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GUIDELINES FOR SPECIES INCLUSION ON THE LIST OF INVASIVE SPECIES IN LATVIA

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SUMMARY

Sub-Action C.5.2: Guidelines for inclusion of species into the list of invasive alien species in Latvia

Deliverable – Guidelines for species inclusion into the National List of Invasive Species

The aim of the Guidelines for Inclusion of Species in the List of Invasive Species (hereinafter - the Guidelines) is to improve the assessment process and criteria for inclusion of invasive alien species (IAS) into the national Regulation approved by the Cabinet of Ministers containing the list of invasive species in Latvia. The Latvian regulatory framework governing this process was adopted in 2008, and it applies only to plant species. However, Latvia as an EU Member State is bound by EU Regulation 1143/2014 on Invasive Alien Species (IAS Regulation), which sets the need for clarifications and additions to the relevant Latvian legislation including if deemed necessary by the Member State setting of a national list of invasives species and implementation of management measures appropriate to the specific circumstances of the Member States.

The Guidelines describe the procedure for performing risk analysis of species and determine the need to include them in the Latvian list of invasive species, as well as identify necessary actions or management measures to identify, limit and reduce negative impacts. The guidelines are based on a guideline procedure plan (Chapter 2) and a guideline procedure scheme (Figure 1). Definitions of terms used in the guidelines are described in Chapter 1.

The guidelines have been developed by experts from Daugavpils University in cooperation with representatives of the Nature Conservation Agency, the Ministry of Environmental Protection and Regional Development and the State Plant Protection Service.

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Guidelines for listing invasive species in Latvia

The Guidelines for the inclusion of species in the list of invasive species (hereinafter – the Guidelines) describe the procedure, in which a risk analysis is performed for species and the need for their inclusion in the Latvian list of invasive species is determined, as well as the necessary actions or management measures are identified to identify the spread of these species, limit their spread and mitigate their negative impacts. The guidelines are based on the guidelines procedure plan (Chapter 2) and the guidelines procedure scheme (Figure 1). The definitions of the concepts used in the guidelines are described in Chapter 1.

The guidelines have been developed by experts from Daugavpils University in collaboration with the Nature Protection Board, the Ministry of Environmental Protection and Regional Development, and the State Plant Protection Service. representatives of the project "Optimization of the management and administration of Natura 2000 protected areas" (LIFE19IPE/LV/000010 LIFE-IP LatViaNature) within the framework of activity C.5.2.

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Related documents:

1. Atlases_criteria.xlsx
2. Risk_analysis.xlsx
3. BDMA_instruction.docx
4. Form_BDMA_update.docx
5. Form_monitorings_izmainas.xlsx

1. Concepts used in the guidelines

The definitions used in the guidelines are in accordance with Regulation (EC) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species (hereinafter referred to as Regulation (EC) No 1143/2014) and the definitions used in the European Commission's regulatory enactments on risk analysis (Official Journal of the European Union 2014, Roy *et al.* 2018).

Risk analysis is a set of criteria that assesses both the likelihood of a risk and the significance of its impact.

level. The risk analysis consists of a risk assessment and management measures section.

Alien species – a species that has not existed naturally in the country or region for a long time.

Invasive species – an alien species whose introduction or spread threatens or adversely affects biodiversity and related ecosystem services.

Invasive species of concern to Latvia – an invasive alien species (except for invasive alien species of concern to the European Union) which, if released into the wild and spreads, would have an adverse impact, based on scientific evidence, even if it is not entirely clear, on the territory of the country or part thereof and would require action at the national level (hereinafter – invasive species).

Invasive species of European Union concern – an invasive species whose adverse impacts are considered to require coordinated action at European Union level. These species are included in the list of invasive alien species in Regulation No 1143/2014.

Management – lethal or non-lethal action aimed at eradicating, controlling or limiting the population of an invasive species while minimizing the impact on non-target species and their habitats.

Eradication – the complete and permanent destruction of a population of an invasive species by lethal or non-lethal means.

Containment – any measure aimed at creating barriers that minimize the risk of the dispersal and spread of an invasive species population outside the affected area.

Widespread – an invasive species whose population has survived the naturalization stage and become a self-sustaining population, and has spread, occupying a large part of the potential range in which it is able to survive and reproduce.

Introduction – the introduction of an invasive species into a country through the deliberate intervention of a human. Unintentional introduction – entry into a country through the unintentional intervention of a human.

Introduction – the accidental entry of an invasive species into a country with natural capabilities, for example, in the case of transboundary spread, if the species has been introduced into the European hemiboreal region.

Establishment – the ability of an organism to survive and reproduce within the territory of a country, creating a stable population.

Spread – the ability of an invasive species to expand its range while already present in the country.

Boreal region – biogeographical regional division used in the European Union risk analysis (Annex 4) (Roy *et al.* 2018).

Invasive Species Advisory Council – ensures the prevention and management of the introduction and spread of invasive species. The Advisory Council is composed of representatives from state administration, scientific and municipal institutions, non-governmental organizations and other organizations whose areas of activity are affected by invasive species.

Coordinating authority - the authority that coordinates the implementation of Regulation No. 1134/2014.

Competent authority – an authority with competence for data collection or management of specific species or groups of species.

2. Guidelines procedure plan

The points of the guideline procedure plan are linked to the guideline procedure diagram (Figure 1).

1. Every six years, using the selection criteria for alien plant and animal species (Chapter 3), the alien species relevant to the country are reviewed, i.e. an initial selection of priority species is carried out. Species that are assessed as not and will not be invasive in the country in the next 50-100 years are not re-assessed according to the plant and animal selection criteria. According to the selection results, species are divided into the watchlist, grey list and black list. In the event that a new alien species is detected in the country or if the list of species of concern to the European Union is supplemented with a new species, it is immediately assessed according to the selection criteria. In the event that a new alien species is detected in the country, for which an assessment has previously been carried out according to the plant and animal selection criteria, the plant and animal selection criteria form for the species is reviewed and, if necessary, a risk analysis is carried out, assessing the situation. Species for which a risk analysis has been carried out are not re-assessed according to the plant and animal species selection criteria.

2. Species that have been included in the grey or black list are invited to report on public observation websites. Certified experts or specialists in the relevant field, by filling out the alien plant and animal species selection criteria form, draw conclusions on the need to include the species in the appropriate sub-programmes of the biodiversity monitoring programme, indicating in which sub-programmes the species needs to be included. The plant and animal species selection criteria form is reviewed and the competent authority decides on the inclusion of the species in the sub-programmes of the biodiversity monitoring programme. For species on the grey and black list and species of concern to the European Union, a risk analysis is carried out (Chapter 5 and Annex 2) in order of priority (Chapter 4).

3. For species that, in the assessment part of the risk analysis (Parts A and B of Annex 2), obtain a high score in the sections - introduction, entry routes and spread (at least 19 points) and probability of establishment (at least 17 points), and at least a medium-high score in the impact section (at least 7 points), carry out the management options assessment part of the risk analysis (Part C of Annex 2) and the management measures analysis (Annex 3). For species that do not reach the above score threshold, management measures analysis is not performed and the species is not included in the list of invasive species. For these species, after the risk analysis assessment by experts or specialists, the competent authorities decide on the need to continue monitoring the species in the relevant sub-programmes of the biodiversity monitoring programme and after six years, a repeated risk analysis is performed, using data obtained in monitoring programmes, studies and other sources. After the analysis of management measures, the appropriate management measures strategy is determined (Annex 3). Management measures strategies are described in Section 6.

in the department.

