquitos, plant health species) and for some species of EU concern these will probably need to be developed. Whether these schemes generate useful data for the surveillance system of the species of EU/MS/regional concern should be analysed. Centralising the data represents a particular challenge. Issues of data standards, data validation flows, database interoperability and data licensing will have to be addressed both at regional, Belgian and international level. This will require a great deal of coordination and collaboration.
- 3) **Related articles :** 11, 12, 17, 18.
- 4) **List of existing structures :** Existing monitoring schemes in Flanders (S₁), Existing monitoring schemes in Wallonia (S₂), monitoring schemes in Brussels Capital Region; Early warning system for IAS in Flanders/Brussels Capital Region/Wallonia (S₅), Existing monitoring schemes in the marine environment (S₅). Each of them is either not fit for purpose or only partly covering the criteria as defined by the regulation.

- **S₁ : Monitoring schemes in Flanders.**

Description : In Flanders various organizations are engaged in the collection of data on species (groups). An overview of these initiatives (e.g. common breeding bird monitoring, monitoring rare breeding birds, florabank, monitoring (non-native) freshwater fish, waterbird census, mammal atlas inventory, marten network, inventory amphibians and reptiles, forest inventory...) is already available and was a part of an exercise for the establishment of a **monitoring network for conservation status of Natura 2000 habitats and species (92/43/EEC)**. However, whether these monitoring systems yield appropriate data to comply with surveillance sensu IAS regulation is at current unknown. Also, **monitoring** is performed **in relation to the Water Framework Directive (2000/60/EG)**, which primarily yields data on non-native macrophytes, macro-invertebrates and fish. Additionally, in Flanders, in 2012 a survey was launched by INBO towards working groups and stakeholders (excluding professional monitoring schemes) in order to

make an inventory of datasets that potentially held non-native species data. The survey included questions on metadata, project, invasive species in the data collection, but also some targeted questions about the quality and usefulness of the data for early warning purposes (speed of recording, validation etc.) and whether the data would become available for open data aggregators such as GBIF. The results of the survey show that in Flanders, there are a number of local authorities and independent working groups gathering data on high impact invasive species, in various projects and of varying quality. The centralization of these represents a challenge that needs to be addressed. A dedicated, sustainably funded and neutrally perceived portal is needed that centralizes IAS data from various monitoring initiatives and meets the standards for reporting of the IAS regulation.

- **S₂ : monitoring schemes in Wallonia**

Description : In Wallonia, various organizations are engaged in the collection of data on species (groups). However, whether these monitoring systems yield appropriate data to comply with surveillance *sensu* IAS regulation is currently unknown. A dedicated system is needed that centralizes IAS data from various monitoring initiatives and meets the standards for reporting of the IAS regulation. A notable difference with Flanders is the availability of OFFH (Observatoire Flore-Faune et Habitats), a government-run online recording system for observations, the basis of which can be used to set up separate systems for dedicated surveys. Dedicated mapping tools developed by the CiEi (Cellule Interdépartementale sur les Espèces Invasives) are available for invasive macrophytes, giant hogweed and Canada goose.

- **S₃ : monitoring scheme in Brussels Capital Region**

Management actions will be undertaken against damaging species. In line with the 2012 'Ordonnance Nature', regarding Nature conservation, the Government will settle a monitoring scheme on species and habitats in the BCR.

- **S₄ : Early warning system for IAS in Flanders/Wallonia/Brussels Capital Region**

Description : In 2011, the Agency for Nature and Forest (ANB) and the Institute for Nature and Forest Research (INBO) initiated an early warning pilot for some notorious IAS. This was launched through the widely used online recording platform www.waarnemingen.be as verified citizen science. Setting up this project was done in cooperation with all Belgian regions and the major non-governmental organizations in the field of nature conservation. The system allows for reporting sightings, consulting fact sheets and setting up user-driven automated e-mail alerts. It already generates good quality data used for (mostly uncoordinated) rapid responses by various bodies (e.g. in Flanders, control of invasive aquatic plants such as floating pennywort, water primrose, Parrot's feather, ruddy duck, Pallas' squirrel, quarantine insects, American bullfrog, giant hogweed and Chinese muntjac). The system is however primarily targeted towards naturalist observers and therefore not used by all stakeholders. It is property of a conservation ngo and

is targeted towards the naturalist's community. It is therefore not used by hunters, fishermen etc. Also, professional managers preferably use their own systems. The module has been funded on an ad-hoc basis in Flanders, in Wallonia it has been free. Species lists are not harmonized across Belgian regions and not brought in line with EU or MS concern lists. The Flemish data are not being made available as open data and are currently not freely available. Also, this system is not fit to report on management and is currently probably not compliant with EU regulation reporting standards.