4. Based on the appropriate management measures identified for the relevant management strategy, management action plans shall be developed for the species in order of priority (Chapter 7). The development of management action plans shall be organised by the competent national authorities in cooperation with the invasive species management authority.



advisory council After the development of management action plans, species, depending on the management action strategy and the desired management measures, are included in additional necessary appropriate monitoring programs, the data of which are stored in an appropriate information system. For species that enter the Latvian list of invasive species, a risk analysis is repeated every six years, supplemented with data obtained from monitoring programs, studies and other sources.

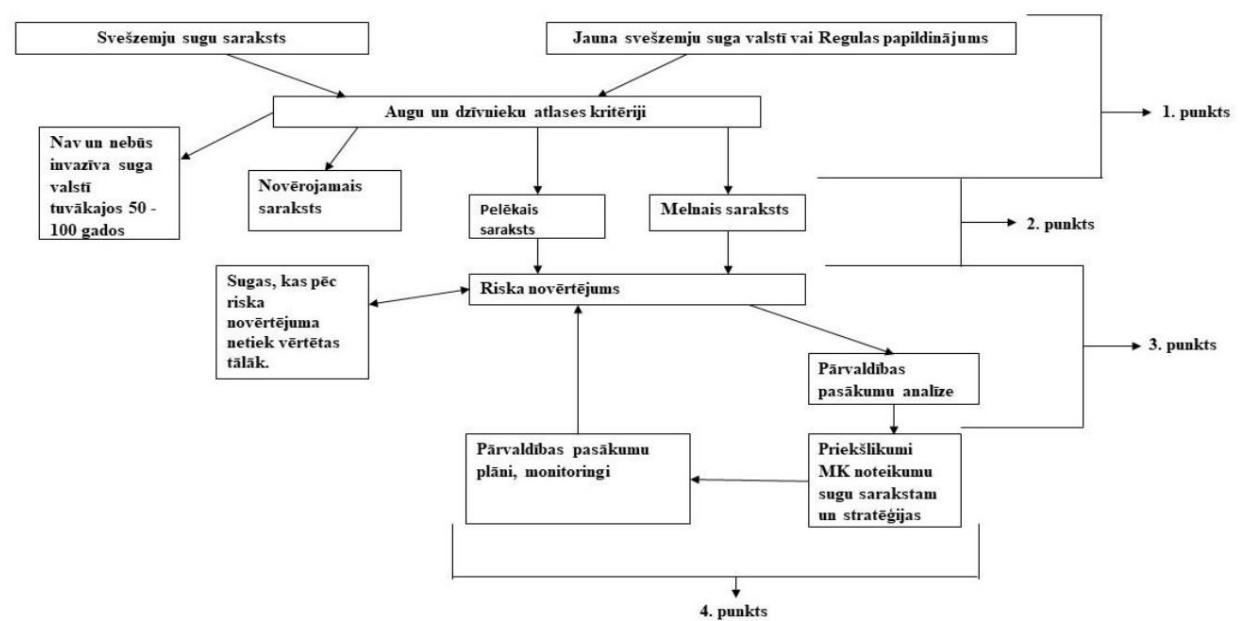


Figure 1. Schematic of the guideline procedure.

3. Initial selection of alien plant and animal species

To update the list of invasive species in Latvia, experts or specialists evaluate every six years alien species in accordance with the selection criteria for alien plant and animal species (Annex 1). According to the obtained ratings, species are divided into three lists: watchable, grey and black. The alien plant and animal species selection criteria form is attached as a separate file (selection_criteria.xls).

Grey and black list species need to be included in the relevant sub-programmes of the biodiversity monitoring programme with the aim of assessing their distribution and trends in distribution changes in the national territory. The public is informed about grey and black list species and invited to report them on public observation websites. All grey and black list species need to undergo the risk analysis assessment section (Parts A and B of Annex 2) in priority order (Chapter 4). Species for which a risk analysis has been carried out are not re-evaluated according to the selection criteria for plant and animal species.

4. Priority order of species for risk analysis

Based on the results of the selection criteria for invasive plant and animal species, a risk analysis is performed for the species in the following priority order:

- 1) Blacklisted species that are of concern to the European Union but are not widely distributed in the country;

- 2) Grey List species that are of concern to the European Union but are not widely distributed in the country;
- 3) Blacklisted species that are of concern to the European Union and have spread widely in the country;
- 4) Grey List species that are of concern to the European Union and are widely distributed in the country;
- 5) Blacklisted species that are not widely distributed in the country;
- 6) Grey List species that are not widely distributed in the country;
- 7) Blacklisted species that are widely distributed in the country;
- 8) Grey list species that are widely distributed in the country.

5. Risk analysis

The risk analysis consists of a risk assessment section (Annex 2, Part A and B) and a management measures analysis section (Annex 2, Part C and Annex 3). The risk analysis results in

The list of potential invasive species in Latvia, for which a management plan needs to be developed in order of priority, identifies the most significant risks and provides recommendations for the development of a management plan. The risk analysis form is attached as a separate file (riska_analize.xls).

The main principles of risk analysis: the risk analysis is developed by at least two experts or specialists in the relevant field, the risk analysis is evaluated by at least one expert or specialist in the relevant field, who comments on and assesses the risk analysis, asking for its supplementation if necessary. It is preferable that the expert who carries out the evaluation of the risk analysis does not work in the same organization as the developers of the risk analysis. The experts who develop it are responsible for the quality of the risk analysis. The initiation of the risk analysis is initiated by the competent institutions. This is carried out in accordance with the procedure specified in regulatory enactments and in accordance with the provisions of these guidelines.

The risk assessment section identifies the main risks and assesses the ability of the alien species to enter and establish, as well as to spread in the national territory, using criteria related to the routes of introduction and spread, establishment and reproduction capabilities, and assesses the significance of the impact on ecosystems, native species, human health and the economy (European Parliament 2016, Roy et al. 2018). For each criterion (in the notes column) and the overall risk analysis result, the level of confidence (Table 1) in the reliability of the result is assessed. The essential facts for the assessment and determination of species management measures are recorded in the notes column of the table and references are indicated.



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1. tabula

Characterization of confidence levels of criteria evaluated in risk analysis.

Confidence level	Confidence level description
Low	<p>There are no direct observations, no studies to support this assessment. For example, only artificially created data has been used to support the observation. (statistical projections, forecasts, etc.) or data of a different scale, therefore they would not be applicable and directly attributable to the territory of the country, or the evidence is scarce and difficult to interpret, or the sources of information are few and contain information that is not reliable.</p>
Medium	<p>There are some direct observations, studies that would support this assessment, but some of the data are artificially created (statistical projections, forecasts, etc.) to support the observation, or studies on this topic have a small scale, but it is possible to use these data, applying them to the necessary scale. The interpretation of the data at the appropriate scale can be ambitious or contradictory.</p>
High	<p>There are direct observations, studies that would support this assessment, and they are on a comparable scale. There are reliable and good quality sources of information, and the information is not contradictory.</p>

The notes field identifies and describes in detail the risk areas of the species, routes of entry and spread, and impacts on ecosystems, native species, human health, and the economy, providing correct references to the data sources used.

The risk assessment (Appendix 2) is divided into three main criteria: 1) introduction, routes of entry and spread, 2) likelihood of establishment and 3) impacts. Each of the criteria is assessed separately, categorizing species into high, medium and low risk invasive species groups (Table 2).

2. tabula

Distribution of points of the main criteria of risk analysis into groups.

Criteria group	Range of points for determining risk groups
Introduction, entry routes and spread	High risk – 19–30 points Medium risk – 10–18 points Low risk – 0–9 points
Probability of settling	High – 17–24 points Medium – 10–16 points Low – 0–9 points
Impacts	High – 14–20 points Medium – 7–13 points Low – 0–6 points



The list of invasive species in Latvia includes species that have become established in the territory of the country or they have a high probability of introduction and a high probability of establishment, and which have a high or medium rating in the impact section (all 3 significant factors in the indicated risk level). Accordingly, after conducting a risk analysis, the list of invasive species in Latvia includes species that have obtained at least 19 points in the section "introduction, entry routes and spread", at least 17 points in the section "probability of settlement" and at least 7 points in the "impacts" section.

For species that have reached the above assessment thresholds, a management measures analysis is performed. The purpose of the management measures analysis is to determine possible management measures, determining the most appropriate management measures strategy for each species, and to provide recommendations for the development of management measures plans. Species that have not obtained the required number of points are not considered invasive to Latvia with such a significant impact that it is necessary to regulate and develop measures at the national or administrative territory level. These species are not further assessed for regulation. After the assessment of experts or specialists, the competent authorities decide on the need for monitoring of the species and perform a repeated risk analysis for them after six years, using data obtained from monitoring programs, studies and other sources.

The management measures analysis consists of two parts – management options (Annex 2, Part C) and the management measures analysis, which results in the determination of the management measures strategy appropriate for a specific invasive species (Chapter 7). In the notes column of the management options section, the expert provides recommendations for the development of a management measures plan, describing the management measures in detail, including providing correct references to the data sources used and assessing the level of confidence in the information provided. The management measures analysis and strategies are borrowed from the Belgian risk analysis (Adriaens et al. 2019) and adapted to the Latvian situation.

6. Management measures

Management measures consist of lethal or non-lethal physical, chemical or biological actions or combinations of techniques aimed at eradicating, controlling or reducing the population of an invasive species, as well as other conditions and restrictions that limit the entry, establishment and spread of the species (e.g. prohibitions on the introduction or spread of the species, mandatory eradication and monitoring, penalty systems). Management measures also include actions aimed at the host ecosystem of the invasive species and aimed at increasing the resilience of the ecosystem to invasions. Management measures for widespread invasive species

For the purpose of eradicating, controlling or containing invasive species, the commercial exploitation of those species may be temporarily permitted, where there is a strong justification for this and provided that all necessary control measures are in place to prevent their further spread. Management measures

should avoid adverse effects on the environment and human health, including occupational safety requirements. Anyone involved in the eradication, control or containment of invasive species should take the necessary measures to avoid unnecessary pain, suffering and suffering to animals during the process, taking into account best practices in this field as far as possible. The use of non-lethal methods should be considered wherever possible, and any



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The measure should be implemented in a way that minimises the impact on non-target species (Official Journal of the European Union 2014).

Based on the results of the management measures analysis, invasive species are included in the Latvian list of invasive species and the management measures strategy corresponding to each species is determined. The management measures strategies are summarized in Table 3, providing for different management measures and monitoring.

3. tabula

Management measures strategies.

Management measures and monitoring	Strategy 1	Strategy 2	Strategy 3	Strategy 4	
Rapid eradication	X				
Eradication throughout the country		X			
Containment of the spread				X	
Prevention – import, restrictions on distribution, trade, use; unlimited extraction	X	X		X	X
Authorization for use under restricted conditions	X	X	X		X
In biodiversity monitoring	X	X	X		X
Public observation reports	X	X	X		X
Accurate surveying/recording at management event sites	X	X	X		
Monitoring of risk areas – in places where the species has a higher probability of spreading	X	X	X		



Strategy 1

The first strategy applies to invasive species that are not currently found in the national territory, but according to the results of the risk assessment have the potential to be introduced, enter, spread and establish themselves in the wild, and, according to the risk assessment, could cause significant/substantial damage. These species are included in the early detection and rapid eradication system. The competent authorities are responsible for monitoring the management measures.

Strategy 2

The second strategy applies to invasive species that are not widely distributed in the country. They have small and local populations. Using effective management measures, it is possible to eradicate these species from the country's territory. It is desirable to involve municipalities in the implementation and monitoring of management measures in cooperation with competent authorities.

Strategy 3

The third strategy applies to invasive species that are widespread in the country and that cannot be completely eradicated from the country in a short period of time, but through management measures, it is possible to limit and control the spread of populations. The long-term goal of the strategy is the eradication of invasive species throughout the country. It is desirable to involve local governments in the implementation and monitoring of management measures in cooperation with competent authorities.

Strategy 4

Three cases have been identified in which management measures aimed at eradicating an invasive species throughout the country are not possible: 1.

Management is practically impossible because the available management measures are ineffective;
 2. The costs of eradication will disproportionately exceed the benefits of eradicating the species;
 3. Eradication methods have negative impacts on human health, native species or ecosystems
 (the negative impacts outweigh the benefits) (European Parliament 2016).

In such cases, minimum mandatory management measures should be provided for, such as the inclusion of in the lists of unlimited game species, inclusion in the appropriate biodiversity monitoring systems, prohibition of importing, keeping, breeding the species without special permits, transport, trade, use or exchange, propagate, cultivate and spread in the environment, etc. The competent authorities are responsible for monitoring the implementation of management measures.

In relation to all invasive species included in the Latvian list of invasive species, uniform restrictions are set, prohibiting the import, keeping, breeding, transportation, trade, use or exchange, propagation, cultivation and release into the environment of these species without obtaining special permits. Invasive species included in Regulation No. 1143/2014 are included in the national list of invasive species on the list, if, in order to ensure their effective management, it is necessary to establish, in addition to the above-mentioned restrictions and the conditions of Regulation No. 1143/2014 (Chapter 8) additional management measures or specify in detail the procedure for their implementation.

7. Priority order of species for the development of management action plans

Based on the results of the risk analysis, priority invasive species for management are identified. The following invasive species are determined as priority species for management in the territory of the state:

1. which are of concern to the European Union and have received high ratings in risk analyses in the impact section of the assessment;
2. which are not widespread and have received a high rating in the risk analysis assessment in the influences section;
3. widespread species that have received a high rating in the risk analysis assessment in the influences section;
4. which are of concern to the European Union and have received an average rating in the risk analysis assessment in the influences section;
5. which are not widely distributed and have received an average rating in the risk analysis assessment in the influences section;
6. widespread species that have received an average rating in the risk analysis assessment in the influences section.