- **Structure S₅ : monitoring schemes in the marine environment.**

Description : In the marine environment, monitoring is being developed as a response to existing legislative frameworks, in particular the European Marine Strategy Framework Directive (2008/56/EC) (MSFD) and the Joint Assessment and Monitoring Programme (JAMP) by OSPAR the surveillance system *sensu* Art 14 should build on that. The relative density of human activities is at a level that is not harmful to the environment” is one of the generic qualitative MSFD descriptors taken into consideration for determining the environmental status.

As included in the monitoring programme for Belgian marine waters (MSFD – Art. 11), The Royal Belgian Institute of Natural Sciences (RBINS – OD Nature) monitors the presence of non-indigenous species introduced by human activities in Belgian marine waters in the form of dedicated surveys. These surveys focus on hard substrate, such as groynes, buoys, wind turbines and other man-made structures at sea (e.g. artificial reefs).

Non-dedicated alien species surveys are executed by the Institute for Agricultural and Fisheries Research (ILVO – Aquatic Environment and Quality), which performs regular (epi)benthic and demersal fish surveys on soft sediments in the Belgian part of the North Sea in function of the evaluation of the impact of human activities at sea. Appearance of non-native species may be reported.

These two surveys cover the hard and soft sediment types, however the pelagic component of the marine environment remains uncovered. The pelagic component may however be of great importance in the IAS surveillance system, as many benthic (non-indigenous) animals occur during part of their life cycle in the pelagic environment. Moreover, holoplanktonic organisms such as some jellyfish and fish may remain undetected.

A general surveillance should be installed with species-specific (risk-oriented) monitoring schemes as the marine environment holds many non-natives that are often cryptic or require sophisticated techniques (e.g. genetic tools) for species identification.

Landward of the baseline (mean low water at spring tide i.e. port areas, estuaries, intertidal), the management of non-native species is a Flemish competence. Here, a dedicated surveillance is currently lacking. The monitoring/surveillance of species that occur on either side of the baseline (e.g. sessile species with pelagic life stages at sea) should be harmonized between federal (RBINS) and regional surveillance programmes. Important actors are VLIZ, Coastal municipalities (rescue stations), Agency for Maritime and Coastal Services (AMT), Agency for Nature and Forests (ANB), the

Institute for Agricultural and Fisheries Research (ILVO) and the Institute for Nature and Forest Research (INBO).

The Flemish marine institute (VLIZ) coordinates the *Alien Species Consortium*, a network of experts delivering data and fact sheets on marine (and estuarine) non-native species introduced through human activities (i.e. introduced species). This resulted in a dynamic overview of introduced species in the Belgian part of the North Sea and adjacent estuaries (e.g. Spuikom Ostend and Westerscheldt). The year of the first observation, native range and references, distribution along the coast and references on impact are mentioned in fact sheets. This information only concerns established aliens, yet this information system offers a profound basis for the marine component of the surveillance and could be further developed in line with reporting requirements and standards of the IAS Regulation.

5) Gaps and tools needed:

Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)
Centralized non-native species register	Web based portal	Human, IT, protocols and standards, budget
No overview of IAS comprised in existing monitoring schemes	Analysis	Human, budget
No dedicated surveillance of IAS	Surveillance scheme	Human, IT, protocols and standards, budget
No centralization of IAS data originating from existing monitoring (Natura2000, other)	Web based portal	Human, IT, protocols and standards, budget
Harmonisation of MSFD/OSPAR monitoring and IAS surveillance (see further marine monitoring)	Protocol	human, financial, IT, budget

No early warning system	Official early warning system	human, IT, technics, protocols, budget
Live link distribution data in IAS to Belgian IAS information system	The information system Harmonia should live link to real-time information on species distributions from various data sources. Issues of database interoperability, data standards and licensing will have to be addressed both at regional, Belgian and international level	human, IT, technics, protocols
Dedicated surveillance landward of the baseline (Flanders)	Monitoring system, protocol	human, financial, protocols
Further develop marine non-native species information system and link with other information systems	Online database	human, financial, IT, technics, protocols

6) Best option suggested by the scientific working group :

- *Ad hoc* cooperation is needed to analyze existing systems and gaps in monitoring EU species.
- *Ad hoc* cooperation is needed to harmonize existing systems for monitoring EU species.
- Cooperation agreement is needed to ensure coherent data and knowledge flow. Between the different authorities and related scientific institutions.