8. Requirements of Regulation No. 1143/2014

Regardless of the results of the risk analysis and inclusion in the national list of invasive species, all invasive species included in Regulation No. 1143/2014 must comply with the requirements of Regulation No. 1143/2014.

the above requirements, including management measures obligations, rapid eradication obligation, restoration of adversely affected ecosystems, implementation of a monitoring system, emergency measures and notification of their implementation to neighbouring countries, Commission permits for the keeping, breeding, propagation, movement of invasive species, etc. In the event that a Member State, when carrying out a risk analysis assessment for a species not included in the

In the list of invasive species of Regulation No. 1143/2014, it is determined that the invasive species is binding for at least two Member States of the European Union, it is advisable to conduct a risk analysis in accordance with the procedure set out in Regulation No. 1143/2014 and report on the need to include the species in the list of invasive species of the European Union.



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Attachments

Annex 1

Selection criteria for alien plant and animal species

To determine the likelihood of an alien species occurring in a country, methods have been developed worldwide. various risk assessment methods and criteria.

The main groups of criteria are similar for all methods: the species' survival and reproduction capabilities (suitable climatic conditions); the species' introduction capabilities and distribution routes; the species' establishment, natural distribution and competitive capabilities; the species' impact on ecosystems, native species, the economy, and human health (Smallwood and Salmon 1992; Weber and Gut 2004; Pergl et al. 2016; Nutt and Kubjas 2020; Roy et al. 2020).

One of the best methods that allows species to be prioritized has been developed by Pergl et al. (2016), dividing invasive species into three lists: a black-list , a grey - list , and a *watch-list*.

Using the main criteria groups, the points method and the approach to classify species by priority into three lists, different criteria were developed for alien plant and animal species.

Depending on the number of points obtained, species are grouped into the black list (MS), grey list (PS) and watch list (NS).

Invasive species lists		Point range for animals	Point range plants
MS Black List – priority monitoring species of vascular plants, mosses and animals that have been found in Latvia, are recognized as invasive in neighboring countries, pose a threat to natural and semi-natural habitats and local species Grey List – species		12 – 15	15–17
PS have suitable climatic conditions in Latvia, are recognized as invasive in neighboring countries, pose or may pose a threat to natural and semi-natural habitats or local species		8 – 11	8–14
NS Watchlist – currently, climatic conditions are not suitable, but in the foreseeable future (50-100 years) such conditions are expected in Latvia.		< 8	< 8

In the event that a species is not likely to survive and reproduce in Latvia in the foreseeable future or if the species is not expected to have a negative impact on local species, ecosystems or human health with a high level of confidence,

health, it is assumed that it is not and will not be an alien species with an invasive nature for the foreseeable future (50–100 years).

Only species that **have objectively proven significant adverse impacts on native species or habitats** are included in the blacklist. Plant species must score maximum points in the first plant species selection criterion and animal species must score maximum points in the fifth animal species selection criterion!

Criteria for selecting alien plant species

The system of selection criteria for alien plants is based on 7 standardized selection criteria with different point scores depending on the distribution and impact of the species. The criteria were developed based on the selection criteria for priority species included in the project "Development of an Invasive Alien Species Monitoring Program" implemented by Daugavpils University (Evarts-Bunders *et al.* 2016; Evarts-Bunders and Evert-Bundere 2020), supplemented with potential

alien species risk assessment methodology (Weber and Gut 2004; Pergl *et al.* 2016).

7 selection criteria have been put forward:

1. Existing or potential routes of entry and spread of the species; (establishment)
2. Distribution of the species in the country, including cultivated areas; (stabilization)
3. The species has been recognized as invasive in neighboring countries and elsewhere in temperate Europe.

in the zone: (stabilization and further spread)

4. The species threatens or could threaten natural and semi-natural habitats or native species; (environmental impact)
5. The species is reproducing or can reproduce in the wild; (further spread)
6. The species shows signs of further invasion; (further spread)
7. Classification of alien species into risk classes

In order to objectively evaluate those plant species that are currently not found in Latvia and neighboring countries, but which could still be included in the observation list, it is recommended to use plant hardiness zones <https://www.houzz.com/europeZoneFinder> as an exclusion factor when starting the evaluation of the selection criteria for alien plant species. According to this division, the territory of Latvia falls into three zones:

Zone 4 (-35°C to -29°C) – Eastern Vidzeme and Latgale;

Zone 5 (-29°C to -23°C) – Central Vidzeme, Eastern Zemgale;

Zone 6 (-23°C, up to -18°C) – Seaside Lowland, Pieriga, Kurzeme.,

In each of the defined hardiness zones, there are possible areas with a different climate – warmer or, conversely, colder climate, however, the common regularities remain – critically low temperatures in the coldest months of the year are the main limiting factor for the spread of alien plant species in the temperate climate zone. Taking into account both the variability of species and their adaptation to a harsher climate, as well as the expected climate changes modeled in the territory of Latvia (Jansons 2011; Avotniece *et al.* 2017), there is a certain possibility that the climatic conditions of Latvia will become suitable for species that are currently limited to the 7th hardiness zone (-18°C to -12°C) in the next 50 years, therefore the following species are also included in the monitoring list. Accordingly, only those alien plant species that fall into the 4th, 5th, 6th and 7th hardiness zones are evaluated further.

The developed selection criteria are described in detail.



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VIDZEMES AUGSTSKOLA



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Criterion 1: Existing or potential routes of entry and spread of the species.

Explanation The	Rating
species is (may be) deliberately introduced for the purposes of landscaping, agriculture, forestry, etc.	1
The introduction of the species into the country is accidental.	0

Criterion 2: Distribution of the species in the country, including cultivated areas.

The quantitative distribution of a species is characterized by the number of its occurrences. Quantitative distribution can be assessed by analyzing the occurrence of a species using one of the grid maps. The presence of a species in a grid is marked with a point, which is conditionally identified with the species occurrence. For example, if a species is known from 10% or more grid squares in Latvia, the species is considered common. The criterion was chosen to assess how many places further invasion is possible, which in this case is an important indicator of possible invasions.

Explanation More	Rating
than 10% of the squares of the selected network are known 2–10% of the	3
squares of the selected network are known	2
Less than 2% of the squares in the selected grid are known	1
Not detected in Latvia	0

Criterion 3: The species is recognized as invasive in neighboring countries and elsewhere in temperate Europe

in the zone.

The most dangerous species are those that are invasive in Latvia and neighboring countries, with particular attention paid to species included in "Regulation (EU) No. 1143/2014 of the European Parliament and of the Council on the prevention and management of the introduction and spread of invasive alien species" if they potentially correspond to winter hardiness zones (see Winter hardiness zones).

Explanation The	Rating
species has been recognized as invasive in one of the neighboring countries (Belarus, Estonia, Lithuania, Pskov region (Russia), Finland).	2
The species is recognized as invasive in the temperate climate zone of Europe.	1
The species is not recognized as invasive in the temperate climate zone of Europe.	0

Criterion 4: Threatens natural and semi-natural habitats or native species.

To assess the threat to natural and semi-natural habitats (habitats included in Annex I to Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, hereinafter referred to as protected habitats of the European Union) and local species, it is planned to use, for example, data from the nature data management system "Ozols" for the last 5 years, as well as precise information from herbarium collections, scientific publications and databases.

For species for which no data on impacts on habitats or native species are available, the adverse impact is assessed based on information available on the adverse impact of the species in neighbouring countries. **The criterion is considered mandatory for inclusion of the species in the black list (maximum number of points).**

Explanation: The	Rating
adverse impact of the species on native species or habitats is objectively demonstrable in the country.	3
The species goes wild in ruderal areas, roadsides, cemetery edges, dumps, etc.	2
The species has a potential adverse impact on native species or habitats in the country because it has suitable climatic conditions and has been observed to have adverse impacts on habitats or native species in neighbouring countries.	1
The species is not expected to have any adverse impact on habitats or native species in Latvia.	0

Criterion 5: The species reproduces or can reproduce in the wild.

Explanation: The	Rating
species reproduces in the wild, and efficient vegetative and generative reproduction has been observed.	3
The species reproduces or can reproduce generatively in the wild.	2
The species reproduces or can reproduce in the wild vegetatively.	1
The species has not been observed breeding in the wild and is not expected to do so in the foreseeable future.	0

Criterion 6: The species shows signs of further invasion.

The species has not occupied its ecological niche, and its number of occurrences has not stabilized. Outside of human-controlled conditions, the species is found only as single individuals among local plant species and does not form dense monodominant stands.

Explanation The	Rating
species has not occupied its ecological niche and is showing signs of aggressive invasion.	2
The species has not occupied its ecological niche and shows moderate signs of invasion, or the species is not found in the country, but if it is found in the country, moderate signs of invasion are expected.	1
The species has occupied its ecological niche and does not show further signs of invasion, or the species is not found in the country and no signs of invasion are expected.	0

Criterion 7: Classification of alien species into risk classes.

Analyzing several studies devoted to the specific issue (Phelong 1995; Wilgen *et al.* 2001; Andersen *et al.* 2004; Genovesi & Shine 2004; Burgiel & Muir 2010; Verbrugge *et al.* 2010; Crossman *et al.* 2011; Mcdougall *et al.* 2011; Sandvik *et al.* 2015; Pyšek *et al.* 2017), invasiveness

The risk assessment was based on the 2004 study by Weber and Gut (Weber & Gut 2004), which used relatively simple and easily defined criteria for assessing the risk of invasive potential of species. Weber and Gut (Weber & Gut 2004) used 12 criteria for the assessment. The scheme proposed by the authors has been adapted to Latvian conditions, with minor changes made, for example, changing the term "Europe" to "Northern Europe", since several species that occur wild in Central Europe,

It has been introduced to Latvia and is showing signs of invasiveness.

Invasiveness risk class criteria

No.	Criterion Question	Answer	To the point	
1.	Climatic compatibility	Does the distribution range of the species under assessment include similar climatic zones as the risk assessment area? No	2 0	
2.	Species status In Europe	Is the species found in the wild in Europe? Yes	2 0	
3.	Geographical the spread In Europe	In how many countries is the species found? Species found in >5 countries The species occurs in 2–5 countries The species is not found or is found in one country	3 2 1	
4.	Worldwide distribution	How common is the species in the world (wild and introduced)? Wide distribution range, exceeding 15° latitude or longitude on one continent or part of the world, or found on several continents or parts of the world Small distribution area, species found in a small area on one continent or part of the world	3 0	
5.	Agriculture characteristics weed elsewhere in the world	Is the species listed as a weed elsewhere in the world? Yes No	3 0	
6.	Taxonomy and	Are there other weed species (anthropophytes) in the genus? Yes No	3 0	
7.	Seed viability and multiplication a	Approximately how many seeds does one individual of a species produce? If a species is found in a risk assessment area, it is assessed for the plants found there. If the species occurs elsewhere in Europe, it is assessed based on the data known there. If the species is not present	Many seeds Unknown Few seeds or seeds not germinating	3 2 1



In Europe, the issue is related to its wildlife
 or introduced habitat elsewhere in the world.

8.	Vegetative reproduction	Evaluate the species according to the criteria provided. If more than one statement applies to a species, the species receives the highest score.	The species (branches, rhizomes, tubers, etc.) easily fragments, fragments can spread and form new plants	3
			The species has well-developed stolons and/ or rhizomes for active lateral growth.	3
			If the species being assessed is a tree, it has the ability to form root collar shoots or a trunk and branches from the stump. takes root upon contact with soil	2
			The species has bulbs or rhizomes	1
			The species is not known to reproduce vegetatively.	
9.	In distribution type of	Evaluate the species according to the criteria provided. If more than one statement applies to a species, the species receives the highest score.	The fruits are dry and the seeds are adapted for wide dispersal by wind (fluff, hairs, wings) or by animals (hooks, thorns, etc.)	4
			Species have self-seeding mechanisms	2
			The fruits are fleshy and less than 5 cm in diameter.	2
			Other or unknown	0
10. Life form	What is the life form of the species?	Perennial large herb (>80 cm)	4	
		Tree	4	
		The species is free-floating in the water	4	
		Annual large herbaceous plant (> 80 cm)	2	
		Perennial small herb (< 80 cm)		
		Other	2	
		Annual small herb (< 80 cm)	2	



11. Species habitats	Evaluate the species according to the criteria provided. If more than one statement applies to a species, the species receives the highest score.	Seashore habitats	3
		Swamps	3
		Wet grasslands	3
		Dry grasslands	3
		Forests	3
		Lakes, rivers, their shores	3
		Other	0
12. Population density	What is the density of the species in a particular location? If the species occurs in the risk assessment area, it is assessed for the plants that occur there. If the species occurs elsewhere in Europe, it is assessed based on the data known there. If the species is not found in Europe, the question is related to its wild or introduced range elsewhere in the world.	The species forms large and dense monodominant stands	4
		The species sometimes forms dense stands	2
		The species occurs as widely scattered single individuals	0

By summing the points obtained across all 12 criteria, alien species are divided into high, potentially high and low risk classes, according to the range of points indicated in the following table.

Explanation	Rating
28–38 High-risk species are likely to become a threat if they become naturalized natural habitats or native species.	3
21–27 Potential high-risk species that need to be monitored.	2
3–20 Low-risk species that are unlikely to threaten natural and semi-natural habitats or native species.	1



Criteria for selecting alien animal species

For the purpose of selecting alien animal species, the invasiveness of species is assessed according to four main criteria, broadly analyzed which internationally uses risk

(Smallwood and Salmon 1992; Weber and Gut 2004; Pergl *et al.* 2016; Roy *et al.* 2020; Nutt and Kubjas 2020), -

- 1) Invasion sites of the species in Europe
- 2) the survival and reproduction capacity of the species;
- 3) routes and vectors of entry of the species;
- 4) establishment of the species, natural dispersal capabilities; 5)
- impact of the species on native species, ecosystems or human health.

Criterion 1: Invasion sites of the species in Europe

Explanation	Rating
The species is found in Latvia	3
Invasive in the nearest neighboring countries - BY, EE, FI, LT, PL, RUS (Pskov and Leningrad regions)	2
Recognized as invasive in European Union countries	1
Not recognized as invasive in the European Union	0

Criterion 2: The species' ability to survive and reproduce.