ARTICLE 15 : OFFICIAL CONTROLS

- 1) **Summary of the article:** MS shall have in place structures to carry out official risk-based controls necessary to prevent intentional introduction into the Union of IAS of EU concern. The CION, together with the MS, shall develop guidelines and training programs to facilitate the identification and detection of IAS of EU concern and the performance of efficient and effective controls.
- 2) **Recommendations:** Guidelines and training should be based on scientific grounds. Article 15(6) states that MS shall put in place procedures to ensure the exchange of relevant information and the efficient and effective coordination and cooperation between all authorities involved (...). Interception data (registration of incursed goods during risk-based controls *sensu* paragraph 2) are essential in risk management. Data on border and post-border detections are required to provide a measure of propagule pressure (numbers of individuals and release events) which is an important factor associated with the successful establishment of exotic species. Also, these data can provide information on the proportion of introduction events for a species through different pathways (e.g. stowaways, illegal import and smuggling, seized or stolen from private collections post-border)/commodities which is essential to risk analysis and pathway regulation. The following information should be regarded as a minimum standard for nationally consistent and comprehensive incursion records:

- (1) species identification = scientific name;
- (2) propagule size = the number of individuals detected;
- (3) status of specimens = whether individuals were alive or dead when detected or collected;
- (4) occurrences = dates and locations where individuals were detected or collected;
- (5) provenance = origin and entry locations
- (6) the type of containment and mode or commodity of transport e.g. vessel type.

These data will also help addressing the obligations on pathway inventory and pathway management *sensu* the Regulation. A nationally coordinated framework for data collection and data sharing of such incursion data among competent agencies in Belgium is required. The current registration procedure applied at the border controls (e.g. for CITES) needs to be revisited in order to investigate its accuracy. For vertebrates and in light of a growing internet trade it can be expected that the majority of detections are of animals seized, surrendered or stolen from private collections (post-border). This, however, is a regional competence (nature inspection). There is no clear picture of the registration of such detections, if any, nor of the level of consistency of these data.

- 3) **Related articles:** article 8 as regard to training for inspections, 13.
- 4) **List of existing structures to be used: customs (CITES, plant health inspections);** *Does not fulfill the obligation so far.*
- 5) **Gaps and tools needed:**

Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)
Border control officers don't know the species of EU or MS concern	Guidelines, training programmes, identification materials	Human, financial
No procedures to ensure the exchange of relevant information between involved authorities	Protocol for information exchange	Human, IT, financial

- 6) **Best option suggested by the scientific working group** : *Ad hoc* cooperation is needed. However, a cooperation agreement would have an added-value to ensure scientific coherence and quality.

ARTICLES 17: RAPID ERADICATION AT EARLY STAGE OF INVASION

- 1) **Summary of the article:** MS shall apply eradication measures, notify CION and inform other MS. Eradication measures have to be effective in achieving the complete and permanent removal of target species at a reasonable cost and without impacting adversely non-target organisms and human health.
- 2) **Recommendations:** Several scientific issues are linked to this general goal: (i) the identification of best practices for the early eradication of each species; (ii) methodological development to assess the technical feasibility and the cost-efficiency of eradication actions and (iii) technical guidelines for the establishment of a monitoring system of eradication actions and the interpretation of data collected. It is worth noting that operational implementation would require the development of rapid response protocol and capacity.
- 3) **Related articles:** article 11, 14, 18
- 4) **List of existing structures to be used: Rapid eradication processes in Flanders, Wallonia and BCR.**

- **Structure S₁: Rapid eradication process in Flanders.** Partly fulfills the regulation.

Description : There is no formal coherent framework in Flanders to set up early eradication of emerging invasive species. Several structures have been set-up to support the management of invasive alien species:

- The ANB management regulation ('beheerregeling') is an official structure allowing 4 types of action: (1) communication and guidance by codes of conduct, (2) management and eradication actions, (3) agreements with third parties concerning these actions, (4) limitations in trade when concerning invasive alien species. The management plan needs to be approved by the minister after advice by the Mina council. So far, no official management plans have been approved and only for a few species unofficial action plans have been developed in Flanders.
- To evaluate the feasibility of management actions, the management feasibility protocol has been developed. This tool allows to assess management feasibility in an objectified manner, taking into account financial costs, legislation, species ecology and site characteristics and could be used for reporting to the EU.

- **Structure S₂: rapid eradication process in Wallonia.** Partly fulfills the regulation.

Description : There is no formal coherent framework in Wallonia to set up early eradication of emerging invasive species. So far, the only official tool which is available is the Ministerial guideline n°2688 dedicated to the control of non-native animal species (MB 07.03.2007) allowing hunters and foresters to shoot those species. A Regulation proposal is however in progress, which will provide the legal background to establish action plans and provide permission to take actions in non-SPW sites (see the contribution of the legal subgroup).

- **Structure S3: rapid eradication process in Brussels Capital Region**

The Plan Nature/Natuurplan of Brussels Capital Region (BCR) adopted in first reading by the regional Government states that the Government may adopt action plans to decrease the degradation of biological diversity, including by tackling invasive species. Management actions, including rapid eradication could be undertaken against damaging species.

5) Gaps and tools needed:

	Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)
6) B e s t i t i o n s u g g e s t e d b	Best practices for early eradication	Catalogue of best practices for each species included in the different lists	-human -financial -protocol
	Assessment of the technical feasibility and cost-efficiency	Methodology + species-specific information on ecology, distribution... to assess technical feasibility and cost-efficiency, partly solved by the manageability protocol in Flanders	-human -protocol
	Technical guidelines for the establishment of a monitoring system and data interpretation	Technical guidelines	-human
	Eradication follow up	System allowing the follow up of eradication actions	- Human - Financial - IT

y the scientific working group : *Ad hoc* cooperation is needed. However, a cooperation agreement would have an added-value to ensure scientific coherence and quality.

ARTICLE 18: DEROGATION FROM THE OBLIGATION OF RAPID ERADICATION

- 1) **Summary of the article:** MS may not to apply eradication measures based on robust scientific evidence when one of the following conditions is met: 1) Eradication demonstrated to be technically unfeasible because available methods cannot be applied; 2) a cost-benefit analysis demonstrates the costs to be exceptionally high and disproportionate to benefits; 3) eradication methods are not available or have serious adverse impacts. MS shall ensure that containment measures are in place to avoid further spread to other MS. 3 months after early warning (for first species: 01/03/2016 provided EU list adopted by 1/01/2016).
- 2) **Recommendations:** Scientific issues linked to this general goal are similar to article 17: (i) the identification of best practices for the early eradication of each species; (ii) methodological development to assess the technical feasibility and the cost-efficiency of eradication actions.
- 3) **Related articles: articles :** 11, 14, 17, 22, 28.
- 4) **List of existing structures: Rapid eradication processes in Flanders, Wallonia and BCR.**
- 5) **Gaps and tools needed:**

Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)
Best practices for early eradication	Catalogue of best practices for each species included in the different lists	human, financial, protocol
Assessment of the technical feasibility and cost-efficiency	Methodology + species-specific information on ecology, distribution... to assess technical feasibility and cost-efficiency, partly solved by the manageability protocol in Flanders	human, protocol
Technical guidelines for the establishment of a monitoring system and data interpretation	Technical guidelines	human

- 6) **Best option suggested by the scientific working group :** *Ad hoc* cooperation is needed. However, a cooperation agreement would have an added-value to ensure scientific coherence and quality.

ARTICLES 19: MANAGEMENT MEASURES

- 1) **Summary of the article** : MS shall have in place effective management measures for the species of EU concern which the MS have found to be widely spread on their territory so that their impact on biodiversity, the related ecosystem services, and where applicable on human health or economy are minimized.
- 2) **Recommendations** : Several scientific issues are linked to this general goal: (i) the identification of best practices for the management of each species; (ii) methodological development to assess the technical feasibility and the cost-efficiency of management actions; (iii) technical guidelines for the establishment of a monitoring system of management actions and the interpretation of data collected and (iv) the prioritization of species and coupled actions based on invasiveness and manageability.
- 3) **Related article** : 11, 14, 18, 20, 22
- 4) **.List of existing structures: Management process in Flanders, Wallonia and BCR.**

Each of them is only partly covering the regulation

- **.Structure S1: Management process in Flanders.**

Description : There is no structured and official management program for invasive alien species. Several structures have been set-up to support the management of invasive alien species:

- The ANB management regulation ('beheerregeling') is an official structure allowing 4 types of action: (1) communication and guidance by codes of conduct, (2) management and eradication actions, (3) agreements with third parties concerning these actions, (4) limitations in trade when concerning invasive alien species. The management plan needs to be approved by the minister after advice by the Mina council. So far, no official management plans have been approved and only for a few species unofficial action plans have been developed in Flanders.
- To evaluate the feasibility of management actions, the management feasibility protocol has been developed. This tool allows to assess management feasibility in an objectified manner, taking into account financial costs, legislation, species ecology and site characteristics and could be used for reporting to the EU.
- The management plan ('beheerplan') is an official engagement that can be agreed upon by a site owner. This structure regulates the management of the site and, if followed properly, enables the owner to obtain subsidies for the site management. The management plan is obliged for ANB sites, Natura 2000 sites and to be acknowledged as nature reserve but is optional for other site owners. One of the criteria of the management plan is the management of invasive alien species.