The survival and reproduction of animal species are directly dependent on climatic conditions. The main climatic factor that affects the survival and reproduction of a species is temperature. Other factors that have an impact on individual species are: the number of days with snow cover, the thickness of the snow cover, the number of days below 0°C, the average humidity level in different periods of the year and the number of days with ice cover. According to the Latvian Centre for Environment, Geology and Meteorology

According to data, the average air temperature in Latvia in 2020 is +17 °C in summer, -4.6 °C in winter, on average +5.9 per year. °C. According to the latest maximum climate change scenarios, the average air temperature may increase by an average of 1 °C over the next ten years, and the largest changes are expected in the winter period –

It is expected that the average air temperature could increase by 2 °C. By 2071, however, forecasts predict that the average air temperature will have increased by 5.5 °C (Avotniece *et al.* 2017).

Explanation The	Rating
species is ecologically plastic, it is able to adapt to different temperatures; the temperature required for its development, reproduction and survival does not differ from the average summer and winter temperatures in the country.	3
The species is ecologically plastic, it is moderately able to adapt to different climatic conditions; the average temperature of the coldest month or the average temperature of the warmest month in the country does not critically threaten the survival and reproduction of the species in the country.	2



The species is not ecologically plastic or the species is ecologically plastic, but the average temperature of the coldest month or the average temperature of the warmest month in the country critically threatens the survival or reproduction ability of the species, or the maximum lowest or highest temperature in the country critically threatens the survival or reproduction ability of the species; there is reason to believe that due to climate warming, it will be able to spread in Latvia in 50 or more years.	1
The species is not ecologically plastic; the average temperature of the coldest month or the average temperature of the warmest month in the country critically threatens the survival or reproduction of the species; conditions are not suitable for the species in Latvia and, according to climate forecasts, they will not occur. The species may be accidentally detected, but will not be able to reproduce, develop and spread, forming stable populations.	0

Criterion 3: Routes and vectors of spread of the species.

Explanation	Rating
main vector of spread of the species is human-assisted dispersal, which allows the species to spread over large distances and has good natural dispersal capabilities, as a result of which the species is able to spread rapidly and invade new territories.	3
The species can be spread by humans and has good natural dispersal ability or the species is spread by humans but has low natural dispersal ability. As a result, the species has a moderate ability to spread and invade new areas	2
The species rarely spreads through humans, but has good natural dispersal capabilities. It can spread over distances of at least 10–100 km within a year without direct human intervention.	1
The species is not spread by humans and has weak natural dispersal capabilities.	0

Criterion 4: Species establishment, natural distribution and competitive ability.

Explanation	Rating
High dispersal potential documented. High dispersal and fecundity potential: the species is very fecund, easily spreads actively or passively over distances exceeding 10 km per year, and is capable of generating new populations.	3
Medium dispersal and medium to high fecundity have been documented. The species is not found in sparsely populated areas with a high proportion of natural habitats.	2
Natural dispersal without direct human intervention rarely exceeds 10 km per year. However, the species can become locally invasive due to its strong reproductive potential.	
Invasiveness is low: the species spreads poorly in the environment due to its low dispersal ability and low reproductive rate.	1
There is no data on which to base the assessment.	0





Criterion 5: Adverse impact of the invasive species on native species, ecosystems or human health.

Explanation	Rating
The negative impact on native species, ecosystems, ecosystem services or human health is significant (competing with native species, transmitting diseases dangerous to native species, altering ecosystems, causing allergies or diseases) and the level of confidence is high.	3
The negative impact on native species, ecosystems, ecosystem services or human health is significant (transmits dangerous diseases, hybridization, strong competition or predation, alters ecosystems, causes allergies or diseases), but the level of confidence is medium.	2
The negative impact on native species, ecosystems, ecosystem services or human health is minor (competition or predation, minor ecosystem changes), the level of confidence is high. The negative impact is questionable and the level of confidence is low.	1
Negative impacts on native species in the ecosystem, ecosystem services or human health are not expected (the invasive species has a negative impact on species that are not found in Latvia, it does not change ecosystems and does not affect ecosystem services, does not cause allergies), high level of confidence.	0



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Risk analysis form

Part A – Species information	
Species information 1.	Answer – citing the literature, indicating the most important information
Species name	<ul style="list-style-type: none"> • Latin name of the species with author: • Latvian name of the species: <p>Although the risk analysis should be carried out for a single species, in some cases it may be carried out for a genus or several subspecies if it is clear that the ecology of these species is similar and that equivalent risk analysis results are expected. In such cases, it should be clearly stated that the risk analysis is carried out for a group of species.</p>
2. Similar species that may be found in the territory of the country	<p>Both native and alien species that may be found should be included, including the following options:</p> <ul style="list-style-type: none"> • Other invasive species with similar morphological and ecological characteristics (in this case, a single risk analysis may be performed): • Other morphologically similar alien species that do not have the characteristics of invasive species and which may be found in the territory of the country: • Morphologically similar native species that may be confused with the invasive resistant:
3. Is the invasive species found in the wild in the country?	<ul style="list-style-type: none"> • Yes • No





	The time when the invasive species was first detected in the country, whether it has become established and how common it is in the country (mentioning regional distribution characteristics, if any).	
4. Is there a previous risk analysis for the specific species in Latvia?	Time and result of the previous risk analysis.	
Risk analysis expert and organization Risk analysis assessor and organization Part B.1 –	Name Surname, organization, date	
Introduction, entry routes and spread		
<p>Instruction:</p> <p>1. If several answers meet a species' criteria, the species receives the maximum number of points for that criterion. The number of points for the answers does not add up and applies to criteria 1.1, 1.2, 1.4.</p> <p>2. The notes describe the most important aspects of the criterion, referring to the literature used, and assess the level of confidence according to Table 1.</p> <p>3. In the section on introduction, routes of entry and spread criteria, criteria 1.1-1.3 apply to both plants and animals. 1.4-1.8 are filled in for plants, 1.9-1.13 are filled in for animals.</p>		
Criterion Question 1.1. Entry routes	Answer	Points Notes
What are the main entry routes?	<p>The species enters indirectly through humans (freight, ballast water, transport)</p> <p>A species enters with the direct help of humans as an ornamental plant, pet species, aquarium species, zoo species, etc.</p> <p>The species very rarely enters through direct or indirect human intervention, but it does so with naturally good dispersal abilities.</p>	<p>4</p> <p>3</p> <p>2</p> <p>Precisely identify routes of entry, indicating the main vectors and the likely frequency of infestation. For plants, the ability to spread is assessed according to the criterion of 1.4 and for animals according to the criterion of 1.9.</p> <p>Confidence level:</p>





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		The species very rarely enters through direct or indirect human intervention, mainly through natural dispersal abilities, which are moderately good.	1	
1.2. Pathways of spread	What are the main routes of spread of the species? The species spreads indirectly through humans The species spreads naturally with good dispersal abilities The species spreads directly through humans The species spreads naturally with moderately good dispersal abilities.	4 3 2 1	Precisely identify the routes of spread, taking into account the dispersal capabilities of animals (criterion 1.9) or the spread of types of plants (criterion 1.4). Confidence level:	
1.3. Population density	What is the density of a species in a given population? If the species is found in the territory of a country, it is estimated for individuals found there. If the species is found elsewhere in Europe, it is estimated based on data known there. If the species is not found in Europe, the question is related to its wild or introduced range elsewhere in the world.	4 2 1	Describes the population structure and composition of a species. Confidence level:	