- **Structure S2: Management process in Wallonia**

Description : There is no formal program for IAS control in Wallonia and legal basis to undertake concrete actions in the field is insufficient so far (but see Ministerial guideline n°2688 dedicated to the control of non-native animal species (MB 07.03.2007) allowing hunters and foresters to shoot those species). Regulation proposal is however in progress, which will provide the legal background to establish action plans and provide permission to take actions in non-SPW sites (see the contribution of the legal subgroup). Most control actions are undertaken on a voluntary basis. Local regulation of some municipalities has been adapted to allow management actions in private sites.

Two official structures of the regional administration are involved in IAS management, i.e. (i) the Invasive Species Unit that coordinates the elaboration and the implementation of action plans and (ii) the Muskrat Control Unit in charge of the control of muskrat and other aquatic mammals. These two units work in close cooperation with the different Departments of the regional administration and with local actors (municipalities).

Two kinds of control actions are undertaken:

- **coordinated action plans** endorsed by the Nature Minister aiming to reduce IAS populations at the regional level. Regional funding is available to help local managers to control species where strong infestations occur (Muskrat, Giant Hogweed);
- **local actions** aiming to eradicate or reduce IAS population development. Regional funding is available for the implementation of some actions as those undertaken to control the Japanese Mosquito in Natoye. Other actions are undertaken with the support of European Life and Rural Development fundings (Himalayan Balsam, Black Locust, Canada Goose, etc.). IAS control may be integrated amongst the objectives of the management plan of Natura 2000 sites.

• **Structure S3: Management process in Brussels Capital Region**

The Plan Nature/Natuurplan of Brussels Capital Region (BCR) adopted in first reading by the regional Government states that the Government may adopt action plans to decrease the degradation of biological diversity, including by tackling invasive species. Management actions could be undertaken against damaging species.

5) Gaps and tools needed:

Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)
Best practices on management	Catalogue of best practices for each species included in the different lists	human, financial, protocol

Assessment of the technical feasibility and cost-efficiency	Methodology + species-specific information on ecology, distribution... to assess technical feasibility and cost-efficiency, partly solved by the manageability protocol in Flanders. To be adapted	human, protocol
No priority listing based on the combination of invasiveness and manageability so far	Risk analyses and manageability protocol	human
Technical guidelines for the establishment of a monitoring system and data interpretation	Technical guidelines	human

- 6) **Best option suggested by the scientific working group** : *Ad hoc* cooperation is needed. However, a cooperation agreement would have an added-value to ensure scientific coherence and quality.

ARTICLES 20: RESTORATION OF DAMAGED ECOSYSTEMS

- 1) **Summary of the article** : MS shall carry out appropriate restoration measures to assist the recovery of an ecosystem that has been degraded, damaged, or destroyed by IAS of EU concern unless a cost-benefit analysis demonstrates that the costs of those measures will be high and disproportionate to the benefit of restoration. Measures shall include at least : 1) measures to increase the ability of an ecosystem exposed to disturbance cause by the presence of an IAS of EU concern to resist, absorb, accommodate to and to recover from the effects of disturbance.
- 2) **Recommendations** : Several scientific issues are linked to this general goal: (i) the identification of best practices for the restoration of damaged ecosystems; (ii) methodological development to assess the technical feasibility and the cost-efficiency of restoration actions; (iii) technical guidelines for the establishment of a monitoring system of restoration actions and the interpretation of data collected and (iv) the prioritization of ecosystems and coupled actions based on invasibility and restorability.
- 3) **Related article** : 11, 14, 17, 19, 22, 28
- 4) List of existing structures: Restoration processes in Flanders, Wallonia and BCR. Each of them partly covering the regulation.

- **Structure S₁: Restoration process in Flanders.**

Description : There is no structured and official restoration program for IAS. Several structures have been set-up to support the management of invasive alien species:

- The ANB management regulation ('beheerregeling') is an official structure allowing 4 types of action: (1) communication and guidance by codes of conduct, (2) management and eradication actions, (3) agreements with third parties concerning these actions, (4) limitations in trade when concerning invasive alien species. The management plan needs to be approved by the minister after advice by the Mina council. So far, no official management plans have been approved and only for a few species unofficial action plans have been developed in Flanders.
- To evaluate the feasibility of management actions, the management feasibility protocol has been developed. This tool allows to assess management feasibility in an objectified manner, taking into account financial costs, legislation, species ecology and site characteristics and could be used for reporting to the EU.
- The management plan ('beheerplan') is an official engagement that can be agreed upon by a site owner. This structure regulates the management of the site and, if followed properly, enables the owner to obtain subsidies for the site management. The management plan is obliged for ANB sites, Natura 2000 sites and to be acknowledged as nature reserve but is optional for other site owners. One of the criteria of the management plan is the management of invasive alien species.

- **Structure S₂: restoration process in Wallonia**

Description : As for management of IAS, there is no formal program for the restoration of damaged ecosystems in Wallonia and legal basis to undertake concrete actions in the field is insufficient so far. Regulation proposal is however in progress, which will provide the legal background to establish action plans and provide permission to take actions in non-SPW sites (see the contribution of the legal subgroup). Most control actions are undertaken on a voluntary basis. Local regulation of some municipalities has been adapted to allow management actions in private sites.

Two official structures of the regional administration are involved in IAS management, i.e. (i) the Invasive Species Unit that coordinates the elaboration and the implementation of action plans and (ii) the Muskrat Control Unit in charge of the control of muskrat and other aquatic mammals. These two units work in close cooperation with the different Departments of the regional administration and with local actors (municipalities).

Two kind of control actions are undertaken:

- **coordinated action plans** endorsed by the Nature Minister aiming to reduce IAS populations at the regional level. Regional funding is available to help local managers to control species where strong infestations occur (Muskrat, Giant Hogweed);
- **local actions** aiming to eradicate or reduce IAS population development. Regional funding is available for the implementation of some actions as those undertaken to control the Japanese Mosquito in Natoye. Other actions are undertaken with the support of European Life and Rural Development fundings (Himalayan Balsam, Black Locust, Canada Goose, etc.). IAS control may be integrated amongst the objectives of the management plan of Natura 2000 sites.

- **Structure S3: Management process in Brussels Capital Region**

The Plan Nature/Natuurplan of Brussels Capital Region (BCR) adopted in first reading by the regional Government states that the Government may adopt action plans to decrease the degradation of biological diversity, including by tackling invasive species. Management actions including restoration could be undertaken against damaging species.

Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)

5) Gaps and tools needed :

Best practices on restoration	Catalogue of best practices for each ecosystem	human, financial, protocol
Assessment of the technical feasibility and cost-efficiency	Methodology + species-specific information on ecology, distribution... to assess technical feasibility and cost-efficiency, partly solved by the manageability protocol in Flanders	human, protocol
No priority listing based on the combination of invasibility and restorability so far	PRA (+ manageability protocol)	human
Technical guidelines for the establishment of a monitoring system and data interpretation	Technical guidelines	human

6) **Best option suggested by the scientific working group** : *Ad hoc* cooperation is needed. However, a cooperation agreement would have an added-value to ensure scientific coherence and quality.

ARTICLES 22: COOPERATION AND COORDINATION

- 1) **Summary of the article:** Member States shall make efforts to ensure close coordination with all MS concerned and use existing structures arising from regional or international agreement. MS concerned are the ones belonging to the same marine subregions, same biogeographical region, sharing borders, sharing river basins and any other concern.
- 2) **Recommendations:** Scientific cooperation shall be strengthened with scientific entities in other Member States. In particular, cooperation should be undertaken as regard to exchange of information and data, the establishment of action plans on pathways, exchange of best practices on management, control, eradication, restoration and early warning systems.
- 3) **Related articles :** 5, 10, 11, 12, 13, 14, 17, 18, 19, 20
- 4) **List of existing structure:** Informal collaborations between with BE, other MS and third countries.
- 5) **Gaps and tools needed:**

Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)
Harmonization of regional measures	Amendment of legislation	Human

- 6) **Best option suggested by the scientific working group : Cooperation agreement.** Strong cooperation is required in order to avoid duplicating efforts and costs, to mobilize sufficient pools of experts for the assessments and therefore ensure the quality of scientific analyses.