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1.4. Natural method of propagation for plants	<p>Evaluate the species according to the criteria provided.</p> <p>In plants, the rate of spread depends on the types of spread.</p>	<p>The fruits are dry and the seeds are adapted for wide dispersal by wind (fluff, hairs, wings) or by animals (hooks, thorns, etc.)</p> <p>Species have self-seeding mechanisms</p> <p>The fruits are fleshy and less than 5 cm in diameter.</p> <p>cm</p> <p>Other or unknown</p>	4 2 2 0	<p>Describes the mode of spread and the main vectors.</p> <p>Confidence level:</p>
1.5. Reproduction strategies for plants	What are the reproductive strategies for the species?	<p>The species reproduces vegetatively and generatively.</p> <p>The species reproduces generatively</p> <p>The species reproduces vegetatively.</p>	3 2 1	<p>Describes the reproductive strategy of the species.</p> <p>Confidence level:</p>
1.6. Reproductive abilities of plants		<p>The species produces abundantly viable seeds (one plant has more than 100 seeds)</p> <p>The species only produces seeds in favorable years and/or their number is small.</p> <p>The species does not reproduce by seeds.</p>	4 2 0	<p>Describes the reproductive capabilities of a species.</p> <p>Confidence level:</p>





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1.7. Population reproductive capacity in plants	<p>The species (branches, rhizomes, tubers, etc.) easily fragments, fragments can spread and form new plants</p> <p>The species has well-developed stolons and/or rhizomes for active lateral growth.</p> <p>If the species being assessed is a tree, it has the ability to form root collar shoots from the stump or the trunk and branches root when in contact with the soil</p> <p>The species has bulbs or rhizomes</p> <p>The species is not known to reproduce vegetatively.</p>	3 3 2 1 1	Describes the reproductive capacity of a population of a species. Confidence level:
1.8. Life shape for plants	What is the life form of the invasive species? Tree Perennial Annual	4 2 0	
1.9. Natural dispersal abilities in animals	Evaluate the species according to the given criteria. The species has good natural dispersal abilities, and within a year it can spread over distances of over 10 km without direct human intervention. The species has a moderately good natural spread ability, and it can spread throughout the year without direct human intervention.	4 2	Describes the spreading capabilities and main vectors. Confidence level:





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		<p>participations can spread over distances from 1 km to 10 km</p> <p>The species has poor natural dispersal abilities; it does not spread further than 1 km per year without direct human intervention.</p>	0	
1.10. Reproductive strategies in animals	What is the reproductive strategy for the species?	<p>The species reproduces asexually (parthenogenesis, fission, budding)</p> <p>The species is hermaphroditic.</p> <p>The species has asexual reproduction.</p>	3 2 1	<p>Describes the reproductive strategy of the species.</p> <p>Confidence level:</p>
1.11. Reproductive ability in animals	How many offspring does one individual have in a year?	<p>>100</p> <p>11–100</p> <p>1–10</p>	3 2 1	<p>Describes how many offspring an individual of a species has on average per year.</p> <p>Confidence level:</p>
1.12. Starting population size for animals	How large should the number of individuals in the starting population be for the population to become stable?	<p>A species is capable of establishing a stable population from a few individuals in a starting population</p> <p>To establish a stable population, several dozen individuals of a species are required in the starting population.</p>	4 2 0	<p>Describes the ability of a species to establish a stable population at a minimum number of individuals count.</p> <p>Confidence level:</p>





		To establish a stable population, several hundred individuals of a species are required in the starting population.		
1.13. Life duration in animals	How long does an invasive species live on average in the wild?	More than ten years Up to ten years Up to one year	4 2 0	Indicates the average lifespan of a species in the wild. Confidence level:
Part B.2 – Probability of settlement				
2.1. Climatic suitability for the natural habitat	Does the distribution area of the species under assessment include similar climatic zones as in the country?	Yes No	2 0	Indicate the climatic zones that fall within the species' distribution range and describe the climatic conditions of the invaded locations. The climate zone classification used in the European risk analysis is used (Annex 4) Confidence level:
2.2. Natural distribution area of the species	Is the hemiboreal forest region of the temperate zone of Europe the natural range of the species?	No Yes	2 0	Describes the natural distribution area. Uses European risk analysis used the distribution of climatic zones (4).





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				annex). Confidence level:
2.3. Ability to inhabit the territory of the state	Will the species be able to inhabit the country's territory under current and expected future climatic conditions?	The species is capable of or inhabits the territory of the country The species will be able to survive in the foreseeable future (50-100 years), currently unable to inhabit The species is unable and will not be able to inhabit the country's territory in the foreseeable future.	2 1 0	Describes the necessary climatic conditions for a species to survive. Confidence level:
2.4. Ability to reproduce within the territory of the country	Will the species be able to reproduce in the country under current or expected future climatic conditions?	The species is capable of reproducing within the country's territory. The species will be able to reproduce in the country under foreseeable future climatic conditions. The species will not be able to reproduce in the country for the foreseeable future.	2 1 0	Describes the necessary climatic conditions for a species to be able to reproduce. Confidence level:
2.5. Occurrence in Europe	Is the species invasive in Europe?	Viable populations with spreading trends have been identified Small local populations have been identified Individual individuals are detected No	3 2 1 0	Describes known sites of infestation in Europe, their population size and spread trends. Confidence level:





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2.6. Global distribution	What is its global distribution (wild and introduced)?	Wide distribution range, exceeding 15° latitude or longitude on one continent or occurring on several continents and/or parts of the world Small distribution area, species found in a small area on one continent and/or part of the world	3 0	Describes the distribution in the world, both natural distribution and places where the species has been introduced. Confidence level:
2.7 Invasive species	Is the species listed as invasive outside Europe?	Yes No	3 0	Write down the locations where the species has been found to be invasive. Confidence level:
2.8 Taxonomy	Are there other invasive species in the genus?	Yes No	3 0	Write the genus of invasive species. Confidence level:
2.9. Habitability	What habitats/biotopes is the species capable of inhabiting under current climatic conditions?	The species is able to live in natural habitats The species is able to live in disturbed habitats The species lives only in conditions artificially created by man.	4 2 0	Includes habitats in which the species is capable of living, and how large the potential area that the species is capable of inhabiting could be, and identifies risk factors The boundaries of the risk area are identified precisely, for example, the Daugava confluence





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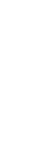
				pool, port areas, South Kurzeme coast. Confidence level:
Part B.3 – Impacts				
Instruction: Only the negative impact of the species is considered.				
Impact on biodiversity and ecosystems				
3.1. Impact on native species	What are the impacts on native species?	Genetic erosion, hybrid formation Competition, predation No effect	4 2 0	Describe the impact, identify native species that are negatively impacted, especially if a negative impact on specially protected species is expected. Confidence level:
3.2. Disease transmission to native species	Does the organism transmit dangerous diseases, pathogens?	Yes No	2 0	Describe diseases transmitted to local populations species and how dangerous these diseases are native species and which species are dangerous. Confidence level:





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3.3. Impact on ecosystems	Can an organism transform natural ecosystems?	Yes No	2 0	Describes which natural ecosystems a species is able to transform, whether these ecosystems are renewable and how big the negative impact is when transforming these ecosystems. Confidence level:
Impact on ecosystem services				
3.4. Ecosystem services	How big is the negative impact of the species on ecosystem services?	Large – impacts are widespread and some ecosystem services are not renewable Medium – impact is local and irreversible, or widespread, but services are renewable Small – there is an impact, but it is local and ecosystem services are renewable None	3 2 1 0	Describes the impact of the species on ecosystem services, whether the services are maintained after the species population is eliminated. renewable, or impact on The availability of specific ecosystem services is local, small-scale or widespread. Confidence level:
Impact on the economy				





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3.5. Economic losses due to the species' current or potential impact	Economic losses due to species impact (per year), significance of impact	Large (e.g. > 1,000,000 euros) Medium (e.g. 100,000 - 1,000,000 euros) Small (e.g. 10 - 100,000 euros) None	3 2 1 0	Used in scientific literature or other The economic losses indicated in studies of this type are averaged over the last ten years or as can be found. If national data are available, they are used. At repeated risk analysis uses average economic losses over the last six years (if possible), the possibility within the limits, indicates what is included in economic losses, the possibility within the limits of: lost resources, monitoring costs, and other costs. After
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				The literature review and data indicate what the approximate economic losses to the country could be as a result of the species' activities. It also includes how large the economic losses will be losses if nothing is done in the future (long-term), or if the impact of the species is reduced by management measures. Confidence level:
3.6. Economic losses to the species existing or due to potential management measures	Economic losses that will occur due to species management measures (per year - preferably in comparable units), significance of impact	Large (e.g. > 1,000,000 euros) Medium (e.g. 100,000 - 1,000,000 euros) Small (e.g. 0 - 100,000 euros) None	3 2 1 0	Used in scientific literature or other costs indicated in studies of the type on average over the last ten years. If national data are available, they are used.





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				repeated risk performing analysis uses the average costs over the last six years, the option within the limits, indicate what is included in the costs, distinguishing between: costs of measures, monitoring systems costs, other costs. Based on the information used, assess what could be the potential costs of species management measures, both for the complete eradication of the species from the national territory and for the control of the species' population within the national territory. Confidence level:
Impact on human health				



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3.7. People health	Negative impact of the species on human health	Major – dangerous widespread impact causing serious and possibly irreversible health damage, may be fatal Moderate – local and causes serious but reversible health damage, or widespread but causes minor and reversible health damage Small – local and causes minor, reversible damage to health None	3 2 1 0	Describes the impact of a species on humans health. Confidence level:
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Part C - Management measures

Criterion	Criterion question	Answer	Notes
Scientific literature or other measures	4.1. Management research has shown effective management measures	With known management measures, the species is capable of eradication With known management measures, the species can be contained No management measures are known, but management measures used for other ecologically similar species may be applicable.	Describes known management measures and their effectiveness in different distributions of the species. Recommends specific management measures. Describes when management measures can eradicate or control a species and when it is not possible to eradicate or control a species.





			limit. Confidence level:
4.2. Effectiveness of current management measures in Latvia	Are current management measures capable of eradicating the species or preventing re-invasion?	<p>Yes, they can completely eradicate the infestation, preventing re-infestation.</p> <p>They can completely eradicate the infestation, but reinfestation is possible.</p> <p>Eradicating the infestation with current measures is difficult</p> <p>Eradication of the infestation with current measures is impossible</p> <p>There are no current management measures in Latvia.</p>	<p>Describes current management measures and assesses their effectiveness in different distribution scenarios of the species, for example, taking into account the distribution trends of the species, the habitats occupied, the age and size of the population. Recommends the necessary management measures, monitoring and surveillance measures so that the effectiveness of the management measures can be assessed.</p> <p>Confidence level:</p>
4.3. Impact on see	Do management measures have negative impacts on native species or ecosystems?	<p>Yes and the impact is significant</p> <p>Yes, but the impact is small</p> <p>No</p>	<p>Describes the impact on native species and ecosystems, recommends what management measures to use and in what cases these measures may be used and in what cases it is not recommended to use these measures.</p> <p>Confidence level:</p>





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4.4. Routes of introduction and spread	Is it possible to limit the routes of introduction and spread?	<p>Yes Yes, but it's complicated. No</p>	Identifies the main pathways of introduction and entry of the species (from Part B of the assessment) and recommends specific possible actions to limit and manage the introduction and spread of the invasive species through these pathways. Confidence level:
4.5. Issuance of permits	Is it permissible to issue permits for an invasive species to be kept under restricted conditions?	<p>Yes No, because the species has very good dispersal routes and it is impossible to ensure its continued spread.</p>	Identify the species' dispersal routes and modes of spread. It is recommended that permits be issued for the invasive species to allow the species to be kept, propagated, and grown under restricted conditions. Confidence level:
4.6. Eradication costs	Do the costs of eradicating a species outweigh the benefits?	<p>Yes, significantly disproportionately exceeds the benefits (for example, by several hundred thousand - this significance is assessed taking into account the current economic situation and opportunities) Yes, but not significantly more than the cost (for example, up to 100,000) No</p>	Conduct and describe an analysis of whether the costs of eradicating the invasive species will outweigh the benefits of eradicating the species, see also criteria 3.5 and 3.6. Recommend whether such costs are necessary, taking into account the feasibility of eradication and the likelihood of re-invasion, and





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			long-term benefits from eradication. Evaluate commercially usable species and whether their commercial use is permissible in relation to benefits and harms.
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Evaluation of results: 1.

The results obtained for each section are added together, obtaining the section result.

2. Each section is assessed separately, drawing conclusions and assessing the level of confidence, after evaluating the sections and drawing conclusions. evaluates the risk assessment as a whole and draws conclusions, and assesses the level of confidence in the reliability of the risk assessment.

Criterion	Result	Overall confidence level	Conclusions
Introduction, entry routes and spread	0/30		
Probability of settling	0/24		
Impacts	0/20		

Overall conclusions of the risk analysis and level of confidence in the reliability of the risk analysis:



Annex 3

Analysis of management measures

The thesis-antithesis principle is used in the analysis of management measures. The thesis and antithesis contain opposing, mutually exclusive statements about the distribution of the species, management measures and their impacts and costs. The number of the next step or the corresponding management strategy is indicated opposite the corresponding statement. If the description of the thesis does not match the situation, the antithesis (-) and the step number indicated next to it are used. If the strategy number is indicated opposite the thesis or antithesis, the analysis is complete.

No.	Thesis – antithesis	View
1.	Taking invasive species management measures to protect native species or ecosystems - does not affect - negatively affects	2. theses Strategy 4
2.	The population of the invasive species in the country is - numerous - small or made up of separate individuals - absent or detected for the first time	3. theses 4. theses Strategy 1
3.	Management measures can eradicate - widespread and large populations - local and small populations	4. theses 7. theses
4.	Effectiveness of management measures - it is possible to estimate - it is not possible to estimate	5. theses Strategy 4
5.	Re-invasion of the species - possible, but it is possible to detect and control it in time - frequent, it is difficult to detect and impossible to control	6. theses Strategy 4
6.	Cost of species eradication - does not exceed the benefits of eliminating the species - disproportionately outweighs the benefits of eliminating the species	Strategy 2 Strategy 4
7.	Eradicating local and small populations - it is possible to limit the further spread of the species - it is not possible to limit the further spread of the species	Strategy 3 Strategy 4



Annex 4

Map of European biogeographic regions