ARTICLES 27: COMMITTEE

- 1) **Competence** : national CIE/CCPIE
- 2) **Deadline** : From 2015 onwards.
- 3) **Summary of the article**: The CION shall be assisted by a committee and may be assisted in its tasks by the scientific forum referred to article 28.
- 4) **Mandatory for MS** : Yes
- 5) **Scientific recommendations**: The committee and the Belgian representative in the committee should be supported by the Belgian representative in the scientific forum.
- 6) **Related article** : 4
- 7) **Best option suggested by the scientific working group** : **Cooperation agreement**
- 8) **List of existing structure to be used** : none
- 9) **Gaps and tools needed**:

Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)	Preferable option
Process at the Belgian level to provide science base to the Be representative	Procedure for information exchange		

ARTICLES 28: SCIENTIFIC FORUM

- 1) **Summary of the article:** The CION shall ensure the participation of representatives of the scientific community appointed by MS in providing advice on any scientific questions related to the application of the regulation, in particular as regard to articles 4, 5, 10, 18.
- 2) **Recommendations:** The Belgian representative in the scientific forum representative should rely on the best scientific evidence, make best use of existing tools in Belgium (Belgian risk analysis and risk assessment protocols) and mobilize the knowhow of the Belgian scientific community.
- 3) **Related articles:** 4, 5, 10, 18, 22
- 4) **List of existing structure to be used:**

Belgian Biodiversity Platform. Partly fulfills the regulation.

Description: The Belgian Biodiversity Platform (Belspo) provides services to the Belgian community engaged in biodiversity research and policy. The Belgian Forum on Invasive Species (BFIS) is an informal structure animated by the Belgian Biodiversity Platform where scientists involved in biological invasions are involved. A major tool developed through this forum is **Harmonia**⁽³⁾, an information system on alien species. It provides species fact sheets but also includes the results of quick risk assessments for terrestrial and freshwater alien species in Belgium. Risk is assessed through dedicated protocols (**ISEIA**⁽¹⁾ and **Harmonia**⁺) that enable the digestion of scientific information into a risk classification. The results from the species assessments are disseminated through Harmonia, in an easily understandable message to policy makers and managers by means of a list system comprising a black list, watch list, white list and alert list of alien species. In addition to these quick risk assessments, a detailed risk analysis scheme compliant with WTO standards was developed in close cooperation between BBPF, DEMNA, INBO, RBINS, ULg and the Federal FOD Environment. Such detailed risk analyses were performed for 23 alien species on the Belgian territory as scientific argumentation for possible trade restriction in Belgium. The enlargement of these detailed risk analyses to the EU territory is missing. The Harmonia⁺ can be used for horizon scanning exercises.

5) Gaps and needs:

Gap	Tool needed	Type of tool (human, financial, IT, technics, protocols,...)

Provide science base for BE representation in the committee	Formal scientific committee + <i>ad hoc</i> experts	Human resources, budget for experts
Knowledge flow from the scientific community to the formal scientific committee	Procedure for information exchange	Human resources, IT
Risk assessment panel; Ability to run series quick risk analysis	Belgian Biodiversity Platform	Human resources, budget for experts
Methodology for cost efficiency and manageability assessment	Revision of the ANB Manageability Protocol	protocol
Detailed species occurrence information in Belgium	National distribution maps	Aggregating tools from existing databases
Enlarge focus of Harmonia+ to marine species	Adaptation of the Harmonia+ protocol	Human resources
Scientific argumentation for trade restriction	Detailed RA at EU scale	Budget and/or human resources (BBPF or call for tender)
Cooperation with other MS from the same bioregion		

6) Best option suggested by the scientific working group : Cooperation agreement

Strong cooperation is required in order to avoid duplicating efforts and costs, to mobilize sufficient pools of experts and therefore ensure the quality of scientific advices.

SUMMARY TABLES

Table 1 : Scientific analysis per article					
Articles	Structures needed	Tasks	Operational level	Option	Related articles
4	Formal scientific committee	<ul style="list-style-type: none"> - Provide science base for BE position on species list of EU concern - Provide science base for BE requests for inclusion of IAS to the list of EU concern 	Belgium	Cooperation Agreement	5 28
5	Formal scientific committee & risk assessment panel	<ul style="list-style-type: none"> - Assess the relevance of inclusion of a new species in the EU list proposed by another MS - to develop new RA report at EU scale to propose inclusion of new species in the EU list 	Belgium	Cooperation Agreement	4 10 11 12 22 28
8	Formal scientific committee	Provide reasoned opinion on holding conditions	Belgium	Cooperation Agreement	15 12
9	Formal scientific committee	Provide reasoned opinion on risk of escape and risk mitigation measures	Belgium	Cooperation Agreement	
10	Formal scientific committee & risk assessment panel	Run horizon scanning exercises and develop new RA reports at EU scale	Belgium	Cooperation Agreement	5 11 12 22 28

11	Formal scientific committee risk assessment panel	<ul style="list-style-type: none"> - Provide science base for BE position on proposals by other MS within the bioregion - identify species from MS list requiring enhanced regional cooperation 	Belgium	Cooperation Agreement	5 10 12 13 14 17 18 19 20 22
12	Formal scientific committee & risk assessment panel	<ul style="list-style-type: none"> - run horizon scanning exercises - develop new RA reports at Belgian scale 	Belgium	Cooperation Agreement	5 8 10 11 13 14 15 17 18 19 20 22
13	Formal scientific committee & budget for call for tender	<ul style="list-style-type: none"> - identify priority pathways & identify priority actions - run a comprehensive pathway analysis at the Belgian scale for any exotic species 	Belgium	Cooperation Agreement	11 12 15 17 22
14	Surveillance scheme, web-base portals, early warning system	<ul style="list-style-type: none"> - dedicated surveillance of IAS - centralization of IAS data - early warning system - species registry 	Federal Regions	<ul style="list-style-type: none"> - Cooperation Agreement to ensure coherent data and knowledge flow - <i>Ad hoc</i> collaboration to harmonize existing systems for monitoring EU species 	11 17 18
15			Federal	<i>Ad hoc</i> Collaborations	8 13
17		<ul style="list-style-type: none"> - Best practices - technical feasibility - cost-efficiency - surveillance 	Federal Regions	<i>Ad hoc</i> Collaborations	11 14 18 22

18		<ul style="list-style-type: none"> - Best practices - technical feasibility - cost-efficiency - surveillance 	Federal Regions	<i>Ad hoc</i> Collaborations	11 14 17 22 28
19		<ul style="list-style-type: none"> - Best practices - technical feasibility - cost-efficiency - surveillance 	Federal Regions	<i>Ad hoc</i> Collaborations	11 14 18 20 22
20		<ul style="list-style-type: none"> - Best practices - technical feasibility - cost-efficiency - surveillance 	Federal Regions	<i>Ad hoc</i> Collaborations	11 14 17 19 22 28
22		Formalize cooperation between BE and other countries	Belgium	Cooperation Agreement	5 10 11 12 13 14 17 18 19 20
27		Information exchange	Belgium		4
28	Formal scientific committee & risk assessment panel Information system	<ul style="list-style-type: none"> - Provide science base for BE positions on species inclusion to lists, priority pathways analyses and action plans, horizon scanning exercises - species registry, occurrence information and early warning system 	Belgium	Cooperation Agreement	4 5 10 18

Table 2 : Structures needed in support of the Belgian implementation of the EU regulation

Structures needed	Tasks	Articles covered
Formal scientific committee	<ul style="list-style-type: none"> - Provide science base for BE position on species list of EU concern - Provide science base for BE requests for inclusion of IAS to the list of EU concern - Provide science base for inclusion of species to a national list of IAS. - Provide reasoned opinion on holding conditions - Provide science base for BE position on proposals by other MS within the bioregion - Identify species from MS list requiring enhanced regional cooperation - Provide science base for BE representation in the committee 	<p>4 5 8 9 10 11 12 28</p>
Risk assessment panel	<ul style="list-style-type: none"> - Assess the relevance of inclusion of a new species in the EU list proposed by another MS - to develop new RA report at EU scale to propose inclusion of new species in the EU list - Run horizon scanning exercises and develop new RA - Identify priority pathways & identify priority actions - Run comprehensive pathway analysis at the Belgian scale for any exotic species reports at EU scale 	<p>5 10 11 12 13 28</p>
Information system	<ul style="list-style-type: none"> - Dedicated surveillance of IAS - Centralization of IAS data - Early warning system - Species registry - Best practices - technical feasibility - cost-efficiency - surveillance 	<p>5 10 11 12 13 14 28 17 18 19 20</p>
	<p>Formalize cooperation between BE and other countries</p>	<p>5 10 11 12 13 14 17 18 19 20</p>

ABBREVIATIONS :

- CION : European commission
- IAS : Invasive alien species
- MS : Member States
- EU LIST : Invasive alien species list of Union concern

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